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Obesity as an independent risk factor for COVID-19 severity and mortality (Review)

Tadayon Najafabadi B, Rayner DG, Shokraee K, Shokraie K, Panahi P, Rastgou P, Seirafianpour F, Momeni Landi F, Alinia P, Parnianfard N, Hemmati N, Banivaheb B, Radmanesh R, Alvand S, Shahbazi P, Dehghanbanadaki H, Shaker E, Same K, Mohammadi E, Malik A, Srivastava A, Nejat P, Tamara A, Chi Y, Yuan Y, Hajizadeh N, Chan C, Zhen J, Tahapary D, Anderson L, Apatu E, Schoonees A, Naude CE, Thabane L, Foroutan F

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[Prognosis Review]

Obesity as an independent risk factor for COVID-19 severity and mortality

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ABSTRACT

Background

Since December 2019, the world has struggled with the COVID-19 pandemic. Even after the introduction of various vaccines, this disease still takes a considerable toll. In order to improve the optimal allocation of resources and communication of prognosis, healthcare providers

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and patients need an accurate understanding of factors (such as obesity) that are associated with a higher risk of adverse outcomes from the COVID-19 infection.

Objectives

To evaluate obesity as an independent prognostic factor for COVID-19 severity and mortality among adult patients in whom infection with the COVID-19 virus is confirmed.

Search methods

MEDLINE, Embase, two COVID-19 reference collections, and four Chinese biomedical databases were searched up to April 2021.

Selection criteria

We included case-control, case-series, prospective and retrospective cohort studies, and secondary analyses of randomised controlled trials if they evaluated associations between obesity and COVID-19 adverse outcomes including mortality, mechanical ventilation, intensive care unit (ICU) admission, hospitalisation, severe COVID, and COVID pneumonia. Given our interest in ascertaining the independent association between obesity and these outcomes, we selected studies that adjusted for at least one factor other than obesity. Studies were evaluated for inclusion by two independent reviewers working in duplicate.

Data collection and analysis

Using standardised data extraction forms, we extracted relevant information from the included studies. When appropriate, we pooled the estimates of association across studies with the use of random-effects meta-analyses. The Quality in Prognostic Studies (QUIPS) tool provided the platform for assessing the risk of bias across each included study. In our main comparison, we conducted meta-analyses for each obesity class separately. We also meta-analysed unclassified obesity and obesity as a continuous variable (5 kg/m^2 increase in BMI (body mass index)). We used the GRADE framework to rate our certainty in the importance of the association observed between obesity and each outcome. As obesity is closely associated with other comorbidities, we decided to prespecify the minimum adjustment set of variables including age, sex, diabetes, hypertension, and cardiovascular disease for subgroup analysis.

Main results

We identified 171 studies, 149 of which were included in meta-analyses. As compared to 'normal' BMI (18.5 to 24.9 kg/m^2) or patients without obesity, those with obesity classes I (BMI 30 to 35 kg/m^2), and II (BMI 35 to 40 kg/m^2) were not at increased odds for mortality (Class I: odds ratio [OR] 1.04, 95% confidence interval [CI] 0.94 to 1.16, high certainty (15 studies, 335,209 participants); Class II: OR 1.16, 95% CI 0.99 to 1.36, high certainty (11 studies, 317,925 participants)). However, those with class III obesity (BMI 40 kg/m^2 and above) may be at increased odds for mortality (Class III: OR 1.67, 95% CI 1.39 to 2.00, low certainty, (19 studies, 354,967 participants)) compared to normal BMI or patients without obesity. For mechanical ventilation, we observed increasing odds with higher classes of obesity in comparison to normal BMI or patients without obesity (class I: OR 1.38, 95% CI 1.20 to 1.59, 10 studies, 187,895 participants, moderate certainty; class II: OR 1.67, 95% CI 1.42 to 1.96, 6 studies, 171,149 participants, high certainty; class III: OR 2.17, 95% CI 1.59 to 2.97, 12 studies, 174,520 participants, high certainty). However, we did not observe a dose-response relationship across increasing obesity classifications for ICU admission and hospitalisation.

Authors' conclusions

Our findings suggest that obesity is an important independent prognostic factor in the setting of COVID-19. Consideration of obesity may inform the optimal management and allocation of limited resources in the care of COVID-19 patients.

PLAIN LANGUAGE SUMMARY

Obesity and adverse COVID-19 outcomes

What are the effects of obesity on COVID-19 outcomes?

Key messages

• There is enough evidence to support the finding that extreme obesity (BMI > 40 kg/m^2) increases the chance of a person dying, requiring a breathing tube, being hospitalised, and being admitted to the ICU due to COVID-19.

• Obesity in general will result in a person requiring a breathing tube.

• The higher one's BMI gets, the higher the chance that a person will suffer from severe COVID-19 disease.

What is obesity?

Obesity is defined as abnormal or excessive fat accumulation in different parts of the human body and it presents a risk to health. To assess obesity, different indices such as body mass index (BMI) can be used, which is one's weight in kilograms divided by the square of height in

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metres. The WHO has classified obesity into three classes. According to this classification, class I obesity includes a BMI ranging from 30 to 35 kg/m^2, class II from 35 to 40 kg/m^2, and class III from 40 kg/m^2 and more.

What did we want to find out?

We wanted to find out whether obesity has any effects on mortality, requiring a breathing tube, hospitalisation, ICU admission, severe disease or pneumonia due to COVID-19 disease.

What did we do?

We conducted a systematic search in medical databases for evidence looking at the association of obesity and mortality and other outcomes from December 2019 to April 2021. We then categorised and rated these findings based on our confidence in the evidence, study size, and quality.

What did we find?

We identified 171 eligible studies, with 149 studies (12,045,976 participants) providing quantitative data for at least one of our meta-analyses. In terms of the outcomes, 111 studies reported on mortality, 48 on requiring a breathing tube, 47 on ICU admission, 34 on hospitalisation, 32 on severe COVID-19, six on pneumonia, five on length of hospitalisation, two on length of ICU admission, and one on the duration of the requirement of a breathing tube.

Main results

Our findings indicate that there is a high certainty of evidence that class III obesity is associated with an increased risk of mortality among COVID-19 patients. However, we found that, in mild cases of obesity (classes I and II), this factor might not be independently associated with increased risk of mortality in COVID-19 patients. Similarly, we are very certain that obesity is an independent important factor associated with the risk of requiring a breathing tube in COVID-19 patients. However, the effect estimate sizes were not consistent with a dose-response relationship across increasing obesity classes for ICU admission, hospitalisation, severe COVID-19 disease and pneumonia. To conclude, this review investigated the potential association between obesity and adverse COVID-19 outcomes. We were able to gather evidence from multiple studies and concluded that the association of obesity with mortality and requiring a breathing tube is of high certainty.

What are the limitations of the evidence?

Although BMI is a widely used measurement, the relationship between BMI and body fat is non-linear. Moreover, our review did not discriminate against self-reported and measured BMI. Finally, we were unable to keep up with the rapid pace of publications on COVID-19 despite our best efforts.

How up-to-date is the evidence?
The evidence is up-to-date to April 2021.

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SUMMARY OF FINDINGS

Summary of findings 1. Obesity Class I compared to Normal Weight or Non-Obese for Adults with COVID-19

Obesity class I (30 kg/m² ≤ BMI < 35 kg/m²) compared to normal BMI or patients with a BMI < 30 kg/m² for adults with COVID-19

Patient or population: Adults with COVID-19
Settings: Community and in-hospital

Outcomes *Time frame of absolute effects*	Absolute effects from study(ies)* (95% CI)			Relative effect 95% CI	No of Participants (studies)	Quality of the evidence (GRADE)	Plain language summary
	Normal BMI or Non-Obese	Obesity Class I	Difference with Obesity Class I				
Mortality *(in-hospital)*	180 per 1000	186 per 1000	6 more per 1000 (9 fewer to 23 more)	Odds Ratio: 1.04(CI 95% 0.94 to 1.16)[1]	335,209 (15)	⊕⊕⊕⊕ HIGH[2]	Obesity class I has little or no difference on mortality.
Mechanical ventilation *(in-hospital)*	198 per 1000	254 per 1000	56 more per 1000 (31 more to 84 more)	Odds Ratio: 1.38(CI 95% 1.2 to 1.59)[3]	187,895 (10)	⊕⊕⊕⊖ MODERATE[4]	Obesity class I probably increases the risk of mechanical ventilation.
ICU admission *(in-hospital)*	208 per 1000	263 per 1000	55 more per 1000 (10 more to 107 more)	Odds Ratio: 1.36(CI 95% 1.06 to 1.75)[5]	162,741 (7)	⊕⊕⊕⊖ MODERATE[6]	Obesity class I probably increases the risk of ICU admission.
Hospitalisation *(30-days, community)*	146 per 1000	141 per 1000	5 fewer per 1000 (23 fewer to 17 more)	Odds Ratio: 0.96(CI 95% 0.82 to 1.14)[7]	515,155 (5)	⊕⊕⊕⊖ MODERATE[8]	Obesity class I probably has little or no difference on the risk of hospitalisation.
Severe COVID-19 *(in-hospital)*	158 per 1000	217 per 1000	59 more per 1000 (21 more to 102 more)	Odds Ratio: 1.48(CI 95% 1.16 to 1.87)[9]	1040 (3)	⊕⊕⊖⊖ LOW[10]	Obesity class I may increase the risk of severe Covid-19.
Pneumonia	-	-	-	-	-	-	No studies were found that looked at the impact of obesity class I on pneumonia.

*The basis for the **control group absolute risks** from the study(ies) is mean risk across study(ies) unless otherwise stated in comments. **The intervention absolute risk and difference** is based on the risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

GRADE Working User Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.

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Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

1.Systematic review. Baseline/comparator control arm of reference used for intervention.
2. No reasons to rate down.
3. Systematic review. Baseline/comparator control arm of reference used for intervention.
4. Imprecision: serious. The lower bound 95% CI crossed our absolute risk difference of 50 per 1000 patients followed.
5. Systematic review. Baseline/comparator control arm of reference used for intervention.
6. Inconsistency: serious. Lack of overlap in point estimates and 95% CI across studies. Our subgroup analyses failed to explain the observed heterogeneity. Low credibility (based on ICEMAN) for one statistically significant subgroup analysis based on the reference group.
7. Systematic review. Baseline/comparator control arm of reference used for intervention.
8. Inconsistency: serious. A significant subgroup effect was observed based on the adjustment criteria. The credibility of this subgroup effect, however, was low (based on ICEMAN).
9. Systematic review. Baseline/comparator control arm of reference used for intervention.
10. Risk of Bias: serious. 2 of 3 studies were at an overall high risk of bias. Imprecision: serious. The lower bound 95% CI crossed our prespecified absolute risk difference threshold of 50 per 1000 patients followed.
Note: BMI - Body Mass Index; CI - Confidence Interval; GRADE - Grading of Recommendations, Assessment, Development and Evaluations

Summary of findings 2. Obesity Class II compared to Normal Weight or Non-Obese for Adults with COVID-19

Obesity Class II (35 kg/m^2 ≤ BMI < 40 kg/m^2) compared to normal BMI or patients with a BMI < 30 kg/m^2 for adults with COVID-19

Patient or population: Adults with COVID-19
Settings: Community and in-hospital

Outcomes *Time frame of absolute effects*	**Absolute effects from study(ies)* (95% CI)**			**Relative effect 95% CI**	**No of Participants (studies)**	**Quality of the evidence (GRADE)**	**Plain language summary**
	Normal BMI or Non-Obese	**Obesity Class II**	**Difference with Obesity Class II**				
Mortality *(in-hospital)*	180 per 1000	203 per 1000 (178 to 244)	23 more per 1000 (1 fewer to 50 more)	Odds Ratio: 1.16(CI 95% 0.99 to 1.36)[1]	317,925 (11)	⊕⊕⊕⊕ HIGH[2]	Obesity class II has little or no difference on the risk of mortality.
Mechanical ventilation *(in-hospital)*	198 per 1000	292 per 1000 (281 to 388)	94 more per 1000 (62 more to 128 more)	Odds Ratio: 1.67(CI 95% 1.42 to 1.96)[3]	171,149 (6)	⊕⊕⊕⊕ HIGH[4]	Obesity class II increases the risk of mechanical ventilation.

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ICU admission *(in-hospital)*	208 per 1000	211 per 1000 (187 to 239)	3 more per 1000 (17 fewer to 24 more)	Odds Ratio: 1.02(CI 95% 0.9 to 1.15)[7]	157,665 (4)	⊕⊕⊖⊖ LOW[6]	Obesity class II may have little or no difference in the risk of ICU admission.
Hospitalisation *(30-days, community)*	209 per 1000	216 per 1000 (188 to 250)	7 more per 1000 (17 fewer to 32 more)	Odds Ratio: 1.04(CI 95% 0.9 to 1.2)[9]	293,707 (3)	⊕⊕⊕⊖ MODERATE[8]	Obesity class II probably has little or no difference on the risk of hospitalisation.
Severe COVID	-	-	-	-	-	-	No studies were found that looked at the impact of obesity class II on severe COVID.
Pneumonia	-	-	-	-	-	-	No studies were found that looked at the impact of obesity class II on pneumonia.

*The basis for the **control group absolute risks** from the study(ies) is mean risk across study(ies) unless otherwise stated in comments. **The intervention absolute risk and difference** is based on the risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

GRADE Working UserGroup grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

1. Systematic review. Baseline/comparator control arm of reference used for intervention.
2. No reasons to rate down.
3. Systematic review. Baseline/comparator control arm of reference used for intervention.
4. No reasons to rate down.
5. Systematic review. Baseline/comparator control arm of reference used for intervention.
6. Risk of Bias: very serious. There were only 4 studies in the meta-analysis and about 70% of the total study weights came from the 3 studies at a high risk of bias.
7. Systematic review. Baseline/comparator control arm of reference used for intervention.
8. Inconsistency: serious. One study that did not adjust for the prespecified adjustment set and was at low risk of bias showed a statistically significant larger effect size. The credibility of this subgroup effect, however, was low (based on ICEMAN). Therefore, we decided to rate down for inconsistency.
Note: BMI - Body Mass Index; CI - Confidence Interval; GRADE - Grading of Recommendations, Assessment, Development and Evaluations

Summary of findings 3. Obesity Class III compared to Normal BMI, Non-obese, or BMI < 40 for Adults with COVID-19

Obesity class III (BMI ≥ 40 kg/m^2) compared to normal weight, patients with a BMI < 30 kg/m^2, or BMI < 40 for adults with COVID-19

Patient or population: Adults with COVID-19

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Settings: Community and in-hospital

Outcomes *Time frame of absolute effects*	Absolute effects from study(ies)* (95% CI)			Relative effect 95% CI	No of Participants (studies)	Quality of the evidence (GRADE)	Plain language summary
	Normal BMI, Non-obese, or BMI < 40	Obesity Class III	Difference with Obesity Class III				
Mortality *(in-hospital)*	180 per 1000	268 per 1000 (250 to 360)	88 more per 1000 (54 more to 125 more)	Odds Ratio: 1.67 (CI 95% 1.39 to 2.0)[1]	354,967 (19)	⊕⊕⊖⊖ LOW[2]	Obesity class III may increase the risk of mortality.
Mechanical ventilation *(in-hospital)*	198 per 1000	349 per 1000 (314 to 588)	151 more per 1000 (84 more to 225 more)	Odds Ratio: 2.17 (CI 95% 1.59 to 2.97)[3]	174,520 (11)	⊕⊕⊕⊕ HIGH[4]	Obesity class III increases the risk of mechanical ventilation.
ICU admission (adjusted for at least DM, HTN, cardiovascular disease, age, and sex) *(in-hospital)*	208 per 1000	240 per 1000 (201 to 309)	32 more per 1000 (5 fewer to 73 more)	Odds Ratio: 1.2 (CI 95% 0.97 to 1.49)[5]	155,405 (3)	⊕⊕⊕⊖ MODERATE[6]	Obesity class III probably has little or no difference on the risk of ICU admission when adjusted for DM, HTN, cardiovascular disease, age, and sex.
Hospitalisation (adjusted for DM, HTN, cardiovascular disease, age, and sex) *(30-days, community)*	243 per 1000	302 per 1000 (289 to 369)	59 more per 1000 (33 more to 85 more)	Odds Ratio: 1.35 (CI 95% 1.19 to 1.52)[7]	293,004 (4)	⊕⊕⊖⊖ LOW[8]	Obesity class III may increase the risk of hospitalisation when adjusted for DM, HTN, cardiovascular disease, age, and sex.
ICU admission *(in-hospital)*	208 per 1000	372 per 1000 (270 to 488)	164 more per 1000 (62 more to 280 more)	Odds Ratio: 2.26 (CI 95% 1.41 to 3.63)	15,691 (7)	⊕⊕⊖⊖ LOW[9]	Obesity class III may increase the risk of ICU admission.
Hospitalisation *(30-days, community)*	243 per 1000	362 per 1000 (310 to 420)	119 more per 1000 (67 more to 177 more)	Odds Ratio: 1.77 (CI 95% 1.4 to 2.26)	747,176 (7)	⊕⊕⊖⊖ LOW[10]	Obesity class III may increase the risk of hospitalisation.

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Severe COVID	-	-	-	-	-	-	No studies were found that looked at the impact of obesity class III on severe COVID.
.Pneumonia	-	-	-	-	-	-	No studies were found that looked at the impact of obesity class III on pneumonia.

*The basis for the **control group absolute risks** from the study(ies) is mean risk across study(ies) unless otherwise stated in comments. **The intervention absolute risk and difference** is based on the risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

GRADE Working UserGroup grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

1. Systematic review. Baseline/comparator control arm of reference used for intervention.
2. Inconsistency: serious. The visual inspection of the forest plot indicated considerable CIs not overlapping with a high I squared value. None of the prespecified subgroup analyses could explain the heterogeneity. Publication bias: serious. Asymmetrical funnel plot.
3. Systematic review. Baseline/comparator control arm of reference used for intervention.
4. No reasons to rate down.
5. Systematic review. Baseline/comparator control arm of reference used for intervention.
6. Imprecision: serious. The confidence interval for absolute risk difference crossed the prespecified threshold of 50 per 1000 COVID patients.
7. Systematic review. Baseline/comparator control arm of reference used for intervention.
8. Inconsistency: serious. Two studies had non-overlapping CIs. The I-squared value was considerably high. Imprecision: serious. A sensitivity analysis that omits the two studies with different CIs changes the interpretation of the results, therefore, we decided to rate down for imprecision and inconsistency twice. The CI also crossed the prespecified threshold.
9. Risk of Bias: serious. More than 50% of the total weight of the analysis fell on the studies at a high risk of bias. Furthermore, the effect estimate from the low risk of bias studies was too wide to provide a basis for comparison with the overall effect estimate. Inconsistency: serious. The effect estimates from different studies had minimal overlapping confidence intervals with very different indications for interpretation of the results.
10. Inconsistency: very serious. The effect estimate CIs from different studies were very far apart from each other with each warranting different interpretations of the results. Furthermore, the pooled effects for subgroups based on the adjustment set showed very different estimates.
Note: BMI - Body Mass Index; CI - Confidence Interval; GRADE - Grading of Recommendations, Assessment, Development and Evaluations

Summary of findings 4. Obesity (Unclassified) compared to Normal Weight or Non-Obese for Adults with COVID-19

Obesity (unclassified) compared to normal BMI or patients with a BMI < 30 kg/m^2 for adults with COVID-19

Patient or population: Adults with COVID-19

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Settings: Community and in-hospital

Outcomes *Time frame of absolute effects*	Absolute effects from study(ies)* (95% CI)			Relative effect 95% CI	No of Participants (studies)	Quality of the evidence (GRADE)	Plain language summary
	Normal BMI or Non-Obese	Obesity (Unclassified)	Difference with Obesity (Unclassified)				
Mortality *(in-hospital)*	180 per 1000	229 per 1000 (230 to 255)	49 more per 1000 (39 more to 58 more)	Odds Ratio: 1.35 (CI 95% 1.28 to 1.42)[1]	1,307,520 (54)	⊕⊕⊖⊖ LOW[2]	Obesity (unclassified) may have little or no difference on the risk of mortality.
Mechanical ventilation *(in-hospital)*	198 per 1000	294 per 1000 (285 to 394)	96 more per 1000 (64 more to 131 more)	Odds Ratio: 1.69 (CI 95%1.44 to 1.99)[3]	62,348 (21)	⊕⊕⊖⊖ LOW[4]	Obesity (unclassified) may increase the risk of mechanical ventilation.
ICU admission *(in-hospital)*	208 per 1000	328 per 1000 (291 to 367)	120 more per 1000 (83 more to 159 more)	Odds Ratio: 1.86 (CI 95% 1.56 to 2.21)[5]	70,529 (21)	⊕⊕⊕⊖ MODERATE[6]	Obesity (unclassified) probably increases the risk of ICU admission.
Hospitalisation (adjusted for age, sex, DM, HTN, and cardiovascular disease) *(30 days, community)*	257 per 1000	312 per 1000 (308 to 370)	55 more per 1000 (36 more to 75 more)	Odds Ratio: 1.31 (CI 95% 1.2 to 1.44)[7]	510,405 (14)	⊕⊕⊕⊖ MODERATE[8]	Obesity (unclassified) probably increases the risk of hospitalisation.
Severe COVID *(30-days, community)*	191 per 1000	314 per 1000 (309 to 443)	123 more per 1000 (86 more to 163 more)	Odds Ratio: 1.94 (CI 95% 1.62 to 2.32)[9]	878,804 (19)	⊕⊕⊕⊕ HIGH[10]	Obesity (unclassified) increases the risk of severe COVID.
Pneumonia *(30-days, community)*	300 per 1000	382 per 1000 (363 to 516)	82 more per 1000 (41 more to 124 more)	Odds Ratio: 1.44 (CI 95% 1.21 to 1.72)[11]	35,924 (5)	⊕⊕⊕⊖ MODERATE[12]	Obesity (unclassified) probably increases the chance of pneumonia due to COVID.
Hospitalisation *(30 days, community)*	257 per 1000	340 per 1000 (317 to 362)	83 more per 1000 (60 more to 105 more)	Odds Ratio: 1.31 (CI 95% 1.2 to 1.44)[7]	515,517 (20)	⊕⊕⊖⊖ LOW[13]	Obesity (unclassified) may increase the risk of hospitalisation.

*The basis for the **control group absolute risks** from the study(ies) is mean risk across study(ies) unless otherwise stated in comments. **The intervention absolute risk and difference** is based on the risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

GRADE Working UserGroup grades of evidence

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High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

1. Systematic review. Baseline/comparator control arm of reference used for intervention.
2. Inconsistency: serious. There was a considerable I-squared value. We decided to rate down twice for inconsistency and imprecision. Imprecision: serious. The pooled effect estimate was right below our prespecified threshold of absolute risk difference of 50 in every 1000 COVID patients.
3. Systematic review. Baseline/comparator control arm of reference used for intervention.
4. Inconsistency: serious. Many CIs did not overlap and there was a high I-squared value. The subgroup analysis did not explain the heterogeneity. Publication bias: serious. Asymmetrical funnel plot.
5. Systematic review. Baseline/comparator control arm of reference used for intervention.
6. Inconsistency: serious. The confidence interval of some of the studies did not overlap with those of most included studies/the point estimate of some of the included studies. The magnitude of statistical heterogeneity was high, with an I-squared of about 80%.
7. Systematic review. Baseline/comparator control arm of reference used for intervention.
8. Imprecision: serious. Even though a part of the width of the confidence interval was due to the heterogeneity, the pooled confidence interval spanned rather symmetrically around the absolute risk difference threshold of 50 in 1000.
9. Systematic review. Baseline/comparator control arm of reference used for intervention.
10. No reasons to rate down.
11. Systematic review. Baseline/comparator control arm of reference used for intervention.
12.Imprecision: serious. The lower bound of the confidence interval crossed the prespecified threshold of 50 in 1000 for the absolute risk difference.
13. Inconsistency: serious. Some of the confidence intervals did not overlap with the pooled confidence interval. These different studies require different and conflicting interpretation of their results. Publication bias: serious. An asymmetric funnel plot was observed.
Note: BMI - Body Mass Index; CI - Confidence Interval; GRADE - Grading of Recommendations, Assessment, Development and Evaluations

Summary of findings 5. Every 5 units (kg/m^2) increase in BMI compared to N/A for Adults with COVID

Every 5 Units (kg/m^2) Increase in BMI compared to N/A for Adults with COVID

Patient or population: Adults with COVID
Settings: Community and in-hospital

Outcomes *Time frame of absolute effects*	Absolute effects from study(ies)* (95% CI)			Relative effect 95% CI	No of Participants (studies), follow-up	Quality of the evidence (GRADE)	Plain language summary
	N/A	Every 5 Units (Kg/m^2) Increase in BMI	Difference with Every 5 Units (Kg/m^2) Increase in BMI				

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Mortality *(in-hospital)*	180 per 1000	203 per 1000 (194 to 223)	23 more per 1000 (12 more to 34 more)	Odds Ratio: 1.16(CI 95% 1.08 to 1.24)[1]	6,937,150 (10)	⊕⊕⊕⊕ HIGH[2]	Every 5 units (kg/m^2) increase in BMI increases the risk of mortality.
Mechanical ventilation *(in-hospital)*	195 per 1000	237 per 1000 (241 to 255)	42 more per 1000 (36 more to 46 more)	Odds Ratio: 1.28(CI 95% 1.24 to 1.31)[3]	13,527 (2)	⊕⊕⊕⊖ MODERATE[4]	Every 5 units (kg/m^2) increase in BMI probably increases the risk of mechanical ventilation.
ICU admission	-	-	-	-	-	-	No studies were found that looked at the impact of continuous obesity on ICU admission.
Hospitalisation *(30 days, community)*	200 per 1000	226 per 1000 (209 to 226)	26 more per 1000 (8 more to 20 more)	Odds Ratio: 1.17(CI 95% 1.05 to 1.31)[5]	6,911,600 (3)	⊕⊕⊖⊖ LOW[6]	Every 5 units (kg/m^2) increase in BMI may increase the risk of hospitalisation.
Severe COVID (*community*)	175 per 1000	292 per 1000 (243 to 472)	117 more per 1000 (53 more to 189 more)	Odds Ratio: 1.94(CI 95% 1.39 to 2.7)[7]	1041 (5)	⊕⊕⊖⊖ LOW[8]	Every 5 units (kg/m^2) increase in BMI may increase the risk of severe COVID.
Pneumonia	-	-	-	-	-	-	No studies were found that looked at the impact of continuous obesity on pneumonia.

*The basis for the **control group absolute risks** from the study(ies) is mean risk across study(ies) unless otherwise stated in comments. **The intervention absolute risk and difference** is based on the risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

GRADE Working UserGroup grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

1. Systematic review. Baseline/comparator control arm of reference used for intervention.
2. No reasons to rate down.
3. Systematic review. Baseline/comparator control arm of reference used for intervention.
4. Imprecision: serious. For this analysis, as the exposure is measured was a continuous variable, we considered no effect as the threshold. However, the limited number of studies and patients compelled us to rate down by one level.
5. Systematic review. Baseline/comparator control arm of reference used for intervention.

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6. Inconsistency: serious. The direction of the effect was not consistent between the included studies. Imprecision: serious. Even though the total number of patients in the analysis was considerable, most came from one study.
7. Systematic review. Baseline/comparator control arm of reference used for intervention.
8. Risk of Bias: serious. Most of the weight of the analysis was built up of studies at a high risk of bias. Imprecision: serious. The number of participants in the analysis was low.
Note: BMI - Body Mass Index; CI - Confidence Interval; GRADE - Grading of Recommendations, Assessment, Development and Evaluations

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BACKGROUND

1.1. Brief description of the condition and context

In December 2019, a novel coronavirus (SARS-CoV-2) began causing respiratory infections in Wuhan, China. On February 11 2020, the World Health Organization (WHO) classified the virus causing these severe infections as COVID-19 and declared a global pandemic on March 11, 2020 (Cascella 2022). Due to the novelty of COVID-19, researchers around the world are working to understand the prognostic factors that are associated with COVID-19 severity and mortality in order to develop suggestions and guidelines to promote the safety of the public. As of now, various vaccines that are effective against the virus have been introduced (CDC 2022). In many developed countries such as the United States (US), Canada, and the United Kingdom (UK), a considerable proportion of the population has been vaccinated. However, this has not yet stopped the emergence of new COVID-19 variants of concern (WHO 2022). In fact, more than 2 years after the beginning of the pandemic, the high number of infections has imposed a crippling burden on healthcare systems around the world. As such, the COVID-19 pandemic continues to utilise a great proportion of healthcare resources without a clear end in sight. Factors that can help in identifying the most vulnerable individuals may assist in better allocating the limited resources. To this end, the goal of our review is to evaluate the independent association between obesity with COVID-19 outcomes.

1.2. Description of the prognostic factor

Obesity is a complex chronic condition associated with numerous predisposing factors such as genetics, social determinants (e.g. income, family eating patterns), environmental conditions (e.g. geographical region, access to transportation), and behavioural factors (e.g. sleep, sedentary lifestyles). The World Health Organization (WHO) defines obesity as a body mass index (BMI) of 30 kg/m^2 or higher (WHO 2021). This organisation, further, classifies obesity into three categories with increasing BMI (class I: BMI from 30 to 34.9 kg/m^2, Class II: BMI from 35 to 39.9 kg/m^2, and class III: BMI of 40 kg/m^2 and above). Importantly, the global prevalence of obesity is continually rising (Inoue 2018; WHO 2021; Wong 2020). In 2016, 13% of adults (aged 18 years and over) had obesity, and this is predicted to rise to 16.1% by 2025 (WHO 2021; World Obesity 2022). Moreover, obesity is classified by the WHO as a disease, and is also a known prognostic and risk factor for many health conditions, including diabetes, cardiovascular diseases, and cancer (Ayoub 2019; Cefalu 2015; Fruh 2017; Guh 2009). Patients with obesity have been shown to have dysregulated immune responses and chronic low-grade inflammation accompanied by elevated levels of pro-inflammatory cytokines, suggesting that these individuals may be more susceptible to hyperinflammation (Ritter 2020). Likewise, obesity is associated with reduced pulmonary function, including expiratory reserve volume and functional capacity (Dietz 2020). Both of these factors may contribute to poorer prognosis from COVID-19 in patients with obesity (Muscogiuri 2022).

1.3. Health outcomes

Even though the rate of severe adverse events among those who contract the virus remains relatively low, the very contagious nature of the disease has resulted in billions of infections and, consequently, a heavy burden on healthcare systems worldwide (CDC 2022; Chavez-MacGregor 2021; Schneider 2021). The range of COVID-19 symptoms varies considerably. About a third of the infected individuals remain asymptomatic, while the other two-thirds could develop symptoms ranging from mild flu-like symptoms to severe respiratory distress syndromes requiring oxygenation, hospitalisation, intensive care unit (ICU) admission, mechanical ventilation, and even death (Thevarajan 2020). Other serious complications following this infection include cardiac, thromboembolic, neurologic, and inflammatory complications. According to the data available from the United States Center for Disease Control (CDC), amongst the approximately 70 million reported cases of COVID disease in January 2022 in the US, more than 860,000 patients died (CDC 2022).

The time to recovery following initial symptoms can be quite different based on the patient's age, comorbidities, and severity of disease. Usually, healthy young adults would be symptom-free in as soon as two weeks, while others might suffer from symptoms for much longer (Sykes 2021).

1.4. Why it is important to do this review

Emerging evidence suggests that obesity increases the severity of COVID-19 and the risk of mortality. Several systematic reviews and meta-analyses have reviewed studies assessing the prognostic value of obesity for COVID-19 severity (Huang 2020; Hussain 2020; Izcovich 2020; Popkin 2020; Tamara 2020; Tocalini 2020; Yang 2020). Nonetheless, the studies in these reviews provide conflicting conclusions about the prognostic value of obesity. Some reviews suggest that individuals with obesity are at greater risk for adverse outcomes as compared to individuals with normal weight (Huang 2020; Izcovich 2020; Tamara 2020; Yang 2020). In contrast, a review by Tocalini 2020 noted that there is no significant association between obesity and in-ICU COVID-19 mortality. Thus far, however, few of these reviews considered the role of adjusting for covariates in the association between obesity and the COVID-19 adverse outcomes. The observed heterogeneity and the consequent conflicting conclusions amongst the previous primary studies may be related to the extent of adjustment for other covariates. We conducted our systematic review with the aim of clarifying the inconsistency observed across studies by 1) using a more comprehensive search to identify all studies evaluating the association between obesity and adverse outcomes related to COVID-19, and 2) investigating the role of obesity as an independent prognostic factor for COVID-19 mortality and disease severity. Furthermore, to evaluate how reliable the results are and to assess the certainty in the body of evidence, we used the GRADE methodology (Guyatt 2008). The results of this review may provide evidence for guidelines on the management of COVID-19 patients.

OBJECTIVES

The main objective of this review was to evaluate obesity as an independent prognostic factor for COVID-19 severity and mortality among adult patients in whom infection with the COVID-19 virus is confirmed.

METHODS

3.1 Protocol Registration

We registered the protocol of our systematic review and meta-analysis in the International Prospective Register of Systematic Reviews (CRD42020190687). This review is reported according to

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the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines (Page 2021).

3.2 Criteria for Considering Studies for This Review

3.2.1. Eligibility Criteria

We used the following inclusion criteria for study selection: (i) Study design: case-control, case-series, prospective and retrospective cohort studies, registry data, and secondary analyses of randomised controlled trials; (ii) study participants over 18 years of age who had confirmed COVID-19 infections; (iii) outcomes reported were at least one of the following: mortality, mechanical ventilation, ICU admission, severe COVID, and pneumonia; (iv) statistical analysis included multivariable analyses.

According to the knowledge accumulated to date from the pandemic, children are at minimal risk of contracting the virus and experiencing its adverse outcomes. Therefore, we decided to include only adults above 18 years of age in our review (Drouin 2021). We specified that if more than 10% of an original study population consists of participants below 18 years of age, the study would be excluded. Furthermore, we only included studies that report the prognostic value of obesity among patients with confirmed COVID-19. However, we did not limit the inclusion to the confirmation method used in the study.

There are numerous methods used for measuring and classifying obesity. The most commonly used indicator is BMI, with further classification of obesity categories based on BMI thresholds. BMI was used to classify obesity into obesity classes I, II, and III. According to the WHO classification, class I obesity includes the BMI range from 30 to 35 kg/m^2, class II from 35 to 40 kg/m^2, and class III 40 kg/m^2 and more (WHO 2000). Other indicators include waist circumference, waist-to-hip circumference ratio, or other adiposity indicators. We did not exclude the studies that did not use BMI. However, for meta-analyses, we only used obesity categories based on BMI and BMI as a continuous variable. The main reason for this decision was to minimise the degree of expected clinical heterogeneity. Since some countries use lower thresholds for classifying obesity (lower than 30 kg/m^2), we accepted the threshold set out in the original studies for our obesity categories. Finally, we included studies that measured and classified obesity prior to the occurrence of our outcomes of interest.

The primary outcomes prespecified in our study protocol were mortality (key outcome), mechanical ventilation, ICU admission, hospitalisation, oxygen requirement, and profound health complications resulting from COVID-19. Due to the availability of resources and practice variations in the administration of oxygen, we decided to omit oxygen requirement as an outcome. We used severe COVID and pneumonia as profound COVID-19 complications because of the availability of data. Furthermore, we included both the binary reporting of hospitalisation and ICU admission, as well as their continuous measures, length of hospitalisation, and ICU admission. We did not place any restriction on the timing of outcome assessment, and included studies with any follow-up period.

This study aimed to further add to the current understanding of the effects of obesity by investigating its independent association with the outcomes. To report independent associations, the most common method that researchers use in observational studies is to statistically adjust the effect estimate for other possible prognostic factors. Therefore, we decided to only include original studies that at least adjusted their reported obesity effect estimate for another factor. In other words, we only included studies that investigated the (more) independent association between obesity and the outcomes by conducting a multivariable analysis. Due to the large number of included studies, we did not request data that we could not find from the articles from the study authors, for feasibility reasons.

3.3 Search Methods for Identification of Studies

3.3.1. Electronic Databases and Other Sources

Two information specialists developed and conducted systematic searches in the following English and Chinese databases in April 2021 for studies without language or publication status restrictions:

- MEDLINE (via PubMed) (1 Dec 2019 to 23 April 2021)
- Embase (via Ovid) (1 Dec 2019 to 22 April 2021)
- Cochrane COVID-19 Study Register (https://covid-19.cochrane.org/) (searched on 23 April 2021)
- COVID-19 Global literature on coronavirus disease (https://search.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/) (searched on 23 April 2021)
- China Network Knowledge Infrastructure (CNKI) (http://www.cnki.net/) (until 22 April 2021)
- Chinese Scientific Journals Database (VIP) (http://www.cqvip.com/) (until 22 April 2021)
- Wanfang data (http://www.wanfangdata.com.cn/index.html) (until 22 April 2021)
- SinoMed (http://www.sinomed.ac.cn/) (until 22 April 2021)

Our detailed search strategy is available as supplemental material in Appendix 1. For greater precision, we searched MEDLINE and Embase from 1 December 2019 onwards as this is the time when COVID-19 became well known. All other sources were searched from inception and without date limits. We elected to employ a Chinese search strategy in four Chinese biomedical databases due to a substantial proportion of the evidence stemming from China at the time of the search.

3.3.2. Other Sources

We also searched the indexed conference abstracts for any additional published papers that were not identified in our electronic search. We included abstracts (otherwise not published) that provided sufficient data for inclusion in our review.

3.3.3. Screening

The results of the systematic searches were screened independently in duplicate according to the eligibility criteria in two stages: title and abstract screening, and full-text screening. We used prespecified question sets for checking the eligibility of studies. These sets were piloted before the screening to ensure a similar understanding among the screeners. In case of any disagreement between the initial screeners, they were instructed to discuss the reasons for their decisions. If a unanimous decision was not reached after the discussion, an adjudicator with expertise in methodology would settle the disagreement. To facilitate the screening process, we used Covidence systematic

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review software, Veritas Health Innovation, Melbourne, Australia. Available at www.covidence.org (Covidence).

3.3.4. Inclusion of non-English language studies

We did not restrict our inclusion to any specific language. When the English text of a paper or abstract was not available, they were screened by authors with adequate knowledge of the relevant language for screening and data extraction.

3.4 Data collection and analysis

We designed an electronic data extraction sheet in Microsoft Excel based on the CHARMS-PF checklist. This checklist is modified by Riley 2019 from the CHARMS checklist for extracting data from prediction model studies (Moons 2014). The modified checklist is specifically geared toward prognostic factor reviews. Before starting data extraction, we piloted the extraction sheet among the authors to ensure a similar understanding. Data extractors were divided into pairs. Each pair extracted data from the studies in duplicate and independently. Similar to the screening phase, after individual data extraction, disagreements were resolved through pair discussion or third member adjudication, if a unanimous decision was not reached.

For each included study, reviewers extracted the information about study publication, study design and settings, study recruitment and follow-up, study population characteristics, prognostic factor measurement and definition, outcome definition, prognostic factor and outcome prevalence, the unadjusted and adjusted magnitude of effect, adjustment method, adjusted covariates, and missing data. A blank copy of the extraction sheet is provided in the supplementary material as Appendix 2.

3.5. Assessment of Risk of Bias in the Included Studies

Two reviewers independently assessed the risk of bias in the included studies using the Quality in Prognostic Studies (QUIPS) tool (Hayden 2013). The QUIPS instrument classifies the risk of bias based on six domains: participant selection, attrition, prognostic factor measurement, outcome measurement, study confounding, statistical analysis, and reporting. Each domain can be rated as low, moderate, or high risk of bias. For each study, we rated the overall risk of bias as either high or low. When five QUIPS domains or more were at low risk of bias or only two domains were at moderate risk of bias, we classified the study as at an overall low risk of bias. Otherwise, the study was considered to be at a high overall risk of bias. To facilitate the assessment of the risk of bias, we extracted the suggested information regarding the risk of bias suggested by the CHARMS-PF checklist. We also reported the risk of bias for each study in the forest plots.

3.6. Measures of association

We extracted the magnitude of associations using odds ratios (ORs), hazard ratios (HRs), and relative risks (RRs) for the purpose of meta-analysis. Other measures of association were also gathered for narrative review. We employed validated statistical methods that use each study event rate, the prevalence of prognostic factors, and adjusted effect estimates to calculate the baseline risk of the outcome (Absolute Risk Calculator 2020; Foroutan 2020b). Consequently, using the mentioned values, HRs and RRs were converted to ORs. The reason to undertake these transformations was to enable pooling from a wider range of studies including different methodological designs.

3.7. Dealing with Missing Data

We extracted the available information about the missing prognostic factors and outcomes data from the included studies' text. This information was incorporated into the assessment of the risk of bias. Due to the large volume of included studies, we did not ask the original study authors for further information regarding missing data. We also did not apply other methods such as imputations due to the scarcity of sufficient information on the missing data.

3.8. Assessment of Heterogeneity

We explored statistical heterogeneity by visually inspecting forest plots, considering the consistency of point estimates and the extent of overlap in confidence intervals. Even though we calculated statistical measures of heterogeneity such as I^2 and the chi^2 test significance value, we mostly relied on visual inspection since these measures in meta-analyses of observational studies are usually very large and not helpful. We did not use strict thresholds for the statistical indices. These values along with the visual inspection of the forest plots provided the basis for interpretation of the amount of heterogeneity in a minimally contextualised review setting (Iorio 2015).

3.9. Assessment of Reporting Deficiencies

In order to assess the risk of bias in reporting the individual studies, we considered the reporting and statistical domain of the QUIPS tool. As for the other domains, the detailed guiding questions directed the final domain judgement. Furthermore, whenever 10 or more studies informed a meta-analysis, we built a funnel plot (Sterne 2011). The symmetry and distribution of the effect estimates informed our evaluation of publication bias. We did not rely on other tests for the risk of publication bias.

3.10. Data Synthesis

3.10.1 Data Synthesis and Meta-Analysis Approaches

We used Stata 2015 for all analyses. We conducted random-effects model meta-analyses using the Dersimonian and Laird method (DerSimonian 1986) that pooled the effect estimates from all eligible studies to obtain a summary estimate and confidence interval for each outcome. In addition, for the timing of reported outcomes (other than time-to-event analysis), we decided to consider the closest timing of the reported outcome to 30 days from symptom development. Relevant outcomes included hospitalisation, severe COVID, and pneumonia. Such studies reporting on multiple time points were scarce in this review.

3.10.2. Subgroup Analysis and Investigation of Heterogeneity

We included three subgroup analyses in this review, where possible, which included statistical adjustment set (adjusting for a minimum set of covariates), risk of bias, and statistical reference group for obesity comparison. We specified the subgroup analyses before data extraction. During team discussion, the lack of a strong and unanimous rationale for subgroup effects compelled us to limit the number of subgroup analyses to minimise the chance of observing spurious subgroup effects. For each subgroup

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analysis, we used the Instrument for assessing the Credibility of Effect Modification Analyses (ICEMAN) tool to guide us to estimate the credibility of the observed subgroup effect (Schandelmaier 2020). This tool has been developed for the evaluation of the credibility of a subgroup effect observed in randomised trials or systematic reviews of randomised trials. Even though the tool has not been validated for the systematic reviews of observational studies, each item in the tool is relevant to our review. Furthermore, after discussions, we were unable to add any critical items that were missing from the tool. As we still needed some methods to evaluate the credibility of any observed subgroup effect, we decided to use the concepts and guidance from this tool in addition to the methodologic and clinical expertise of the authors. If moderate or high credibility in the observed subgroup effect emerged after duplicate evaluation, we would report the more appropriate subgroup effect estimate alongside the results from the overall analysis. Furthermore, low or moderate credibility in the subgroup effect was an indicator of possible inconsistency in certainty ratings. The decision to provide both the subgroup and overall effects relies on the fact that the ICEMAN tool has been developed for randomised trials and uncertainty around its performance with observational studies remains.

In the first analysis, we considered the adjustment subgroup. As obesity is closely associated with other comorbidities such as diabetes and cardiovascular diseases, we believe that it is crucial for original studies to at least adjust for some specific variables. Therefore, we decided to prespecify the minimum adjustment set of variables based on the knowledge of COVID-19 disease. Our minimum adjustment set was defined as age, sex, diabetes, hypertension, and cardiovascular disease. This subgroup analysis was performed on all of the mentioned outcomes. Our hypothesis for the direction of this subgroup analysis was that not adjusting for the minimum set would overestimate the magnitude of the effect. It is noteworthy that although the issue of confounders is considered in the statistical analysis domain of the risk of bias evaluation tool, we feel that the importance of the issue in this setting is not sufficiently represented only by a domain of risk of bias. Current evidence strongly supports the role of comorbidities in COVID-19 adverse outcomes (CDC 2020).

We hypothesised that if there is an association between BMI and COVID outcomes that extends even below the 30 kg/m 2 threshold, considering lower BMI reference ranges would mean that each obesity class magnitude of effect would be estimated larger.

Next, we conducted another subgroup analysis for the effect of the obesity reference group each original study adopted in their regression model. We hypothesised that, if there was an association between BMI and the risk of COVID-19 outcomes that extended even below the 30 kg/m^2 threshold, considering lower BMI reference ranges would mean a larger estimated magnitude of association. The choice of this subgroup analysis was also based on considering a wide range for the comparator group. The results of the analysis could advise the appropriateness of pooling across studies with different reference groups. We considered the group without obesity (BMI < 30 kg/m^2) to be the more appropriate reference group. It is important to notice that the association that has been proposed between obesity and COVID adverse outcomes is J-shaped. This means that, potentially, both the very low and very high values of BMI can increase the risk of adverse outcomes from COVID. Therefore, comparing obesity classes to different ranges of baseline BMI (Bhaskaran 2018) might affect the magnitude of the effect differently. We believe conducting this subgroup analysis clearly presents how the choice of the reference group influences the magnitude of the effect estimates.

The last subgroup analysis of this review was the overall risk of bias as determined by the QUIPS tool. This subgroup analysis also provided required information for the decision about the overall risk of bias when rating the certainty in the evidence.

3.10.3. Sensitivity Analysis

We only used sensitivity analysis to evaluate the effects of excluding the studies that were believed to drive a considerable portion of overall heterogeneity by having either non-overlapping confidence intervals or noticeably heterogeneous point estimates from the majority of the other studies. We only undertook these sensitivity analyses if the number of excluded studies was below three (Schandelmaier 2020). The consequent assessment of heterogeneity and the changes in the statistical measures of heterogeneity were considered when assessing the inconsistency of the effect estimates.

We also encountered instances where included studies used BMI < 40 kg/m^2 as the reference group for the statistical analyses regarding the association between class III obesity and the outcomes. As this range does not completely overlap the non-obese BMI range, we conducted sensitivity analyses to investigate the effects of removing these studies from the pooled estimates on the interpretation of our results.

3.11 Conclusion and Summary of Findings

For each outcome, we used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) guidance for prognostic factors to assess the certainty of the evidence (Foroutan 2020a). This methodology guides reviewers to systematically evaluate the certainty of the evidence they have gathered. The certainty levels defined by GRADE include high, moderate, low, and very low. For prognostic factor reviews, the evidence originating from observational studies starts at a high certainty of evidence. Subsequently, this certainty can be rated down or up based on specific grounds. Domains each can rate down the certainty by one or two levels and they include risk of bias in included studies, inconsistency across the effect estimates, imprecision of the pooled estimate, indirectness of the gathered evidence, or risk of publication bias. On the other hand, the situations that allow rating up include a large magnitude of observed effect size, dose-response, and the nature of plausible confounders. In order to rate our certainty in the minimally contextualised framework, we converted the relative effects to absolute risks by using the relative measure of association (OR), the median prevalence of obesity class in patients with COVID-19, and the median of the overall risk of the outcomes across the included studies (Caussy 2020; Foroutan 2020b). To assess imprecision, we determined an absolute risk increase of 5% to be our threshold for a clinically meaningful prognostic factor (or 50 in 1000 as indicated in the summary of findings tables). When the subgroup analysis for risk of bias showed a significant difference across the high and low risk of bias studies, we used the analysis and conclusions of the meta-analysis of studies at low risk of bias. To prepare the evidence tables presented here we used the Magic online review and guideline management software (Magic 2022). In the summary of

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findings tables, mortality, mechanical ventilation, hospitalisation, ICU admission, pneumonia, and severe COVID were considered as outcomes.

RESULTS

4.1. Description of Studies

4.1.1. Results of the Search

Our searches yielded 10,514 unique records. After the first stage of screening, 495 studies proceeded to full-text screening and 171 were included in the review (Figure 1). One hundred and forty-nine studies with a total of 12,045,976 participants provided quantitative data for at least one of our meta-analyses. Three manuscripts were in Chinese and were reviewed by a pair of review authors proficient in Chinese. More details of each included study including their set of adjusted covariates can be found in the Characteristics of included studies.

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Figure 1. Study flow diagram

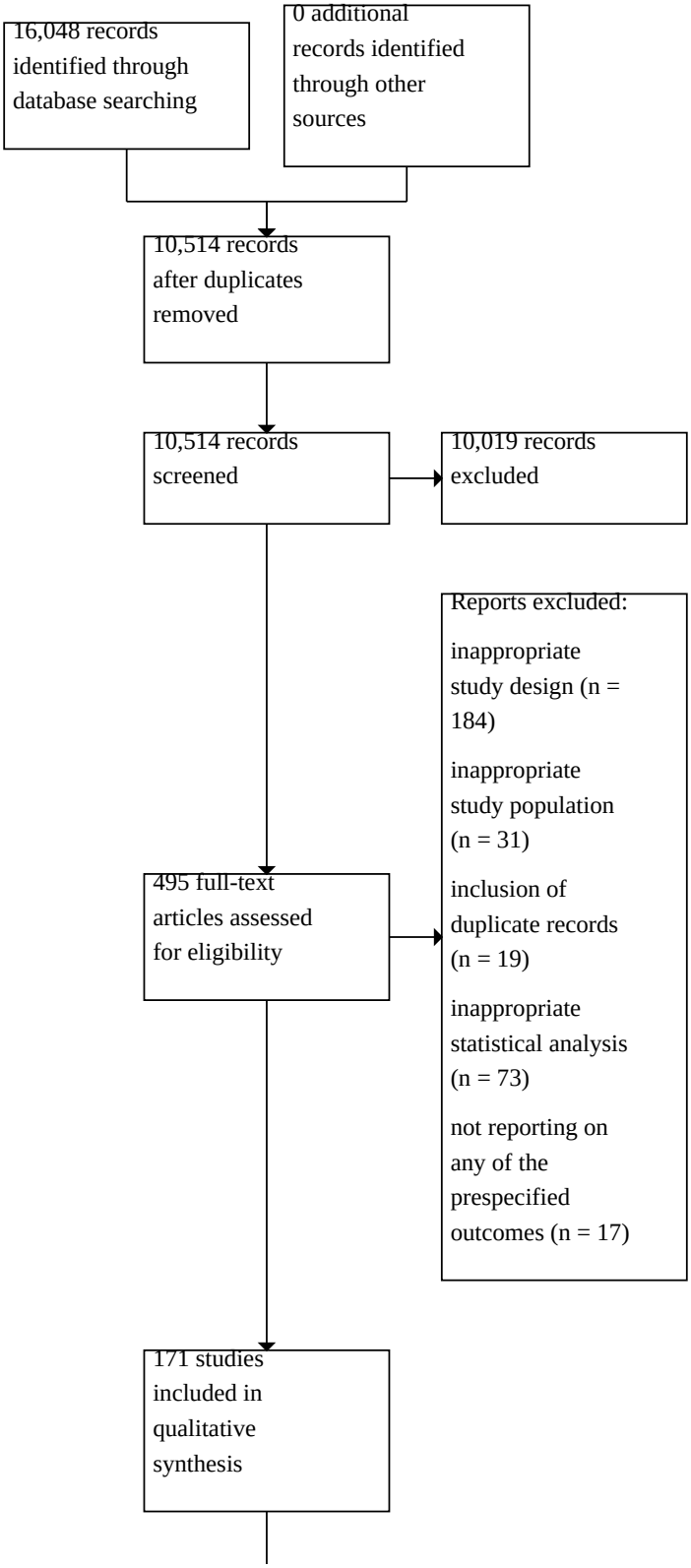

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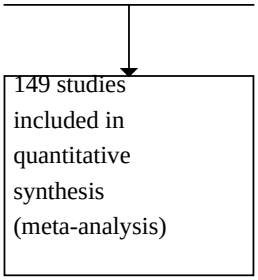
Figure 1. (Continued)



4.1.2. Included studies

Among the 171 included studies, only three studies used a case-control design while 35 and 133 studies were registry data and cohort studies, respectively. Amongst the cohorts, 101 studies were retrospective cohorts and 32 were prospective. More than half of the included studies were conducted in the United States or China (Table 1). One hundred and fifty-one studies used BMI as an indicator of obesity. Amongst these, 133 used obesity categorisations according to BMI, and 22 used BMI as a continuous variable in their analyses. In terms of the outcomes, 111 studies reported on mortality, 48 on mechanical ventilation, 47 on ICU admission, 34 on hospitalisation, 32 on severe COVID, six on pneumonia, five on length of hospitalisation, two on length of ICU admission, and one on length of mechanical ventilation. As per our inclusion criteria, all these studies adjusted for at least one covariate in addition to obesity. A table of characteristics of included studies provides the full details of each included study including the set of adjusted covariates (Characteristics of included studies).

4.1.3. Excluded Studies

In total, 324 studies were excluded after reviewing full texts. Reasons for this include inappropriate study design (n = 184), inappropriate study population (n = 31), the inclusion of duplicate records (n = 19), inappropriate statistical analysis (n = 73, only univariate analysis), and not reporting on any of the prespecified outcomes (n = 17). We have provided examples of eight key studies that were excluded in Characteristics of excluded studies.

4.1.4. Risk of Bias in Included Studies

We used the QUIPS tool to assess the risk of bias in the included studies. We assigned scores of 0, 1, and 2 to each domain at a low, medium, and high risk of bias respectively. The sum of domain scores of more than 2 indicated the studies were at a high risk of bias. We judged 54% of all reported outcomes at low risk of bias (Risk of Bias Assessments). Regarding the ICU admission, most of the studies had low risk of bias (n = 27, 57%). Most of the studies that measured mortality, hospitalisation and mechanical ventilation had low risk of bias (56%, 57%, and 52%, respectively). We found one study that measured the length of mechanical ventilation, which we judged to have a low risk of bias. For pneumonia and length of ICU stay, 50% of studies had a low risk of bias. However, regarding the length of hospitalisation and severe Covid-19 outcomes, most of the studies had a high risk of bias (60% and 58%, respectively). Table 2, Table 3, Figure 2, and Figure 3 summarise the judgements about the overall risk of bias and risk of bias domains judgments for each outcome. We used funnel plots to investigate the risk of publication bias for comparisons that included more than 10 studies (Appendix 3).

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Figure 2.

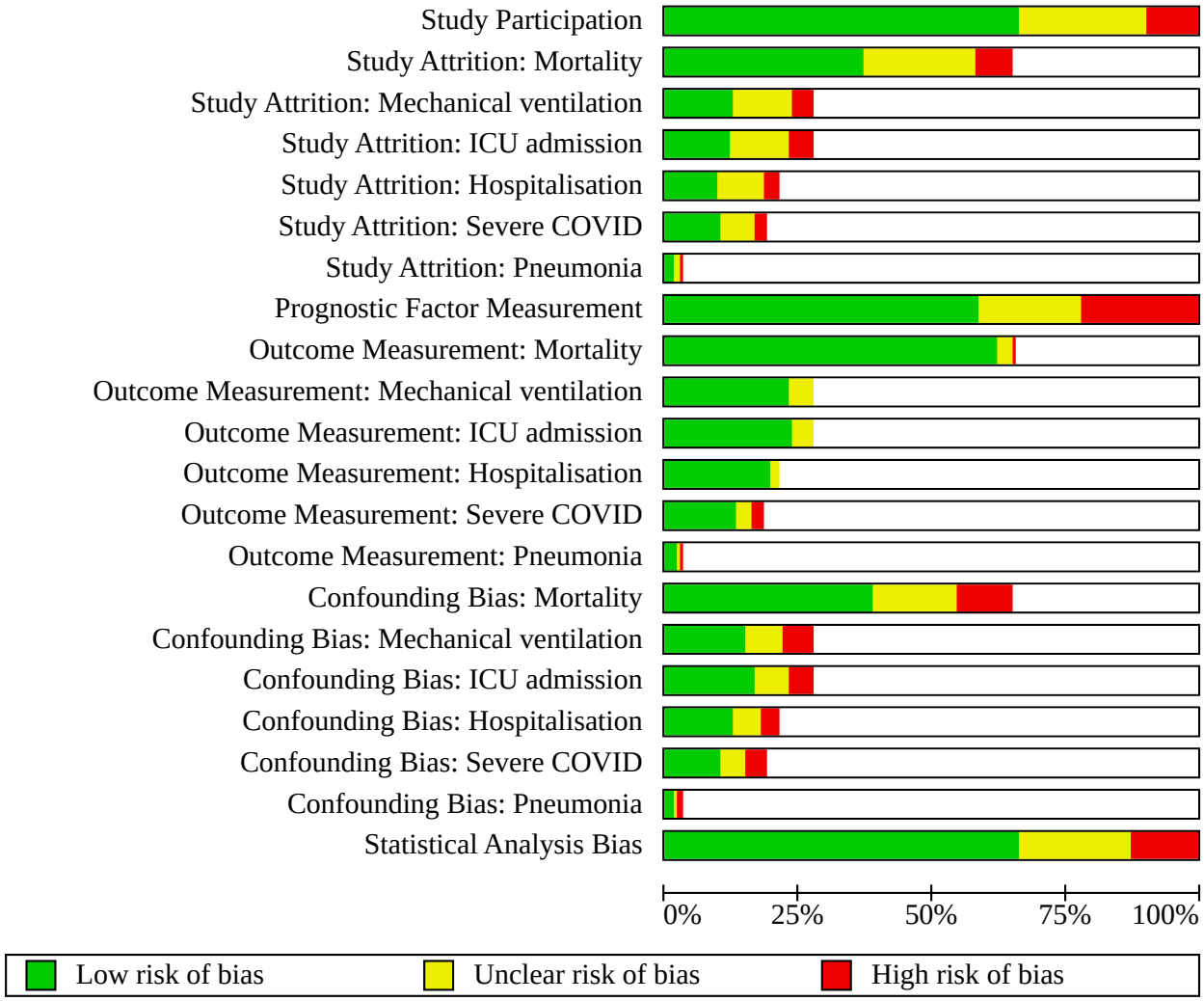

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Figure 3.

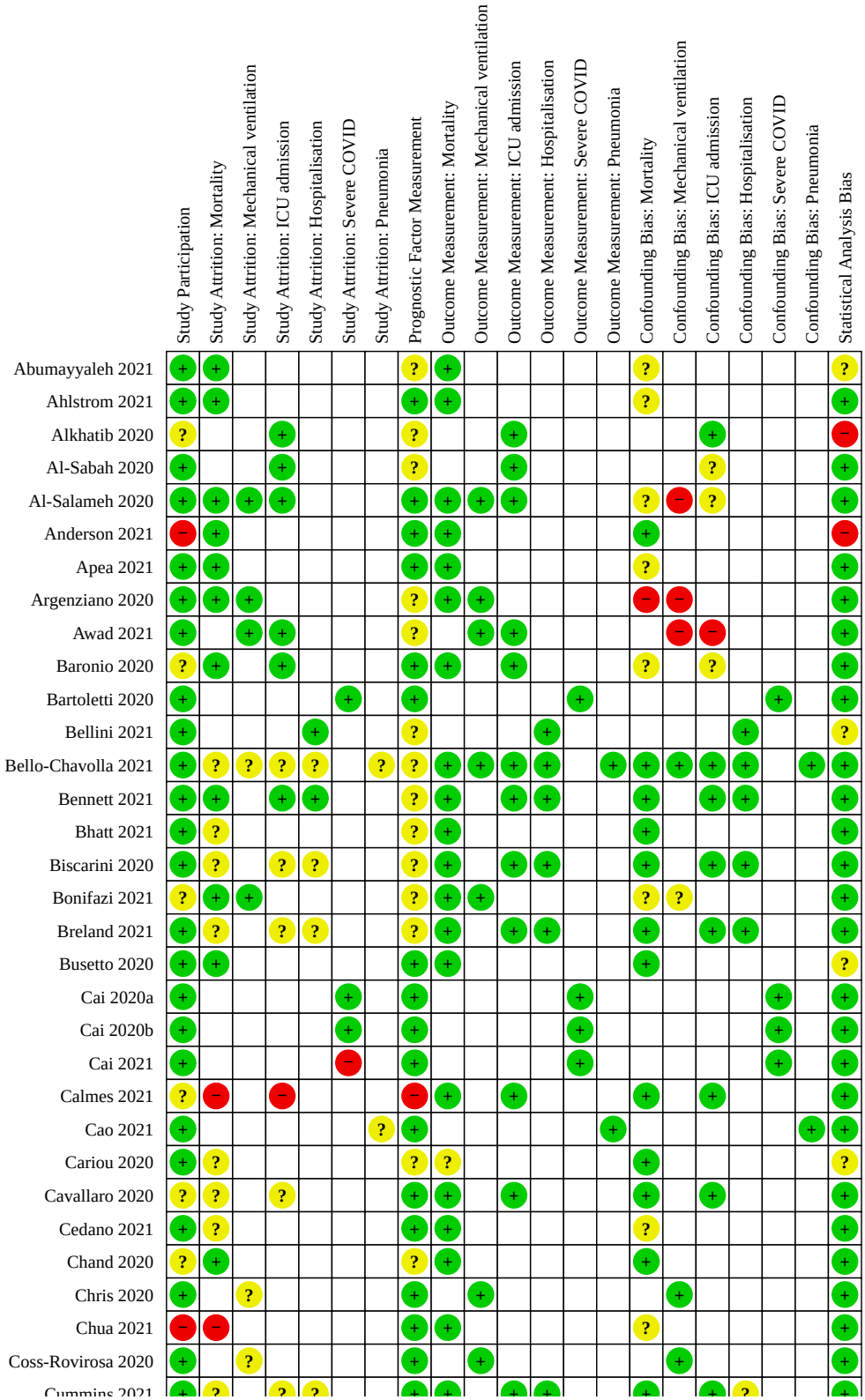

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Figure 3. (Continued)

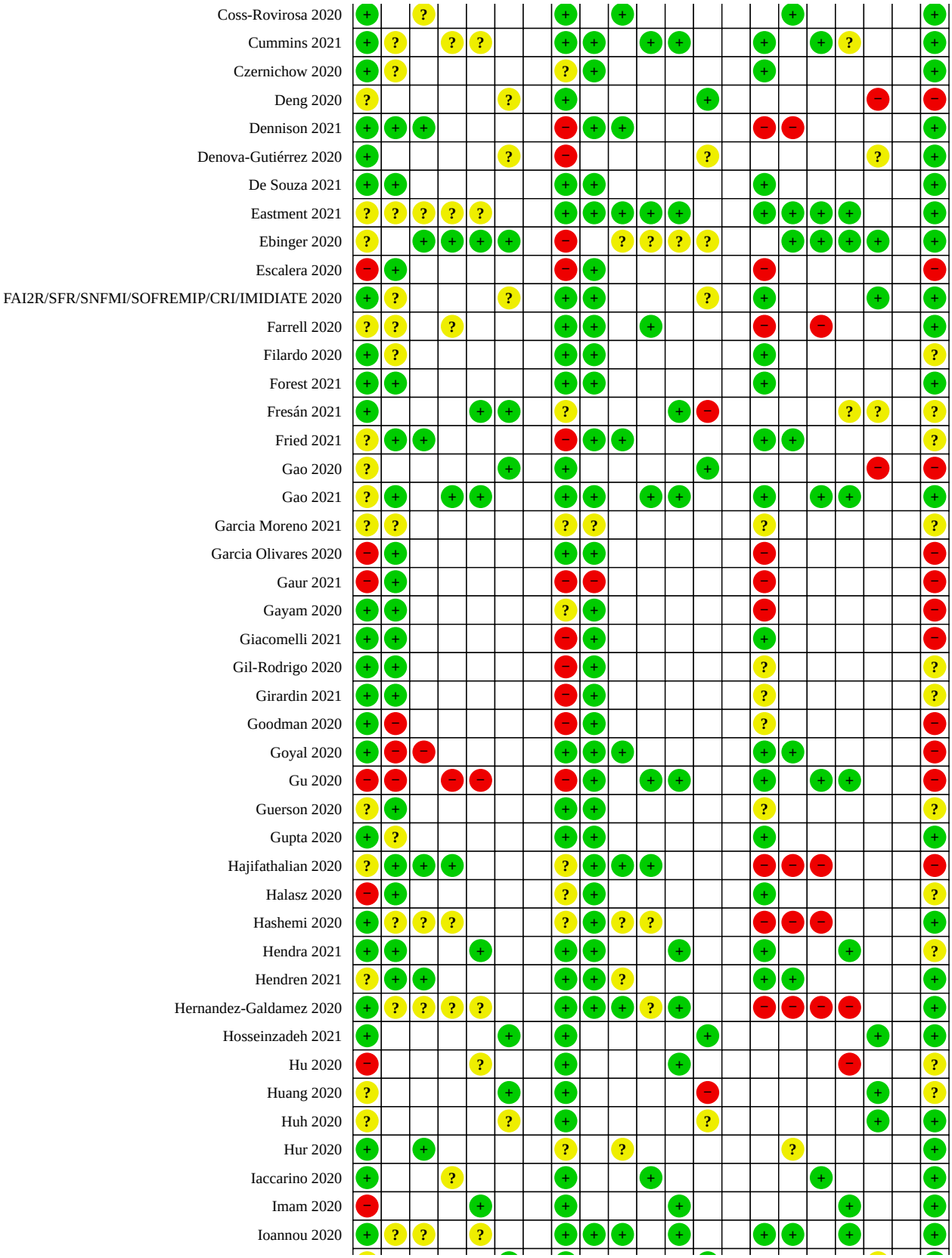

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Figure 3. (Continued)

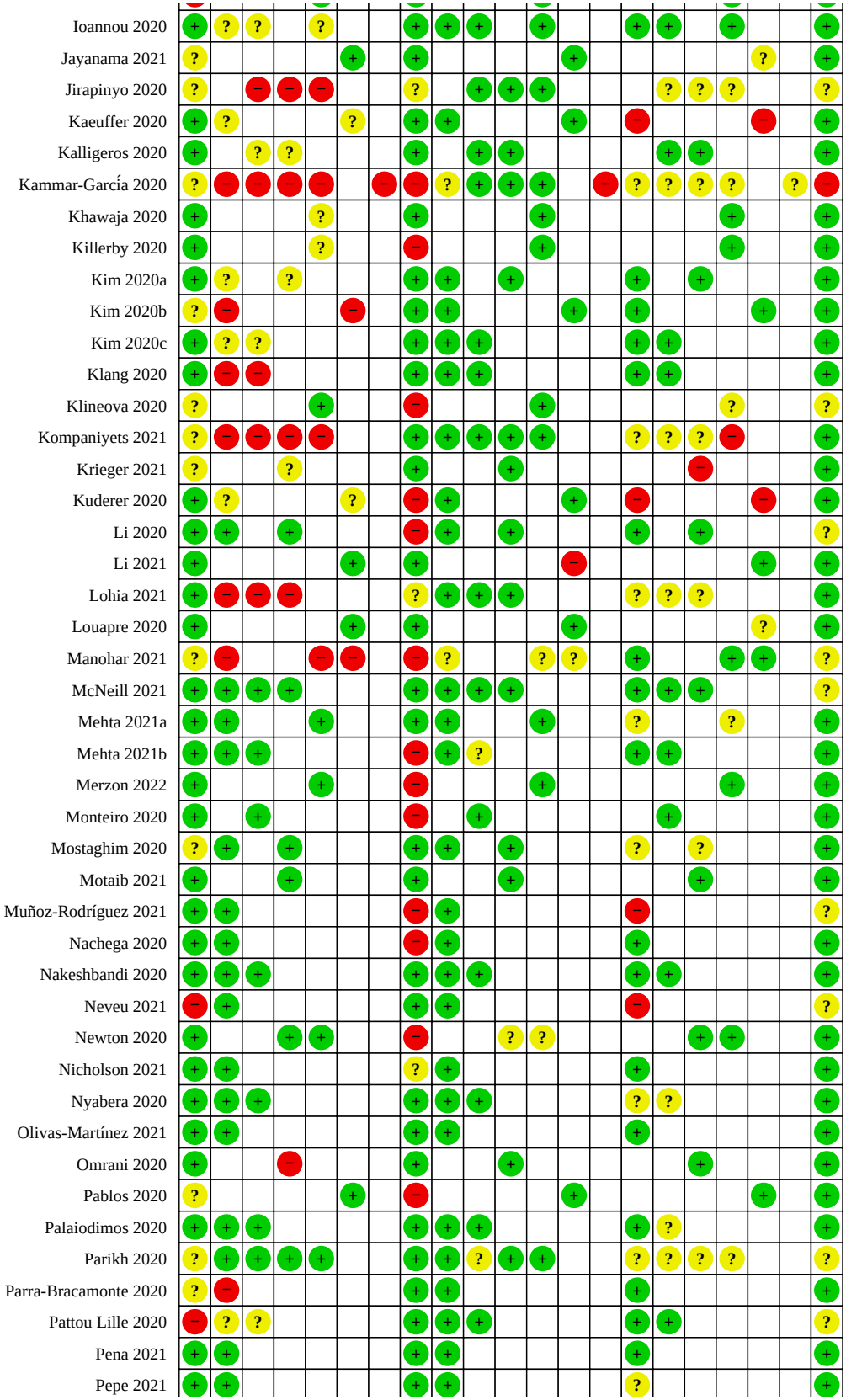

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Figure 3. (Continued)

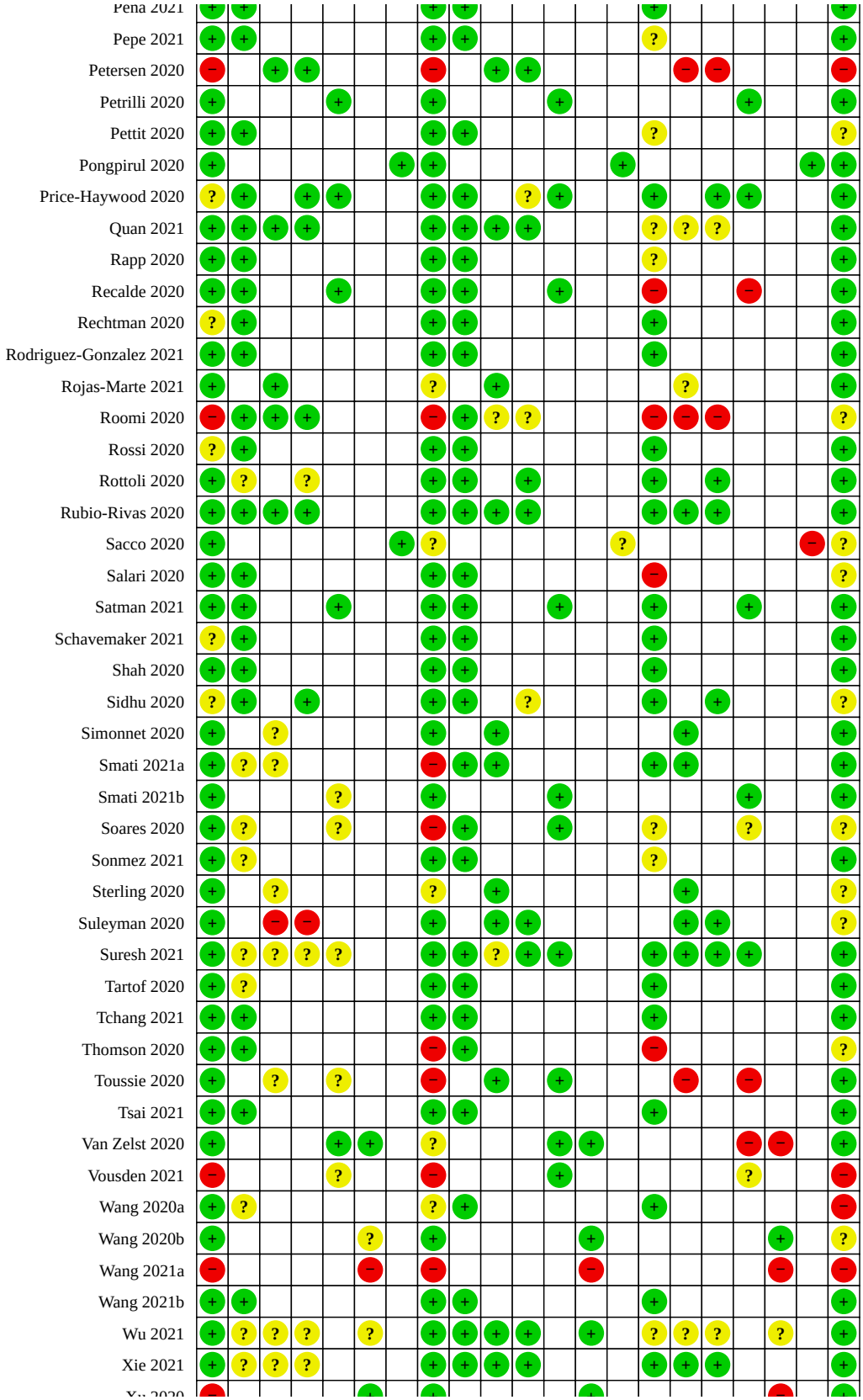

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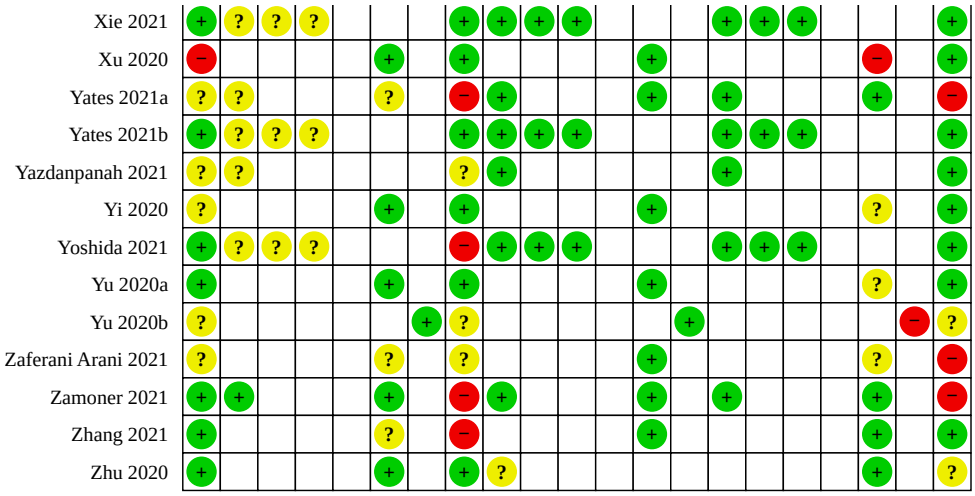
Figure 3. (Continued)



4.2. Results of the Synthesis

Below, we provide a summary of the results of all the outcomes of interest to the review. Detailed findings for the outcomes we considered to be of greater importance to the patients (mortality, mechanical ventilation, and ICU admission) are presented in this section, with brief interpretations of the findings of the remaining outcomes. Further details on the findings for the remaining outcomes are detailed in the Summary of findings tables and forest plots.

4.2.1. Mortality

In total, 105 studies reported effect sizes on the association between obesity and mortality. The majority of the studies reported at least one association (n = 61) between unclassified obesity and mortality due to COVID-19. Further, we were able to extract 15, 12, and 23 reported effect estimates for obesity class I, II, and III meta-analyses, respectively.

4.2.1.1. Obesity Class I

We included 15 studies to estimate a pooled effect estimate for the association between obesity class I (versus patients without obesity) and COVID-19 mortality. These studies included 335,209 participants in total. Nine of the studies were judged to be at low overall risk of bias. Synthesis of the results of these studies revealed that patients within class I obesity did not have a higher odds of mortality due to COVID (pooled OR 1.04, 95% CI 0.94 to 1.16, I^2 = 76.1%, Figures S1-S3) compared to patients without obesity. We incorporated the baseline risk of death from the included studies to transform this relative effect into an absolute risk difference (baseline risk: 180/1000). We concluded that when comparing 1000 obesity class I COVID-19 patients to the ones without obesity, six more patients die amongst every 1000 obesity class 1 patients with COVID-19 compared to COVID-19 patients without obesity (95% CI from 9 fewer to 23 more, GRADE certainty in the evidence: High, Summary of findings 1).

Comparing this finding to the minimally contextualised threshold of 50 patients in every 1000, we believe obesity class I makes little to no difference to the risk of mortality from COVID-19. We also conducted three subgroup analyses. First, we compared effect estimates from studies that adjusted for at least age, sex, DM (diabetes mellitis), HTN (hypertension), and cardiovascular diseases with those from studies that did not (Figure S1). Next, we compared effect estimates between studies that used different BMI ranges as their reference group (Figure S2) and between studies with high and low overall risk of bias (Figure S3). Our evaluation of these subgroup effects, as guided by the ICEMAN tool, did not suggest any credible difference.

4.2.1.2. Obesity Class II

Eleven studies with 317,925 participants in total contributed to the pooled effect size for the association between COVID-19 death and obesity class II. Six of the studies were at a low overall risk of bias. Ten studies used the normal BMI range (18.5 to 24.9 kg/m^2) as the reference regression analysis group, one study used the non-obese range (BMI < 30 kg/m^2), and the last study did not specify its reference range. Our meta-analysis indicated that obesity class II based on BMI can introduce 1.16 times higher odds of mortality compared to having a BMI between 18.5 and 24.9 kg/m^2 (pooled OR 1.16, 95% CI 0.99 to 1.36, I^2 = 83.3%, Figures S4-S6), but since the 95% CI includes 1, we cannot infer that the patients with obesity class II have a higher risk of mortality compared to the normal BMI patients. After considering the baseline risk of 180/1000 for COVID-19 mortality in the included studies, this result translates into 23 more patients (95% CI from 1 fewer to 50 more, GRADE certainty in the evidence: High, Summary of findings 2) dying amongst every 1000 obesity class II patients with COVID-19 compared to COVID-19 patients without obesity.

Therefore, we believe that obesity class II makes little to no difference to the risk of mortality from COVID-19 when considering a minimally important difference threshold of 50 more deaths in every 1000 patients. Similar to the previous class, our three subgroup analyses did not find any credible subgroup effects (Figures S4-S6).

4.2.1.3. Obesity Class III

We pooled the effect sizes from 19 studies with a total of 354,967 participants. Fourteen studies were at a low overall risk of bias. Similarly, 15 studies adjusted their effect estimate for at least age,

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sex, DM, HTN, and cardiovascular diseases. Most of the studies used the normal or non-obese BMI range as the reference group (n = 15). However, four studies did not specify what reference group they reported their effect estimate against and one study used any BMI less than 40 kg/m^2 as the comparator (Bennett 2021). The results of the meta-analysis indicate that COVID-19 patients with class III obesity, as compared to patients with BMI < 30 kg/m^2 (without obesity), have approximately 1.6 times higher odds of mortality (pooled OR 1.67, 95%CI 1.39 to 2.00, I^2 = 85.6%, Figures S7-S9). Applying this to the baseline risk of mortality (180/1000 from the included studies) translates to 88 more deaths (95% CI from 54 more to 125 more, GRADE certainty in the evidence: Low, Summary of findings 3) amongst every 1000 COVID-19 patients with class III obesity compared to patients with BMI < 30 kg/m^2.

Although the confidence interval of the pooled effect size surpasses the minimally contextualised threshold of 50 in 1000, we decided to rate down the certainty in the evidence because of inconsistency and the risk of publication bias (Summary of findings 3). The judgement about possible publication bias was based on the asymmetry in the funnel plot (Funnel Plots). Moreover, heterogeneity and considerable visual inconsistency among reported effect estimates with various possible interpretations informed the decision about penalising the certainty of evidence in the inconsistency domain. Therefore, we believe that obesity class III may increase the risk of mortality from COVID-19.

The evidence suggests that obesity class III may increase the risk of mortality among COVID-19 patients compared to those with BMI < 30 kg/m^2. We conducted three subgroup analyses on adjustment covariates, regression reference group, and risk of bias (Figures S7-S9). Our evaluation of these analyses did not suggest any credible subgroup effect. Furthermore, as the regression analysis reference group in Bennett 2021 included other obesity classes, we carried out a sensitivity analysis to investigate the effect of excluding this study from the meta-analysis. The result of this analysis did not indicate any change in the interpretation of the results (pooled OR 1.61, 95% CI 1.34 to 1.92, 18 studies, 335,178 participants, I^2 = 84.4%).

4.2.1.4. Obesity (Unclassified)

We also pooled the effect estimates from the studies that reported on the association between mortality among COVID-19 patients and obesity without further classifying it (BMI ≥ 30 kg/m^2). This meta-analysis included 60 effect estimates from 54 studies with a total of 1,307,516 participants. Thirty studies were at low overall risk of bias. Twenty-two studies used BMI < 30 kg/m^2, nine studies BMI between 18.5 and 24.9 kg/m^2, and 23 studies unspecified range as the reference group. The results suggest that patients with obesity with COVID-19, compared to the patients without (BMI < 30 kg/m^2), demonstrate a higher odds of mortality (pooled OR 1.35, 95% CI 1.28 to 1.42, I^2 = 70.7%, Figures S10-S12). Similar to the previous categories, we translated this relative measure to an absolute risk difference by incorporating the baseline risk of mortality in COVID-19 patients (180/1000) from the included studies. We concluded that, in every 1000 unclassified COVID-19 patients with obesity, compared to 1000 COVID-19 patients without, on average 49 more patients die (95% CI from 39 more to 58 more, GRADE certainty in the evidence: Low, Summary of findings 4).

We decided to rate down the certainty in this evidence for inconsistency and imprecision. The pooled confidence cut through the prespecified minimally important threshold. In addition, the effect estimates were visually inconsistent across the threshold. This, in our belief, cannot justify the confidence interval crossing over the threshold. Therefore, we believe that unclassified obesity may make little to no difference to the risk of mortality. Notice that our point estimate of the effect size lies exactly below the 50 in 1000 threshold for an important difference. The results of subgroup analyses could not convince us of any credible differences among subgroups (Figures S10-S12).

4.2.1.5. Units Change in BMI

Ten studies reported effect estimates considering BMI as a continuous independent variable. These studies had 6,937,151 participants. However, 6,910,695 participants were from one study. Six of the studies were at low risk of bias and six adjusted the effect estimate for at least age, sex, DM, HTN, and cardiovascular diseases. We calculated the effect estimates from each study corresponding to every 5 units increase in BMI using appropriate logarithmic transformations. The analysis revealed that increasing BMI corresponds to higher odds for mortality among COVID-19 patients (for every 5 units increase in BMI: pooled OR 1.16, 95% CI 1.08 to 1.24, I^2 = 94.4%, Figures S13-S14).

We calculated that considering the baseline mortality risk of 180/1000, on average 23 more (95% CI from 12 more to 34 more, GRADE certainty in the evidence: High, Summary of findings 5) out of every 1000 COVID patients die compared to 1000 with 5 units lower BMI. Since this interpretation of results is dealing with a continuous exposure variable, we avoided the use of the previous threshold (defined for binary interpretations of exposure) and considered a difference of zero as the threshold. We, therefore, concluded that every 5-unit increase in BMI increases the risk of mortality among patients with COVID-19 infection.

4.2.2. Mechanical Ventilation

We were able to extract 81 effect estimates from 46 unique studies that associated some measure of obesity with the incidence of mechanical ventilation after contracting the COVID-19 virus. Similar to mortality, most studies (n = 22) used unclassified obesity (BMI ≥ 30 kg/m^2). This was followed by obesity class III (n = 12), class I (n = 10), class II and III aggregate (n = 9), and class II (n = 6).

4.2.2.1. Obesity Class I

We included 10 studies in the meta-analysis on the association between obesity class I and the need for mechanical ventilation with a total of 187,895 participants. The risk of bias assessment indicated that six of these studies have a low overall risk of bias. All studies compared this obesity class to normal BMI (BMI 18.5 to 24.9 kg/m^2) except one that did not indicate its analysis reference group. In terms of adjustment, eight studies adjusted their effect estimate for at least age, sex, DM, HTN, and cardiovascular diseases. The meta-analysis revealed that COVID-19 patients with class I obesity are at higher odds of needing mechanical ventilation compared to those within the normal BMI range of 18.5 to 24.9 kg/m^2 (pooled OR 1.38, 95% CI 1.20 to 1.59, I^2 = 62.1%, Figures S15-S17).

The calculations estimated that the baseline risk of the need for mechanical ventilation is 198 in every 1000 COVID-19 infections. We applied the pooled OR to this risk and found that in every

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1000 obesity class I patients with COVID-19, 56 more people (95% CI from 31 more to 84 more, GRADE certainty in the evidence: Moderate, Summary of findings 1) need mechanical ventilation compared to BMI between 18.5 to 24.9 kg/m^2. We rated down the certainty in this evidence since the pooled confidence interval crossed the prespecified minimal important threshold of 50 in 1000. Therefore, we concluded that obesity class I, compared to the normal BMI range, probably increases the risk of mechanical ventilation. Our subgroup analyses did not point to any credible difference between the subgroups (Figures S15-S17).

4.2.2.2. Obesity Class II

A total of 171,149 participants from six studies contributed to estimating the effects of class II obesity on mechanical ventilation. Half of the studies were at low overall risk of bias. Similar to the previous class, only one study did not specify its reference group while others used the normal BMI range of 18.5 to 24.9 kg/m^2. The synthesis of the results of the included studies revealed that obesity class II COVID-19 patients have higher odds of needing mechanical ventilation (pooled OR 1.67, 95% CI 1.42 to 1.96, I^2 = 61.7%, Figures S18-S20).

This relative effect means that considering the baseline risk (198/1000), 94 more (95% CI from 62 more to 128 more, GRADE certainty in the evidence: High, Summary of findings 2) patients among every 1000 with COVID-19 need mechanical ventilation when categorised as having class II obesity compared to the normal BMI range. Therefore, obesity class II increases the risk of requiring mechanical ventilation among COVID-19 patients. The subgroup analyses did not demonstrate any considerable differences across the groups (Figures S18-S20).

4.2.2.3. Obesity Class III

Twelve studies with a total of 174,520 participants reported on the prognostic effects of class II obesity on mechanical ventilation. Five studies were at a low overall risk of bias. Reference groups in these studies included patients without obesity, normal BMI range, BMI less than 40, and unspecified. The analysis suggested that obesity class III, compared to the patients without obesity (BMI < 30 kg/m^2), increases the odds of requiring mechanical ventilation among COVID-19 (pooled OR 2.17, 95% CI 1.59 to 2.97, I^2 = 95.0%, Figures S21-S23).

This means that with the baseline risk of 198/1000, in every 1000 COVID-19 patients 151 more with obesity class III (95% CI from 84 more to 225 more, GRADE certainty in the evidence: High, Summary of findings 3) require mechanical ventilation compared to those without obesity. Therefore, we believe that obesity class III increases the risk of mechanical ventilation among COVID-19 patients. We also conducted a sensitivity analysis to evaluate the effects of removing studies with a BMI less than 40 as the reference for our interpretation. This analysis showed that removing these studies does not alter our findings (pooled OR 2.12, 95% CI 1.50 to 2.98, 10 studies, 173,679 participants, I^2 = 95.9%). Further, the subgroup analyses did not yield any credible subgroup effects (Figures S21-S23).

4.2.2.4. Obesity (Unclassified)

We also conducted a meta-analysis of effect estimates from studies that reported the association between mechanical ventilation and obesity without further classifying it (BMI ≥ 30 kg/m^2). Pooling information from 21 studies with a total of 62,348 participants showed that COVID-19 patients with obesity have higher odds of needing mechanical ventilation compared to those without obesity (BMI < 30 kg/m^2) (pooled OR 1.69, 95% CI 1.44 to 1.99, I^2 = 93.9%, Figures S24-S26).

Applying this relative measure to the baseline risk indicates that, in every 1000 patients with obesity, relative to those patients without, 96 more (95% CI from 64 more to 131 more, GRADE certainty in the evidence: Low) patients would need mechanical ventilation. We rated down the certainty in the evidence due to inconsistency and publication bias. Therefore, we can conclude that obesity may increase the risk of mechanical ventilation among COVID-19 patients. The subgroup analyses did not show any credible subgroup effects (Figures S24-S26).

4.2.2.5. Units Change in BMI

Two studies with 13,527 participants investigated BMI as a continuous prognostic factor for mechanical ventilation. One of these was at low overall risk of bias. COVID-19 infected patients with higher BMIs, on average, had higher odds of requiring mechanical ventilation (for every 5 units increase in BMI: pooled OR 1.28, 95% CI 1.24 to 1.31, I^2 = 0.0%, Figure S27). This translates into 42 more per 1000 (95% CI from 36 more to 46 more, GRADE certainty in the evidence: Moderate, Summary of findings 5). We rated down the certainty in the evidence due to imprecision as the number of studies and participants in the analysis was limited. Therefore, we believe that increasing BMI probably increases the risk of requiring mechanical ventilation among COVID-19 patients. The subgroup analyses did not show any subgroup effect.

4.2.3. ICU admission

We extracted 63 effect estimates on the association between obesity and ICU admission. These were reported by 45 unique studies. Unclassified obesity (BMI ≥ 30 kg/m^2), class I obesity, class II obesity, class III obesity, and continuous BMI accounted for 21, 7, 4, 7, and 5 effect estimates, respectively.

4.2.3.1. Obesity Class I

For obesity class I, seven studies were included. In the analysis of the effects of obesity class I on ICU admission, seven studies with a total of 162,741 participants provided information. Just more than half of the studies were at low overall risk of bias (n = 4), and studies at a high risk of bias accounted for more than 40% of the total pooling weight and 90% of participants. Both patients without obesity (BMI < 30 kg/m^2, n = 2) and normal BMI ranges (18.5 ≤ BMI < 25 kg/m^2, n = 5) served as the reference group in the included studies. On average, COVID-19 patients with class I obesity had higher odds of being admitted to ICU compared to those patients without obesity (pooled OR 1.36, 95% CI 1.06 to 1.75, I^2 = 82.4%, Figures S28-S30).

We calculated the baseline risk of ICU admission in the included studies (208/1000). Combining this with the pooled OR revealed that in every 1000 COVID-19 patients with class I obesity compared to patients without obesity, 55 more (95% CI from 10 more to 107 more, GRADE certainty in the evidence: Moderate, Summary of findings 1) patients were admitted to ICU. We rated down (by one level) the certainty in the evidence for imprecision and risk of bias combined as the confidence interval crossed the minimally contextualised threshold of 50 in 1000 and the high risk of bias

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studies accounted for nearly half of the total weight of the pooled analysis. Therefore, obesity class I probably increases the risk of ICU admission. The subgroup analyses for this class of obesity did not demonstrate a credible subgroup effect (Figures S28-S30). It is noteworthy that, however, the pooled effect size from studies with a reference group with normal range of BMI was smaller than that of studies with a reference group with a non-obese range of BMI .

4.2.3.2. Obesity Class II

For obesity class II, four studies were included. We pooled the effect estimates from four studies with 157,665 patients that reported on the effects of obesity class II on ICU admission. Only one of the studies, contributing 30% of the total weight of the pooled analysis, was at low risk of bias. All of the studies used the normal BMI range ($18.5 \leq BMI < 25$ kg/m^2) as their statistical analysis reference group. Patients with class II obesity, compared to the normal range of BMI, had almost similar odds of ICU admission (pooled OR 1.02, 95% CI 0.90 to 1.15, $I^2 = 35.9\%$, Figures S31-S33).

After applying the baseline risk (208/1000), we found that three more (95% CI from 17 fewer to 24 more, GRADE certainty in the evidence: Low, Summary of findings 2) out of 1000 COVID-19 patients with obesity class II, compared to normal BMI range, were admitted to ICU out of every 1000 patients. Rating down the certainty in the evidence was due to the very serious risk of bias in the included studies. Therefore, we concluded from this result that obesity class II may have little to no difference in the risk of ICU admission.

4.2.3.3. Obesity Class III

Seven studies reported the difference between patients with a normal BMI and patients with class III obesity. For the effects of this class of obesity on ICU admission, we found a subgroup difference when comparing studies that adjusted the effect estimate for at least age, sex, DM, HTN, and cardiovascular diseases (Figure S34). As mentioned in the Methods section, we considered the guidance by the ICEMAN tool as a general framework for the evaluation of the subgroup-effect credibility. Because the subgroup effect was credible, we conducted a meta-analysis that only included studies that adjusted for the minimum set of DM, HTN, cardiovascular disease, age, and sex. For this reason, we present the results of both the overall meta-analysis and the sensitivity analysis including only the studies adjusting for a minimum set of covariates in the following text and Summary of findings 3.

For the overall group of studies, seven studies contributed to the meta-analysis with a total of 159,691 participants. The four studies that were at a high risk of bias in this analysis contributed about 56% of the weight of the total pooled analysis. While two studies considered a BMI less than 40 kg/m^2 as the reference, four considered the normal BMI range (18.5 to 24.9 kg/m^2), and one did not specify their reference group. The analysis suggests that patients with morbid obesity have a higher odds of admission to the ICU (pooled OR 2.26, 95% CI 1.41 to 3.63, 7 studies, 159,691 participants, $I^2 = 94.3\%$, Figures S35-S36) compared to the normal BMI range.

This finding can be expressed as an absolute risk difference after incorporating the baseline risk of 208/1000. When comparing 1000 COVID-19 patients with class III obesity to 1000 who are not suffering from morbid obesity, 164 more patients are admitted to ICU (95% CI from 62 more to 280 more, GRADE certainty in the evidence: Low, Summary of findings 3). As mentioned earlier, these results should be cautiously interpreted alongside the results from the minimally adjusted subgroup.

In the sensitivity analysis including only the studies adjusting for a minimum set of covariates, we included three studies with 155,405 participants. Only one study with a weight of about 40% of the total pooled effect was at low risk of bias. Also, one study used BMI less than 40 as the reference group (Suleyman 2020), while others used the normal BMI range ($18.5 \leq BMI < 25$ kg/m^2). We found that, on average, COVID-19 patients with obesity class III had an OR of 1.20 (95% CI 0.97 to 1.49, $I^2 = 74.7\%$, Figures S37-S38) of requiring ICU admission compared to normal range BMI.

We translated this finding to an absolute risk difference by incorporating the baseline risk of ICU admission from included studies (208/1000). In every 1000 COVID-19 patients with obesity class III, 32 more (95% CI from 5 fewer to 73 more, GRADE certainty in the evidence: Moderate, Summary of findings 3) patients would get admitted to ICU compared to those having a BMI range between 18.5 and 24.9 kg/m^2. Therefore, obesity class III probably makes little to no difference to the risk of ICU admission when adjusted for DM, HTN, cardiovascular diseases, age, and sex. A sensitivity analysis to investigate the effects of removing the study using a BMI less than 40 as the reference group demonstrated no change in the interpretation of the results or the certainty in the evidence (pooled OR 1.06, 95% CI 1.01 to 1.11, 2 studies, 155,050 participants, $I^2 = 0.0\%$).

4.2.3.4. Obesity (Unclassified)

Twenty one-studies investigated the association between obesity and ICU admission without specification of obesity class (BMI > 30 kg/m^2). These studies included 69,147 participants and 12 of them were at a low overall risk of bias. The reference groups used in these 21 studies included normal BMI range ($18.5 \leq BMI < 25$ kg/m^2, n = 3), non-obese BMI range (BMI < 30 kg/m^2, n = 8), and unspecified (n = 10). On average, COVID-19 patients with obesity had an almost twice larger odds of ICU admission (pooled OR 1.86, 95% CI 1.56 to 2.21, $I^2 = 88.4\%$, Figures S39-S41) compared to those patients without obesity.

By applying the baseline risk of 208/1000, this can be expressed as 123 more (95% CI from 84 more to 164 more, GRADE certainty in the evidence: Moderate, Summary of findings 4) people would get admitted to ICU amongst every 1000 patients with obesity compared to those without (BMI < 30 kg/m^2). Therefore, after comparing this absolute risk difference to the threshold of 50 in every 1000, we conclude that obesity (without further classification) probably increases the risk of ICU admission.

4.2.3.5. Units Change in BMI

No studies were found that looked at the impact of continuous obesity on ICU admission.

4.2.4. Hospitalisation

4.2.4.1. Obesity Class I

Analyses provided moderate-certainty evidence that patients with class I obesity probably have a similar risk of hospitalisation compared to patients without obesity (BMI < 30 kg/m^2) with no

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evidence of credible subgroup effects (pooled OR 0.96, 95% CI 0.82 to 1.14, 5 studies, 515,115 participants, I^2 = 96.8%, Summary of findings 1; Figures S42-S44).

4.2.4.2. Obesity Class II

Analyses provided moderate-certainty evidence that patients with class I and II obesity probably have a similar risk of hospitalisation compared to patients without obesity (BMI < 30 kg/m^2) with no evidence of credible subgroup effects (pooled class II: OR =1.04, 95% CI 0.90 to 1.2, 3 studies, 293,707 participants, I^2 = 94.9%, Summary of findings 2; Figures S45-S46).

4.2.4.3. Obesity Class III

On the contrary to classes I and II obesity, patients with class III obesity (low certainty of evidence, Summary of findings 3) may have an increased risk of hospitalisation, when considering studies that adjusted for at least age, sex, DM, HTN, and cardiovascular diseases (pooled class III: OR = 1.35, 95% CI 1.19 to 1.52, 3 studies, 293,004 participants, I^2 = 91.4%, Summary of findings 3; Figures S47-S51). The analyses that considered all the studies suggested that obesity class III may be an important factor increasing the risk of hospitalisation (pooled class III: OR = 1.77, 95% CI 1.40 to 2.26, 7 studies, 747,176 participants, I^2 = 95.4%, low certainty-evidence, Summary of findings 3; Figures S47-S51).

4.2.4.4. Obesity (Unclassified)

Patients with unclassified obesity (moderate certainty of evidence, Summary of findings 4) probably have an increased risk of hospitalisation, when considering studies that adjusted for at least age, sex, DM, HTN, and cardiovascular diseases (pooled obesity (unclassified): OR 1.31, 95% CI 1.20 to 1.44, 14 studies, 510, 405 participants, I^2 = 91.4%, Figures S52-S56). The analyses that considered all the studies suggested that unclassified obesity may be an important factor increasing the risk of hospitalisation (pooled obesity (unclassified): OR 1.49, 95% CI 1.34 to 1.64, 20 studies, 515,517 participants, I^2 = 82.1%, low certainty-evidence, Summary of findings 4; Figures S52-S56).

4.2.4.5. Units Change in BMI

Also, low-certainty evidence suggests that every 5 units increase in BMI may also increase this risk (pooled OR, 1.17, 95% CI 1.05 to 1.31, 3 studies, 6,911,600 participants, I^2 = 62.9%, Summary of findings 5; Figures S57-S58).

4.2.5. Severe COVID disease

4.2.5.1. Obesity Class I

Analyses provided low-certainty evidence that patients with class I obesity may have an increased risk of severe COVID compared to patients without (BMI < 30 kg/m^2), with no evidence of credible subgroup effects (pooled class I: OR = 1.48, 95% CI 1.16 to 1.87, 3 studies, 1040 participants, I^2 = 0.0%, Summary of findings 1; Figures S59-S61).

4.2.5.2. Obesity Class II

No studies were found that looked at the impact of obesity class II on severe COVID-19 disease.

4.2.5.3. Obesity Class III

No studies were found that looked at the impact of obesity class III on severe COVID-19 disease.

4.2.5.4. Obesity (Unclassified)

As to the association between unclassified obesity and this outcome, high-certainty evidence suggests that COVID-19 patients with obesity, compared to patients without (BMI < 30 kg/m^2), are at an increased risk of developing severe disease (pooled OR =1.94, 95% CI 1.62 to 2.32, 19 studies, 878,804 participants, I^2 = 69.5%, Summary of findings 4; Figures S62-S64).

4.2.5.5. Units Change in BMI

Analyses provided low-certainty evidence that patients with higher BMI (continuous) may have an increased risk of severe COVID-19 compared to patients without (BMI < 30 kg/m^2), with no evidence of credible subgroup effects (pooled BMI per 5 kg/m^2 increase: OR 1.94, 95% CI 1.39 to 2.7, 5 studies, 1041 participants, I^2 = 35.1%, Summary of findings 5; Figures S65-S66).

4.2.6. Pneumonia

4.2.6.1. Obesity Class I

No studies were found that looked at the impact of obesity class I on pneumonia due to COVID-19 disease.

4.2.6.2. Obesity Class II

No studies were found that looked at the impact of obesity class II on pneumonia due to COVID-19 disease.

4.2.6.4. Obesity (Unclassified)

Analysis of moderate-certainty evidence suggests that patients with obesity (unclassified), compared to those with non-obesity (BMI < 30 kg/m^2) probably have an increased risk of pneumonia due to COVID-19 (pooled OR = 1.44, 95% CI 1.21 to 1.72, 5 studies, 35,924 participants, I^2 = 81.4%, Summary of findings 4; Figure S67).

4.2.6.5. Units Change in BMI

No studies were found that looked at the impact of the increase in BMI on pneumonia due to COVID-19 disease.

4.3. Other Outcomes

We also identified other studies that reported on length of hospitalisation, length of ICU admission, and length of mechanical ventilation. All but one of these studies reported adjusted hazard ratios by considering hospital discharge, ICU discharge, or extubation as time-to-event outcomes. Biscarini 2020, in contrast, considered the length of hospitalisation a continuous outcome and reported a beta coefficient (slope) for the adjusted effects of obesity.

Hur 2020 included 564 patients hospitalised with COVID-19 and analysed the data for a final cohort of 486 patients of whom a total of 138 patients were intubated during the course of the study. The study considered the time from intubation to extubation with censoring patients at death or those intubated at the time of the final follow-up. This adjusted analysis for age, sex, race, HTN, and smoking indicated an HR of 0.53 (95% CI 0.32 to 0.90) for obesity class I and II combined (BMI 30 to 40 kg/m^2) and an HR

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of 0.40 (95% CI 0.19 to 0.83) for obesity class III. These were both compared to the reference group of the patients without obesity. These findings suggest that COVID-19 patients without obesity have a higher instantaneous chance of extubation at any time during their period of intubation.

Another study by Parikh 2020 reported on time from ICU admission to ICU discharge among 160 COVID-19 patients who were admitted to ICU. After adjusting for age, sex, and a history of asthma, the study reported an adjusted HR of 0.9 (95% CI 0.5 to 1.7) for ICU discharge and an adjusted HR of 1.2 (95% CI 0.7 to 2.2) for hospital discharge when comparing patients with obesity to those without. While the point estimates may indicate that obesity lowers the instantaneous chance of ICU discharge but increases the same chance for hospital discharge after ICU admission, the wide confidence intervals include the no-effect line.

Regarding the time from hospital admission to discharge, Hu 2020 and Van Zelst 2020 conducted Cox proportional hazard regression analysis, compared to the linear regression by Biscarini 2020. This latter study reported that the analysis of 427 patients suggests that patients with obesity, compared to those without, have an average increase of 1.19 days (95% CI -1.88 to 4.26) in the length of hospital stay when adjusted for some covariates like age, sex, and some comorbidities. The study by Huh 2020 included 58 admitted patients with mild COVID-19 from whom those with obesity had an adjusted HR of 0.83 (P value for trend = 0.001) for hospital discharge. The other study with a similar analysis, by Van Zelst 2020, analysed the data for 79 COVID-19-positive patients, of whom 74 were admitted to the hospital. After adjustment for age, sex, and presence of metabolic syndrome, this study reported a hospital discharge adjusted HR of 0.97 (95% CI 0.92 to 1.01) when comparing patients with obesity to those without.

DISCUSSION

5.1. Summary of main results

Our review investigated the prognostic effects of obesity on adverse COVID-19 outcomes. We located and evaluated available evidence about patient-important outcomes such as mortality, mechanical ventilation, and ICU admission. We also investigated the effects of obesity on hospitalisations, severe disease, and pneumonia due to COVID-19.

High-certainty evidence suggested that obesity class I and II does not meet a minimal threshold of 5% absolute risk increase for mortality. On the other hand, our analysis for class III obesity showed that the effect of this class exceeds this threshold, although this is low-certainty evidence. A closer look at these observed effect sizes, interestingly, reveals that a dose-response relationship exists. The absolute mortality risk difference (relative to patients without obesity) for COVID-19 patients with obesity indicates a rise from 0.06% more to 8.8%, from class I to class III, respectively. This suggests that obesity possibly plays a role in increasing the risk of mortality, even though the milder two classes impose less than a 5% risk increase, which we considered the threshold of an **important** prognostic factor. This finding is also in line with the high-certainty of evidence that exhibited an increased mortality risk for every five units of BMI increase. Our best estimate is that every five units of BMI increase inflates mortality risk by more than 2%.

Coherently for all obesity classes, the evidence points toward an increased risk of mechanical ventilation among patients with obesity. The certainty of the evidence for classes II and III is high while for class I is moderate. Similar to mortality, we observed a dose-response relationship which further supports the conclusion that obesity is associated with an increased risk for this outcome. The amount of this risk increase ranges from more than 5% to 15% for different obesity classes. Findings regarding every 5 units increase in BMI and unclassified obesity was also aligned with this elevated risk, however, with moderate and low certainty of evidence. We interpret these findings to indicate that all obesity classes are important prognostic factors for the need for mechanical ventilation among COVID-19 patients.

In contrast to mortality and mechanical ventilation, the observed effects on ICU admission were not congruent across obesity classes. We observed the highest risk of ICU admission with an absolute risk increase of 5.5% from moderate-quality evidence amongst participants with class I obesity. This suggests that this obesity class is probably an important prognostic factor. However, for obesity class II and class III, the absolute increase in ICU admission risk was only 0.03% and 2.3% from low-quality and moderate-quality evidence, respectively. Further adding to this incongruency, the low-quality evidence from studies investigating unclassified obesity suggests a 12.3% increase in ICU admission risk. Therefore, we believe that interpretation of our findings for ICU admission should be accompanied by utmost caution. Even though unclassified obesity seems like an important prognostic factor for ICU admission, findings regarding obesity classes do not support this conclusion. One possible explanation for these contradictory results could be that the decision about ICU admission is made by the treating physician. This subjective decision can be informed by many different factors that are known to physicians, such as obesity. The resulting differential misclassification bias can introduce this unexpected difference. To a lesser degree, this bias can influence our results about mechanical ventilation too.

In terms of hospitalisation, we found moderate-quality evidence that classes I and II of obesity alter the risk of hospitalisation negligibly (-0.05% and 0.07%, respectively). On the other hand, the 3.2% and 5.5% increased risk of hospitalisation for class III and unclassified obesity arise from low certainty in the evidence. Therefore, although obesity might be a prognostic factor for hospitalisation, we do not think it is an important prognostic factor.

The available data for severe COVID-19 disease only showed class I and unclassified obesity associations with this outcome. High-quality evidence suggests that unclassified obesity is an important prognostic factor for severe disease with an increased risk of 12.3%. Similarly, we only found moderate-quality evidence that unclassified obesity is an important prognostic factor for COVID-19 pneumonia with an 8.2% increase in absolute risk.

5.2. Overall completeness and applicability of evidence

In this review, we sought to determine if obesity is an independent prognostic factor for adverse outcomes among adult patients with confirmed COVID-19 infections. Obesity as a prognostic variable is complex and has been examined in different ways, which can complicate interpretation. Part of this complexity also includes using different comparators in analyses, such as those that include or exclude being overweight (BMI 25 to 29.9 kg/m^2). Examining obesity as three separate classes, as continuous BMI, and also

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assessing the congruency across the various approaches, as we did, may address part of this complexity and provide some of the nuanced details required for clinical and policy decision-making.

Our findings demonstrate clear dose-response relationships between obesity and in-hospital mortality, and obesity and mechanical ventilation amongst adult COVID-19 patients. Unclassified obesity is an important prognostic factor for severe COVID-19 disease and is probably an important prognostic factor for COVID-19 pneumonia. However, findings for ICU admission and hospitalisation had more variability and uncertainty. These findings could be used for risk stratification of COVID-19 patients, and to inform customised clinical management and resource allocation when providing care.

On the flip side of management, taking precautions to minimise the risk for infection with COVID-19 is important for everyone, but even more so for certain groups of people, particularly regarding modifiable risk factors. Specifically, our findings indicate that adults living with obesity can be considered a potentially vulnerable group. These findings are, therefore, also relevant for COVID-19 practice and policy decisions around prevention, and may also be informative for decisions around detection and testing. Importantly, the use of these findings for management and prevention decisions should be considered within the context of the roles of other prominent prognostic factors (e.g. age).

Based on the exclusion criteria of the included studies, the findings of this review are specifically most applicable to adults living with obesity who have been hospitalised with confirmed COVID-19 infection. Included studies were undertaken in a wide range of countries and amongst people from a wide age range (approximately between 31 and 77 years old on average). Although present in a minority of studies, the following are examples of sub-populations excluded from these studies: pregnant women, nursing home residents, and patients living with severe morbid obesity (e.g. > 300 kg, BMI > 100 kg/m^2), organ transplants, active cancer, and terminal illnesses. Importantly, a large proportion of included studies did not report their exclusion criteria.

Numerous interdependent prognostic variables for adverse outcomes in COVID-19 patients have been identified, including obesity. A better understanding of whether obesity per se is a key prognostic variable will help to identify vulnerable patients, inform treatment decisions and better allocate limited resources. For these reasons, we only included studies with multivariable analyses and then sought to examine if associations were different between studies using a minimum adjustment set (age, sex, diabetes, hypertension, and cardiovascular disease) compared to those that did not.

5.3. Certainty of the evidence

As evident from the summary of findings tables, we have a variety of evidence quality levels for different comparisons and outcomes. We have started our certainty in the evidence as high for each comparison and subsequently rated the level down for pertinent issues. The most common reasons for downgrading the certainty in the evidence include imprecision and heterogeneity followed by risk of bias. While we did not have problems with the directness of the evidence, suspected publication bias affected some of the ratings. You can refer to the individual summary of findings tables for each comparison and outcome reasons and explanations for the downgrading of certainty in the evidence.

5.4. Potential biases in the review process

Our review has several notable strengths. We systematically searched all bibliographic databases for studies published in any language. Therefore, our inferences on the prognostic value of obesity, in the setting of COVID-19, are informed by the totality of peer-reviewed publications on this topic. In addition to summarising the individual studies, we critically appraised their risk of bias with the use of QUIPS. Furthermore, for each of WHO's obesity classes, we were able to conduct a separate meta-analysis to obtain a pooled estimate and 95% CI. Beyond the WHO classification, our review also evaluated the prognostic utility of BMI as a continuous variable. Specifically, in evaluating the risk of bias, we determined a minimal set of key covariates (age, diabetes, cardiovascular disease) that authors of primary studies should have adjusted for in their multivariable regression modelling. We used subgroup analyses to evaluate whether this minimal set of key covariates had bearing on the association between obesity and outcomes. The combination of only including studies with multivariate analyses, the use of QUIPS to assess risk of bias (which explicitly incorporates the extent of covariates adjusted for) and the conducting of subgroup analyses based on the adequate adjustment of covariates allowed us to address the complex relationship between obesity and comorbidities in influencing mortality and other adverse COVID-related outcomes. In summarising our findings, we translated the pooled relative effects to absolute risk difference to clinically contextualise the findings of our review. Our review also benefited from the GRADE framework, which informed our certainty in the prognostic value of obesity.

Our review also had several notable limitations. We continuously strived to maintain an updated list of eligible articles. We did this by repeating our search and screening multiple times in the conduct of this systematic review. Despite our best efforts, however, we were unable to keep up with the rapid pace of publications on COVID-19. Therefore, by the time this review is completed, several new articles may be published that are eligible for inclusion but not within our review. To date, our search has captured studies published up to April 2021. These additional studies may have variable impact on the outcomes reported in our review. We believe that additional studies may have minimal impact on the pooled estimates for mortality and mechanical ventilation. These outcomes had the highest number of patients and events, and thus the inclusion of additional studies may minimally impact on our findings. This, however, is not the case for other outcomes (such as ICU admission, hospitalisation, and severe COVID-19), which were informed by much fewer studies. The inclusion of additional studies published after April 2021 may introduce an additional source of heterogeneity: inclusion of studies following cohorts of patients previously vaccinated for COVID-19. Another point to mention is that, in the case of missing data, we did not contact the authors of the original works. However, this can also have minimal impact on the results based on the previously mentioned reasons.

In our review, the included primary studies, in their multivariable regression modelling, adjusted for different types of covariates. Seldom did we observe two studies adjusting for the exact set of covariates, and some studies only adjusted for a single covariate. Although we prespecified a set of important covariates that authors

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should adjust for (as part of our risk of bias assessment, including age, sex, diabetes, hypertension, and cardiovascular disease), considerable heterogeneity exists in the covariates adjusted for. A notable limitation of our review is that we were unable to explore this methodologic heterogeneity beyond the exploration of subgroups. The most ideal method for dealing with this source of heterogeneity is to conduct a meta-analysis of individual patient data. These differing covariates may be a contributing factor to the observed inconsistency, beyond random error, observed in meta-analyses for mechanical ventilation, ICU admission, and hospitalisation. To account for and acknowledge this degree of heterogeneity, we ensured that we conducted all our meta-analyses under the random-effects framework. Furthermore, we acknowledge the doubt created by heterogeneity in assessing our certainty in the prognostic value of obesity.

Finally, the findings of our review are dependent on the underlying assumption that BMI is a meaningful and valid measure to capture obesity and its severity. The relationship between BMI and percentage of body fat is non-linear, and the measure does not account for nonfat sources of mass (e.g. bone, muscle), the natural changes in body composition that accompany age, and the natural differences in body composition across different ethnicities (Hall 2006; Rothman 2008). Furthermore, there are differences between self-reported and measured BMI (Maukonen 2018). However, despite these limitations, BMI remains the predominant measure of an individual's adiposity due to its ease of use and relatively low cost of collection (Burkhauser 2008). BMI was selected as the measure of obesity in our review due to its widespread use, however, we acknowledge the bias that the measure may bring when evaluating obesity's prognostic value.

5.5. Agreements and disagreements with other studies or reviews

Since the beginning of the COVID-19 pandemic, multiple systematic reviews have strived to investigate the association of obesity with adverse outcomes of COVID-19 disease. However, the methodologic quality, number of included studies, and reporting of these studies vary.

Dessie 2021 included a total of 423,117 participants from a total of 42 studies in their review to locate mortality-related risk factors of COVID-19. Their quantitative analysis of 11 studies concluded with an OR of 1.34 (95% CI 1.17 to 1.52) and an HR of 1.5 (95% CI 1.26 to 1.75) for patients with obesity versus those without. These results are in line with our calculated pooled OR for obesity unclassified (OR 1.35, 95% CI 1.28 to 1.42). However, there are methodological concerns with this study. For example, the study did not mention any protocol registration or clear eligibility criteria.

Another study, Raeisi 2022, conducted a systematic search in June 2020 (published in July 2021). In contrast to other reviews, this study also evaluated the quality of evidence through the application of GRADE. This study investigated the association of obesity with mortality, mechanical ventilation, ICU admission, and hospitalisation amongst COVID-19 patients. This study found low-quality evidence for mortality, mechanical ventilation, and ICU admission and very low-quality evidence for hospitalisation. Similar to other reviews, authors only compared patients with obesity versus those without further classification of obesity groups. The findings of this study agree with our findings in that they found ORs of 1.23 (95% CI 1.06 to 1.41), 2.24 (95% CI 1.70 to 2.94), 1.75 (95% CI 1.38 to 2.22), and 1.75 (95% CI 1.47 to 2.09) for mortality, mechanical ventilation, ICU admission, and hospitalisation. However, we reported lower ORs for mechanical ventilation and hospitalisation.

Other reviews also had systematic searches from May 2020 to July 2020 (Chu 2020; Földi 2020; Soeroto 2020). These reviews investigated the association between obesity and various outcomes such as mortality, mechanical ventilation, ICU admission, and poor outcomes. Most findings by these reviews were in line with our findings in terms of the association direction. However, Chu 2020 reported a statistically non-significant lower odds for mortality among those with obesity. This study reported an OR of 0.89 (95% CI 0.32 to 2.51, 3856 participants from 3 studies) for patients with obesity versus those without obesity in COVID-19 patients. In addition, another study investigated factors associated with mortality amongst COVID-19 patients admitted to the ICU (Taylor 2021). The study included 21 studies to compare the mean BMI between the deceased and survival groups. What they found was a statistically non-significant difference between the groups (SMD 0.05, 95%CI -0.06 to 0.16). It is noteworthy that an asymmetry in their forest plot suggests the possibility of publication bias.

AUTHORS' CONCLUSIONS

6.1. Implications for practice

Our findings are most applicable to adults living with obesity who have been hospitalised with confirmed COVID-19 infection. In these patients, the evidence suggests clear dose-response relationships between obesity and in-hospital mortality, and obesity and mechanical ventilation. Unclassified obesity is an important prognostic factor for severe COVID-19 disease and is probably an important prognostic factor for COVID-19 pneumonia. However, findings for ICU admission and hospitalisation were less clear. These findings could be used to inform risk stratification of adult COVID-19 patients for the provision of clinical care, allocation of resources, and planning prevention, detection, and testing strategies.

6.2. Implications for research

As the findings of our review suggest, obesity is an important prognostic factor for at least some of the patient-important COVID-19 adverse outcomes. Therefore, it is important that future research acknowledge this fact and clearly report on their population in regard to obesity. Another important consideration is for researchers to ensure that patients with obesity should be sufficiently represented in trials on COVID-19 treatments and vaccines. To ensure this, any systematic exclusion of this group should only take place with a strong rationale and in exceptional circumstances. Finally, our review demonstrates the variability in covariates adjusted for across studies exploring obesity as a prognostic factor amongst patients diagnosed with COVID-19. Future individual patient data meta-analyses are needed to explore the independent association of obesity and COVID-19 outcomes under a controlled set of covariates.

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We would like to commemorate one of the authors of this review who we lost during the conduct of this review. Dr. Kamran Shokraee was a bright young man with great aspirations who contributed

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to this review with unparalleled enthusiasm and sincerity. Even though his departure was very sudden, saddening, and shocking to his family and friends, his great achievements in academic and social life will be remembered. He not only represented the true meaning of academic excellence but touched many lives through his compassion. Kamran was a caring teacher, curious researcher, compassionate doctor, and a loving brother and friend. Although his journey was short in this world, his memory will linger with us forever.

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Cochrane Metabolic and Endocrine Disorders Groups upported the authors in the development of this review. The following people conducted the editorial process for this article

- Sign-off Editor (final editorial decision): Brenda Bongerts, Co-ordinating editor at the Cochrane Metabolic and Endocrine Disorders group
- Managing Editor (selected peer reviewers, provided comments, collated peer-reviewer comments, provided editorial guidance to authors, edited the article): Lara Kahale and Colleen Ovelman, Cochrane Central Editorial Service
- Editorial Assistant (conducted editorial policy checks and supported editorial team): Lisa Wydrzynski, Cochrane Central Editorial Service
- Copy Editor (copy-editing and production): [NAME, AFFILIATION] (will be identified later)
- Peer-reviewers (provided comments and recommended an editorial decision): Carmen Piernas, MSc PhD; University Research Lecturer, University of Oxford (content review), Robert Walton. Senior Fellow in General Practice, Cochrane UK (content review); Kerry Dwan, Cochrane Methods Support Unit (methods review); and Robin Featherstone, Cochrane Central Editorial Service (search review).

One additional peer reviewer provided content peer review, but chose not to be publicly acknowledged

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References to other published versions of this review

New Reference 2

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New Reference 3

New Reference 4

New Reference 5

New Reference 6

* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Abumayyaleh 2021

Study characteristics

Notes

English title

Does there exist an obesity paradox in COVID-19? Insights of the international HOPE-COVID-19-registry

Study setting

Start of study recruitment (MM/YYYY)

NR

End of study recruitment (MM/YYYY)

05/2020

Study design

retrospective cohort

Study centre(s)

international

Number of centres/clinics/areas

21

Study setting

inpatient

Number of participants recruited

3635

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 1518

Age measure, value

median (range), 63 (18, 99)

Central tendency measure of age

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Abumayyaleh 2021 *(Continued)*

median

Value

63

Dispersion measure of age

range

Value (report as single Value or as X1, X2)

18, 99

Inclusion criteria

Hospitalised COVID-19 patients were included.

Exclusion criteria

Lack of data about body mass index (BMI) and patients age < 18

Smoking

(absolute number), 266

Diabetes

(absolute number), 678

Hypertension

(absolute number), 1808

Cardiovascular diseases

(absolute number), 824

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

(absolute number), 624

Please indicate if additional information is available

NR

Immunosuppression

(absolute number), 239

Please indicate if additional information is available

Immunosuppressive therapy for psoriasis arthritis, lung transplantation, kidney transplantation or systemic lupus erythematosus; oncological disease such as mamma-ca, prostate-ca, myelodysplastic syndrome or gammopathy, glucocorticoid therapy caused by COPD, dialysis, HIV or hepatitis

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Abumayyaleh 2021 *(Continued)*

Chronic kidney disease

(absolute number), 191

Cancer

(absolute number), 401

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

2552/3562 for O2 support at admission, 785/3515 for high-flow nasal cannula

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity is defined as a BMI ≥ 30 kg/m^2 according to the recommended classification by the World Health Organization (WHO)

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

BMI ≥ 30 kg/m^2

Measure of frequency

absolute number

Frequency value

1061

How many eligible outcomes reported?

1

How many eligible outcomes reported?

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Abumayyaleh 2021 *(Continued)*

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (BMI ≥ 30 kg/m^2)

Outcome

mortality

Prognostic factor (category):

BMI ≥ 30 kg/m^2

Follow-up

Number of patients followed completely for this outcome

3635

Number of obese patients followed completely for this outcome

1061

Number of non-obese patients followed completely for this outcome

2574

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, BMI < 25 kg/m^2, BMI > 30 kg/m^2, connective tissue disease, elevated creatinine, GCS < 15, ICU (intensive care unit) admission, peripheral oxygen saturation (SpO2) < 92%

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.15 (0.893,1.479)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3

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Abumayyaleh 2021 *(Continued)*

Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Ahlstrom 2021

Study characteristics

Notes

English title

The Swedish Covid-19 intensive care cohort: risk factors of ICU admission and ICU mortality

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 05/2020

Study design: Case-control

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Inpatient

Number of participants recruited: 1981

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 516

Age measure, value: Median (IQR), 61 (52-69)

Inclusion criteria: The study population was defined by at least one COVID-19 registration in the SIRI until data acquisition on 27 May 2020. From RTB, four age- and sex-matched controls per patient were drawn. Age matching was performed as close to ICU admission as possible, on the age at 31 January 2020. Cases could not become controls and controls could not be selected twice.

Exclusion criteria: Exclusion criteria were aged < 18 years or the absence of a Swedish personal identification number (PIN)

Smoking frequency: NR

Diabetes frequency: 522

Hypertension frequency: 982

Cardiovascular disease frequency: 317

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Ahlstrom 2021 *(Continued)*

Asthma frequency: 133

Chronic obstructive pulmonary disease frequency: 75

Other pulmonary disease frequency: NR

Immunosuppression frequency: 236

Chronic kidney disease frequency: 75

Cancer frequency: 94

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity was defined based on ICD-10 coding E66

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 123

Prognostic factor(s): BMI > 30 kg/m^2

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 1981

Number of obese patients followed completely for the outcome: 123

Number of non-obese patients followed completely for the outcome: 1858

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, gender, simplified acute physiology score 3 (SAPS3)

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.87 (0.51, 1.48), 0.61

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Ahlstrom 2021 *(Continued)*

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Al-Sabah 2020

Study characteristics	
Notes	**English title** COVID-19: impact of obesity and diabetes on disease severity **Study setting** **Start of study recruitment (MM/YYYY):** 02/2020 **End of study recruitment (MM/YYYY):** 04/2020 **Study design:** Retrospective cohort **Study centre(s):** Multiple centres/clinics/areas within a country **Number of centres, clinics or areas:** 1 **Study setting:** Inpatient **Number of participants recruited:** 1158 **Sampling method:** Consecutive participants **Participants** **Female participants (absolute number):** 213 **Age measure, value:** Median (IQR), 40.5 (31.5-52.1) **Inclusion criteria:** The patients with positive results of COVID-19 test were included in the study. **Exclusion criteria:** The patients with negative or equivocal results of COVID-19 test were excluded. **Smoking frequency:** NR **Diabetes frequency:** 271 **Hypertension frequency:** 236 **Cardiovascular disease frequency:** NR

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Al-Sabah 2020 *(Continued)*

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Normal weight (BMI of 18.5-24.9 kg/m^2), overweight (BMI of 25.0-29.9 kg/m^2) and obese (BMI ≥ 30 kg/m^2). The subjects with obesity were further stratified into classes: class I obesity was defined as a BMI of 30-34.9 kg/m^2; class II obesity, by a BMI of 35-39.9 kg/m^2; and morbid obesity, by a BMI ≥ 40 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination: BMI

Threshold used for definition: 30

Obesity frequency (Absolute number): 157

Prognostic factor(s): Class I obesity (BMI of 30-34.9 kg/m^2)

Class II obesity (BMI of 35-39.9 kg/m^2)

Morbid obesity (BMI ≥ 40 kg/m^2)

Outcome(s)

ICU admission

Outcome (prognostic factor)

Mortality (Class I obesity (BMI of 30-34.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 1158

Number of obese patients followed completely for the outcome: 157

Number of non-obese patients followed completely for the outcome: 570

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 3.51 (1.60, 7.69), 0.002

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

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Al-Sabah 2020 *(Continued)*

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.70 (1.17, 6.20), 0.019

Outcome (prognostic factor)

Mortality (Class II obesity (BMI of 35-39.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 1158

Number of obese patients followed completely for the outcome: 157

Number of non-obese patients followed completely for the outcome: 570

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.78 (0.93, 8.27), 0.066

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.61 (0.50, 5.15), 0.423

Outcome (prognostic factor)

Mortality (Morbid obesity (BMI ≥ 40 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 1158

Number of obese patients followed completely for the outcome: 157

Number of non-obese patients followed completely for the outcome: 570

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.18 (1.50, 17.85), 0.009

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.95 (1.00, 15.20), 0.046

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3

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Al-Sabah 2020 *(Continued)*

Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Al-Salameh 2020

Study characteristics

Notes

English title

The association between body mass index class and coronavirus disease 2019 outcomes

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 329

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 143

Age measure, value: Median (IQR), 72 (61-84)

Inclusion criteria: A confirmed diagnosis of COVID-19 and inpatient admission to Amiens University Hospital

Exclusion criteria: Opposition to data collection by the patient or his/her legal guardian and age under 18

Smoking frequency: 249

Diabetes frequency: 93

Hypertension frequency: 202

Cardiovascular disease frequency: 115

Asthma frequency: NR

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Al-Salameh 2020 *(Continued)*

Chronic obstructive pulmonary disease frequency: 34

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 50

Cancer frequency: 53

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Underweight (BMI < 18.5), normal weight (BMI of 18.5-24.9 kg/m^2), overweight (BMI of 25.0-29.9 kg/m^2) and obese (BMI ≥ 30 kg/m^2)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 124

Prognostic factor(s): BMI ≥ 30 kg/m^2

Outcome(s)

ICU admission

Mortality

Mechanical ventilation

Outcome (prognostic factor)

ICU admission (BMI ≥ 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 329

Number of obese patients followed completely for the outcome: 124

Number of non-obese patients followed completely for the outcome: 205

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 6 (3.08, 12.52), < 0.0001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, ALAT > 40 U/I, ASAT > 40 U/I, cancer, cardiac disease, COPD, CRP on admission, CVD total, diabetes, sex (female)

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.05 (1.25, 7.82), 0.017

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Al-Salameh 2020 *(Continued)*

Outcome (prognostic factor)

Mortality (BMI ≥ 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 329

Number of obese patients followed completely for the outcome: 124

Number of non-obese patients followed completely for the outcome: 205

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.78 (0.41, 1.47), 0.44

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, ALAT > 40 U/I, ASAT > 40 U/I, cancer, cardiac disease, COPD, CRP on admission, CVD total, diabetes, sex (female)

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.35 (0.47, 3.96), 0.025

Outcome (prognostic factor)

Mortality (BMI ≥ 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 329

Number of obese patients followed completely for the outcome: 124

Number of non-obese patients followed completely for the outcome: 205

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 8.21 (3.21, 25.48), < 0.0001

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3

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Al-Salameh 2020 *(Continued)*

Study Attrition Mechanical ventilation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Alkhatib 2020

Study characteristics	
Notes	**English title** BMI is associated with coronavirus disease 2019 Intensive Care Unit admission in African Americans **Study setting** **Start of study recruitment (MM/YYYY):** 03/2020 **End of study recruitment (MM/YYYY):** 04/2020 **Study design:** Registry data **Study centre(s):** Single centre/clinic/area within a country **Number of centres, clinics or areas:** 1 **Study setting:** Outpatient and inpatient **Number of participants recruited:** 158 **Sampling method:** Consecutive participants **Participants** **Female participants (absolute number):** 97

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Alkhatib 2020 *(Continued)*

Age measure, value: Mean (SD), 57 (15.1)

Inclusion criteria: Self-reported African American patients confirmed to have COVID-19 who presented to a tertiary academic hospital

Exclusion criteria: Patients with missing data or pending COVID-19 confirmatory testing

Smoking frequency: NR

Diabetes frequency: 76

Hypertension frequency: 107

Cardiovascular disease frequency: 21

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 32

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 21

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: World Health Organization (WHO) obesity class, defined as: class I obesity (30.0–34.9 kg/m^2), class II obesity (35.0–39.9 kg/m^2), and class III obesity (≥ 40.0 kg/m^2)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 96

Prognostic factor(s): BMI

Outcome(s)

ICU admission

Outcome (prognostic factor)

ICU admission (BMI)

Follow-up

Number of patients followed completely for the outcome: 158

Number of obese patients followed completely for the outcome: 96

Number of non-obese patients followed completely for the outcome: 62

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

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Alkhatib 2020 *(Continued)*

Effect measure value (95% CI), P value: 1.063 (1.020, 1.108), 0.0044

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, CKD, congestive heart failure, DM, hypertension, obstructive lung disease (both chronic obstructive pulmonary disease and asthma), sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.115 (1.052, 1.182), 0.0002

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Anderson 2021

Study characteristics

Notes

English title

Body mass index and risk for intubation or death in SARS-CoV-2 infection: a retrospective cohort study

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

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Anderson 2021 *(Continued)*

2

Study setting

inpatient

Number of participants recruited

533

Sampling method

consecutive participants

Participants

Female participants

(percentage), 42

Age measure, value

median (interquartile range), 67 (54, 78)

Inclusion criteria

COVID-19 positive

Exclusion criteria

NR

Smoking

(percentage), 12

Diabetes

(percentage), 40

Hypertension

(percentage), 52

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

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Anderson 2021 *(Continued)*

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

(percentage), 18

Cancer

(percentage), 13

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

The BMI categories were defined a priori by using the World Health Organization criteria: underweight (< 18.5 kg/m^2), normal weight (18.5 to 24.9 kg/m^2), overweight (25.0 to 29.9 kg/m^2), class 1 obesity (30 to 34.9 kg/m^2), class 2 obesity (35 to 39.9 kg/m^2), and class 3 obesity (≥ 40 kg/m^2).

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

BMI ≥ 30 kg/m^2

Measure of frequency

absolute number

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Anderson 2021 *(Continued)*

Frequency value

189

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (class I obesity (30 to 34.9 kg/m^2))

Outcome

Mortality

Prognostic factor (category):

class I obesity (30 to 34.9 kg/m^2)

Follow-up

Number of patients followed completely for this outcome

NR

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.2 (0.8, 1.7)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, asthma or chronic obstructive pulmonary disease, cancer, chronic kidney disease, diabetes, hypertension, pulmonary hypertension, race/ethnicity, sex, smoking

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

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Anderson 2021 *(Continued)*

1.4 (0.97, 2.0)

Outcome (prognostic factor)

mortality (class II obesity (35 to 39.9 kg/m^2))

Outcome

Mortality

Prognostic factor (category):

class II obesity (35 to 39.9 kg/m^2)

Follow-up

Number of patients followed completely for this outcome

NR

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.7 (0.4, 1.1)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, asthma or chronic obstructive pulmonary disease, cancer, chronic kidney disease, diabetes, hypertension, pulmonary hypertension, race/ethnicity, sex, smoking

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.0 (0.6, 1.7)

Outcome (prognostic factor)

mortality (class III obesity (≥ 40 kg/m^2))

Outcome

Mortality

Prognostic factor (category):

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Anderson 2021 *(Continued)*

class III obesity (≥ 40 kg/m^2)

Follow-up

Number of patients followed completely for this outcome

NR

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.9 (0.5, 1.5)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, asthma or chronic obstructive pulmonary disease, cancer, chronic kidney disease, diabetes, hypertension, pulmonary hypertension, race/ethnicity, sex, smoking

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.6 (0.9, 2.7)

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3

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Anderson 2021 *(Continued)*

Statistical Analysis Bias	No	Appendix 3

Apea 2021

Study characteristics

Notes

English title

Ethnicity and outcomes in patients hospitalised with COVID-19 infection in East London: an observational cohort study

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 5

Study setting: Inpatient

Number of participants recruited: 1996

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 786

Age measure, value: Mean (SD), 63.40 (18.22)

Inclusion criteria: NR

Exclusion criteria: Those under 16 years were excluded. The first emergency admission encompassing the first positive SARS-CoV-2 test, or the first emergency admission within 2 weeks of positive outpatient testing was defined as the index admission; community diagnoses without an associated emergency hospital admission were excluded.

Smoking frequency: 173

Diabetes frequency: 664

Hypertension frequency: 1009

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 397

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 363

Cancer frequency: 144

Steroid administration frequency: NR

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Apea 2021 *(Continued)*

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: World Health Organization (WHO) obesity class, defined as: class I obesity (30.0–34.9 kg/m^2), class II obesity (35.0–39.9 kg/m^2), and class III obesity (≥ 40.0 kg/m^2)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 409

Prognostic factor(s): BMI ≥ 30 kg/m^2

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI ≥ 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 1996

Number of obese patients followed completely for the outcome: 409

Number of non-obese patients followed completely for the outcome: 839

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.42 (1.09, 1.85), 0.009

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Apea 2021 *(Continued)*

Mortality		
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Argenziano 2020

Study characteristics

Notes

English title

Characterization and clinical course of 1000 patients with coronavirus disease 2019 in New York: retrospective case series

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Outpatient and inpatient

Number of participants recruited: 1000

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 404

Age measure, value: Median (IQR), 63 (50-75)

Inclusion criteria: All patients with COVID-19 who received emergency department or inpatient care at NYP/CUIMC

Exclusion criteria: COVID-19 patients who had performed their test in the outpatient setting or at another hospital

Smoking frequency: 230 (including ex-smokers)

Diabetes frequency: 372

Hypertension frequency: 601

Cardiovascular disease frequency: NR

Asthma frequency: 113

Chronic obstructive pulmonary disease frequency: 66

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

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Argenziano 2020 *(Continued)*

Cancer frequency: 67

Steroid administration frequency: 178 (only inpatient)

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 352

Prognostic factor(s): BMI

Outcome(s)

Mortality

Mechanical ventilation

Outcome (prognostic factor)

Mortality (BMI)

Follow-up

Number of patients followed completely for the outcome: 1000

Number of obese patients followed completely for the outcome: 352

Number of non-obese patients followed completely for the outcome: 489

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.02 (1.00, 1.05), 0.025

Outcome (prognostic factor)

Mechanical ventilation (BMI)

Follow-up

Number of patients followed completely for the outcome: 1000

Number of obese patients followed completely for the outcome: 352

Number of non-obese patients followed completely for the outcome: 489

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Argenziano 2020 *(Continued)*

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.02 (0.999, 1.04), 0.0682

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Awad 2021

Study characteristics

Notes

English title

Impact of hydroxychloroquine on disease progression and ICU admissions in patients with SARS-CoV-2 infection

Study setting

Start of study recruitment (MM/YYYY)

03/2020

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Awad 2021 *(Continued)*

End of study recruitment (MM/YYYY)

04/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

336

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 157

Age measure, value

mean (standard deviation), 64.3 (17)

Inclusion criteria

Patients were included in the cohorts if they were admitted during the study time frame and tested positive for SARS-CoV-2.

Exclusion criteria

Patients were excluded if they did not test positive for SARS-CoV-2, if they required intubation within 24 hours of admission, or if they were not admitted to the hospital.

Smoking

NR

Diabetes

(absolute number), 94

Hypertension

NR

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

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Awad 2021 *(Continued)*

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

hydroxychloroquine

Dose if applicable

loading dose of 400 mg every 12 hours on day 1 followed by a dose of 200 mg every 12 hours

Duration if applicable

5-day course of therapy

Percentage received this treatment

44.04

Prognostic factor(s)

Study's definition for obesity

World Health Organization (WHO) obesity class, defined as: overweight (25.0- 29.90 kg/m^2) class I obesity (30.0–34.9 kg/m^2), class II obesity (35.0–39.9 kg/m^2), and class III obesity (≥ 40.0 kg/m^2)

The time when obesity has been measured

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Awad 2021 *(Continued)*

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

BMI ≥ 25 kg/m^2

Measure of frequency

absolute number

Frequency value

241

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

ICU admission, mechanical ventilation

Outcome (prognostic factor)

ICU admission (BMI ≥ 25 kg/m^2)

Outcome

ICU admission

Prognostic factor (category):

BMI ≥ 25 kg/m^2

Follow-up

Number of patients followed completely for this outcome

336

Number of obese patients followed completely for this outcome

241

Number of non-obese patients followed completely for this outcome

95

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

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Awad 2021 *(Continued)*

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.26 (0.69, 2.31)

Outcome (prognostic factor)

mechanical ventilation (BMI ≥ 25 kg/m^2)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI ≥ 25 kg/m^2

Follow-up

Number of patients followed completely for this outcome

336

Number of obese patients followed completely for this outcome

241

Number of non-obese patients followed completely for this outcome

95

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

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Awad 2021 *(Continued)*

1.19 (0.64, 2.2)

Outcome (prognostic factor)

ICU admission (BMI ≥ 25 kg/m^2)

Outcome

ICU admission

Prognostic factor (category):

BMI ≥ 25 kg/m^2

Follow-up

Number of patients followed completely for this outcome

122

Number of obese patients followed completely for this outcome

46

Number of non-obese patients followed completely for this outcome

76

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

4.81 (0.94, 24.73)

Outcome (prognostic factor)

mechanical ventilation (BMI ≥ 25 kg/m^2)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI ≥ 25 kg/m^2

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Awad 2021 *(Continued)*

Follow-up

Number of patients followed completely for this outcome

122

Number of obese patients followed completely for this outcome

46

Number of non-obese patients followed completely for this outcome

76

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

4.41 (1.01, 19.28)

Outcome (prognostic factor)

ICU admission (BMI ≥ 25 kg/m^2)

Outcome

ICU admission

Prognostic factor (category)

BMI ≥ 25 kg/m^2

Follow-up

Number of patients followed completely for this outcome

214

Number of obese patients followed completely for this outcome

73

Number of non-obese patients followed completely for this outcome

141

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Awad 2021 *(Continued)*

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.03 (0.51, 2.06)

Outcome (prognostic factor)

mechanical ventilation (BMI ≥ 25 kg/m^2)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI ≥ 25 kg/m^2

Follow-up

Number of patients followed completely for this outcome

214

Number of obese patients followed completely for this outcome

73

Number of non-obese patients followed completely for this outcome

141

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

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Awad 2021 *(Continued)*

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.95 (0.47, 1.94)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Confounding Bias ICU admission	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Baronio 2020

Study characteristics

Notes

English title

Italian SARS-CoV-2 patients in intensive care: towards an identikit for subjects at risk?

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Case series

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Baronio 2020 *(Continued)*

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 191 (cohort 1), 157 (cohort 2)

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 42 (cohort 1), 33 (cohort 2)

Age measure, value: Mean (SD), 64.5 (9.9) (cohort 1), median (IQR), 33 (59-70) (cohort 2)

Inclusion criteria: 157 critically ill patients from the Intensive Care Unit (ICU) and 34 stable patients from the Medical and Surgical Departments (hereafter referred to as 'controls'), who did not develop severe respiratory failure (cohort 1), 157 critically ill patients from the ICU (cohort 2)

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 34 (cohort 1), 25 (cohort 2)

Hypertension frequency: NR

Cardiovascular disease frequency: 114 (cohort 1), 94 (cohort 2)

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI values were classified in three categories: optimal (< 25 kg/m^2), overweight (25-30 kg/m^2)

and obese (≥ 30 kg/m^2).

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 59 (cohort 1), 52 (cohort 2)

Prognostic factor(s): BMI > 30 kg/m^2

Outcome(s)

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Baronio 2020 *(Continued)*

ICU admission

Mortality

Outcome (prognostic factor)

ICU admission (BMI > 30 kg/m^2) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 191

Number of obese patients followed completely for the outcome: 59

Number of non-obese patients followed completely for the outcome: 132

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Without adjustment

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.63 (1.73, 21.09), NR

Outcome (prognostic factor)

Mortality (BMI > 30 kg/m^2) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 191

Number of obese patients followed completely for the outcome: 59

Number of non-obese patients followed completely for the outcome: 132

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Without adjustment

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.66 (1.76, 13.15), NR

Outcome (prognostic factor)

Mortality (BMI > 30 kg/m^2) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 157

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Baronio 2020 *(Continued)*

Number of obese patients followed completely for the outcome: 52

Number of non-obese patients followed completely for the outcome: 105

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI, lymphocyte count, temperature, sex

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.23 (1.15, 4.35), 0.02

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Bartoletti 2020

Study characteristics

Notes

English title

Development and validation of a prediction model for severe respiratory failure in hospitalised patients with SARS-CoV-2 infection: a multicentre cohort study (PREDI-CO study)

Study setting

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Bartoletti 2020 *(Continued)*

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 4 (cohort 1), 7 (cohort 2)

Study setting: Inpatient

Number of participants recruited: 644 (cohort 1), 469 (cohort 2)

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 268 (cohort 1), 141 (cohort 2)

Age measure, value: Mean (SD), 63.7 (15.6) (cohort 1), 68.5 (14.1) (cohort 2)

Inclusion criteria: All consecutive adults (18 years) diagnosed with SARS-CoV-2 infection during the study period

Exclusion criteria: Hospital discharge within 24 hours of admission to Emergency Department and occurrence of SRF (severe respiratory failure) within 24 hours of hospitalisation

Smoking frequency: NR

Diabetes frequency: 37 (cohort 1), 23 (cohort 2)

Hypertension frequency: 321 (cohort 1), 258 (cohort 2)

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 58 (cohort 1), 55 (cohort 2)

Other pulmonary disease frequency: NR

Immunosuppression frequency: 21 (cohort 1), 21 (cohort 2)

Chronic kidney disease frequency: 61 (cohort 1), 54 (cohort 2)

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI > 30 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 122 (cohort 1), 74 (cohort 2)

Prognostic factor(s): BMI > 30 kg/m^2

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Bartoletti 2020 *(Continued)*

Outcome(s)

Severe respiratory failure

Outcome (prognostic factor)

Severe respiratory failure (BMI > 30 kg/m^2) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 644

Number of obese patients followed completely for the outcome: 122

Number of non-obese patients followed completely for the outcome: 522

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 6.09 (3.99, 9.30), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.62 (7.70, 2.78), < 0.001

Outcome (prognostic factor)

Severe respiratory failure (BMI > 30 kg/m^2) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 469

Number of obese patients followed completely for the outcome: 74

Number of non-obese patients followed completely for the outcome: 395

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.26 (1.37, 3.74), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.07 (0.72, 1.60), 0.73

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3

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Bartoletti 2020 *(Continued)*

Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Bellini 2021

Study characteristics

Notes

English title

Obesity as a risk factor for hospitalization in COronaVIrus Disease19 (COVID-19) patients: analysis of the Tuscany regional database

Study setting

Start of study recruitment (MM/YYYY)

30/04/2020

End of study recruitment (MM/YYYY)

30/04/2020

Study design

registry data

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

outpatient and inpatient

Number of participants recruited

4481

Sampling method

consecutive participants

Participants

Female participants

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Bellini 2021 *(Continued)*

(percentage), 49.5

Age measure, value

NR

Inclusion criteria

NR

Exclusion criteria

patients with any missing data

Smoking

NR

Diabetes

NR

Hypertension

NR

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

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Bellini 2021 *(Continued)*

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity was defined as BMI ≥ 30 kg/m^2

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

BMI ≥ 30 kg/m^2

Measure of frequency

absolute number

Frequency value

157

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

hospitalisation

Outcome (prognostic factor)

Hospitalisation (BMI > 30 kg/m^2 (obese))

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Bellini 2021 *(Continued)*

Outcome

Hospitalisation

Prognostic factor (category):

BMI > 30 kg/m^2 (obese)

Follow-up

Number of patients followed completely for this outcome

4481

Number of obese patients followed completely for this outcome

157

Number of non-obese patients followed completely for this outcome

4424

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.74 (1.56, 1.97)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, all factors associated with hospitalisation at univariate analysis as possible confounders (factors were not reported)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3 (2.16, 4.29)

Outcome (prognostic factor)

Hospitalisation (BMI > 30 kg/m^2 (obese))

Outcome

Hospitalisation

Prognostic factor (category):

BMI > 30 kg/m^2 (obese)

Follow-up

Number of patients followed completely for this outcome

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Bellini 2021 *(Continued)*

2307

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, all factors associated with hospitalisation at univariate analysis as possible confounders (factors were not reported)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

4.08 (2.53, 6.77)

Outcome (prognostic factor)

Hospitalisation (BMI > 30 kg/m^2 (obese))

Outcome

Hospitalisation

Prognostic factor (category):

BMI > 30 kg/m^2 (obese)

Follow-up

Number of patients followed completely for this outcome

2377

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

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Bellini 2021 *(Continued)*

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, all factors associated with hospitalisation at univariate analysis as possible confounders (factors were not reported)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.91 (1.4, 2.65)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Bello-Chavolla 2021

Study characteristics

Notes

English title

Unequal impact of structural health determinants and comorbidity on COVID-19 severity and lethality in older Mexican adults: considerations beyond chronological aging

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 06/2020

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Bello-Chavolla 2021 *(Continued)*

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 475

Study setting: Outpatient and inpatient

Number of participants recruited: 101,238

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 44,239

Age measure, value: NR

Inclusion criteria: All SARS-CoV-2 PCR-positive cases up to June 3, 2020, in individuals aged 60 and older.

Exclusion criteria: NR

Smoking frequency: 8333

Diabetes frequency: 17,489

Hypertension frequency: 20,955

Cardiovascular disease frequency: 2594

Asthma frequency: 2930

Chronic obstructive pulmonary disease frequency: 1990

Other pulmonary disease frequency: 26,925

Immunosuppression frequency: 1555

Chronic kidney disease frequency: 2339

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Unspecified

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): 20,599

Prognostic factor(s): Obesity

Outcome(s)

Pneumonia

Hospitalisation

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Bello-Chavolla 2021 *(Continued)*

ICU admission

Mechanical ventilation

Mortality

Outcome (prognostic factor)

Pneumonia (obesity)

Follow-up

Number of patients followed completely for the outcome: 101,238

Number of obese patients followed completely for the outcome: 20,599

Number of non-obese patients followed completely for the outcome: 80,639

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, male sex, indigenous, CVD, CKD, COPD, immunosuppression, smoking, diabetes, obesity, hypertension, social lag index

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.26 (1.11, 1.36), NR

Outcome (prognostic factor)

Hospitalisation (obesity)

Follow-up

Number of patients followed completely for the outcome: 101,238

Number of obese patients followed completely for the outcome: 20,599

Number of non-obese patients followed completely for the outcome: 80,639

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, male sex, indigenous, CVD, CKD, COPD, immunosuppression, smoking, diabetes, obesity, hypertension, social lag index

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.09 (1.01, 1.18), NR

Outcome (prognostic factor)

ICU admission (obesity)

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Bello-Chavolla 2021 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 101,238

Number of obese patients followed completely for the outcome: 20,599

Number of non-obese patients followed completely for the outcome: 80,639

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, male sex, indigenous, CVD, CKD, COPD, immunosuppression, smoking, diabetes, obesity, hypertension, social lag index

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.26 (1.09, 1.45), NR

Outcome (prognostic factor)

Mechanical ventilation (obesity)

Follow-up

Number of patients followed completely for the outcome: 101,238

Number of obese patients followed completely for the outcome: 20,599

Number of non-obese patients followed completely for the outcome: 80,639

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, male sex, indigenous, CVD, CKD, COPD, immunosuppression, smoking, diabetes, obesity, hypertension, social lag index

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.31 (1.15, 1.50), NR

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 101,238

Number of obese patients followed completely for the outcome: 20,599

Number of non-obese patients followed completely for the outcome: 80,639

Univariable unadjusted analysis for obesity

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Bello-Chavolla 2021 *(Continued)*

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, male sex, indigenous, CVD, CKD, COPD, immunosuppression, smoking, diabetes, obesity, hypertension, social lag index

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.19 (1.12, 1.27), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Study Attrition Pneumonia	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Outcome Measurement Pneumonia	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3

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Bello-Chavolla 2021 *(Continued)*

Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Confounding Bias Pneumonia	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Bennett 2021

Study characteristics

Notes

English title

Underlying conditions and risk of hospitalisation, ICU admission and mortality among those with COVID-19 in Ireland: a national surveillance study

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

07/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

8

Study setting

outpatient and inpatient

Number of participants recruited

26,106

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 11,153

Age measure, value

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Bennett 2021 *(Continued)*

NR

Inclusion criteria

NR

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 1224

Hypertension

NR

Cardiovascular diseases

(absolute number), 2700

Please indicate if additional information is available

CVD defined as chronic heart disease

Asthma

(absolute number), 467

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

(absolute number), 2053

Please indicate if additional information is available

chronic respiratory disease

Immunosuppression

(absolute number), 402

Please indicate if additional information is available

including HIV

Chronic kidney disease

(absolute number), 558

Cancer

(absolute number), 747

Steroid administration

NR

Supplemental oxygen

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Bennett 2021 *(Continued)*

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Detailed body mass index (BMI) information is not routinely captured by the ESF and instead recorded as the presence or absence of morbid obesity, defined as a BMI of ≥ 40 kg/m^2

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

BMI ≥ 40 kg/m^2 (only morbidly obese patients)

Measure of frequency

absolute number

Frequency value

298

How many eligible outcomes reported?

3

How many eligible outcomes reported?

3

Outcome(s)

mortality, hospitalisation, ICU admission

Outcome (prognostic factor)

mortality (BMI ≥ 40 kg/m^2 (morbid obesity))

Outcome

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Bennett 2021 *(Continued)*

mortality

Prognostic factor (category):

BMI ≥ 40 kg/m^2 (morbid obesity)

Follow-up

Number of patients followed completely for this outcome

19,789

Number of obese patients followed completely for this outcome

298

Number of non-obese patients followed completely for this outcome

19,491

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age (linear, quadratic, cubic), asthma (requiring meds), BMI > 40, cancer, diabetes, chronic heart disease, chronic kidney disease, chronic liver disease, chronic neurological disease, Community health office, chronic respiratory disease, immunodeficiency, other comorbidity, residential care facility, route of transmission, unknown comorbidity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.89 (1.8, 4.64)

Outcome (prognostic factor)

hospitalisation (BMI ≥ 40 kg/m^2 (morbid obesity))

Outcome

hospitalisation

Prognostic factor (category):

BMI ≥ 40 kg/m^2 (morbid obesity)

Follow-up

Number of patients followed completely for this outcome

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Bennett 2021 *(Continued)*

19,789

Number of obese patients followed completely for this outcome

298

Number of non-obese patients followed completely for this outcome

19,491

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age (linear, quadratic, cubic), asthma (requiring meds), BMI > 40, cancer, diabetes, chronic heart disease, chronic kidney disease, chronic liver disease, chronic neurological disease, community health office, chronic respiratory disease, immunodeficiency, other comorbidity, residential care facility, route of transmission, unknown comorbidity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

4.29 (3.27, 5.65)

Outcome (prognostic factor)

ICU admission (BMI ≥ 40 kg/m^2 (morbid obesity))

Outcome

ICU admission

Prognostic factor (category):

BMI ≥ 40 kg/m^2 (morbid obesity)

Follow-up

Number of patients followed completely for this outcome

2811

Number of obese patients followed completely for this outcome

134

Number of non-obese patients followed completely for this outcome

2677

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Bennett 2021 *(Continued)*

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age (linear, quadratic, cubic), asthma (requiring meds), BMI > 40, cancer, diabetes, chronic heart disease, chronic kidney disease, chronic liver disease, chronic neurological disease, community health office, chronic respiratory disease, immunodeficiency, other comorbidity, residential care facility, route of transmission, unknown comorbidity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

7.53 (4.94, 11.48)

Outcome (prognostic factor)

mortality (BMI ≥ 40 kg/m^2 (morbid obesity))

Outcome

mortality

Prognostic factor (category):

BMI ≥ 40 kg/m^2 (morbid obesity)

Follow-up

Number of patients followed completely for this outcome

2811

Number of obese patients followed completely for this outcome

134

Number of non-obese patients followed completely for this outcome

2677

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

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Bennett 2021 *(Continued)*

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age (linear, quadratic, cubic), asthma (requiring meds), BMI > 40, cancer, diabetes, chronic heart disease, chronic kidney disease, chronic liver disease, chronic neurological disease, community health office, chronic respiratory disease, immunodeficiency, other comorbidity, residential care facility, route of transmission, unknown comorbidity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.19 (1.34, 3.56)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Bhatt 2021

Study characteristics

Notes

English title

Clinical outcomes in patients with heart failure hospitalized with COVID-19

Study setting

Start of study recruitment (MM/YYYY): 04/2020

End of study recruitment (MM/YYYY): 09/2020

Study design: Prospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: More than 1041 centres

Study setting: Inpatient

Number of participants recruited: 8383

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 4205

Age measure, value: Mean (SD), 72 (13.2)

Inclusion criteria: Patients with at least 1 Heart Failure (HF) hospitalisation or 2 HF outpatient visits between January 1, 2019, and March 31, 2020, who were subsequently hospitalised between April and September 2020 with coronavirus disease-2019 (COVID-19)

Exclusion criteria: NR

Smoking frequency: 3665

Diabetes frequency: 5107

Hypertension frequency: 6997

Cardiovascular disease frequency: 4548 (arrhythmia), 1417 (valvular disease)

Asthma frequency: 628

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 3539

Immunosuppression frequency: NR

Chronic kidney disease frequency: 5020

Cancer frequency: 290

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 17

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

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Bhatt 2021 *(Continued)*

The time when obesity has been measured: NR

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): 2461

Prognostic factor(s): Obesity

Morbid obesity

Outcome(s)

In-hospital mortality

Outcome (prognostic factor)

In-hospital mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 8383

Number of obese patients followed completely for the outcome: 2461

Number of non-obese patients followed completely for the outcome: 5922

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, race, discharge month, region, LVEF, obesity, morbid obesity, diabetes mellitus, hypertension, kidney disease, pulmonary disease, smoking, malignancy

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.19 (1.01, 1.40), NR

Outcome (prognostic factor)

In-hospital mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 8383

Number of obese patients followed completely for the outcome: 2461

Number of non-obese patients followed completely for the outcome: 5922

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

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Bhatt 2021 *(Continued)*

The set of prognostic factors used for adjustment: Age, sex, race, discharge month, region, LVEF, obesity, morbid obesity, diabetes mellitus, hypertension, kidney disease, pulmonary disease, smoking, malignancy

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.25 (1.07, 1.46), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Biscarini 2020

Study characteristics

Notes

English title

The obesity paradox: analysis from the SMAtteo COvid-19 REgistry (SMACORE) cohort

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 03/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 427

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 136

Age measure, value: Mean (SD), 67 (21)

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Biscarini 2020 *(Continued)*

Inclusion criteria: Patients with confirmed diagnosis of COVID-19 hospitalised between 21st February and 31st March 2020

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 66

Hypertension frequency: 174

Cardiovascular disease frequency: 98

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 212

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 22

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity was defined as BMI > 30 kg/m^2

The time when obesity has been measured: Some time after presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 80

Prognostic factor(s): BMI > 30 kg/m^2

Outcome(s)

Mortality

ICU admission

Death in ICU

Length of stay

Outcome (prognostic factor)

Mortality (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 427

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 252

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Biscarini 2020 *(Continued)*

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, antibiotic therapy, antiviral therapy, CRP > 10 mg/dL, diabetes, heart disease, hypertension, interstitial pneumonia, obesity, PF ratio < 260 (arterial partial pressure of oxygen (PaO2)/fractional inspired oxygen (fiO2)), respiratory frequency, sex, tumour

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.03 (0.65, 1.67), NR

Outcome (prognostic factor)

ICU admission (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 427

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 252

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, antibiotic therapy, antiviral therapy, CRP > 10 mg/dL, diabetes, heart disease, hypertension, interstitial pneumonia, obesity, PF ratio < 260 (arterial partial pressure of oxygen (PaO2)/fractional inspired oxygen (fiO2)), respiratory frequency, sex, tumour

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.96 (1.03, 3.75), NR

Outcome (prognostic factor)

Death in ICU (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 427

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 252

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

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Biscarini 2020 *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, antibiotic therapy, antiviral therapy, CRP > 10 mg/dL, diabetes, heart disease, hypertension, interstitial pneumonia, obesity, PF ratio < 260 (arterial partial pressure of oxygen (PaO2)/fractional inspired oxygen (fiO2)), respiratory frequency, sex, tumour

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.65 (0.38, 7.15), NR

Outcome (prognostic factor)

Length of stay (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 427

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 252

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Linear regression

The set of prognostic factors used for adjustment: Age, antibiotic therapy, antiviral therapy, CRP > 10 mg/dL, diabetes, heart disease, hypertension, interstitial pneumonia, obesity, PF ratio < 260 (arterial partial pressure of oxygen (PaO2)/fractional inspired oxygen (fiO2)), respiratory frequency, sex, tumour

Effect measure for obesity: Slope (beta)

Effect measure value (95% CI), P value: 1.19 (-1.88, 4.26), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Biscarini 2020 *(Continued)*

ICU admission		
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Bonifazi 2021

Study characteristics

Notes

English title

Predictors of worse prognosis in young and middle-aged adults hospitalized with COVID-19 pneumonia: a multi-center Italian study (COVID-UNDER50)

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

9

Study setting

inpatient

Number of participants recruited

263

Sampling method

consecutive participants

Participants

Female participants

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Bonifazi 2021 *(Continued)*

(absolute number), 99

Age measure, value

median (Interquartile range), 45.3 (40.4, 48.4)

Inclusion criteria

patients, aged 18–50 years, hospitalised for confirmed or probable diagnosis of SARS-CoV2 infection

Exclusion criteria

NR

Smoking

NR

Diabetes

NR

Hypertension

NR

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

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Bonifazi 2021 *(Continued)*

NR

Supplemental oxygen

(absolute number), 88

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

up to normal weight (BMI < 25 kg/m^2), overweight (25 ≤ BMI < 30 kg/m^2) and obese (BMI ≥ 30 kg/m2).

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

BMI ≥ 30 kg/m^2

Measure of frequency

absolute number

Frequency value

51

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

Mechanical ventilation, mortality

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 30 kg/m^2)

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Bonifazi 2021 *(Continued)*

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI ≥ 30 kg/m^2

Follow-up

Number of patients followed completely for this outcome

263

Number of obese patients followed completely for this outcome

51

Number of non-obese patients followed completely for this outcome

146

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, comorbidities, smoking status, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.5 (1.44, 8.79)

Outcome (prognostic factor)

Mechanical ventilation (25 < BMI < 30 (overweight))

Outcome

Mechanical ventilation

Prognostic factor (category):

25 < BMI < 30 (overweight)

Follow-up

Number of patients followed completely for this outcome

263

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Bonifazi 2021 *(Continued)*

Number of obese patients followed completely for this outcome

51

Number of non-obese patients followed completely for this outcome

146

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, comorbidities, smoking status, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.43 (0.54, 3.81)

Outcome (prognostic factor)

mortality (BMI ≥ 30 kg/m^2)

Outcome

mortality

Prognostic factor (category):

BMI ≥ 30 kg/m^2

Follow-up

Number of patients followed completely for this outcome

263

Number of obese patients followed completely for this outcome

51

Number of non-obese patients followed completely for this outcome

146

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

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Bonifazi 2021 *(Continued)*

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, comorbidities

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.79 (0.27, 2.27)

Outcome (prognostic factor)

mortality (25 < BMI < 30 (overweight))

Outcome

mortality

Prognostic factor (category):

25 < BMI < 30 (overweight)

Follow-up

Number of patients followed completely for this outcome

263

Number of obese patients followed completely for this outcome

51

Number of non-obese patients followed completely for this outcome

146

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, comorbidities

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Bonifazi 2021 *(Continued)*

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.29 (0.05, 1.74)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Breland 2021

Study characteristics

Notes

English title

BMI and risk for severe COVID-19 among Veterans Health Administration patients

Study setting

Start of study recruitment (MM/YYYY): 03/2021

End of study recruitment (MM/YYYY): 05/2021

Study design: Prospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

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Breland 2021 *(Continued)*

Number of participants recruited: 9347

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 833

Age measure, value: NR

Inclusion criteria: The Veterans Health Administration (VHA) who tested positive for COVID-19, who had a valid BMI measurement, and who were not VHA employees.

Exclusion criteria: Weight < 75 or ≥ 700 lb and height < 48 or ≥ 84 inches

Smoking frequency: NR

Diabetes frequency: 3560

Hypertension frequency: 5820

Cardiovascular disease frequency: 3003

Asthma frequency: 554

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 1881

Immunosuppression frequency: 710

Chronic kidney disease frequency: 290

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): BMI 23-30 kg/m^2

BMI 30-39 kg/m^2

Outcome(s)

Mortality

ICU admission

Hospitalisation

Outcome (prognostic factor)

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Breland 2021 *(Continued)*

BMI 23-30 kg/m^2 (mortality)

Follow-up

Number of patients followed completely for the outcome: 9347

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.96 (0.93, 0.98), NR

Outcome (prognostic factor)

BMI 23-30 kg/m^2 (ICU admission)

Follow-up

Number of patients followed completely for the outcome: 9347

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.99 (0.97, 1.02), NR

Outcome (prognostic factor)

BMI 23-30 kg/m^2 (hospitalisation)

Follow-up

Number of patients followed completely for the outcome: 9347

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

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Breland 2021 *(Continued)*

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.97 (0.95, 0.99), NR

Outcome (prognostic factor)

BMI 30-39 kg/m^2 (mortality)

Follow-up

Number of patients followed completely for the outcome: 9347

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.02 (1.02, 1.04), NR

Outcome (prognostic factor)

BMI 30-39 kg/m^2 (ICU admission)

Follow-up

Number of patients followed completely for the outcome: 9347

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age

Effect measure for obesity: Odds ratio

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Breland 2021 *(Continued)*

Effect measure value (95% CI), P value: 1.01 (1.00, 1.03), NR

Outcome (prognostic factor)

BMI 30-39 kg/m^2 (hospitalisation)

Follow-up

Number of patients followed completely for the outcome: 9347

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.02 (1.01, 1.03), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias	Yes	Appendix 3

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Breland 2021 *(Continued)*

ICU admission		
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Busetto 2020

Study characteristics

Notes

English title

Obesity and COVID-19: an Italian snapshot

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 92

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 35

Age measure, value: Mean (SD), 70.5 (13.3)

Inclusion criteria: Being positive to an oropharyngeal swab used for real-time reverse-transcriptase polymerase chain reaction assays specific for SARS-CoV-2

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 28

Hypertension frequency: 59

Cardiovascular disease frequency: 29

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 12 (chronic respiratory diseases)

Immunosuppression frequency: NR

Chronic kidney disease frequency: 5

Cancer frequency: 12

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Busetto 2020 *(Continued)*

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 58

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI > 25

The time when obesity has been measured: Some time after presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 60

Prognostic factor(s): Obesity (BMI > 25)

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (obesity (BMI > 25))

Follow-up

Number of patients followed completely for the outcome: 92

Number of obese patients followed completely for the outcome: 32

Number of non-obese patients followed completely for the outcome: 60

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.27 (0.03, 2.05), 0.204

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Busetto 2020 *(Continued)*

Mortality		
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Cai 2020a

Study characteristics	
Notes	**English title** Association between obesity and clinical prognosis in patients infected with SARS-CoV-2 **Study setting** **Start of study recruitment (MM/YYYY):** 01/2020 **End of study recruitment (MM/YYYY):** 02/2020 **Study design:** Retrospective cohort **Study centre(s):** Multiple centres/clinics/areas within a country **Number of centres, clinics or areas:** 3 **Study setting:** Inpatient **Number of participants recruited:** 96 **Sampling method:** Consecutive participants **Participants** **Female participants (absolute number):** 42 **Age measure, value:** NR **Inclusion criteria:** All confirmed SARS-CoV-2 infection **Exclusion criteria:** NR **Smoking frequency:** 8 **Diabetes frequency:** NR **Hypertension frequency:** NR **Cardiovascular disease frequency:** NR **Asthma frequency:** NR **Chronic obstructive pulmonary disease frequency:** NR **Other pulmonary disease frequency:** NR **Immunosuppression frequency:** NR **Chronic kidney disease frequency:** NR **Cancer frequency:** NR

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Cai 2020a *(Continued)*

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity was defined as BMI > 24 kg/m^2

The time when obesity has been measured: Some time after presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 24

Obesity frequency (absolute number): 37

Prognostic factor(s): BMI > 24 kg/m^2

Outcome(s)

ICU admission

Outcome (prognostic factor)

ICU admission (BMI > 24 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 92

Number of obese patients followed completely for the outcome: 37

Number of non-obese patients followed completely for the outcome: 52

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.19 (2.11, 12.76), < 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, BMI

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.258 (1.07, 1.47), 0.005

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Cai 2020a *(Continued)*
Severe COVID

Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Cai 2020b

Study characteristics

Notes

English title

Obesity and COVID-19 severity in a designated hospital in Shenzhen, China

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 02/2020

Study design: Registry data

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 383

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 200

Age measure, value: NR

Inclusion criteria: hospitalised patients with COVID-19 admitted, aged 18 years or above

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 22

Hypertension frequency: 58

Cardiovascular disease frequency: 35

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 32

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 5

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Cai 2020b *(Continued)*

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 3

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Some time after presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): 164

Prognostic factor(s): Overweight

Obesity

Outcome(s)

Severe COVID-19

Outcome (prognostic factor)

Severe COVID-19 (overweight) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 383

Number of obese patients followed completely for the outcome: 164

Number of non-obese patients followed completely for the outcome: 219

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: age, sex, epidemiological characteristics, days from disease onset to hospitalisation, disease history, and drugs used for treatment, compared with the normal weight group

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.84 (0.99, 3.43), 0.050

Outcome (prognostic factor)

Severe COVID-19 (obesity) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 383

Number of obese patients followed completely for the outcome: 164

Number of non-obese patients followed completely for the outcome: 219

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Cai 2020b *(Continued)*

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: age, sex, epidemiological characteristics, days from disease onset to hospitalisation, disease history, and drugs used for treatment, compared with the normal weight group

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.40 (1.40, 8.26), 0.007

Outcome (prognostic factor)

Severe COVID-19 (overweight) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 183

Number of obese patients followed completely for the outcome: 73

Number of non-obese patients followed completely for the outcome: 78

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: age, sex, epidemiological characteristics, days from disease onset to hospitalisation, disease history, and drugs used for treatment, compared with the normal weight group

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.98 (0.78, 5.00), 0.150

Outcome (prognostic factor)

Severe COVID-19 (obesity) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 183

Number of obese patients followed completely for the outcome: 32

Number of non-obese patients followed completely for the outcome: 78

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

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Cai 2020b *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: age, sex, epidemiological characteristics, days from disease onset to hospitalisation, disease history, and drugs used for treatment, compared with the normal weight group

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.66 (1.80, 17.57), 0.003

Outcome (prognostic factor)

Severe COVID-19 (overweight) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 200

Number of obese patients followed completely for the outcome: 50

Number of non-obese patients followed completely for the outcome: 141

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: age, sex, epidemiological characteristics, days from disease onset to hospitalisation, disease history, and drugs used for treatment, compared with the normal weight group

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.64 (0.63, 4.29), 0.310

Outcome (prognostic factor)

Severe COVID-19 (obesity) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 200

Number of obese patients followed completely for the outcome: 9

Number of non-obese patients followed completely for the outcome: 141

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: age, sex, epidemiological characteristics, days from disease onset to hospitalisation, disease history, and drugs used for treatment, compared with the normal weight group

Effect measure for obesity: Odds ratio

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Cai 2020b *(Continued)*

Effect measure value (95% CI), P value: 0.70 (7.20, 0.07), 0.760

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Cai 2021

Study characteristics

Notes

English title

High body mass index is a significant risk factor for the progression and prognosis of imported COVID-19: a multicenter, retrospective cohort study

Study setting

Start of study recruitment (MM/YYYY)

NR

End of study recruitment (MM/YYYY)

02/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

455

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Cai 2021 *(Continued)*

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 239

Age measure, value

mean (standard deviation), 44.53 (14.73)

Inclusion criteria

NR

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 40

Hypertension

(absolute number), 74

Cardiovascular diseases

(absolute number), 10

Please indicate if additional information is available

Heart disease

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(absolute number), 1

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

NR

Immunosuppression

(absolute number), 1

Please indicate if additional information is available

NR

Chronic kidney disease

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Cai 2021 *(Continued)*

(absolute number), 3

Cancer

(absolute number), 6

Steroid administration

(absolute number), 89

Supplemental oxygen

(absolute number), 8

Differential values for various oxygenation methods (if indicated)

mechanical ventilation

Other treatment

Antibiotic therapy (n = 236)
Use of corticosteroid (n = 89)
Use of immunoglobulin (n = 87)

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

underweight is defined as BMI ≤ 18.5 kg/m^2, overweight is defined as BMI ≥ 24 kg/m^2, and obesity is defined as BMI ≥ 28 kg/m^2.

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

24

Measure of frequency

absolute number

Frequency value

139

How many eligible outcomes reported?

1

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Cai 2021 *(Continued)*

How many eligible outcomes reported?

1

Outcome(s)

severe COVID

Outcome (prognostic factor)

severe COVID (BMI ≥ 24, < 28)

Outcome

severe COVID

Prognostic factor (category):

BMI ≥ 24, < 28

Follow-up

Number of patients followed completely for this outcome

455

Number of obese patients followed completely for this outcome

187

Number of non-obese patients followed completely for this outcome

268

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.83 (0.92, 3.64)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for age, sex, exposure to Wuhan, any coexisting medical condition, highest temperature, LDH, and C-reactive protein

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.11 (0.47, 2.63)

Outcome (prognostic factor)

severe COVID (BMI ≥ 28)

Outcome

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Cai 2021 *(Continued)*

severe COVID

Prognostic factor (category):

BMI ≥ 28

Follow-up

Number of patients followed completely for this outcome

455

Number of obese patients followed completely for this outcome

187

Number of non-obese patients followed completely for this outcome

268

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

4.37 (1.96, 9.75)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for age, sex, exposure to Wuhan, any coexisting medical condition, highest temperature, LDH, and C-reactive protein

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.8 (1.32, 10.93)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	No	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias	Yes	Appendix 3

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Cai 2021 *(Continued)*
Severe COVID

Statistical Analysis Bias	Yes	Appendix 3

Calmes 2021

Study characteristics

Notes

English title

Asthma and COPD are not risk factors for ICU stay and death in case of SARS-CoV2 infection

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Registry data

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 596

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 302

Age measure, value: NR

Inclusion criteria: adult patients who were hospitalised in University Hospital of Liege between March 18 and April 17, 2020, for COVID-19

Exclusion criteria: NR

Smoking frequency: 50

Diabetes frequency: 124

Hypertension frequency: 246

Cardiovascular disease frequency: 116

Asthma frequency: 57

Chronic obstructive pulmonary disease frequency: 46

Other pulmonary disease frequency: emphysema (70), bronchiectasis (23)

Immunosuppression frequency: 32

Chronic kidney disease frequency: 42

Cancer frequency: 70

Steroid administration frequency: inhaled corticosteroid (56), oral corticosteroid (23)

Supplemental oxygen administration frequency: 41

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Calmes 2021 *(Continued)*

Other treatments (frequency): hydroxychloroquine (596), doxycycline (596)

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): 115

Prognostic factor(s): Obesity

Outcome(s)

ICU admission

Death

Outcome (prognostic factor)

ICU admission (obesity)

Follow-up

Number of patients followed completely for the outcome: 595

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 9 (4.5, 15), < 0.0001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 8.5 (5.10, 14), < 0.0001

Outcome (prognostic factor)

Death (obesity)

Follow-up

Number of patients followed completely for the outcome: 595

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2 (1.2, 3.3), 0.0078

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Calmes 2021 *(Continued)*

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Male gender, older age

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.80 (1.10, 3.20), 0.029

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	No	Appendix 3
Study Attrition ICU admission	No	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Cao 2021

Study characteristics

Notes

English title

Obesity and COVID-19 in adult patients with diabetes

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

03/2020

Study design

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Cao 2021 *(Continued)*

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

1637

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 823

Age measure, value

median (interquartile range), 60 (50, 68)

Inclusion criteria

COVID patients aged > 18 years

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 231

Hypertension

(absolute number), 473

Cardiovascular diseases

(absolute number), 106

Please indicate if additional information is available

Coronary artery disease: 90; congestive heart failure: 16

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(absolute number), 46

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Cao 2021 *(Continued)*

Other pulmonary diseases

(absolute number), 355

Please indicate if additional information is available

Dyspnoea

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 6

Cancer

(absolute number), 29

Steroid administration

(absolute number), 197

Supplemental oxygen

(absolute number), 404

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

BMI < 18.5 kg/m^2; normal weight, 18.5–23.9 kg/m^2; overweight, 24.0–27.9 kg/m^2; and obesity > 28 kg/m^2

The time when obesity has been measured

some time after presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

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Cao 2021 *(Continued)*

28

Measure of frequency

absolute number

Frequency value

572

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

pneumonia

Outcome (prognostic factor)

pneumonia (other: BMI 24 to 27.9)

Outcome

pneumonia

Prognostic factor (category):

other: BMI 24 to 27.9

Follow-up

Number of patients followed completely for this outcome

1637

Number of obese patients followed completely for this outcome

717

Number of non-obese patients followed completely for this outcome

920

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.13 (1.32, 0.97)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex, and comorbidities

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Cao 2021 *(Continued)*

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.14 (1.32, 0.98)

Outcome (prognostic factor)

pneumonia (other: BMI >= 28)

Outcome

pneumonia

Prognostic factor (category):

other: BMI >= 28

Follow-up

Number of patients followed completely for this outcome

1637

Number of obese patients followed completely for this outcome

717

Number of non-obese patients followed completely for this outcome

920

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.46 (1.89, 1.14)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex, and comorbidities

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.47 (1.88, 1.15)

Item	Authors' judgement	Support for judgement

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Cao 2021 *(Continued)*

Study Participation	Yes	Appendix 3
Study Attrition Pneumonia	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Pneumonia	Yes	Appendix 3
Confounding Bias Pneumonia	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Cariou 2020

Study characteristics

Notes

English title

Phenotypic characteristics and prognosis of inpatients with COVID-19 and diabetes: the CORONADO study

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 53

Study setting: Inpatient

Number of participants recruited: 1317

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 462

Age measure, value: Mean (SD), 69.8 (13)

Inclusion criteria: 1. Hospitalisation in a dedicated COVID-19 unit with COVID-19 diagnosis confirmed biologically (by SARS-CoV-2 PCR test) and/or clinically/radiologically (i.e. as ground-glass opacity and/or crazy paving on chest computed tomography [CT] scan), 2. Personal history of diabetes or newly diagnosed diabetes on admission (i.e. HbA1c ≥ 48 mmol/mol [6.5%] during hospitalisation)

Exclusion criteria: NR

Smoking frequency: 57 (from 1029)

Diabetes frequency: 1205 (including type 1 diabetes)

Hypertension frequency: 1003 (from 1299)

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Cariou 2020 *(Continued)*

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 133 (from 1278)

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 60 (from 831)

Cancer frequency: 194 (active cancer, from 1282)

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 838

Prognostic factor(s): Obesity

Outcome(s)

Tracheal intubation and/or death within 7 days of admission

Death

Outcome (prognostic factor)

Tracheal intubation and/or death within 7 days of admission (obesity)

Follow-up

Number of patients followed completely for the outcome: 1317

Number of obese patients followed completely for the outcome: 838

Number of non-obese patients followed completely for the outcome: 279

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.25 (1.09, 1.42), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.24 (1.06, 1.44), 0.0064

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Cariou 2020 *(Continued)*

Other measures of precision: "Prior to admission" model, stepwise selection with age and sex forced: OR (95% CI) = 1.28 (1.10, 1.47), P value = 0.0010

Outcome (prognostic factor)

Death (obesity)

Follow-up

Number of patients followed completely for the outcome: 1317

Number of obese patients followed completely for the outcome: 838

Number of non-obese patients followed completely for the outcome: 279

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Unclear	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Cavallaro 2020

Study characteristics

Notes

English title

Contrasting factors associated with COVID-19-related ICU and death outcomes: interpretable multivariable analyses of the UK CHESS dataset

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Cavallaro 2020 *(Continued)*

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 06/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Inpatient

Number of participants recruited: 13,954

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 5661

Age measure, value: Median (IQR), 70 (56-81)

Inclusion criteria: Confirmed COVID-19

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 2219

Hypertension frequency: 3768

Cardiovascular disease frequency: 2247

Asthma frequency: 1172

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 1521 (chronic respiratory disease)

Immunosuppression frequency: 377

Chronic kidney disease frequency: 1172

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Clinical obesity

The time when obesity has been measured: NR

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): 1479

Prognostic factor(s): Obesity (clinical)

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Cavallaro 2020 *(Continued)*

Outcome(s)

Mortality

ICU admission

Outcome (prognostic factor)

Mortality (obesity (clinical))

Follow-up

Number of patients followed completely for the outcome: 13,954

Number of obese patients followed completely for the outcome: 1480

Number of non-obese patients followed completely for the outcome: 12,474

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: 37 pre-existing conditions (including immunosuppression due to disease, asthma requiring medication, immunosuppression due to treatment, neurological conditions, respiratory conditions, obesity, type-1 and type-2 diabetes, hypertension, heart conditions, renal disease, liver diseases, and other comorbidities) and demographic factors

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.63 (1.01, 1.33), NR

Outcome (prognostic factor)

ICU admission (obesity (clinical))

Follow-up

Number of patients followed completely for the outcome: 13,954

Number of obese patients followed completely for the outcome: 1480

Number of non-obese patients followed completely for the outcome: 12,474

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: 37 pre-existing conditions (including immunosuppression due to disease, asthma requiring medication, immunosuppression due to treatment, neurological conditions, respiratory conditions, obesity, type-1 and type-2 diabetes, hypertension, heart conditions, renal disease, liver diseases, and other comorbidities) and demographic factors

Effect measure for obesity: Odds ratio

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Cavallaro 2020 *(Continued)*

Effect measure value (95% CI), P value: 3.371 (2.900, 3.920), NR

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Cedano 2021

Study characteristics

Notes

English title

Characteristics and outcomes of patients with COVID-19 in an intensive care unit of a community hospital; retrospective cohort study

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

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Cedano 2021 *(Continued)*

1

Study setting

inpatient

Number of participants recruited

132

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 54

Age measure, value

median (interquartile range), 63 (53, 71)

Inclusion criteria

adult patients, admitted to the ICU, with severe COVID-19 infection, between 3 March 2020 and 22 April 2020, with positive PCR for SARS-COV2

Exclusion criteria

Patients that required cardiopulmonary resuscitation on the medical floors but did not survive to be transferred to the ICU were excluded from the study.

Smoking

NR

Diabetes

(absolute number), 60

Hypertension

(absolute number), 78

Cardiovascular diseases

(absolute number), 15

Please indicate if additional information is available

Coronary artery disease

Asthma

(absolute number), 7

Chronic obstructive pulmonary disease

(absolute number), 11

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

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Cedano 2021 *(Continued)*

NR

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 25

Cancer

(absolute number), 8

Steroid administration

(absolute number), 96

Supplemental oxygen

(absolute number), 104

Differential values for various oxygenation methods (if indicated)

Mechanical ventilation

Other treatment

Azithromycin (n = 99; 79%), hydroxychloroquine (n = 109; 82%), tocilizumab (n = 17; 19%)

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

Azithromycin (79%), hydroxychloroquine (82%), tocilizumab (19%)

Prognostic factor(s)

Study's definition for obesity

BMI >= 30

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

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Cedano 2021 *(Continued)*

Frequency value

59

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (BMI ≥ 30)

Outcome

mortality

Prognostic factor (category):

BMI ≥ 30

Follow-up

Number of patients followed completely for this outcome

132

Number of obese patients followed completely for this outcome

59

Number of non-obese patients followed completely for this outcome

69

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.51 (1.06, 6.14)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex, comorbidities

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

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Cedano 2021 *(Continued)*

	2.92 (1.07, 8.01)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Chand 2020

Study characteristics	
Notes	**English title** COVID-19-associated critical illness—report of the first 300 patients admitted to intensive care units at a New York City medical center **Study setting** **Start of study recruitment (MM/YYYY):** 03/2020 **End of study recruitment (MM/YYYY):** 04/2020 **Study design:** Prospective cohort **Study centre(s):** Multiple centres/clinics/areas within a country **Number of centres, clinics or areas:** 9 ICUs within 3 hospitals **Study setting:** Inpatient **Number of participants recruited:** 300 **Sampling method:** Consecutive participants **Participants** **Female participants (absolute number):** 118 **Age measure, value:** Mean (SD), 58.2 (12.6) **Inclusion criteria:** age > 18, ICU admitted **Exclusion criteria:** Exclusion criteria were aged < 18 years or the absence of a Swedish personal identification number (PIN)

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Chand 2020 *(Continued)*

Smoking frequency: 67

Diabetes frequency: 134

Hypertension frequency: 200

Cardiovascular disease frequency: 65

Asthma frequency: 39

Chronic obstructive pulmonary disease frequency: 17

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 39

Cancer frequency: 18

Steroid administration frequency: 167

Supplemental oxygen administration frequency: 274 (mechanical ventilation), 2 (ECMO), 131 (NM blockade), 174 (prone positioning)

Other treatments (frequency): 233 (any vasopressor support), 226 (norepinephrine), 89 (phenylephrine), 104 (vasopressin), 25 (epinephrine), 28 (chloroquine), 279 (hydroxychloroquine)

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 25

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 257

Prognostic factor(s): Obesity

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 300

Number of obese patients followed completely for the outcome: 163

Number of non-obese patients followed completely for the outcome: 137

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.01 (1.00, 1.03), 0.02

Comment: For different obesity categories: obesity class 1: 1.35 (0.88, 2.06), obesity class 2 (BMI > 35): 1.54 (0.98, 2.43)

Multivariable analysis for obesity

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Chand 2020 *(Continued)*

Modelling method: Linear regression

The set of prognostic factors used for adjustment: Age, AKI status, Covid-19 symptoms, comorbidities, laboratory values, race, sex, smoking, total number of comorbidities

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.020 (1.010, 1.040), 0.004

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Chris 2020

Study characteristics

Notes

English title

Risk factors associated with critical COVID-19 requiring mechanical ventilation

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

case series

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

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Chris 2020 *(Continued)*

inpatient

Number of participants recruited

990

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 479

Age measure, value

median (interquartile range), 68 (55, 82)

Inclusion criteria

NR

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 279

Hypertension

(absolute number), 482

Cardiovascular diseases

(absolute number), 253

Please indicate if additional information is available

coronary artery disease (n = 133), congestive heart failure (n = 120)

Asthma

(absolute number), 78

Chronic obstructive pulmonary disease

(absolute number), 119

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(absolute number), 55

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Chris 2020 *(Continued)*

Please indicate if additional information is available

steroid in last month

Chronic kidney disease

(absolute number), 126

Cancer

(absolute number), 14

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

BMI >= 30

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

352

How many eligible outcomes reported?

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Chris 2020 *(Continued)*

1

How many eligible outcomes reported?

1

Outcome(s)

mechanical ventilation

Outcome (prognostic factor)

mechanical ventilation (BMI >= 30)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI >= 30

Follow-up

Number of patients followed completely for this outcome

990

Number of obese patients followed completely for this outcome

352

Number of non-obese patients followed completely for this outcome

638

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.035 (1.011, 1.06)

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Chris 2020 *(Continued)*

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Chua 2021

Study characteristics	
Notes	**English title** Prognostication in COVID-19: a prospectively derived and externally validated risk prediction score for in-hospital death **Study setting** **Start of study recruitment (MM/YYYY)** NR **End of study recruitment (MM/YYYY)** NR **Study design** prospective cohort **Study centre(s)** single centres/clinics/areas within a country **Number of centres/clinics/areas** 1 **Study setting** inpatient **Number of participants recruited** 983 **Sampling method** consecutive participants

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Chua 2021 *(Continued)*

Participants

Female participants

(unspecified), NR

Age measure, value

median (interquartile range), 70 (53, 83)

Inclusion criteria

NR

Exclusion criteria

NR

Smoking

NR

Diabetes

(unspecified), NR

Hypertension

(unspecified), NR

Cardiovascular diseases

(unspecified), NR

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

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Chua 2021 *(Continued)*

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

unspecified

Frequency value

NR

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

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Chua 2021 *(Continued)*

Outcome (prognostic factor)

mortality (BMI > 30)

Outcome

mortality

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

983

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.39 (1.88, 3.03)

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	No	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3

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Chua 2021 *(Continued)*

Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Coss-Rovirosa 2020

Study characteristics

Notes

English title

Are overweight and obesity risk factors for invasive mechanical ventilation in severe coronavirus disease 2019 pneumonia?

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

07/2020

Study design

registry data

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

355

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 120

Age measure, value

mean (standard deviation), 53.31 (15.29)

Inclusion criteria

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Coss-Rovirosa 2020 *(Continued)*

We included patients 18 years old or older who had a documented diagnosis of COVID-19 (defined as a positive PCR for SARS-CoV2 or a chest CT scan showing characteristics of COVID-19 pneumonia)

Exclusion criteria

excluded patients with missing values

Smoking

NR

Diabetes

(absolute number), 61

Hypertension

(absolute number), 100

Cardiovascular diseases

(percentage), 0.024

Please indicate if additional information is available

NR

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(percentage), 0.02

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

NR

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(percentage), 2

Cancer

(percentage), 14

Steroid administration

(absolute number), 24

Supplemental oxygen

(absolute number), 121

Differential values for various oxygenation methods (if indicated)

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Coss-Rovirosa 2020 *(Continued)*

Required mechanical ventilation

Other treatment

Lopinavir/ritonavir; azithromycin; hydroxychloroquine; glucocorticoids; tocilizumab

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

A normal BMI is between 18.5 and 24.9 kg/m^2, an overweight BMI ranges from 25-29.9 kg/m^2, and obesity BMI is > 30 kg/m^2

The time when obesity has been measured

some time after presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

160

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mechanical ventilation

Outcome (prognostic factor)

mechanical ventilation (overweight: BMI ranges from 25-29.9 kg/m^2)

Outcome

mechanical ventilation

Prognostic factor (category):

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Coss-Rovirosa 2020 *(Continued)*

overweight: BMI ranges from 25-29.9 kg/m^2

Follow-up

Number of patients followed completely for this outcome

355

Number of obese patients followed completely for this outcome

274

Number of non-obese patients followed completely for this outcome

82

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.47 (0.82, 2.6)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age- and sex-adjusted, also adjusted for possible confounders, such as C-reactive protein levels, oxygen-saturation levels, and mean arterial pressure on admission.

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.67 (0.29, 1.53)

Outcome (prognostic factor)

mechanical ventilation (obesity BMI is > 30 kg/m^2)

Outcome

mechanical ventilation

Prognostic factor (category):

obesity BMI is > 30 kg/m^2

Follow-up

Number of patients followed completely for this outcome

355

Number of obese patients followed completely for this outcome

274

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Coss-Rovirosa 2020 *(Continued)*

Number of non-obese patients followed completely for this outcome

82

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.7 (0.9, 3.1)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age- and sex-adjusted, also adjusted for possible confounders, such as C-reactive protein levels, oxygen-saturation levels, and mean arterial pressure on admission

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.82 (0.94, 3.53)

Outcome (prognostic factor)

mechanical ventilation (obesity as a BMI over 35 kg/m^2)

Outcome

mechanical ventilation

Prognostic factor (category):

obesity as a BMI over 35 kg/m^2

Follow-up

Number of patients followed completely for this outcome

355

Number of obese patients followed completely for this outcome

37

Number of non-obese patients followed completely for this outcome

318

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.55 (0.77, 3.08)

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Coss-Rovirosa 2020 *(Continued)*

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age- and sex-adjusted, also adjusted for possible confounders, such as C-reactive protein levels, oxygen-saturation levels, and mean arterial pressure on admission

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.86 (1.09, 7.5)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Cummins 2021

Study characteristics

Notes

English title

Factors associated with COVID-19 related hospitalisation, critical care admission and mortality using linked primary and secondary care data

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

06/2020

Study design

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Cummins 2021 *(Continued)*

registry data

Study centre(s)

unspecified

Number of centres/clinics/areas

NR

Study setting

outpatient and inpatient

Number of participants recruited

1781

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 797

Age measure, value

not reported

Inclusion criteria

aged 16 or older with confirmed COVID-19 infection between 01/02/2020 and 30/06/2020

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 641

Hypertension

(absolute number), 825

Cardiovascular diseases

(absolute number), 107

Please indicate if additional information is available

Atrial fibrillation

Asthma

(absolute number), 244

Chronic obstructive pulmonary disease

(absolute number), 145

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Cummins 2021 *(Continued)*

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 365

Cancer

(absolute number), 148

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

NR

Threshold used for definition of obesity

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Cummins 2021 *(Continued)*

NR

Measure of frequency

absolute number

Frequency value

482

How many eligible outcomes reported?

3

How many eligible outcomes reported?

3

Outcome(s)

hospitalisation, ICU admission, mortality

Outcome (prognostic factor)

Hospitalisation (obese)

Outcome

Hospitalisation

Prognostic factor (category):

obese

Follow-up

Number of patients followed completely for this outcome

1781

Number of obese patients followed completely for this outcome

482

Number of non-obese patients followed completely for this outcome

1299

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

gender, age, stratified into 16-49, 50-69 and 70+ years of age, asthma; atrial fibrillation; cancer; chronic heart disease (CHD); chronic kidney disease (CKD); chronic obstructive pulmonary disease (COPD); de-

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Cummins 2021 *(Continued)*

mentia; depression; diabetes (type 1 and type 2 diabetes); epilepsy; heart failure; hypertension; learning disability; severe mental illness; peripheral arterial disease (PAD); and stroke.

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.64 (1.25, 2.15)

Outcome (prognostic factor)

ICU admission (obese)

Outcome

ICU admission

Prognostic factor (category):

obese

Follow-up

Number of patients followed completely for this outcome

1781

Number of obese patients followed completely for this outcome

482

Number of non-obese patients followed completely for this outcome

1299

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

gender, age, stratified into 16-49, 50-69 and 70+ years of age, asthma; atrial fibrillation; cancer; chronic heart disease (CHD); chronic kidney disease(CKD); chronic obstructive pulmonary disease (COPD); dementia; depression; diabetes (Type 1 and Type 2 diabetes); epilepsy; heart failure; hypertension; learning disability; severe mental illness; peripheral arterial disease (PAD); and stroke.

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.74 (1.18, 2.56)

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Cummins 2021 *(Continued)*

Outcome (prognostic factor)

mortality (obese)

Outcome

mortality

Prognostic factor (category):

obese

Follow-up

Number of patients followed completely for this outcome

1781

Number of obese patients followed completely for this outcome

482

Number of non-obese patients followed completely for this outcome

1299

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

gender, age, stratified into 16-49, 50-69 and 70+ years of age, asthma; atrial fibrillation; cancer; chronic heart disease (CHD); chronic kidney disease(CKD); chronic obstructive pulmonary disease (COPD); dementia; depression; diabetes (Type 1 and Type 2 diabetes); epilepsy; heart failure; hypertension; learning disability; severe mental illness; peripheral arterial disease (PAD); and stroke.

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.15 (0.86, 1.55)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3

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Cummins 2021 *(Continued)*

Study Attrition ICU admission	Unclear	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Czernichow 2020

Study characteristics

Notes

English title

Obesity doubles mortality in patients hospitalized for (SARS-CoV-2) in Paris hospitals, France: a cohort study on 5,795 patients

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Prospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 39

Study setting: Outpatient and inpatient

Number of participants recruited: 5795

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 2004

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Czernichow 2020 *(Continued)*

Age measure, value: Mean (SD), 59.7 (13.73)

Inclusion criteria: Aged 18 to 79 years, hospitalised

Exclusion criteria: Subjects who objected to the reuse of their data

Smoking frequency: 786

Diabetes frequency: 2473

Hypertension frequency: 3142

Cardiovascular disease frequency: 264 (only heart failure)

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 543

Cancer frequency: 656

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 1984

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI > 30

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 1264

Prognostic factor(s): Obesity class 1 (30 < BMI < 35)

Obesity class 2 (35 < BMI < 40)

Obesity class 3 (BMI >40)

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (Obesity class 1 (30 < BMI < 35))

Follow-up

Number of patients followed completely for the outcome: 5795

Number of obese patients followed completely for the outcome: 1264

Number of non-obese patients followed completely for the outcome: 2792

Comment: 1739 patients had missing data for BMI

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Czernichow 2020 *(Continued)*

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, comorbidities, sex, smoking status

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.89 (1.45, 2.47), NR

Outcome (prognostic factor)

Mortality (Obesity class 2 (35 < BMI < 40))

Follow-up

Number of patients followed completely for the outcome: 5795

Number of obese patients followed completely for the outcome: 1264

Number of non-obese patients followed completely for the outcome: 2792

Comment: 1739 patients had missing data for BMI

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, comorbidities, sex, smoking status

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.79 (1.95, 3.97), NR

Outcome (prognostic factor)

Mortality (obesity class 3 (BMI > 40))

Follow-up

Number of patients followed completely for the outcome: 5795

Number of obese patients followed completely for the outcome: 1264

Number of non-obese patients followed completely for the outcome: 2792

Comment: 1739 patients had missing data for BMI

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

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Czernichow 2020 *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, comorbidities, sex, smoking status

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.55 (1.62, 3.95), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

De Souza 2021

Study characteristics

Notes

English title

On the analysis of mortality risk factors for hospitalized COVID-19 patients: a data-driven study using the major Brazilian database

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

08/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

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De Souza 2021 *(Continued)*

inpatient

Number of participants recruited

162,045

Sampling method

non-random sample

Participants

Female participants

(absolute number), 202, 333

Age measure, value

not reported

Inclusion criteria

The criteria for hospitalisation according to the Ministry of Health concerned the individual presenting gripal syndrome along with dyspnoea/respiratory distress or persistent pressure in the chest or blood oxygen saturation < 95% in room air or blue lips/face. The gripal syndrome concerned the individual with an acute respiratory condition, characterised by at least two of the following signs and symptoms: fever (even if referred), chills, sore throat, headache, cough, runny nose, olfactory disorders or taste disorders. We used in our study data from 162,045 patients who had closed outcomes (cure or death) in order to provide a profile overview of the patients and after, a 44,128 patient cohort with full symptom/comorbidity information aiming to analyse risk factors for mortality.

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 17,573

Hypertension

(unspecified)

Cardiovascular diseases

(absolute number), 22,957

Please indicate if additional information is available

NR

Asthma

(absolute number), 2118

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(absolute number), 2788

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De Souza 2021 *(Continued)*

Please indicate if additional information is available

Pneumopathy: 2788

Immunosuppression

(absolute number), 2343

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

other (please specify)

Threshold used for definition of obesity

NR

Measure of frequency

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De Souza 2021 *(Continued)*

absolute number

Frequency value

3633

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (obesity)

Outcome

Mortality

Prognostic factor (category):

Obesity

Follow-up

Number of patients followed completely for this outcome

44,128

Number of obese patients followed completely for this outcome

3633

Number of non-obese patients followed completely for this outcome

40,495

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.88 (0.83, 0.93)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Male sex, age (40-60, 60-80, 80+), fever, cough, dyspnoea, respiratory distress, SPO2, diarrhoea, other symptoms, cardiac disease, liver disease, asthma, diabetes, neuropathy, pneumopathy, immunodepression, kidney disease, other comorbidity, flu vaccine, flu antiviral, ICU admission, invasive mechanical ventilation, non-invasive ventilation

Effect measure for obesity

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De Souza 2021 *(Continued)*

hazard ratio

Effect measure value (95% CI)

NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Deng 2020

Study characteristics

Notes

English title

Obesity as a potential predictor of disease severity in young COVID-19 patients: a retrospective study

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 03/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 65

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 29

Age measure, value: Mean (SD), 33.6 (5.76)

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Deng 2020 *(Continued)*

Inclusion criteria: Confirmed COVID-19 based on a positive RNA test for SARS-CoV-2 in a respiratory sample, age between 18 and 40 years, chest computed tomography (CT) scan data available, and weight and height had been recorded

Exclusion criteria: Pregnancy

Smoking frequency: 1

Diabetes frequency: 2

Hypertension frequency: 3

Cardiovascular disease frequency: 0

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 1

Steroid administration frequency: 12

Supplemental oxygen administration frequency: 23

Other treatments (frequency): 65 (antiviral), 52 (antibacterial), 12 (immunoglobulin), 3 (albumin)

Prognostic factor(s)

Study's definition for obesity: No exact definition was given in the study. According to the categorisation in the table, the obesity was probably defined as a BMI ≥ 28

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 28

Obesity frequency (absolute number): 10

Prognostic factor(s): Obesity

Outcome(s)

Severe COVID

Outcome (prognostic factor)

Severe COVID (obesity)

Follow-up

Number of patients followed completely for the outcome: 65

Number of obese patients followed completely for the outcome: 10

Number of non-obese patients followed completely for the outcome: 55

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

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Deng 2020 *(Continued)*

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Comment: This study was adjusted for 6 models; no information is available regarding each model and adjusted covariates. Model 1: 115.89 (18.96,+∞), P = 0.001, Model 2: 73.77 (11.79, +∞), P < 0.001, Model 3: 88.76 (13.31,+∞), P < 0.001, Model 4: 6.46 (0.58,+∞), P = 0.1, Model 5: 86 (13.56,+∞), P < 0.001, Model 6: 90.03 (12.71,+∞), P < 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	No	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Dennison 2021

Study characteristics

Notes

English title

Circulating activated neutrophils in COVID-19: an independent predictor for mechanical ventilation and death

Study setting

Start of study recruitment (MM/YYYY)

05/2020

End of study recruitment (MM/YYYY)

08/2020

Study design

retrospective cohort

Study centre(s)

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Dennison 2021 *(Continued)*

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

331

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 107

Age measure, value

median (interquartile range), 53 (41, 65)

Inclusion criteria

All adult patients presenting to the emergency department of SQUH with symptoms consistent with COVID-19 and confirmed for SARS-CoV-2 by RT-PCR from May to August 2020 were included in the study.

Exclusion criteria

Patients who had haemoglobinopathies, haematologic or solid malignancy on chemotherapy were excluded. Patients were also excluded if a CBC was not done at the time of admission

Smoking

NR

Diabetes

(absolute number), 116

Hypertension

(absolute number), 118

Cardiovascular diseases

(absolute number), 30

Please indicate if additional information is available

only CAD

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

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Dennison 2021 *(Continued)*

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

a body mass index of >= 30 (patients with missing weight and height values were labelled obese if treating physicians labelled them as obese before the outcome)

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

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Dennison 2021 *(Continued)*

Measure of frequency

absolute number

Frequency value

31

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

mechanical ventilation, mortality

Outcome (prognostic factor)

Mechanical ventilation (BMI >= 30)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI >= 30

Follow-up

Number of patients followed completely for this outcome

300

Number of obese patients followed completely for this outcome

31

Number of non-obese patients followed completely for this outcome

269

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, DM, HTN, IG (immature granulocytes), NEUT-RI (neutrophil reactivity intensity), WBC

Effect measure for obesity

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Dennison 2021 *(Continued)*

odds ratio

Effect measure value (95% CI)

6.55 (NR)

Outcome (prognostic factor)

Mortality (BMI >= 30)

Outcome

Mortality

Prognostic factor (category):

BMI >= 30

Follow-up

Number of patients followed completely for this outcome

274

Number of obese patients followed completely for this outcome

unspecified

Number of non-obese patients followed completely for this outcome

unspecified

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, DM, HTN, NEUT-RI (neutrophil reactivity intensity)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.02 (NR)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3

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Dennison 2021 *(Continued)*

Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Denova-Gutiérrez 2020

Study characteristics

Notes

English title

The association of obesity, type 2 diabetes, and hypertension with severe coronavirus disease 2019 on admission among Mexican patients

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

Number of participants recruited: 3844

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 1614

Age measure, value: Mean (SD), 45.40 (15.8)

Inclusion criteria: Laboratory-confirmed cases with complete information

Exclusion criteria: NR

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Denova-Gutiérrez 2020 *(Continued)*

Smoking frequency: 365

Diabetes frequency: 669

Hypertension frequency: 557

Cardiovascular disease frequency: 727

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: 38

Chronic kidney disease frequency: 108

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): antiviral (738)

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): 668

Prognostic factor(s): Obesity

Outcome(s)

Severe COVID

Outcome (prognostic factor)

Severe COVID (obesity)

Follow-up

Number of patients followed completely for the outcome: 3844

Number of obese patients followed completely for the outcome: 668

Number of non-obese patients followed completely for the outcome: 3176

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

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Denova-Gutiérrez 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, cardiovascular disease, CKD, drug treatment, immunosuppression, place of care, sex, smoking status, USMER (health units that monitor respiratory diseases)

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.43 (1.11, 1.83), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Severe COVID	Unclear	Appendix 3
Confounding Bias Severe COVID	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Eastment 2021

Study characteristics

Notes

English title

BMI and outcomes of SARS-CoV-2 among US veterans

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 06/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

Number of participants recruited: 276,564

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 30,145

Age measure, value: Mean (SD), 61.70 (15.6)

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Eastment 2021 *(Continued)*

Inclusion criteria: All VA patients, who were tested for SARS-CoV-2 nucleic acid by polymerase chain reaction (PCR) in the inpatient or outpatient setting between February 28, 2020, and June 21, 2020

Exclusion criteria: VA employees, BMI < 12 kg/m^2 or > 100 kg/m^2 (n = 129) and those who were missing information on BMI (n = 5289)

Smoking frequency: 57,525 (including ex-smokers)

Diabetes frequency: 94,861

Hypertension frequency: 173,129

Cardiovascular disease frequency: 64,715

Asthma or chronic obstructive pulmonary disease frequency: 75,502

Other pulmonary disease frequency: obstructive sleep apnoea (84,905), obesity hypoventilation (1936)

Immunosuppression frequency: NR

Chronic kidney disease frequency: 45,633

Cancer frequency: 75,225

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI 30 to 34.9 kg/m^2 (class 1 obesity), 35 to 39.9 kg/m^2 (class 2 obesity), and ≥ 40 kg/m^2 (class 3 obesity)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 119,417

Prognostic factor(s): Class I obesity (30 < BMI < 34.9)

Class II obesity (35 < BMI < 39.9)

Class III obesity (BMI > 40)

Outcome(s)

Hospitalisation

ICU admission

Mechanical ventilation

Mortality

Outcome (prognostic factor)

Hospitalisation (Class I obesity (30 < BMI < 34.9))

Follow-up

Number of patients followed completely for the outcome: 25,925

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Eastment 2021 *(Continued)*

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.75 (0.70, 0.81), NR

Outcome (prognostic factor)

Hospitalisation (Class II obesity (35 < BMI < 39.9))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.83 (0.75, 0.91), NR

Outcome (prognostic factor)

Hospitalisation (Class III obesity (BMI > 40))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

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Eastment 2021 *(Continued)*

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.96 (0.86, 1.07), NR

Outcome (prognostic factor)

ICU admission (Class I obesity (30 < BMI < 34.9))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.92 (0.81, 1.03), NR

Outcome (prognostic factor)

ICU admission (Class II obesity (35 < BMI < 39.9))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

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Eastment 2021 *(Continued)*

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.94 (0.81, 1.10), NR

Outcome (prognostic factor)

ICU admission (Class III obesity (BMI > 40))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.15 (0.96, 1.36), NR

Outcome (prognostic factor)

Mechanical ventilation (Class I obesity (30 < BMI < 34.9))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

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Eastment 2021 *(Continued)*

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.15 (0.94, 1.41), NR

Outcome (prognostic factor)

Mechanical ventilation (Class II obesity (35 < BMI < 39.9))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.35 (1.06, 1.72), NR

Outcome (prognostic factor)

Mechanical ventilation (Class III obesity (BMI > 40))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

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Eastment 2021 *(Continued)*

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value**:** 1.77 (1.35, 2.32), NR

Outcome (prognostic factor)

Mortality (Class I obesity (30 < BMI < 34.9))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value**:** NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value**:** 0.89 (0.76, 1.03), NR

Outcome (prognostic factor)

Mortality (Class II obesity (35 < BMI < 39.9))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value**:** NR

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Eastment 2021 *(Continued)*

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value**:** 0.95 (0.78, 1.16), NR

Outcome (prognostic factor)

Mortality (Class III obesity (BMI > 40))

Follow-up

Number of patients followed completely for the outcome: 25,925

Number of obese patients followed completely for the outcome: 12,672

Number of non-obese patients followed completely for the outcome: 13,253

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value**:** NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (continuous), alcohol dependence, asthma or chronic obstructive pulmonary disease, cancer, cerebrovascular disease, chronic kidney disease, cirrhosis, congestive heart failure, coronary artery disease, diabetes, dialysis, ethnicity, geographic region (COVID-19 burden in each patient's state or territory of residence as of August 19, 2020), hyperlipidaemia, hypertension, obstructive sleep apnoea, obesity hypoventilation syndrome, race (black, white, other), substance use dependence, sex, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value**:** 1.42 (1.12, 1.78), NR

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Study Attrition	Unclear	Appendix 3

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Eastment 2021 *(Continued)*

Hospitalisation		
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Ebinger 2020

Study characteristics

Notes

English title

Pre-existing traits associated with Covid-19 illness severity

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): NR

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

Number of participants recruited: 442

Sampling method: Consecutive participants

Participants

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Ebinger 2020 *(Continued)*

Female participants (absolute number): 186

Age measure, value: Mean (SD), 57.72 (19.65)

Inclusion criteria: NR

Exclusion criteria: NR

Smoking frequency: 16

Diabetes frequency: 84

Hypertension frequency: 161

Cardiovascular disease frequency: 49

Asthma or Chronic obstructive pulmonary disease frequency: 70

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): Obesity

Outcome(s)

Hospitalisation

ICU admission

Mechanical ventilation

Severe COVID

Outcome (prognostic factor)

Hospitalisation (obesity)

Follow-up

Number of patients followed completely for the outcome: 442

Number of obese patients followed completely for the outcome: 71

Number of non-obese patients followed completely for the outcome: 371

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Ebinger 2020 *(Continued)*

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value**:** NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, ACEI use, ARB use, asthma or COPD, DM, Elixhauser comorbidity score, ethnicity (Hispanic), HTN, myocardial infarction or HF, race (African-American), sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 1.99 (0.97, 4.08), 0.059

Comment: In this study, age- and sex-adjusted multivariate analysis is also given: 2.04 (1.14, 3.65), P = 0.016

Outcome (prognostic factor)

ICU admission (obesity)

Follow-up

Number of patients followed completely for the outcome: 442

Number of obese patients followed completely for the outcome: 71

Number of non-obese patients followed completely for the outcome: 371

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value**:** NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 1.26 (0.62, 2.57), 0.520

Outcome (prognostic factor)

Mechanical ventilation (obesity)

Follow-up

Number of patients followed completely for the outcome: 442

Number of obese patients followed completely for the outcome: 71

Number of non-obese patients followed completely for the outcome: 371

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value**:** NR

Multivariable analysis for obesity

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Ebinger 2020 *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 1.57 (0.72, 3.41), 0.260

Outcome (prognostic factor)

Severe COVID (obesity)

Follow-up

Number of patients followed completely for the outcome: 442

Number of obese patients followed completely for the outcome: 71

Number of non-obese patients followed completely for the outcome: 371

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value**:** NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, ACEI use, ARB use, asthma or COPD, DM, Elixhauser comorbidity score, ethnicity (Hispanic), HTN, myocardial infarction or HF, race (African-American), sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 1.95 (1.11, 3.42), 0.021

Comment: In this study, age- and sex-adjusted multivariate analysis is also given: 1.96 (1.19, 3.24), P = 0.009. Moreover, after adding smoking to multivariate analysis (non-missing data on smoking): 1.48 (0.76, 2.9), P = 0.25

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3

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Ebinger 2020 *(Continued)*

Outcome Measurement Mechanical ventilation	Unclear	Appendix 3
Outcome Measurement ICU admission	Unclear	Appendix 3
Outcome Measurement Hospitalisation	Unclear	Appendix 3
Outcome Measurement Severe COVID	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Escalera 2020

Study characteristics	
Notes	**English title** Risk factors for mortality in patients with Coronavirus Disease 2019 (COVID-19) in Bolivia: an analysis of the first 107 confirmed cases **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 03/2020 **Study design** retrospective cohort **Study centre(s)** multiple centres/clinics/areas within a country **Number of centres/clinics/areas** unspecified **Study setting**

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Escalera 2020 *(Continued)*

outpatient and inpatient

Number of participants recruited

107

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 52

Age measure, value

median (standard deviation), 43.9 (17.6)

Inclusion criteria

unspecified

Exclusion criteria

unspecified

Smoking

NR

Diabetes

(absolute number), 5

Hypertension

(absolute number), 10

Cardiovascular diseases

(absolute number), 2

Please indicate if additional information is available

CHF

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified),

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Escalera 2020 *(Continued)*

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

unspecified

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

unspecified

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

other (please specify)

Threshold used for definition of obesity

unspecified

Measure of frequency

absolute number

Frequency value

6

How many eligible outcomes reported?

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Escalera 2020 *(Continued)*

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (obesity)

Outcome

mortality

Prognostic factor (category):

obesity

Follow-up

Number of patients followed completely for this outcome

107

Number of obese patients followed completely for this outcome

6

Number of non-obese patients followed completely for this outcome

101

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

12.125 (1.69, 86.948)

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

unclear

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

unspecified

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Escalera 2020 *(Continued)*

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Statistical Analysis Bias	No	Appendix 3

FAI2R/SFR/SNFMI/SOFREMIP/CRI/IMIDIATE 2020

Study characteristics	
Notes	**English title** Severity of COVID-19 and survival in patients with rheumatic and inflammatory diseases: data from the French RMD COVID-19 cohort of 694 patients **Study setting** **Start of study recruitment (MM/YYYY):** 02/2020 **End of study recruitment (MM/YYYY):** 04/2020 **Study design:** Prospective cohort **Study centre(s):** Multiple centres/clinics/areas within a country **Number of centres, clinics or areas:** NR **Study setting:** Outpatient and inpatient **Number of participants recruited:** 694 **Sampling method:** NR **Participants** **Female participants (absolute number):** 462 **Age measure, value:** Mean (SD), 56.1 (16.4) **Inclusion criteria:** Patients of all ages with confirmed iRMD (rheumatic and inflammatory diseases) and highly suspected/confirmed diagnosis of COVID-19 **Exclusion criteria:** NR **Smoking frequency:** NR **Diabetes frequency:** 62 **Hypertension frequency:** 182

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FAI2R/SFR/SNFMI/SOFREMIP/CRI/IMIDIATE 2020 *(Continued)*

Cardiovascular disease frequency: 85

Asthma frequency: 52

Chronic obstructive pulmonary disease frequency: 28

Other pulmonary disease frequency: interstitial lung disease (26)

Immunosuppression frequency: NR

Chronic kidney disease frequency: 42

Cancer frequency: 33

Steroid administration frequency: 215

Supplemental oxygen administration frequency: NR

Other treatments (frequency): hydroxychloroquine (40), azithromycin (26), lopinavir/ritonavir (21), darunavir/ritonavir (10), remdesivir (2), tocilizumab (3), anakinra (1), HCQ + AZI (24), HCQ + AZI + anakinra (1)

Prognostic factor(s)

Study's definition for obesity: BMI > 30

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 146

Prognostic factor(s): BMI 30-39.9

BMI ≥ 40

Outcome(s)

Severe COVID

Mortality

Outcome (prognostic factor)

Severe COVID (BMI 30-39.9)

Follow-up

Number of patients followed completely for the outcome: 694

Number of obese patients followed completely for the outcome: 126

Number of non-obese patients followed completely for the outcome: 459

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 1.25 (2.25, 0.69), 0.46

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

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FAI2R/SFR/SNFMI/SOFREMIP/CRI/IMIDIATE 2020 *(Continued)*

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 1.47 (0.76, 2.82), 0.25

Outcome (prognostic factor)

Severe COVID (BMI ≥ 40)

Follow-up

Number of patients followed completely for the outcome: 694

Number of obese patients followed completely for the outcome: 20

Number of non-obese patients followed completely for the outcome: 459

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 3.43 (1.26, 9.32), 0.016

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 4.10 (1.28, 13.11), 0.017

Outcome (prognostic factor)

Mortality (BMI 30-39.9)

Follow-up

Number of patients followed completely for the outcome: 675

Number of obese patients followed completely for the outcome: 121

Number of non-obese patients followed completely for the outcome: 452

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 1.56 (0.78, 2.97), 0.19

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 1.95 (0.88, 4.18), 0.093

Outcome (prognostic factor)

Mortality (BMI ≥ 40)

Follow-up

Number of patients followed completely for the outcome: 675

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FAI2R/SFR/SNFMI/SOFREMIP/CRI/IMIDIATE 2020 *(Continued)*

Number of obese patients followed completely for the outcome: 19

Number of non-obese patients followed completely for the outcome: 452

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 3.64 (1.07, 10.29), 0.026

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value**:** 3.77 (0.86, 15.09), 0.07

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Severe COVID	Unclear	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Farrell 2020

Study characteristics

Notes

English title

Sociodemographic variables as predictors of adverse outcome in SARS-CoV-2 infection: an Irish hospital experience

Study setting

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Farrell 2020 *(Continued)*

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Prospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 257

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 104

Age measure, value: Mean (SD), 60.1 (18.4)

Inclusion criteria: NR

Exclusion criteria: NR

Smoking frequency: 29

Diabetes frequency: NR

Hypertension frequency: NR

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Overweight (BMI 25–30) or obese (BMI > 30)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 166

Prognostic factor(s): Overweight or obese (BMI > 25)

Outcome(s)

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Farrell 2020 *(Continued)*

Mortality

ICU admission

Outcome (prognostic factor)

Mortality (overweight or obese (BMI > 25))

Follow-up

Number of patients followed completely for the outcome: 257

Number of obese patients followed completely for the outcome: 166

Number of non-obese patients followed completely for the outcome: 91

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value**:** NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, Charlson Comorbidity Index

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value**:** 2.20 (0.88, 5.52), 0.093

Outcome (prognostic factor)

ICU admission (overweight or obese (BMI > 25))

Follow-up

Number of patients followed completely for the outcome: 257

Number of obese patients followed completely for the outcome: 166

Number of non-obese patients followed completely for the outcome: 91

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value**:** NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value**:** 2.37 (1.37, 6.83), 0.01

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3

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Farrell 2020 *(Continued)*

Study Attrition Mortality	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias ICU admission	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Filardo 2020

Study characteristics

Notes

English title

Comorbidity and clinical factors associated with COVID-19 critical illness and mortality at a large public hospital in New York City in the early phase of the pandemic (March-April 2020)

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): NR

Number of centres, clinics or areas: NR

Study setting: Inpatient

Number of participants recruited: 337

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 108

Age measure, value: Mean (SD), 57.4 (12.64)

Inclusion criteria: Patients aged 18 and older admitted to BHC with laboratory-confirmed COVID-19 between March 9th 2020 and April 8th 2020

Exclusion criteria: Incarcerated individuals

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Filardo 2020 *(Continued)*

Smoking frequency: 65

Diabetes frequency: 109

Hypertension or cardiovascular disease frequency: 175

Chronic pulmonary disease frequency: 43

Immunosuppression frequency: 14

Chronic kidney disease frequency: 27

Cancer frequency: 10

Steroid administration frequency: 102

Supplemental oxygen administration frequency: 272

Other treatments (frequency): lopinavir/ritonavir (31), HCQ (44), HCQ + azithromycin (200), tocilizumab (29), remdesivir study enrolment (receipt of remdesivir or placebo is unknown for these patients) (4), antimicrobials (206)

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 130

Prognostic factor(s): Obesity (BMI ≥ 30)

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (obesity (BMI ≥ 30))

Follow-up

Number of patients followed completely for the outcome: 270

Number of obese patients followed completely for the outcome: 109

Number of non-obese patients followed completely for the outcome: 161

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value**:** 1.19 (0.82, 1.74), < 0.05

Multivariable analysis for obesity

Modelling method: Linear regression

The set of prognostic factors used for adjustment: Age, cardiovascular comorbidity, dementia, diabetes, HIV, immunosuppression, malignancy, race, renal comorbidity, pulmonary comorbidity, sex

Effect measure for obesity: Relative risk

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Filardo 2020 *(Continued)*

Effect measure value (95% CI), P value**:** 1.37 (1.07, 1.74), < 0.05

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Forest 2021

Study characteristics

Notes

English title

De novo renal failure and clinical outcomes of patients with critical coronavirus disease 2019

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

03/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

inpatient

Number of participants recruited

330

Sampling method

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Forest 2021 *(Continued)*

consecutive participants

Participants

Female participants

(absolute number), 130

Age measure, value

not reported

Inclusion criteria

>= 18 years old, RT-PCR+, endotracheal intubation and mechanical ventilation upon initial presentation or during inpatient hospitalisation, history of ESRD

Exclusion criteria

Patients who expired in the emergency department without planned hospital admission

Smoking

NR

Diabetes

(absolute number), 194

Hypertension

(absolute number), 224

Cardiovascular diseases

(absolute number), 55

Please indicate if additional information is available

CAD 55, CHF 55

Asthma

(absolute number), 83

Chronic obstructive pulmonary disease

(absolute number), 83

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

HIV 10

Chronic kidney disease

(absolute number), 81

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Forest 2021 *(Continued)*

Cancer

(unspecified)

Steroid administration

(unspecified),

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

BMI greater than or equal to 30

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

unspecified

Frequency value

NR

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

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Forest 2021 *(Continued)*

mortality

Outcome (prognostic factor)

mortality (BMI >= 30)

Outcome

mortality

Prognostic factor (category):

BMI >= 30

Follow-up

Number of patients followed completely for this outcome

330

Number of obese patients followed completely for this outcome

unspecified

Number of non-obese patients followed completely for this outcome

unspecified

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age (60 years old cut-point), CVD, CKD, COPD or asthma, DM, HTN, race, renal replacement therapy, sex

Effect measure for obesity

NR

Effect measure value (95% CI)

2.138 (1.039, 4.399)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3

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Forest 2021 *(Continued)*

Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Fresán 2021

Study characteristics

Notes

English title

Independent role of severe obesity as a risk factor for COVID-19 hospitalization: a Spanish population-based cohort study

Study setting

Start of study recruitment (MM/YYYY): 03/2020 (cohorts 1-4), 02/2020 (cohorts 5-8)

End of study recruitment (MM/YYYY): 04/2020

Study design: Prospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

Number of participants recruited: 216,054 (cohort 1), 132,126 (cohort 2), 85,815 (cohort 3), 433,995 (cohort 4), 650,000 (cohorts 5-8)

Sampling method: Consecutive participants

Participants

Female participants (absolute number): NR (cohorts 1-3), 217,346 (cohort 4), 325,520 (cohorts 5-8)

Age measure, value: NR

Inclusion criteria: Population aged 25 to 79 years and covered by the Health Service

Exclusion criteria: Age under 25 or 80 and over, healthcare professionals, nursing home residents, not covered by Navarra health service, terminally ill patients

Smoking frequency: NR (cohorts 1-3), 1552 (cohort 4), 148,850 (cohorts 5-8)

Diabetes frequency: NR

Hypertension frequency: NR (cohorts 1-3), 71,888 (cohort 4), 107,640 (cohorts 5-8)

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

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Fresán 2021 *(Continued)*

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Class 3 obesity, defined as BMI ≥ 40 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 40

Obesity frequency (absolute number): NR (cohorts 1-3), 7460 (cohort 4), 11,115 (cohorts 5-8)

Prognostic factor(s): BMI > 40 (obesity class 3)

Outcome(s)

Hospitalisation

Severity

Outcome (prognostic factor)

Hospitalisation (BMI > 40 (obesity class 3)) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 216,054

Number of obese patients followed completely for the outcome: 2834

Number of non-obese patients followed completely for the outcome: 213,220

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value**:** 7.01 (4.57, 10.47), < 0.001

Multivariable analysis for obesity

Modelling method: Poisson regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value**:** 5.02 (3.19, 7.90), < 0.001

Outcome (prognostic factor)

Hospitalisation (BMI > 40 (obesity class 3)) (cohort 2)

Follow-up

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Fresán 2021 *(Continued)*

Number of patients followed completely for the outcome: 132,126

Number of obese patients followed completely for the outcome: 2661

Number of non-obese patients followed completely for the outcome: 129,465

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value**:** 2.15 (1.30, 3.55), 0.003

Multivariable analysis for obesity

Modelling method: Poisson regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value**:** 1.87 (1.12, 3.12), 0.017

Outcome (prognostic factor)

Hospitalisation (BMI > 40 (obesity class 3)) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 85,815

Number of obese patients followed completely for the outcome: 1965

Number of non-obese patients followed completely for the outcome: 83,850

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value**:** 1.25 (0.72, 2.17), 0.429

Multivariable analysis for obesity

Modelling method: Poisson regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.22 (0.70, 2.12), 0.488

Outcome (prognostic factor)

Hospitalisation (BMI > 40 (obesity class 3)) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 433,995

Number of obese patients followed completely for the outcome: 7360

Number of non-obese patients followed completely for the outcome: 426,535

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 2.82 (2.14, 3.73), < 0.001

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Fresán 2021 *(Continued)*

Multivariable analysis for obesity

Modelling method: Poisson regression

The set of prognostic factors used for adjustment: Health-related characteristics: primary healthcare visits in prior 12 months, hospitalisation in prior 12 months, smoking status, hypertension, and major chronic conditions

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 2.20 (1.66, 2.93), < 0.001

Outcome (prognostic factor)

Severity (BMI > 40 (obesity class 3)) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 439,490

Number of obese patients followed completely for the outcome: 7460

Number of non-obese patients followed completely for the outcome: 426,535

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 3.44 (1.82, 6.52), < 0.001

Multivariable analysis for obesity

Modelling method: Poisson regression

The set of prognostic factors used for adjustment: Sociodemographic characteristics (sex, age, country of origin, municipality size, and annual taxable income level), health-related characteristics (primary healthcare visits in prior 12 months, hospitalisation in prior 12 months, smoking status, hypertension, and major chronic conditions)

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 2.30 (1.20, 4.40), < 0.001

Outcome (prognostic factor)

Severity (BMI > 40 (obesity class 3)) (cohort 6)

Follow-up

Number of patients followed completely for the outcome: 216,056

Number of obese patients followed completely for the outcome: 2834

Number of non-obese patients followed completely for the outcome: 213,220

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 32.24 (8.34, 124.69), < 0.001

Multivariable analysis for obesity

Modelling method: Poisson regression

The set of prognostic factors used for adjustment: Sociodemographic characteristics (sex, age, country of origin, municipality size, and annual taxable income level), health-related characteristics

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Fresán 2021 *(Continued)*

(primary healthcare visits in prior 12 months, hospitalisation in prior 12 months, smoking status, hypertension, and major chronic conditions)

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 13.80 (3.11,61.17), < 0.001

Outcome (prognostic factor)

Severity (BMI > 40 (obesity class 3)) (cohort 7)

Follow-up

Number of patients followed completely for the outcome: 132,126

Number of obese patients followed completely for the outcome: 2661

Number of non-obese patients followed completely for the outcome: 129,465

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 3.04 (0.95, 9.76), 0.62

Multivariable analysis for obesity

Modelling method: Poisson regression

The set of prognostic factors used for adjustment: Sociodemographic characteristics (sex, age, country of origin, municipality size, and annual taxable income level), health-related characteristics (primary healthcare visits in prior 12 months, hospitalisation in prior 12 months, smoking status, hypertension, and major chronic conditions)

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 2.07 (0.62, 6.85), < 0.001

Outcome (prognostic factor)

Severity (BMI > 40 (obesity class 3)) (cohort 8)

Follow-up

Number of patients followed completely for the outcome: 85,815

Number of obese patients followed completely for the outcome: 1965

Number of non-obese patients followed completely for the outcome: 53,850

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.54 (0.57, 4.17), 0.398

Multivariable analysis for obesity

Modelling method: Poisson regression

The set of prognostic factors used for adjustment: Sociodemographic characteristics (sex, age, country of origin, municipality size, and annual taxable income level), health-related characteristics (primary healthcare visits in prior 12 months, hospitalisation in prior 12 months, smoking status, hypertension, and major chronic conditions)

Effect measure for obesity: Relative risk

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Fresán 2021 *(Continued)*

Effect measure value (95% CI), P value: 1.42 (0.52, 3.88), 0.496

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Outcome Measurement Severe COVID	No	Appendix 3
Confounding Bias Hospitalisation	Unclear	Appendix 3
Confounding Bias Severe COVID	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Fried 2021

Study characteristics

Notes

English title

Patient characteristics and outcomes of 11 721 patients with coronavirus disease 2019 (COVID-19) hospitalized across the United States

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres/clinics/areas: 245

Study setting: Inpatient

Number of participants recruited: 11,721

Sampling method: Consecutive participants

Participants

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Fried 2021 *(Continued)*

Female participants (absolute number): 5457

Age measure, value: NR

Inclusion criteria: Patients aged ≥ 18 years indicating COVID-19 with ICD-10 code

Exclusion criteria: NR

Smoking frequency: 1922

Diabetes frequency: 3254

Hypertension frequency: 5475

Cardiovascular disease frequency: 2182

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 1737

Immunosuppression frequency: NR

Chronic kidney disease frequency: 1854

Cancer frequency: 2390

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 6896

Other treatments (frequency): Remdesivir (0.4%)

Prognostic factor(s)

Study's definition for obesity: Obesity (BMI ≥ 30 kg/m^2)

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: 30

Obesity frequency (absolute number): 1891

Prognostic factor(s): Obesity (BMI ≥ 30 kg/m^2)

Outcome(s)

Mechanical ventilation, mortality

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 11,721

Number of obese patients followed completely for the outcome: 1891

Number of non-obese patients followed completely for the outcome: 9830

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

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Fried 2021 *(Continued)*

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, insurance status at admission, history of chronic kidney disease, stage 5 kidney disease, hypertension, diabetes, pulmonary disease, cardiovascular disease, liver disease, obesity, and smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.47 (1.28, 1.69), NR

Outcome (prognostic factor)

Mortality (BMI ≥ 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 11,721

Number of obese patients followed completely for the outcome: 1891

Number of non-obese patients followed completely for the outcome: 9830

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, insurance status at admission, history of chronic kidney disease, stage 5 kidney disease, hypertension, diabetes, pulmonary disease, cardiovascular disease, liver disease, obesity, and smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.07 (0.93, 1.24), NR

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Fried 2021 *(Continued)*

Mechanical ventilation		
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Gao 2020

Study characteristics	
Notes	**English title** Obesity is a risk factor for greater COVID-19 severity **Study setting** **Start of study recruitment (MM/YYYY):** 01/2020 **End of study recruitment (MM/YYYY):** 02/2020 **Study design:** Retrospective cohort **Study centre(s):** Multiple centres/clinics/areas within a country **Number of centres, clinics or areas:** 3 **Study setting:** Inpatient **Number of participants recruited:** 150 **Sampling method:** Consecutive participants **Participants** **Female participants (absolute number):** 56 **Age measure, value:** Mean (SD), 48 (NR) **Inclusion criteria:** Adults with BMI > 25 **Exclusion criteria:** NR **Smoking frequency:** NR **Diabetes frequency:** 29 **Hypertension frequency:** NR **Cardiovascular disease frequency:** NR **Asthma frequency:** NR **Chronic obstructive pulmonary disease frequency:** 0 **Other pulmonary disease frequency:** NR **Immunosuppression frequency:** NR **Chronic kidney disease frequency:** NR

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Gao 2020 *(Continued)*

Cancer frequency: 0

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI > 25 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 75

Prognostic factor(s): Obesity

Outcome(s)

Severity

Outcome (prognostic factor)

Severity (obesity)

Follow-up

Number of patients followed completely for the outcome: 150

Number of obese patients followed completely for the outcome: 75

Number of non-obese patients followed completely for the outcome: 75

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.91 (1.31, 6.47), 0.007

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, smoking status, hypertension, diabetes, and dyslipidaemia, age, smoking status

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.00 (1.22, 7.38), NR

Comment: Adjusted for each unit of BMI as a continuous outcome: 1.13 (1.01, 1.28)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3

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Gao 2020 *(Continued)*

Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	No	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Gao 2021

Study characteristics

Notes

English title

Associations between body-mass index and COVID-19 severity in 6·9 million people in England: a prospective, community-based, cohort study

Study setting

Start of study recruitment (MM/YYYY)

01/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

prospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

outpatient

Number of participants recruited

6,910,695

Sampling method

unspecified

Participants

Female participants

(percentage), 53.1

Age measure, value

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Gao 2021 *(Continued)*

(reported in categories)

20 to 39 years: 2,384,223 (34.5%)

40 to 59 years: 2,444,011 (35.4%)

60 to 79 years: 1,652,615 (23.9%)

>= 80 years: 429,846 (6.2%)

Inclusion criteria

aged 20–99 years who were registered at a general practice (GP) that contributes to the QResearch database and had available BMI data.

Exclusion criteria

Participants without at least one BMI measurement

Smoking

(percentage), 17.1

Diabetes

(percentage), 8.4

Hypertension

(percentage), 19.7

Cardiovascular diseases

(percentage), 6

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(percentage), 16.1

Please indicate if additional information is available

COPD and asthma

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(percentage), 4.7

Cancer

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Gao 2021 *(Continued)*

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity I: BMI = 30-34.9, obesity II/III = +35

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

BMI ≥ 30

Measure of frequency

absolute number

Frequency value

1,681,112

How many eligible outcomes reported?

3

How many eligible outcomes reported?

3

Outcome(s)

hospitalisation, ICU admission, mortality

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Gao 2021 *(Continued)*

Outcome (prognostic factor)

hospitalisation (BMI)

Outcome

hospitalisation

Prognostic factor (category):

BMI

Follow-up

Number of patients followed completely for this outcome

6,910,695

Number of obese patients followed completely for this outcome

1,681,112

Number of non-obese patients followed completely for this outcome

5,229,583

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.05 (1.05, 1.06)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, sex, ethnicity, economic status, geographical region, smoking status, non-obesity-related morbidity, including conditions related to severe COVID-19 disease (namely, chronic obstructive pulmonary disease, asthma, autoimmune diseases [systemic lupus erythematosus, rheumatoid diseases], ulcerative colitis or Crohn's disease, type 1 diabetes, chronic liver disease, chronic renal disease, chronic neurological disease, and cerebral palsy); obesity-related morbidity, including hypertension, cardiovascular disease (including congestive heart failure and stroke), reflux disease or gastro-oesophageal reflux disease, and sleep apnoea; and type 2 diabetes

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.04 (1.04, 1.05)

Outcome (prognostic factor)

ICU admission (BMI)

Outcome

ICU admission

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Gao 2021 *(Continued)*

Prognostic factor (category):

BMI

Follow-up

Number of patients followed completely for this outcome

6,910,695

Number of obese patients followed completely for this outcome

1,681,112

Number of non-obese patients followed completely for this outcome

5,229,583

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.1 (1.09, 1.11)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, sex, ethnicity, economic status, geographical region, smoking status, non-obesity-related morbidity, including conditions related to severe COVID-19 disease (namely, chronic obstructive pulmonary disease, asthma, autoimmune diseases [systemic lupus erythematosus, rheumatoid diseases], ulcerative colitis or Crohn's disease, type 1 diabetes, chronic liver disease, chronic renal disease, chronic neurological disease, and cerebral palsy); obesity-related morbidity, including hypertension, cardiovascular disease (including congestive heart failure and stroke), reflux disease or gastro-oesophageal reflux disease, and sleep apnoea; and type 2 diabetes

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.09 (1.08, 1.1)

Outcome (prognostic factor)

mortality (BMI)

Outcome

mortality

Prognostic factor (category):

BMI

Follow-up

Number of patients followed completely for this outcome

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Gao 2021 *(Continued)*

6,910,695

Number of obese patients followed completely for this outcome

1,681,112

Number of non-obese patients followed completely for this outcome

5,229,583

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.03 (1.03, 1.02)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, sex, ethnicity, economic status, geographical region, smoking status, non-obesity-related morbidity, including conditions related to severe COVID-19 disease (namely, chronic obstructive pulmonary disease, asthma, autoimmune diseases [systemic lupus erythematosus, rheumatoid diseases], ulcerative colitis or Crohn's disease, type 1 diabetes, chronic liver disease, chronic renal disease, chronic neurological disease, and cerebral palsy); obesity-related morbidity, including hypertension, cardiovascular disease (including congestive heart failure and stroke), reflux disease or gastro-oesophageal reflux disease, and sleep apnoea; and type 2 diabetes

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.04 (1.04, 1.05)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Gao 2021 *(Continued)*

Mortality		
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Garcia Moreno 2021

Study characteristics

Notes

English title

Analysis of factors related to the clinical course of COVID-19 infection in patients with hypertension

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

03/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

571

Sampling method

consecutive participants

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Garcia Moreno 2021 *(Continued)*

Participants

Female participants

(absolute number), 233

Age measure, value

median (interquartile range), 76 (66, 83)

Inclusion criteria

diagnosis of hypertension, hospital admission for COVID-19 between 1 March and 24 March 2020

Exclusion criteria

unspecified

Smoking

NR

Diabetes

(unspecified)

Hypertension

(absolute number) 571

Cardiovascular diseases

(unspecified)

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

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Garcia Moreno 2021 *(Continued)*

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(percentage), 91.9

Differential values for various oxygenation methods (if indicated)

oxygen therapy

Other treatment

unspecified

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

unspecified

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

other (please specify)

Threshold used for definition of obesity

unspecified

Measure of frequency

unspecified

Frequency value

unspecified

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

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Garcia Moreno 2021 *(Continued)*

Outcome (prognostic factor)

mortality (obesity)

Outcome

mortality

Prognostic factor (category):

obesity

Follow-up

Number of patients followed completely for this outcome

571

Number of obese patients followed completely for this outcome

unspecified

Number of non-obese patients followed completely for this outcome

unspecified

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

unspecified

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

unspecified

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3

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Garcia Moreno 2021 *(Continued)*

Outcome Measurement Mortality	Unclear	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Garcia Olivares 2020

Study characteristics

Notes

English title

The age and comorbidities, are independent risk factors for mortality in critically ill COVID-19 patients?

Study setting

Start of study recruitment (MM/YYYY)

unspecified

End of study recruitment (MM/YYYY)

unspecified

Study design

prospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

150

Sampling method

consecutive participants

Participants

Female participants

(percentage), 29

Age measure, value

mean (standard deviation), 58 (14)

Inclusion criteria

unspecified

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Garcia Olivares 2020 *(Continued)*

Exclusion criteria

unspecified

Smoking

NR

Diabetes

(unspecified)

Hypertension

(percentage), 53

Cardiovascular diseases

(unspecified)

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified),

Supplemental oxygen

(percentage), 88

Differential values for various oxygenation methods (if indicated)

88% mechanical ventilation, 74% prone position

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Garcia Olivares 2020 *(Continued)*

Other treatment

percentage

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

unspecified

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

percentage

Frequency value

53

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (obesity)

Outcome

mortality

Prognostic factor (category):

obesity

Follow-up

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Garcia Olivares 2020 *(Continued)*

Number of patients followed completely for this outcome

150

Number of obese patients followed completely for this outcome

79

Number of non-obese patients followed completely for this outcome

71

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.17 (0.6, 2.25)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

severity (APACHE II, SOFA and mechanical ventilation)

Effect measure for obesity

NR

Effect measure value (95% CI)

unspecified

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Statistical Analysis Bias	No	Appendix 3

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Gaur 2021

Study characteristics

Notes

English title

Macrolevel association of COVID-19 with non-communicable disease risk factors in India

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

11/2020

Study design

registry data

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

unspecified

Study setting

unspecified

Number of participants recruited

unspecified

Sampling method

other

Participants

Female participants

(unspecified)

Age measure, value

not reported

Inclusion criteria

unspecified

Exclusion criteria

unspecified

Smoking

NR

Diabetes

(unspecified), the frequency of diabetes was reported for each province of India separately.

Hypertension

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Gaur 2021 *(Continued)*

(unspecified), the frequency of HTN was reported for each province of India separately.

Cardiovascular diseases

(unspecified)

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

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Gaur 2021 *(Continued)*

NR

Prognostic factor(s)

Study's definition for obesity

unspecified

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

other (please specify)

Threshold used for definition of obesity

unspecified

Measure of frequency

unspecified

Frequency value

the frequency of obesity was reported for each province of India separately.

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (obesity not specified)

Outcome

mortality

Prognostic factor (category):

Obesity not specified

Follow-up

Number of patients followed completely for this outcome

unspecified

Number of obese patients followed completely for this outcome

unspecified

Number of non-obese patients followed completely for this outcome

unspecified

Univariable (unadjusted) analysis for obesity

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Gaur 2021 *(Continued)*

Effect measure for obesity

slope (beta)

Effect measure value (95% CI)

0.52 NR

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

obesity, HTN, diabetes, literacy, smoking

Effect measure for obesity

slope (beta)

Effect measure value (95% CI)

-0.13 (unspecified, unspecified)

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	No	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Gayam 2020

Study characteristics

Notes

English title

Clinical characteristics and predictors of mortality in African-Americans with COVID-19 from an inner-city community teaching hospital in New York

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

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Gayam 2020 *(Continued)*

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 408

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 177

Age measure, value: Median (IQR), 67 (56, 76)

Inclusion criteria: African-American inpatients with positive COVID-19 PCR

Exclusion criteria: NR

Smoking frequency: 36

Diabetes frequency: 176

Hypertension frequency: 271

Cardiovascular disease frequency: 54

Asthma frequency: 54

Chronic obstructive pulmonary disease frequency: 43

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 69

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI continuous

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: NA

Obesity frequency (absolute number): NA

Prognostic factor(s): BMI continuous

Outcome(s)

Mortality

Outcome (prognostic factor)

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Gayam 2020 *(Continued)*

Mortality (BMI continuous)

Follow-up

Number of patients followed completely for the outcome: 408

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR (NR), 0.002

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, BMI, C-reactive protein, and D-dimers, serum ferritin, other lab findings, shortness of breath, myalgia

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.07 (1.04, 1.11), < 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Giacomelli 2021

Study characteristics

Notes

English title

Impact of gender on patients hospitalized for SARS-COV-2 infection: a prospective observational study

Study setting

Start of study recruitment (MM/YYYY)

02/2020

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Giacomelli 2021 *(Continued)*

End of study recruitment (MM/YYYY)

05/2020

Study design

prospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

2

Study setting

inpatient

Number of participants recruited

520

Sampling method

consecutive participants

Participants

Female participants

(percentage), 33

Age measure, value

median (interquartile range), 61(50, 72)

Inclusion criteria

COVID-19 positive

Exclusion criteria

NS

Smoking

NR

Diabetes

(absolute number), 61

Hypertension

(unspecified)

Cardiovascular diseases

(absolute number), 254

Please indicate if additional information is available

NR

Asthma

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Giacomelli 2021 *(Continued)*

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(absolute number), 78

Please indicate if additional information is available

Respiratory disease

Immunosuppression

(absolute number), 39

Please indicate if additional information is available

Immune system disorders

Chronic kidney disease

(absolute number), 42

Cancer

(absolute number), 50

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

before disease or right at presentation

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Giacomelli 2021 *(Continued)*

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

NR

Measure of frequency

absolute number

Frequency value

92

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (obesity NS)

Outcome

Mortality

Prognostic factor (category):

Obesity NS

Follow-up

Number of patients followed completely for this outcome

520

Number of obese patients followed completely for this outcome

92

Number of non-obese patients followed completely for this outcome

428

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.94 (1.14, 3.32)

Multivariable (adjusted) analysis for obesity

Modelling method

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Giacomelli 2021 *(Continued)*

logistic regression

The set of prognostic factors used for adjustment

gender, age, obesity, CVD, cancer, flu vaccination, time from symptoms onset, critical disease at hospital admission, fever yes versus not, anaemia, INR > 1.3, D-dimer ≥ 500 µg/L, CRP ≥ 50 mg/L, eGFR (MDRD) < 60 mL/min, LDH > 245 IU/L, CK > 185 IU/L

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.17 (1.1, 4.31)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Gil-Rodrigo 2020

Study characteristics

Notes

English title

Analysis of clinical characteristics and outcomes in patients with COVID-19 based on a series of 1000 patients treated in Spanish emergency departments

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

prospective cohort

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Gil-Rodrigo 2020 *(Continued)*

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

61

Study setting

inpatient

Number of participants recruited

1000

Sampling method

random sample

Participants

Female participants

(percentage), 43.8

Age measure, value

median (range), 62.3 (17.8)

Inclusion criteria

confirmed or suspected COVID-19 (PCR or clinical manifestations)

Exclusion criteria

unspecified

Smoking

NR

Diabetes

(percentage), 18.8

Hypertension

(percentage), 44.6

Cardiovascular diseases

(percentage), 7.7

Please indicate if additional information is available

for IHD

Asthma

(percentage), 7.3

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

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Gil-Rodrigo 2020 *(Continued)*

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(percentage), 4.9

Please indicate if additional information is available

NR

Chronic kidney disease

(percentage), 7.3

Cancer

(percentage), 9.7

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

unspecified

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

other (please specify)

Threshold used for definition of obesity

unspecified

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Gil-Rodrigo 2020 *(Continued)*

Measure of frequency

percentage

Frequency value

14.3

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (obesity unspecified)

Outcome

mortality

Prognostic factor (category):

obesity unspecified

Follow-up

Number of patients followed completely for this outcome

1000

Number of obese patients followed completely for this outcome

143

Number of non-obese patients followed completely for this outcome

857

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.93 (1.32, 2.82)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, HTN, DM, obesity, DLP, smoking, asthma, and other comorbidities

Effect measure for obesity

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Gil-Rodrigo 2020 *(Continued)*

odds ratio

Effect measure value (95% CI)

2.53 (1.47, 4.35)

Outcome (prognostic factor)

mortality (obesity class 1)

Outcome

mortality

Prognostic factor (category):

obesity class 1

Follow-up

Number of patients followed completely for this outcome

2874

Number of obese patients followed completely for this outcome

812

Number of non-obese patients followed completely for this outcome

2062

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

unspecified

Effect measure for obesity

NR

Effect measure value (95% CI)

1.15 (0.93, 1.4)

Outcome (prognostic factor)

mortality (obesity class 2)

Outcome

mortality

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Gil-Rodrigo 2020 *(Continued)*

Prognostic factor (category):

obesity class 2

Follow-up

Number of patients followed completely for this outcome

2431

Number of obese patients followed completely for this outcome

369

Number of non-obese patients followed completely for this outcome

2062

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

unspecified

Effect measure for obesity

NR

Effect measure value (95% CI)

1.33 (1, 1.76)

Outcome (prognostic factor)

mortality (obesity class 3)

Outcome

mortality

Prognostic factor (category):

obesity class 3

Follow-up

Number of patients followed completely for this outcome

2357

Number of obese patients followed completely for this outcome

295

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Gil-Rodrigo 2020 *(Continued)*

Number of non-obese patients followed completely for this outcome

2062

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

unspecified

Effect measure for obesity

NR

Effect measure value (95% CI)

1.92 (1.4, 2.63)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Girardin 2021

Study characteristics

Notes

English title

Contribution of pulmonary diseases to COVID-19 mortality in a diverse urban community of New York

Study setting

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Girardin 2021 *(Continued)*

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

registry data

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

inpatient

Number of participants recruited

4446

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 1766

Age measure, value

mean (standard deviation), 62 (18.89)

Inclusion criteria

We included only patients with confirmed COVID-19 who had been discharged alive or had died.

Exclusion criteria

omitting hospitalised patients with unknown state information

Smoking

NR

Diabetes

(absolute number), 1473

Hypertension

(absolute number), 2390

Cardiovascular diseases

(absolute number), 580

Please indicate if additional information is available

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Girardin 2021 *(Continued)*

CAD

Asthma

(absolute number), 493

Chronic obstructive pulmonary disease

(absolute number), 329

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(absolute number), 472

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

unspecified

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

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Girardin 2021 *(Continued)*

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

NR

Measure of frequency

absolute number

Frequency value

1660

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (obesity NS)

Outcome

Mortality

Prognostic factor (category):

Obesity NS

Follow-up

Number of patients followed completely for this outcome

4210

Number of obese patients followed completely for this outcome

1660

Number of non-obese patients followed completely for this outcome

2550

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

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Girardin 2021 *(Continued)*

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, ethnicity, gender, income, smoking, obesity, COPD, asthma, sleep apnoea, HTN, hlp, DM, CAD, PAD, autoimmunity, cancer

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.19 (1.04, 1.37)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Goodman 2020

Study characteristics

Notes

English title

Impact of sex and metabolic comorbidities on COVID-19 mortality risk across age groups: 66,646 inpatients across 613 U.S. hospitals

Study setting

Start of study recruitment (MM/YYYY): 04/2020

End of study recruitment (MM/YYYY): 07/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 613

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Goodman 2020 *(Continued)*

Study setting: Inpatient

Number of participants recruited: 66,646

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 31,400

Age measure, value: Mean (SD), 62.8 (17.9)

Inclusion criteria: Patients who their admission included an ICD-10-CM diagnosis code of 'COVID-19' (U07.1)

Exclusion criteria: Under 20-year-old patients

Smoking frequency: NR

Diabetes frequency: 25,611

Hypertension frequency: 42,813

Cardiovascular disease frequency: 9893

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: Chronic pulmonary disease (13,606)

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 1795

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): 14,044

Prognostic factor(s): Obesity

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (obesity) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 7371

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Goodman 2020 *(Continued)*

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Log-binomial models using the modified Poisson regression approach

The set of prognostic factors used for adjustment: A list of underlying diseases, sex, race, admission month

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.92 (1.43, 2.57), < 0.001

Outcome (prognostic factor)

Mortality (obesity) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 6947

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Log-binomial models using the modified Poisson regression approach

The set of prognostic factors used for adjustment: A list of underlying diseases, sex, race, admission month

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.57 (1.3, 2.9), < 0.001

Outcome (prognostic factor)

Mortality (obesity) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 11,138

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

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Goodman 2020 *(Continued)*

Multivariable analysis for obesity

Modelling method: Log-binomial models using the modified Poisson regression approach

The set of prognostic factors used for adjustment: A list of underlying diseases, sex, race, admission month

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.33 (1.19, 1.49), < 0.001

Outcome (prognostic factor)

Mortality (obesity) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 14,343

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Log-binomial models using the modified Poisson regression approach

The set of prognostic factors used for adjustment: A list of underlying diseases, sex, race, admission month

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.26 (1.16, 1.36), < 0.001

Outcome (prognostic factor)

Mortality (obesity) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 12,855

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Log-binomial models using the modified Poisson regression approach

The set of prognostic factors used for adjustment: A list of underlying diseases, sex, race, admission month

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.16 (1.08, 1.25), < 0.001

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Goodman 2020 *(Continued)*

Outcome (prognostic factor)

Mortality (obesity) (cohort 6)

Follow-up

Number of patients followed completely for the outcome: 13,472

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Log-binomial models using the modified Poisson regression approach

The set of prognostic factors used for adjustment: A list of underlying diseases, sex, race, admission month

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.11 (1.02, 1.22), < 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	No	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Goyal 2020

Study characteristics

Notes

English title

Obesity and COVID-19 in New York City: a retrospective cohort study

Study setting

Start of study recruitment (MM/YYYY): 03/2020

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Goyal 2020 *(Continued)*

End of study recruitment (MM/YYYY): 05/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 2

Study setting: Inpatient

Number of participants recruited: 1687

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 683

Age measure, value: Median (IQR), 66.5 (53.7-77.2)

Inclusion criteria: NR

Exclusion criteria: Patients who did not have height or weight data available to calculate body mass index (BMI)

Smoking frequency: 81

Diabetes frequency: 526

Hypertension frequency: 956

Cardiovascular disease frequency: CAD (279), 121 (HF)

Asthma frequency: 159

Chronic obstructive pulmonary disease frequency: 103

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 101

Cancer frequency: 121

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30

The time when obesity has been measured: Some time after presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 525

Prognostic factor(s): Overweight (BMI 25–29.9 kg/m^2)

Mild-to-moderate obesity (BMI 30–39.9 kg/m^2)

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Goyal 2020 *(Continued)*

Morbid obesity (BMI > 40 kg/m^2)

Outcome(s)

Mortality

Mechanical ventilation

Outcome (prognostic factor)

Mortality (overweight (BMI 25–29.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 1104

Number of obese patients followed completely for the outcome: 557

Number of non-obese patients followed completely for the outcome: 547

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, race, smoking, diabetes, hypertension, chronic obstructive pulmonary disease, asthma, end-stage renal disease, coronary artery disease, heart failure, and cancer

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.75 (0.56, 1), NR

Outcome (prognostic factor)

Mortality (mild-to-moderate obesity (BMI 30–39.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 981

Number of obese patients followed completely for the outcome: 434

Number of non-obese patients followed completely for the outcome: 547

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, race, smoking, diabetes, hypertension, chronic obstructive pulmonary disease, asthma, end-stage renal disease, coronary artery disease, heart failure, and cancer

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.98 (0.7, 1.36), NR

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Goyal 2020 *(Continued)*

Outcome (prognostic factor)

Mortality (morbid obesity (BMI > 40 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 638

Number of obese patients followed completely for the outcome: 91

Number of non-obese patients followed completely for the outcome: 547

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, race, smoking, diabetes, hypertension, chronic obstructive pulmonary disease, asthma, end-stage renal disease, coronary artery disease, heart failure, and cancer

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.41 (0.74, 2.7), NR

Outcome (prognostic factor)

Mechanical ventilation (overweight (BMI 25–29.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 1104

Number of obese patients followed completely for the outcome: 557

Number of non-obese patients followed completely for the outcome: 547

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, race, smoking, diabetes, hypertension, chronic obstructive pulmonary disease, asthma, end-stage renal disease, coronary artery disease, heart failure, and cancer

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.32 (1.03, 1.69), NR

Outcome (prognostic factor)

Mechanical ventilation (mild-to-moderate obesity (BMI 30–39.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 981

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Goyal 2020 *(Continued)*

Number of obese patients followed completely for the outcome: 434

Number of non-obese patients followed completely for the outcome: 547

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, race, smoking, diabetes, hypertension, chronic obstructive pulmonary disease, asthma, end-stage renal disease, coronary artery disease, heart failure, and cancer

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.8 (1.39, 2.35), NR

Outcome (prognostic factor)

Mortality (morbid obesity (BMI > 40 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 638

Number of obese patients followed completely for the outcome: 91

Number of non-obese patients followed completely for the outcome: 547

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, race, smoking, diabetes, hypertension, chronic obstructive pulmonary disease, asthma, end-stage renal disease, coronary artery disease, heart failure, and cancer

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.74 (1.08, 2.8), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	No	Appendix 3
Study Attrition Mechanical ventilation	No	Appendix 3

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Goyal 2020 *(Continued)*

Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Gu 2020

Study characteristics

Notes

English title

Characteristics associated with racial/ethnic disparities in COVID-19 outcomes in an academic health care system

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Registry data

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 5698

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 3533

Age measure, value: Mean (SD), 47 (20.9)

Inclusion criteria: Tested for Covid-19 (either positive or negative)

Exclusion criteria: Patients who were still staying at the hospital, age at BMI measurement was missing or below 18 years, height and/or weight were missing, height measurements were below 69 cm or above 234 cm, weight was above 400 kg, BMI deviated more than one unit from BMI calculated from height and weight. Outliers for multiple values per person were defined as values that exceeded the median BMI +/- 3 x the median absolute deviation (MAD)

Smoking frequency: 484 (999 missing)

Diabetes frequency: 1123 (1083 missing)

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Gu 2020 *(Continued)*

Hypertension frequency: NR

Cardiovascular disease frequency: 4205 (2291 missing)

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 78.9 (unspecified) (2291 missing)

Immunosuppression frequency: NR

Chronic kidney disease frequency: 1117 (2291 missing)

Cancer frequency: 1652 (2291 missing)

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI classified as 18.5, 18.5-25, 25-30 and more than 30

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 1943 (1090 missing)

Prognostic factor(s): BMI > 30

25 < BMI < 30

BMI (continuous)

Outcome(s)

Hospitalisation

ICU admission

Mortality

Outcome (prognostic factor)

Hospitalisation (BMI > 30) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 688

Number of obese patients followed completely for the outcome: 525

Number of non-obese patients followed completely for the outcome: 163

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

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Gu 2020 *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.03 (1.63, 5.64), NR

Outcome (prognostic factor)

Hospitalisation (25 < BMI < 30) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 466

Number of obese patients followed completely for the outcome: 303

Number of non-obese patients followed completely for the outcome: 163

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.26 (1.20, 4.25), NR

Outcome (prognostic factor)

Hospitalisation (BMI > 30) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 371

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.89 (1.31, 6.35), NR

Outcome (prognostic factor)

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Gu 2020 *(Continued)*

Hospitalisation (25 < BMI < 30) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 371

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.81 (0.81, 4.01), NR

Outcome (prognostic factor)

Hospitalisation (BMI > 30) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 271

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 6.85 (0.90, 51.99), NR

Outcome (prognostic factor)

Hospitalisation (25 < BMI < 30) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 271

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

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Gu 2020 *(Continued)*

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 71.6 (0.88, 57.92), NR

Outcome (prognostic factor)

ICU admission (BMI > 30) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 688

Number of obese patients followed completely for the outcome: 525

Number of non-obese patients followed completely for the outcome: 163

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.71 (1.17, 6.29), NR

Outcome (prognostic factor)

ICU admission (25 < BMI < 30) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 466

Number of obese patients followed completely for the outcome: 303

Number of non-obese patients followed completely for the outcome: 163

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

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Gu 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.48 (0.62, 3.54), NR

Outcome (prognostic factor)

ICU admission (BMI > 30) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 271

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.68 (0.27, 118.10), NR

Outcome (prognostic factor)

ICU admission (25 < BMI < 30) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 271

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.79 (0.22, 105.00), NR

Outcome (prognostic factor)

ICU admission (BMI > 30) (cohort 5)

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Gu 2020 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 398

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.72 (0.96, 7.71), NR

Outcome (prognostic factor)

ICU admission (25 < BMI < 30) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 398

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.46 (0.50, 4.21), NR

Outcome (prognostic factor)

Mortality (BMI (continuous)) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 688

Number of obese patients followed completely for the outcome: 525

Number of non-obese patients followed completely for the outcome: 163

Univariable unadjusted analysis for obesity

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Gu 2020 *(Continued)*

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.22 (0.74, 2.01), NR

Outcome (prognostic factor)

Mortality (BMI (continuous)) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 271

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.04 (0.52, 2.09), NR

Outcome (prognostic factor)

Mortality (BMI (continuous)) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 398

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, alcohol consumption, BMI, comorbidities, ever-smoker, race

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Gu 2020 *(Continued)*

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.73 (0.28, 1.91), NR

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	No	Appendix 3
Study Attrition ICU admission	No	Appendix 3
Study Attrition Hospitalisation	No	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Guerson 2020

Study characteristics

Notes

English title

The impact of obesity among patients with COVID-19 pneumonia

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

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Guerson 2020 *(Continued)*

05/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

3538

Sampling method

consecutive participants

Participants

Female participants

(percentage), 45

Age measure, value

median (interquartile range), 65 (55, 75)

Inclusion criteria

COVID-19 positive

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 954

Hypertension

(absolute number), 1342

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

Asthma

NR

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Guerson 2020 *(Continued)*

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

(absolute number), 354

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 132

Cancer

(absolute number), 3464

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity was defined as per the CDC guidelines as body mass index (BMI) > 30 kg/m^2. Obesity classes were defined as; Class 1 BMI 30 to 35 kg/m^2, Class 2 BMI 35 to 40 kg/m^2, and Class 3 BMI > 40 kg/m^2.

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

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Guerson 2020 *(Continued)*

BMI

Threshold used for definition of obesity

30

Measure of frequency

percentage

Frequency value

41.72

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (obesity class 1)

Outcome

Mortality

Prognostic factor (category):

obesity class 1

Follow-up

Number of patients followed completely for this outcome

2874

Number of obese patients followed completely for this outcome

812

Number of non-obese patients followed completely for this outcome

2062

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

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Guerson 2020 *(Continued)*

The set of prognostic factors used for adjustment

unspecified

Effect measure for obesity

NR

Effect measure value (95% CI)

1.15 (0.93, 1.4)

Outcome (prognostic factor)

Mortality (obesity class 2)

Outcome

Mortality

Prognostic factor (category):

obesity class 2

Follow-up

Number of patients followed completely for this outcome

2431

Number of obese patients followed completely for this outcome

369

Number of non-obese patients followed completely for this outcome

2062

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

unspecified

Effect measure for obesity

NR

Effect measure value (95% CI)

1.33 (1.00, 1.76)

Outcome (prognostic factor)

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Guerson 2020 *(Continued)*

Mortality (obesity class 3)

Outcome

Mortality

Prognostic factor (category):

obesity class 3

Follow-up

Number of patients followed completely for this outcome

2357

Number of obese patients followed completely for this outcome

295

Number of non-obese patients followed completely for this outcome

2062

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

unspecified

Effect measure for obesity

NR

Effect measure value (95% CI)

1.92 (1.40, 2.63)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Guerson 2020 *(Continued)*

Mortality		
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Gupta 2020

Study characteristics

Notes

English title

Factors associated with death in critically ill patients with coronavirus disease 2019 in the US

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Prospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 65

Study setting: Inpatient

Number of participants recruited: 2215

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 779

Age measure, value: Mean (SD), 60.5 (14.5)

Inclusion criteria: Adults > 18 with positive COVID-19 test

Exclusion criteria: NR

Smoking frequency: 656

Diabetes frequency: 861

Hypertension frequency: 1322

Cardiovascular disease frequency: 484

Asthma frequency: 258

Chronic obstructive pulmonary disease frequency: 173

Other pulmonary disease frequency: NR

Immunosuppression frequency: 65

Chronic kidney disease frequency: 64

Cancer frequency: 112

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Gupta 2020 *(Continued)*

Steroid administration frequency: 800

Supplemental oxygen administration frequency: 1496

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): Overweight

Obesity class I

Obesity class II

Obesity class III

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (overweight)

Follow-up

Number of patients followed completely for the outcome: 2215

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Active cancer, age, body mass index (calculated as weight in kilograms divided by height in meters squared), chronic obstructive pulmonary disease, congestive heart failure, coronary artery disease, covariates assessed at ICU admission (lymphocyte count, ratio of the PaO2 to the fraction of inspired oxygen [FIO2], shock, and the kidney, liver, and coagulation components of the Sequential Organ Failure Assessment score), current smoking status, diabetes, duration of symptoms before ICU admission, hypertension, sex, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.01 (0.73, 1.39), NR

Outcome (prognostic factor)

Mortality (obesity class I)

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Gupta 2020 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 2215

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Active cancer, age, body mass index (calculated as weight in kilograms divided by height in meters squared), chronic obstructive pulmonary disease, congestive heart failure, coronary artery disease, covariates assessed at ICU admission (lymphocyte count, ratio of the PaO2 to the fraction of inspired oxygen [FIO2], shock, and the kidney, liver, and coagulation components of the Sequential Organ Failure Assessment score), current smoking status, diabetes, duration of symptoms before ICU admission, hypertension, sex, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.97 (0.69, 1.37), NR

Outcome (prognostic factor)

Mortality (obesity class II)

Follow-up

Number of patients followed completely for the outcome: 2215

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Active cancer, age, body mass index (calculated as weight in kilograms divided by height in meters squared), chronic obstructive pulmonary disease, congestive heart failure, coronary artery disease, covariates assessed at ICU admission (lymphocyte count, ratio of the PaO2 to the fraction of inspired oxygen [FIO2], shock, and the kidney, liver, and coagulation components of the Sequential Organ Failure Assessment score), current smoking status, diabetes, duration of symptoms before ICU admission, hypertension, sex, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.24 (0.81, 1.89), NR

Outcome (prognostic factor)

Mortality (obesity class III)

Follow-up

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Gupta 2020 *(Continued)*

Number of patients followed completely for the outcome: 2215

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Active cancer, age, body mass index (calculated as weight in kilograms divided by height in meters squared), chronic obstructive pulmonary disease, congestive heart failure, coronary artery disease, covariates assessed at ICU admission (lymphocyte count, ratio of the PaO2 to the fraction of inspired oxygen [FIO2], shock, and the kidney, liver, and coagulation components of the Sequential Organ Failure Assessment score), current smoking status, diabetes, duration of symptoms before ICU admission, hypertension, sex, race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.51 (1.01, 2.25), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Hajifathalian 2020

Study characteristics

Notes

English title

Obesity is associated with worse outcomes in COVID-19: analysis of early data from New York City

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

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Hajifathalian 2020 *(Continued)*

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 2

Study setting: Inpatient

Number of participants recruited: 770 (cohort 1), 975 (cohort 2)

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 302 (cohort 1), 380 (cohort 2)

Age measure, value: Mean (SD), 64 (16.7)

Inclusion criteria: COVID-19 positive patients admitted to either the Emergency Department or inpatient wards with complete BMI data (cohort 1), age > 18 and PCR-positive for COVID-19 (cohort 2)

Exclusion criteria: NR (cohort 1), missing BMI data (cohort 2)

Smoking frequency: NR

Diabetes frequency: 238 (cohort 1), 301 (cohort 2)

Hypertension frequency: 432 (cohort 1), 547 (cohort 2)

Cardiovascular disease frequency: Obstructive sleep apnoea

Asthma or chronic obstructive pulmonary disease frequency: 98 (cohort 1), 124 (cohort 2)

Other pulmonary disease frequency: Obstructive sleep apnoea (36 (cohort 1), 46 (cohort 2))

Immunosuppression frequency: NR

Chronic kidney disease frequency: 100 (cohort 1), 126.75 (cohort 2)

Cancer frequency: 98 (cohort 1), 124 (cohort 2)

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 277 (cohort 1), NR (cohort 2)

Prognostic factor(s): BMI > 30

Outcome(s)

Mortality

ICU admission

Mechanical ventilation

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Hajifathalian 2020 *(Continued)*

Outcome (prognostic factor)

Mortality (BMI > 30) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 770

Number of obese patients followed completely for the outcome: 227

Number of non-obese patients followed completely for the outcome: 493

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Generalised linear models (GLM; with maximum likelihood optimisation and robust standard error estimation) with a Poisson distribution for the dependent variable and a logarithmic (log) link function used to estimate risk ratios and their confidence intervals

The set of prognostic factors used for adjustment: Age, race/ethnicity, and troponin I level

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.15 (0.62, 2.14), 0.663

Outcome (prognostic factor)

ICU admission (BMI > 30) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 770

Number of obese patients followed completely for the outcome: 227

Number of non-obese patients followed completely for the outcome: 493

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Generalised linear models (GLM; with maximum likelihood optimisation and robust standard error estimation) with a Poisson distribution for the dependent variable and a logarithmic (log) link function used to estimate risk ratios and their confidence intervals

The set of prognostic factors used for adjustment: Age, race/ethnicity, and troponin I level

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.76 (1.24, 2.48), 0.001

Outcome (prognostic factor)

Mechanical ventilation (BMI > 30) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 747

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Hajifathalian 2020 *(Continued)*

Number of obese patients followed completely for the outcome: 277

Number of non-obese patients followed completely for the outcome: 465

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Generalised linear models (GLM; with maximum likelihood optimisation and robust standard error estimation) with a Poisson distribution for the dependent variable and a logarithmic (log) link function used to estimate risk ratios and their confidence intervals

The set of prognostic factors used for adjustment: Age, race/ethnicity, and troponin I level

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.72 (1.22, 2.44), 0.002

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Confounding Bias ICU admission	No	Appendix 3
Statistical Analysis Bias	No	Appendix 3

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Halasz 2020

Study characteristics

Notes

English title

Obesity, overweight and survival in critically ill patients with SARS-CoV-2 pneumonia: is there an obesity paradox? Preliminary results from Italy

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 242

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 44

Age measure, value: Median (IQR), 64 (56-71)

Inclusion criteria: Patients with laboratory-confirmed COVID-19 infection treated with invasive ventilation and admitted to the ICU

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 37

Hypertension frequency: 110

Cardiovascular disease frequency: 35

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 21

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

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Halasz 2020 *(Continued)*

Study's definition for obesity: WHO cut-points

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 48

Prognostic factor(s): BMI 25-29.9

BMI 30-35

BMI 35-40

BMI> 40

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI 25-29.9)

Follow-up

Number of patients followed completely for the outcome: 142

Number of obese patients followed completely for the outcome: 104

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, gender, comorbidities (hypertension, cardiovascular disease, COPD, diabetes)

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.04 (0.43, 2.5), 0.93

Outcome (prognostic factor)

Mortality (BMI 30-35)

Follow-up

Number of patients followed completely for the outcome: 69

Number of obese patients followed completely for the outcome: 31

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

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Halasz 2020 *(Continued)*

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, gender, comorbidities (hypertension, cardiovascular disease, COPD, diabetes)

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.51 (0.51, 4.44), 0.45

Outcome (prognostic factor)

Mortality (BMI 35-40)

Follow-up

Number of patients followed completely for the outcome: 45

Number of obese patients followed completely for the outcome: 7

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, gender, comorbidities (hypertension, cardiovascular disease, COPD, diabetes)

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.74 (0.31, 9.69), 0.53

Outcome (prognostic factor)

Mortality (BMI > 40)

Follow-up

Number of patients followed completely for the outcome: 48

Number of obese patients followed completely for the outcome: 10

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, gender, comorbidities (hypertension, cardiovascular disease, COPD, diabetes)

Effect measure for obesity: Hazard ratio

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Halasz 2020 *(Continued)*

Effect measure value (95% CI), P value: 3.91 (NR), 0.09

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Hashemi 2020

Study characteristics

Notes

English title

Impact of chronic liver disease on outcomes of hospitalized patients with COVID-19: a multicentre United States experience

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 9

Study setting: Inpatient

Number of participants recruited: 363

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 162

Age measure, value: Mean (SD), 63.4 (16.5)

Inclusion criteria: All consecutive adult patients hospitalised with a positive SARS-CoV-2 infection via polymerase chain reaction (PCR) nasopharyngeal swab or tracheal aspirate from 11 March to 2 April 2020

Exclusion criteria: Liver transplant recipients

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Hashemi 2020 *(Continued)*

Smoking frequency: 41

Diabetes frequency: 117

Hypertension frequency: 212

Cardiovascular disease frequency: 91

Asthma frequency: NR

Pulmonary disease frequency: 76

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): Obesity

Outcome(s)

Mechanical ventilation

ICU admission

All-cause in-hospital mortality

Outcome (prognostic factor)

Mechanical ventilation (obesity)

Follow-up

Number of patients followed completely for the outcome: NR

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

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Hashemi 2020 *(Continued)*

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.23 (0.77, 1.98), 0.39

Outcome (prognostic factor)

ICU admission (obesity)

Follow-up

Number of patients followed completely for the outcome: NR

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.26 (0.79, 1.98), 0.33

Outcome (prognostic factor)

All-cause in-hospital mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: NR

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.03 (0.51, 2.09), 0.94

Item	Authors' judgement	Support for judgement

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Hashemi 2020 *(Continued)*

Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Unclear	Appendix 3
Outcome Measurement ICU admission	Unclear	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Confounding Bias ICU admission	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Hendra 2021

Study characteristics	
Notes	**English title** Identifying prognostic risk factors for poor outcome following COVID-19 disease among in-centre haemodialysis patients: role of inflammation and frailty **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 05/2020 **Study design** retrospective cohort **Study centre(s)**

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Hendra 2021 *(Continued)*

single centres/clinics/areas within a country

Number of centres/clinics/areas

4

Study setting

outpatient and inpatient

Number of participants recruited

148

Sampling method

consecutive participants

Participants

Female participants

(percentage), 43.2

Age measure, value

mean (standard deviation), 64.13 (14.6)

Inclusion criteria

RT-PCR positive patients

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 78

Hypertension

(absolute number), 122

Cardiovascular diseases

(absolute number), 81

Please indicate if additional information is available

Chronic cardiac disease

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(absolute number), 19

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Hendra 2021 *(Continued)*

Please indicate if additional information is available

Chronic pulmonary disease

Immunosuppression

(absolute number), 18

Please indicate if additional information is available

Immunosuppressive treatment

Chronic kidney disease

(percentage), 100

Cancer

(unspecified)

Steroid administration

(absolute number), 13

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

ACEI/ARB

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

15

Prognostic factor(s)

Study's definition for obesity

BMI continuous

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

NR

Threshold used for definition of obesity

NR

Measure of frequency

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Hendra 2021 *(Continued)*

NR

Frequency value

NR

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

mortality, hospitalisation

Outcome (prognostic factor)

Mortality (BMI continuous)

Outcome

Mortality

Prognostic factor (category):

BMI continuous

Follow-up

Number of patients followed completely for this outcome

148

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, gender, ethnicity, BMI, frailty score, deprivation index, type of vascular access, comorbidities (diabetes, hypertension, chronic cardiac and pulmonary disease), use of immunosuppression and biomarkers including CRP and NLR

Effect measure for obesity

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Hendra 2021 *(Continued)*

odds ratio

Effect measure value (95% CI)

0.94 (0.87, 1.01)

Outcome (prognostic factor)

Hospitalisation (BMI continuous)

Outcome

Hospitalisation

Prognostic factor (category):

BMI continuous

Follow-up

Number of patients followed completely for this outcome

148

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, gender, ethnicity, BMI, frailty score, deprivation index, type of vascular access, comorbidities (diabetes, hypertension, chronic cardiac and pulmonary disease), use of immunosuppression and biomarkers including CRP and NLR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.96 (0.9, 1.03)

Item	Authors' judgement	Support for judgement

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Hendra 2021 *(Continued)*

Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Hendren 2021

Study characteristics

Notes

English title

Association of body mass index and age with morbidity and mortality in patients hospitalized with COVID-19: results from the American Heart Association COVID-19 Cardiovascular Disease Registry

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 07/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 88

Study setting: Inpatient

Number of participants recruited: 7606

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 3399

Age measure, value: Median (IQR), 63 (49-75)

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Hendren 2021 *(Continued)*

Inclusion criteria: All adults (≥18 years old) with available BMI data and completed field entries for age, sex, admission date, discharge date, discharge disposition, and a medical history (selected as either none or as applicable conditions)

Exclusion criteria: NR

Smoking frequency: 510

Diabetes frequency: 2799

Hypertension frequency: 4525

Cardiovascular disease frequency: 1526

Asthma frequency: 741

Chronic obstructive pulmonary disease frequency: 630

Other pulmonary disease frequency: Pulmonary embolism (143)

Immunosuppression frequency: NR

Chronic kidney disease frequency: 972

Cancer frequency: 833

Steroid administration frequency: 1645

Supplemental oxygen administration frequency: NR

Other treatments (frequency): Remdesivir (636)

Prognostic factor(s)

Study's definition for obesity: World Health Organization (WHO) obesity classification, defined as: underweight (< 18.5 kg/m^2), normal weight (18.5-24.9 kg/m^2), overweight (25.0-29.9 kg/m^2), class I obesity (30.0-34.9 kg/m^2), class II obesity (35.0–39.9 kg/m^2), and class III obesity (≥ 40.0 kg/m^2)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 3311

Prognostic factor(s): Class I obesity (30.0-34.9 kg/m^2)

Class II obesity (35.0-39.9 kg/m^2)

Class III obesity (BMI ≥ 40)

Outcome(s)

Mortality

Mechanical ventilation

Outcome (prognostic factor)

Mortality (Class I obesity (30.0-34.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 7606

Number of obese patients followed completely for the outcome: 3311

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Hendren 2021 *(Continued)*

Number of non-obese patients followed completely for the outcome: 4295

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, chronic kidney disease, CVD (myocardial infarction, stroke, heart failure, or percutaneous coronary intervention), diabetes, hypertension, race/ethnicity, sex

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1 (0.83, 1.17), NR

Outcome (prognostic factor)

Mortality (Class II obesity (35.0-39.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 7606

Number of obese patients followed completely for the outcome: 3311

Number of non-obese patients followed completely for the outcome: 4295

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, chronic kidney disease, CVD (myocardial infarction, stroke, heart failure, or percutaneous coronary intervention), diabetes, hypertension, race/ethnicity, sex

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.15 (0.91, 1.44), NR

Outcome (prognostic factor)

Mortality (Class III obesity (BMI ≥ 40))

Follow-up

Number of patients followed completely for the outcome: 7606

Number of obese patients followed completely for the outcome: 3311

Number of non-obese patients followed completely for the outcome: 4295

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

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Hendren 2021 *(Continued)*

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, chronic kidney disease, CVD (myocardial infarction, stroke, heart failure, or percutaneous coronary intervention), diabetes, hypertension, race/ethnicity, sex

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.26 (1.00, 1.58), NR

Outcome (prognostic factor)

Mechanical ventilation (Class I obesity (30.0-34.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 7606

Number of obese patients followed completely for the outcome: 3311

Number of non-obese patients followed completely for the outcome: 4295

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, chronic kidney disease, CVD (myocardial infarction, stroke, heart failure, or percutaneous coronary intervention), diabetes, hypertension, race/ethnicity, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.54 (1.29, 1.84), NR

Outcome (prognostic factor)

Mechanical ventilation (Class II obesity (35.0-39.9 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 7606

Number of obese patients followed completely for the outcome: 3311

Number of non-obese patients followed completely for the outcome: 4295

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, chronic kidney disease, CVD (myocardial infarction, stroke, heart failure, or percutaneous coronary intervention), diabetes, hypertension, race/ethnicity, sex

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Hendren 2021 *(Continued)*

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.88 (1.52, 2.32), NR

Outcome (prognostic factor)

Mechanical ventilation (Class III obesity (BMI ≥ 40))

Follow-up

Number of patients followed completely for the outcome: 7606

Number of obese patients followed completely for the outcome: 3311

Number of non-obese patients followed completely for the outcome: 4295

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, chronic kidney disease, CVD (myocardial infarction, stroke, heart failure, or percutaneous coronary intervention), diabetes, hypertension, race/ethnicity, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.08 (1.68, 2.58), NR

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Unclear	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Hernandez-Galdamez 2020

Study characteristics

Notes

English title

Increased risk of hospitalization and death in patients with COVID-19 and pre-existing noncommunicable diseases and modifiable risk factors in Mexico

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 06/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 475

Study setting: Outpatient and inpatient

Number of participants recruited: 211,003

Sampling method: NR

Participants

Female participants (absolute number): 95,561

Age measure, value: Mean (SD), 45.7 (16.3)

Inclusion criteria: laboratory-confirmed COVID-19 cases were reported in the MoH database up to June 27.

Exclusion criteria: missing or unknown comorbidity or condition

Smoking frequency: 16,445

Diabetes frequency: 34,685

Hypertension frequency: 42,453

Cardiovascular disease frequency: 4949

Asthma frequency: 5854

Chronic obstructive pulmonary disease frequency: 3721

Other pulmonary disease frequency: NR

Immunosuppression frequency: 2895

Chronic kidney disease frequency: 4581

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

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Hernandez-Galdamez 2020 *(Continued)*

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): 41,344

Prognostic factor(s): Obesity

Outcome(s)

Hospitalisation

ICU admission

Endotracheal Intubation (mechanical ventilation)

Mortality

Outcome (prognostic factor)

Hospitalisation (obesity)

Follow-up

Number of patients followed completely for the outcome: 21,103

Number of obese patients followed completely for the outcome: 41,344

Number of non-obese patients followed completely for the outcome: 169,659

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, CKD, immunosuppression, diabetes, COPD, hypertension, CVD, asthma, obesity, smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.29 (1.25, 1.32), < 0.001

Outcome (prognostic factor)

ICU admission (obesity)

Follow-up

Number of patients followed completely for the outcome: 21,103

Number of obese patients followed completely for the outcome: 41,344

Number of non-obese patients followed completely for the outcome: 169,659

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

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Hernandez-Galdamez 2020 *(Continued)*

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, CKD, immunosuppression, diabetes, COPD, hypertension, CVD, asthma, obesity, smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.59 (1.49, 1.69), < 0.001

Outcome (prognostic factor)

Mechanical ventilation (obesity)

Follow-up

Number of patients followed completely for the outcome: 21,103

Number of obese patients followed completely for the outcome: 41,344

Number of non-obese patients followed completely for the outcome: 169,659

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, CKD, immunosuppression, diabetes, COPD, hypertension, CVD, asthma, obesity, smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.62 (1.53, 1.71), < 0.001

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 21,103

Number of obese patients followed completely for the outcome: 41,344

Number of non-obese patients followed completely for the outcome: 169,659

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, CKD, immunosuppression, diabetes, COPD, hypertension, CVD, asthma, obesity, smoking

Effect measure for obesity: Odds ratio

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Hernandez-Galdamez 2020 *(Continued)*

Effect measure value (95% CI), P value: 1.42 (1.37, 1.47), < 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Unclear	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Confounding Bias ICU admission	No	Appendix 3
Confounding Bias Hospitalisation	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Hosseinzadeh 2021

Study characteristics	
Notes	**English title**

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Hosseinzadeh 2021 *(Continued)*

Should all patients with hypertension be worried about developing severe coronavirus disease 2019 (COVID-19)?

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): NR

Study design: retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 176 (cohort 1), 422 (cohort 2)

Sampling method: NR

Participants

Female participants (absolute number): 115 (cohort 1), 289 (cohort 2)

Age measure, value: Mean (SD), 58.21 (22.5) (cohort 1), 56.15 (20.2) (cohort 2)

Inclusion criteria: Cases with COVID-19 pneumonia who were admitted to Baqiyatallah Hospital in Tehran – Iran

Exclusion criteria: Incomplete medical profiles, patients who were not receiving any kind of anti-hypertensive medications and patients who were receiving any corticosteroids

Smoking frequency: 4 (cohort 1), 12 (cohort 2)

Diabetes frequency: 72 (cohort 1), 76 (cohort 2)

Hypertension frequency: 176 (cohort 1), 0 (cohort 2)

Cardiovascular disease frequency: 63 (cohort 1),44 (cohort 2)

Asthma frequency: 31 (cohort 1), 67 (cohort 2)

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 36 (cohort 1), 52 (cohort 2)

Immunosuppression frequency: NR

Chronic kidney disease frequency: 25 (cohort 1), 33 (cohort 2)

Cancer frequency: 4 (cohort 1), 8 (cohort 2)

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Comment: Asthma consists of both asthma and allergy history

Prognostic factor(s)

Study's definition for obesity: BMI > 25 kg/m^2

The time when obesity has been measured: NR

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Hosseinzadeh 2021 *(Continued)*

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): Overweight/obesity

Outcome(s)

Severe COVID-19

Outcome (prognostic factor)

Severe COVID-19 (overweight/obesity) (cohort1)

Follow-up

Number of patients followed completely for the outcome: 176

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age > 60 years, BMI > 25 kg/m^2, increased hospital stays, CVD, diabetes, kidney disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.80 (1.02, 2.42), 0.027

Outcome (prognostic factor)

Severe COVID-19 (overweight/obesity) (cohort2)

Follow-up

Number of patients followed completely for the outcome: 422

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age > 60 years, BMI > 25 kg/m^2, increased hospital stays, CVD, diabetes, kidney disease

Effect measure for obesity: Odds ratio

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Hosseinzadeh 2021 *(Continued)*

Effect measure value (95% CI), P value: 1.34 (0.88, 1.89), 0.21

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Hu 2020

Study characteristics

Notes

English title

Clinical epidemiological analyses of overweight/obesity and abnormal liver function contributing to prolonged hospitalization in patients infected with COVID-19

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 02/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 58

Sampling method: NR

Participants

Female participants (absolute number): 22

Age measure, value: Mean (SD), 49.2 (13.1)

Inclusion criteria: Mild COVID-19 patients

Exclusion criteria: NR

Smoking frequency: NR

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Hu 2020 *(Continued)*

Diabetes frequency: NR

Hypertension frequency: NR

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 24 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 24

Obesity frequency (absolute number): 32

Prognostic factor(s): BMI ≥ 24 kg/m^2

Outcome(s)

Prolonged hospitalisation

Outcome (prognostic factor)

Prolonged hospitalisation (BMI ≥ 24 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 52

Number of obese patients followed completely for the outcome: 29

Number of non-obese patients followed completely for the outcome: 23

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.83 (0.74, 0.92), 0.001

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, SBP, DBP, peripheral absolute, neutrophil count, monocyte count, lymphocyte count, FPG, albumin, creatinine, BUN, CRP

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Hu 2020 *(Continued)*

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.75 (0.63, 0.90), 0.002

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Hospitalisation	No	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Huang 2020

Study characteristics

Notes

English title

Clinical findings of patients with coronavirus disease 2019 in Jiangsu province, China: a retrospective, multicentre study

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 02/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 8

Study setting: Inpatient

Number of participants recruited: 202

Sampling method: NR

Participants

Female participants (absolute number): 86

Age measure, value: Median (IQR), 44 (33-54)

Inclusion criteria: COVID-19 patients from 8 designated hospitals in 8 cities of Jiangsu province, China

Exclusion criteria: NR

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Huang 2020 *(Continued)*

Smoking frequency: 16

Diabetes frequency: 19

Hypertension frequency: 29

Cardiovascular disease frequency: 5

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 7

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 2

Steroid administration frequency: 64

Supplemental oxygen administration frequency: 109

Other treatments (frequency): Antiviral therapy (196), atomised inhalation of interferon α-2b (121), lopinavir/ritonavir (180), Arbidol (59), oseltamivir (32), antibiotic therapy (149), use of gamma globulin (31)

Prognostic factor(s)

Study's definition for obesity: BMI > 28 kg/m^2

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 28

Obesity frequency (absolute number): 24

Prognostic factor(s): BMI > 28 kg/m^2

Outcome(s)

Severe COVID-19

Outcome (prognostic factor)

Severe COVID-19 (BMI > 28 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 202

Number of obese patients followed completely for the outcome: 24

Number of non-obese patients followed completely for the outcome: 148

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 6.9 (2.381, 19.997), < 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

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Huang 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, gender, BMI, hypertension, DM, smoking, WBC, neutrophils, lymphocyte, Hb, PLT, ALT, LDH, Tbil, ALB, CR, CRP, PT

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 9219 (2.731, 31.126), < 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	No	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Huh 2020

Study characteristics

Notes

English title

Impact of obesity, fasting plasma glucose level, blood pressure, and renal function on the severity of COVID-19: a matter of sexual dimorphism?

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): NR

Study design: Case-control

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

Number of participants recruited: 2231

Sampling method: NR

Participants

Female participants (absolute number): 1360

Age measure, value: Mean (NR), 53.7 (NR)

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Huh 2020 *(Continued)*

Inclusion criteria: NR

Exclusion criteria: Patients with lack of checkup data

Smoking frequency: NR

Diabetes frequency: 756

Hypertension frequency: 729

Cardiovascular disease frequency: 562

Asthma frequency: 574

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 1093

Immunosuppression frequency: NR

Chronic kidney disease frequency: 185

Cancer frequency: 182

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 25 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 855

Prognostic factor(s): Obesity class 1

Obesity class 2 & 3

Outcome(s)

Severe COVID-19 or death

Outcome (prognostic factor)

Severe COVID-19 or death (obesity class 1)

Follow-up

Number of patients followed completely for the outcome: 307

Number of obese patients followed completely for the outcome: 151

Number of non-obese patients followed completely for the outcome: 156

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

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Huh 2020 *(Continued)*

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, NIHS expanded coverage for low household income, Charlson comorbidity index, diabetes, hypertension, chronic heart disease, chronic lung disease, asthma, chronic liver disease, chronic kidney disease, cancer, rheumatologic disease, chronic neurologic disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.69 (1.20, 2.38), 0.002

Outcome (prognostic factor)

Severe COVID-19 or death (obesity class 2 & 3)

Follow-up

Number of patients followed completely for the outcome: 307

Number of obese patients followed completely for the outcome: 151

Number of non-obese patients followed completely for the outcome: 156

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, NIHS expanded coverage for low household income, Charlson comorbidity index, diabetes, hypertension, chronic heart disease, chronic lung disease, asthma, chronic liver disease, chronic kidney disease, cancer, rheumatologic disease, chronic neurologic disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.23 (0.58, 2.60), 0.591

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Unclear	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Hur 2020

Study characteristics

Notes

English title

Factors associated with intubation and prolonged intubation in hospitalized patients with COVID-19

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 10

Study setting: Inpatient

Number of participants recruited: 486

Sampling method: NR

Participants

Female participants (absolute number): 215

Age measure, value: Median (IQR), 59 (47-69)

Inclusion criteria: Age more than 18 years and were admitted to any of the 10 hospitals in the Northwestern Memorial HealthCare system spread across the Chicago metropolitan area between March 1 and April 8, 2020

Exclusion criteria: Hospitalised patients with documented ‘‘do not resuscitate and do not intubate’’ (DNR/DNI) orders and those who left the hospital against medical advice, and patients who had missing data on investigated predictor variables and did not reach a clinical endpoint of

intubation or discharge from the hospital

Smoking frequency: 163

Diabetes frequency: 160

Hypertension frequency: 267

Cardiovascular disease frequency: 111

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 78

Immunosuppression frequency: 45

Chronic kidney disease frequency: 42

Cancer frequency: 60

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 326

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Hur 2020 *(Continued)*

Other treatments (frequency): Antibiotics (329), hydroxychloroquine (268), IL-6R inhibitor (33), remdesivir (9)

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 259

Prognostic factor(s): BMI 30-39.99

BMI > 40

Outcome(s)

Mechanical ventilation

Time to extubation

Outcome (prognostic factor)

Mechanical ventilation (BMI 30-39.99)

Follow-up

Number of patients followed completely for the outcome: 468

Number of obese patients followed completely for the outcome: 259

Number of non-obese patients followed completely for the outcome: 227

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, race and ethnicity, hospital, body mass index, respiratory rate temperature, O2 sat, pulse, DM, shortness of breath

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.46 (0.87, 2.46), 0.151

Outcome (prognostic factor)

Mechanical ventilation (BMI > 40)

Follow-up

Number of patients followed completely for the outcome: 468

Number of obese patients followed completely for the outcome: 259

Number of non-obese patients followed completely for the outcome: 227

Univariable unadjusted analysis for obesity

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Hur 2020 *(Continued)*

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, race and ethnicity, hospital, body mass index, respiratory rate temperature, O2 sat, pulse, DM, shortness of breath

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.92 (1.92, 4.00), 0.080

Outcome (prognostic factor)

Time to extubation (BMI 30-39.99)

Follow-up

Number of patients followed completely for the outcome: 468

Number of obese patients followed completely for the outcome: 259

Number of non-obese patients followed completely for the outcome: 227

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, race and ethnicity, hospital, body mass index, respiratory rate temperature, O2 sat, pulse, DM, shortness of breath

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.53 (0.32, 0.90), 0.018

Outcome (prognostic factor)

Time to extubation (BMI > 40)

Follow-up

Number of patients followed completely for the outcome: 468

Number of obese patients followed completely for the outcome: 259

Number of non-obese patients followed completely for the outcome: 227

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, race and ethnicity, hospital, body mass index, respiratory rate temperature, O2 sat, pulse, DM, shortness of breath

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Hur 2020 *(Continued)*

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.40 (0.19, 0.82), 0.012

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mechanical ventilation	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Iaccarino 2020

Study characteristics

Notes

English title

Gender differences in predictors of intensive care units admission among COVID-19 patients: the results of the SARS-RAS study of the Italian Society of Hypertension

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres/clinics/areas: 26 hospitals and centres

Study setting: Inpatient

Number of participants recruited: 2378

Sampling method: NR

Participants

Female participants (absolute number): 889

Age measure, value: Mean (SD) 68.21 (0.38)

Inclusion criteria: patients aged 18 to 101 years with confirmed COVID-19 according to World Health Organization interim guidance

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Iaccarino 2020 *(Continued)*

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 18.2%

Hypertension frequency: 58.5%

Cardiovascular disease frequency: coronary artery disease (14.3%), heart failure (12.1%)

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 8.5%

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 6.1%

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Body mass index ≥ 30 kg/m^2 according to the Center for Disease Control and Prevention

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: 30

Obesity frequency (absolute number): 157

Prognostic factor(s): Obesity

Outcome(s)

ICU admission

Outcome (prognostic factor)

ICU admission (obesity)

Follow-up

Number of patients followed completely for the outcome: 2378

Number of obese patients followed completely for the outcome: 157

Number of non-obese patients followed completely for the outcome: 2221

Univariable unadjusted analysis for obesity

Effect measure for obesity: Pearson

Effect measure value (95% CI), P value: 0.103 (NR), 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

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Iaccarino 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, gender, hypertension, diabetes, CKD, heart failure, CAD, obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.476 (1.724, 3.555), 0.0005

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Imam 2020

Study characteristics

Notes

English title

Independent correlates of hospitalization in 2040 patients with COVID-19 at a large hospital system in Michigan, United States

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 8

Study setting: Outpatient and inpatient

Number of participants recruited: 2040

Sampling method: NR

Participants

Female participants (absolute number): NR

Age measure, value: NR

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Imam 2020 *(Continued)*

Inclusion criteria: NR

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: NR

Hypertension frequency: NR

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI > 30 kg/m^2

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number):

Prognostic factor(s): BMI > 30 kg/m^2

Outcome(s)

Hospitalisation

Outcome (prognostic factor)

Hospitalisation (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 2040

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.5 (1.2, 1.9), 0.002

Multivariable analysis for obesity

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Imam 2020 *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, CCI, race, ACEI/ARB use, BMI > 30, tachycardia (HR > 100), tachypnoea (RR < 20), hypoxia (sPO2 < 90%)

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.8 (1.4, 2.4), < 0.0005

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Ioannou 2020

Study characteristics

Notes

English title

Risk factors for hospitalization, mechanical ventilation, or death among 10 131 US veterans with SARS-CoV-2 infection

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

Number of participants recruited: 10,131

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 912

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Ioannou 2020 *(Continued)*

Age measure, value: Mean (SD), 63.6 (16.2)

Inclusion criteria: All VA enrollees who had nasopharyngeal swabs tested for SARS-CoV-2 nucleic acid by polymerase chain reaction in inpatient or outpatient VA facilities (including VA nursing homes) between February 28 and May 14, 2020

Exclusion criteria: VA employees

Smoking frequency: 5207 (including ex-smokers)

Diabetes frequency: 3860

Hypertension frequency: 6291

Cardiovascular disease frequency: 3323

Asthma frequency: 750

Chronic obstructive pulmonary disease frequency: 1905

Other pulmonary disease frequency: Obstructive sleep apnoea (2715)

Immunosuppression frequency: NR

Chronic kidney disease frequency: 1864

Cancer frequency: 2300

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 4539

Prognostic factor(s): Obesity I

Obesity II or III

Outcome(s)

Hospitalisation

Mechanical ventilation

Death

Outcome (prognostic factor)

Hospitalisation (obesity I)

Follow-up

Number of patients followed completely for the outcome: 10,131

Number of obese patients followed completely for the outcome: 4542

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Ioannou 2020 *(Continued)*

Number of non-obese patients followed completely for the outcome: 5337

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.81 (0.74, 0.90), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Sex, age, race, ethnicity, urban vs rural, BMI, DM, cancer, HTN, CVD, CKD, cirrhosis, asthma, COPD, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.8 (0.72, 0.89), NR

Outcome (prognostic factor)

Hospitalisation (obesity II or III)

Follow-up

Number of patients followed completely for the outcome: 10,131

Number of obese patients followed completely for the outcome: 4542

Number of non-obese patients followed completely for the outcome: 5337

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.94 (0.84, 1.05), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Sex, age, race, ethnicity, urban vs rural, BMI, DM, cancer, HTN, CVD, CKD, cirrhosis, asthma, COPD, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.87 (0.77, 0.98), NR

Outcome (prognostic factor)

Mechanical ventilation (obesity I)

Follow-up

Number of patients followed completely for the outcome: 10,131

Number of obese patients followed completely for the outcome: 4542

Number of non-obese patients followed completely for the outcome: 5337

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.23 (0.97, 1.57), NR

Multivariable analysis for obesity

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Ioannou 2020 *(Continued)*

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Sex, age, race, ethnicity, urban vs rural, BMI, DM, cancer, HTN, CVD, CKD, cirrhosis, asthma, COPD, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.03 (0.80, 1.33), NR

Outcome (prognostic factor)

Mechanical ventilation (obesity II or III)

Follow-up

Number of patients followed completely for the outcome: 10,131

Number of obese patients followed completely for the outcome: 4542

Number of non-obese patients followed completely for the outcome: 5337

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.71 (1.33, 2.2), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Sex, age, race, ethnicity, urban vs rural, BMI, DM, cancer, HTN, CVD, CKD, cirrhosis, asthma, COPD, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.22 (0.93, 1.61), NR

Outcome (prognostic factor)

Death (obesity I)

Follow-up

Number of patients followed completely for the outcome: 10,131

Number of obese patients followed completely for the outcome: 4542

Number of non-obese patients followed completely for the outcome: 5337

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.86 (0.71, 1.03), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Sex, age, race, ethnicity, urban vs rural, BMI, DM, cancer, HTN, CVD, CKD, cirrhosis, asthma, COPD, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.84 (0.69, 1.01), NR

Outcome (prognostic factor)

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Ioannou 2020 *(Continued)*

Death (obesity II or III)

Follow-up

Number of patients followed completely for the outcome: 10,131

Number of obese patients followed completely for the outcome: 4542

Number of non-obese patients followed completely for the outcome: 5337

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.12 (0.91, 1.37), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Sex, age, race, ethnicity, urban vs rural, BMI, DM, cancer, HTN, CVD, CKD, cirrhosis, asthma, COPD, smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.97 (0.77, 1.21), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias	Yes	Appendix 3

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Ioannou 2020 *(Continued)*
Hospitalisation

Statistical Analysis Bias	Yes	Appendix 3

Jayanama 2021

Study characteristics

Notes

English title

The association between body mass index and severity of Coronavirus Disease 2019 (COVID-19): a cohort study

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

prospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

inpatient

Number of participants recruited

147

Sampling method

unspecified

Participants

Female participants

(absolute number), 86

Age measure, value

mean (standard deviation), 39.1 (13)

Inclusion criteria

confirmed COVID-19, aged 15 years and older, and admitted to Chakri Naruebodindra Medical Institute- between March 12 and April 30th, 2020

Exclusion criteria

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Jayanama 2021 *(Continued)*

NR

Smoking

NR

Diabetes

(absolute number), 14

Hypertension

(absolute number), 14

Cardiovascular diseases

(unspecified)

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

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Jayanama 2021 *(Continued)*

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity, defined as excessive accumulation of body fat, is generally determined by body mass index (BMI), calculated by body weight (kg) divided by height squared (m^2)

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

25

Measure of frequency

absolute number

Frequency value

46

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

severe COVID

Outcome (prognostic factor)

Severe pneumonia (severe COVID) (obesity (BMI > 25))

Outcome

Severe pneumonia (severe COVID)

Prognostic factor (category):

Obesity (BMI > 25)

Follow-up

Number of patients followed completely for this outcome

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Jayanama 2021 *(Continued)*

147

Number of obese patients followed completely for this outcome

46

Number of non-obese patients followed completely for this outcome

101

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

6.41 (17.92, 2.29)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, DM, HTN, dyslipidaemia

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

4.73 (1.5, 14.94)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Jirapinyo 2020

Study characteristics

Notes

English title

Effect of obesity and metabolic disease on severity of SARS-CoV-2 infection

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

prospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

unspecified

Number of participants recruited

1680

Sampling method

consecutive participants

Participants

Female participants

(unspecified)

Age measure, value

mean (standard deviation), 51 (18)

Inclusion criteria

Confirmed COVID-19 between March 1, 2020 and April 2, 2020 who were admitted to NR Centers.

Exclusion criteria

NR

Smoking

NR

Diabetes

(unspecified)

Hypertension

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Jirapinyo 2020 *(Continued)*

(unspecified)

Cardiovascular diseases

(unspecified)

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

unspecified

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

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Jirapinyo 2020 *(Continued)*

NR

Prognostic factor(s)

Study's definition for obesity

Only defined morbid obesity as BMI > 35

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

NR

Measure of frequency

percentage

Frequency value

73.4

How many eligible outcomes reported?

3

How many eligible outcomes reported?

3

Outcome(s)

hospitalisation, ICU admission, mechanical ventilation

Outcome (prognostic factor)

Hospitalisation (morbid obesity (BMI > 35))

Outcome

Hospitalisation

Prognostic factor (category):

Morbid obesity (BMI > 35)

Follow-up

Number of patients followed completely for this outcome

1680

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

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Jirapinyo 2020 *(Continued)*

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.2 (1.6, 3.2)

Outcome (prognostic factor)

ICU admission (morbid obesity (BMI > 35))

Outcome

ICU admission

Prognostic factor (category):

Morbid obesity (BMI > 35)

Follow-up

Number of patients followed completely for this outcome

1680

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

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Jirapinyo 2020 *(Continued)*

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.2 (1.9, 5.4)

Outcome (prognostic factor)

Intubation (morbid obesity (BMI > 35))

Outcome

Intubation

Prognostic factor (category):

Morbid obesity (BMI > 35)

Follow-up

Number of patients followed completely for this outcome

1680

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.4 (1.9, 5.9)

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Jirapinyo 2020 *(Continued)*

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mechanical ventilation	No	Appendix 3
Study Attrition ICU admission	No	Appendix 3
Study Attrition Hospitalisation	No	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Confounding Bias Hospitalisation	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Kaeuffer 2020

Study characteristics	
Notes	**English title** Clinical characteristics and risk factors associated with severe COVID-19: prospective analysis of 1,045 hospitalised cases in North-Eastern France, March 2020 **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 03/2020 **Study design** prospective cohort

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Kaeuffer 2020 *(Continued)*

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

2

Study setting

inpatient

Number of participants recruited

1045

Sampling method

consecutive participants

Participants

Female participants

(percentage), 41.4

Age measure, value

mean (standard deviation) 66.3 (16.0)

Inclusion criteria

COVID-19 positive

Exclusion criteria

NR

Smoking

(absolute number), 34

Diabetes

(absolute number), 264

Hypertension

(absolute number), 548

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

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Kaeuffer 2020 *(Continued)*

NR

Please indicate if additional information is available

NR

Immunosuppression

(absolute number), 48

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 117

Cancer

(absolute number), 109

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

patients had BMI ≥ 30 kg/m^2

The time when obesity has been measured

some time after presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

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Kaeuffer 2020 *(Continued)*

Measure of frequency

absolute number

Frequency value

351

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (BMI ≥ 30 kg/m^2)

Outcome

Mortality

Prognostic factor (category):

BMI ≥ 30 kg/m^2

Follow-up

Number of patients followed completely for this outcome

1045

Number of obese patients followed completely for this outcome

351

Number of non-obese patients followed completely for this outcome

236

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.8 (0.6, 1.2)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, DM, HTN, sex, BMI, chronic lung disease, immunosuppression, chronic kidney disease, fever (≥ 38°C), dyspnoea, headache, lymphocytes count < 1000, neutrophil count ≥ 8000, CRP, AST

Effect measure for obesity

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Kaeuffer 2020 *(Continued)*

odds ratio

Effect measure value (95% CI)

1.4 (0.7, 2.5)

Outcome (prognostic factor)

Severe COVID (BMI ≥ 30 kg/m^2)

Outcome

Severe COVID

Prognostic factor (category):

BMI ≥ 30 kg/m^2

Follow-up

Number of patients followed completely for this outcome

1045

Number of obese patients followed completely for this outcome

351

Number of non-obese patients followed completely for this outcome

236

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.6 (1.2, 2.0)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, DM, HTN, sex, BMI, chronic lung disease, fever (≥ 38°C), dyspnoea, headache, lymphocytes count < 1000, neutrophil count ≥ 8000, CRP, AST

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.2 (1.5, 3.3)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3

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Kaeuffer 2020 *(Continued)*

Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias Severe COVID	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Kalligeros 2020

Study characteristics

Notes

English title

Association of obesity with disease severity among patients with coronavirus disease 2019

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres/clinics/areas: 2

Study setting: Inpatient

Number of participants recruited: 103

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 40

Age measure, value: Median (IQR), 60 (50-72)

Inclusion criteria: All consecutive adult patients (≥ 18 years old) who had a laboratory-confirmed (using a reverse transcriptase–polymerase chain reaction assay) SARS-CoV-2 infection and who were admitted to Rhode Island Hospital, the Miriam Hospital, or Newport Hospital in Rhode Island between February 17 and April 5, 2020

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Kalligeros 2020 *(Continued)*

Exclusion criteria: NR

Smoking frequency: 48

Diabetes frequency: 38

Hypertension frequency: 66

Cardiovascular disease frequency: 25

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 20

Immunosuppression frequency: NR

Chronic kidney disease frequency: 11

Cancer frequency: 9

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30 kg/m^2

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: 30

Obesity frequency (absolute number): 49

Prognostic factor(s): BMI 30-34.9 kg/m^2, BMI ≥ 35 kg/m^2

Outcome(s)

ICU admission, mechanical ventilation

Outcome (prognostic factor)

ICU admission (BMI 30-34.9 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 103

Number of obese patients followed completely for the outcome: 49

Number of non-obese patients followed completely for the outcome: 54

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.8 (0.75, 10.48), 0.126

Multivariable analysis for obesity

Modelling method: Logistic regression

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Kalligeros 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, race, gender, BMI, diabetes, hypertension, heart disease, and chronic lung disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.65 (0.64, 10.95), 0.178

Outcome (prognostic factor)

ICU admission (BMI ≥ 35 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 103

Number of obese patients followed completely for the outcome: 49

Number of non-obese patients followed completely for the outcome: 54

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.02 (0.85, 10.74), 0.088

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, race, gender, BMI, diabetes, hypertension, heart disease, and chronic lung disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.39 (1.13, 25.64), 0.034

Outcome (prognostic factor)

Mechanical ventilation (BMI 30-34.9 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 103

Number of obese patients followed completely for the outcome: 49

Number of non-obese patients followed completely for the outcome: 54

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.86 (0.88, 26.68), 0.069

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, race, gender, BMI, diabetes, hypertension, heart disease, and chronic lung disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 6.85 (1.05, 44.82), 0.045

Outcome (prognostic factor)

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Kalligeros 2020 *(Continued)*

Mechanical ventilation (BMI ≥ 35 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 103

Number of obese patients followed completely for the outcome: 49

Number of non-obese patients followed completely for the outcome: 54

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.84 (1.12, 30.55), 0.036

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, race, gender, BMI, diabetes, hypertension, heart disease, and chronic lung disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 9.99 (1.39, 71.69), 0.022

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Kammar-García 2020

Study characteristics

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Kammar-García 2020 *(Continued)*

Notes

English title

Impact of comorbidities in Mexican SARS-CoV-2-positive patients: a retrospective analysis in a national cohort

Study setting

Start of study recruitment (MM/YYYY)

01/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

registry data

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

outpatient and inpatient

Number of participants recruited

13,842

Sampling method

consecutive participants

Participants

Female participants

(percentage), 42.3

Age measure, value

mean (standard deviation), 46.6 (15.6)

Inclusion criteria

COVID-19 positive

Exclusion criteria

NR

Smoking

NR

Diabetes

NR

Hypertension

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Kammar-García 2020 *(Continued)*

NR

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

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Kammar-García 2020 *(Continued)*

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

NR

Threshold used for definition of obesity

NR

Measure of frequency

absolute number

Frequency value

2793

How many eligible outcomes reported?

5

How many eligible outcomes reported?

5

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (obesity)

Outcome

Mortality

Prognostic factor (category):

obesity

Follow-up

Number of patients followed completely for this outcome

13,842

Number of obese patients followed completely for this outcome

2793

Number of non-obese patients followed completely for this outcome

11,049

Univariable (unadjusted) analysis for obesity

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Kammar-García 2020 *(Continued)*

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.8 (1.6, 2.01)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

sex, age, smoking status, and time from onset of symptoms to initial care

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.8 (1.6, 2.1)

Outcome (prognostic factor)

ICU admission (obesity)

Outcome

ICU admission

Prognostic factor (category):

obesity

Follow-up

Number of patients followed completely for this outcome

13,842

Number of obese patients followed completely for this outcome

2793

Number of non-obese patients followed completely for this outcome

11,049

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.7 (1.4, 1.9)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

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Kammar-García 2020 *(Continued)*

The set of prognostic factors used for adjustment

sex, age, smoking status, and time from onset of symptoms to initial care

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.7 (1.4, 2.01)

Outcome (prognostic factor)

pneumonia (obesity)

Outcome

pneumonia

Prognostic factor (category):

obesity

Follow-up

Number of patients followed completely for this outcome

13,842

Number of obese patients followed completely for this outcome

2793

Number of non-obese patients followed completely for this outcome

11049

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.6 (1.4, 1.7)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

sex, age, smoking status, and time from onset of symptoms to initial care

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.6 (1.4, 1.7)

Outcome (prognostic factor)

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Kammar-García 2020 *(Continued)*

hospitalisation (obesity)

Outcome

hospitalisation

Prognostic factor (category):

obesity

Follow-up

Number of patients followed completely for this outcome

13,842

Number of obese patients followed completely for this outcome

2793

Number of non-obese patients followed completely for this outcome

11,049

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.6 (1.5, 1.7)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

sex, age, smoking status, and time from onset of symptoms to initial care

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.6 (1.4, 1.7)

Outcome (prognostic factor)

mechanical ventilation (obesity)

Outcome

mechanical ventilation

Prognostic factor (category)

obesity

Follow-up

Number of patients followed completely for this outcome

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Kammar-García 2020 *(Continued)*

13,842

Number of obese patients followed completely for this outcome

2793

Number of non-obese patients followed completely for this outcome

11,049

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.6 (1.3, 1.9)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

sex, age, smoking status, and time from onset of symptoms to initial care

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.7 (1.4, 2.01)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	No	Appendix 3
Study Attrition Mechanical ventilation	No	Appendix 3
Study Attrition ICU admission	No	Appendix 3
Study Attrition Hospitalisation	No	Appendix 3
Study Attrition Pneumonia	No	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement	Unclear	Appendix 3

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Kammar-García 2020 *(Continued)*

Mortality		
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Outcome Measurement Pneumonia	No	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Confounding Bias Hospitalisation	Unclear	Appendix 3
Confounding Bias Pneumonia	Unclear	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Khawaja 2020

Study characteristics

Notes

English title

Associations with COVID-19 hospitalisation amongst 406,793 adults: the UK Biobank prospective cohort study

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

prospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

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Khawaja 2020 *(Continued)*

NR

Study setting

outpatient

Number of participants recruited

406,793

Sampling method

unspecified

Participants

Female participants

(percentage), 55

Age measure, value

mean (standard deviation), 68 (8)

Inclusion criteria

Individuals resident in England and alive in 2020 from UK Biobank

Exclusion criteria

We excluded participants that were tested but without a positive COVID-19 test in case a proportion were false negatives and given the abundance of controls already available. Participants who died before 2020 or did not attend an assessment centre in England were excluded given they could not become cases.

Smoking

(absolute number), 40,181

Diabetes

(absolute number), 19,897

Hypertension

(absolute number), 135,604

Cardiovascular diseases

(absolute number), 32,831

Please indicate if additional information is available

Ischaemic heart disease

Asthma

(absolute number), 55,127

Chronic obstructive pulmonary disease

(absolute number), 13,805

Other pulmonary diseases

(absolute number), 5377

Please indicate if additional information is available

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Khawaja 2020 *(Continued)*

Obstructive sleep apnoea

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Not specified

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

Not specified

Measure of frequency

unspecified

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Khawaja 2020 *(Continued)*

Frequency value

NR

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

hospitalisation

Outcome (prognostic factor)

Hospitalisation (BMI ≥ 25, < 30)

Outcome

Hospitalisation

Prognostic factor (category):

BMI ≥ 25, < 30

Follow-up

Number of patients followed completely for this outcome

406,793

Number of obese patients followed completely for this outcome

94,690

Number of non-obese patients followed completely for this outcome

312,103

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, ethnicity, education level, Townsend deprivation index, BMI, DBP, alcohol intake frequency, smoking, loop diuretics use, HTN, IHD, stroke, COPD

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

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Khawaja 2020 *(Continued)*

1.26 (1.01, 1.56)

Outcome (prognostic factor)

Hospitalisation (BMI ≥ 30, < 35)

Outcome

Hospitalisation

Prognostic factor (category):

BMI ≥ 30, < 35

Follow-up

Number of patients followed completely for this outcome

406,793

Number of obese patients followed completely for this outcome

94,690

Number of non-obese patients followed completely for this outcome

312,103

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, ethnicity, education level, Townsend deprivation index, BMI, DBP, alcohol intake frequency, smoking, loop diuretics use, HTN, IHD, stroke, COPD

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.37 (1.06, 1.76)

Outcome (prognostic factor)

Hospitalisation (BMI > 35)

Outcome

Hospitalisation

Prognostic factor (category):

BMI > 35

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Khawaja 2020 *(Continued)*

Follow-up

Number of patients followed completely for this outcome

406,793

Number of obese patients followed completely for this outcome

94,690

Number of non-obese patients followed completely for this outcome

312,103

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, ethnicity, education level, Townsend deprivation index, BMI, DBP, alcohol intake frequency, smoking, loop diuretics use, HTN, IHD, stroke, COPD

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.04 (1.5, 2.77)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Killerby 2020

Study characteristics

Notes

English title

Characteristics associated with hospitalization among patients with COVID-19 - metropolitan Atlanta, Georgia, March-April 2020

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres/clinics/areas: Six acute care hospitals and associated outpatient clinics

Study setting: Outpatient and inpatient

Number of participants recruited: 531

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 303

Age measure, value: NR

Inclusion criteria: Hospitalised patients aged ≥ 18 years who were hospitalised with laboratory-confirmed COVID-19 (defined as a positive real-time reverse transcription–polymerase chain reaction [RT-PCR] test result for SARS-CoV-2) during March 1–30 and non-hospitalised patients aged ≥ 18 years with laboratory-confirmed COVID-19 during March 1–April 7

Exclusion criteria: Persons lacking a healthcare visit during which a medical history could be recorded were excluded from analyses and if they stayed for observation or died in an ED. And persons lacking a healthcare visit during which a medical history could be recorded were excluded from analyses.

Smoking frequency: 91

Diabetes frequency: 111

Hypertension frequency: 243

Cardiovascular disease frequency: 20

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 101

Immunosuppression frequency: 15

Chronic kidney disease frequency: 45

Cancer frequency: 34

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

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Killerby 2020 *(Continued)*

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: 30

Obesity frequency (absolute number): 227

Prognostic factor(s): BMI ≥ 30 kg/m^2

Outcome(s)

Hospitalisation

Outcome (prognostic factor)

Hospitalisation (BMI ≥ 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 531

Number of obese patients followed completely for the outcome: 227

Number of non-obese patients followed completely for the outcome: 209

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: 1.82 (1.2, 2.57), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.9 (1.1, 3.3), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias	Yes	Appendix 3

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Killerby 2020 *(Continued)*
Hospitalisation

Statistical Analysis Bias	Yes	Appendix 3

Kim 2020a

Study characteristics

Notes

English title

Risk factors for intensive care unit admission and in-hospital mortality among hospitalized adults identified through the US Coronavirus Disease 2019 (COVID-19)-associated Hospitalization Surveillance Network (COVID-NET)

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres/clinics/areas: 154 acute-care hospitals in 74 counties in 13 states.

Study setting: Inpatient

Number of participants recruited: 2491

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 1165

Age measure, value: Median (IQR), 62 (50-75)

Inclusion criteria: Eligible COVID-19–associated hospitalisations occurred amongst persons who (1) resided in a predefined surveillance catchment area; and (2) had a positive SARS-CoV-2 test within 14 days prior to or during hospitalisation; included adults hospitalised within 154 acute-care hospitals in 74 counties in 13 states with an admission date during 1 March–2 May 2020 who had either been discharged from the hospital or died during hospitalisation and had complete medical chart abstractions

Exclusion criteria: children < 18 years of age due to small counts (n = 101) and 1 surveillance site (Iowa) for which medical chart abstractions were not conducted, also excluded patients who were still hospitalised at the time of this analysis and all patients for whom medical chart abstractions had not yet been completed as of 2 May 2020

Smoking frequency: 792

Diabetes frequency: 819

Hypertension frequency: 1428

Cardiovascular disease frequency: 859

Asthma frequency: 314

Chronic obstructive pulmonary disease frequency: 266

Other pulmonary disease frequency: 747

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Kim 2020a *(Continued)*

Immunosuppression frequency: 263

Chronic kidney disease frequency: NR

Cancer frequency: 101

Steroid administration frequency: 106

Supplemental oxygen administration frequency: 814

Other treatments (frequency): Hydroxychloroquine (1065), azithromycin (725), tocilizumab (103), atazanavir (94), remdesivir (53), lopinavir/ritonavir (27), convalescent plasma (9), chloroquine (7), sarilumab (6), zinc (6)

Prognostic factor(s)

Study's definition for obesity: Body mass index ≥ 30 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: 30

Obesity frequency (absolute number): 1154

Prognostic factor(s): BMI ≥ 30 kg/m^2

Outcome(s)

In-hospital mortality, ICU admission

Outcome (prognostic factor)

In-hospital mortality (BMI ≥ 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 2490

Number of obese patients followed completely for the outcome: 1154

Number of non-obese patients followed completely for the outcome: 1178

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 0.73 (0.61, 0.86), 0.001

Multivariable analysis for obesity

Modelling method: Log-linked Poisson

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking status, hypertension, obesity, diabetes, chronic lung disease, cardiovascular disease, neurologic disease, renal disease, immunosuppression, and outpatient use of an angiotensin receptor blocker

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.09 (1.30, 0.92), NR

Outcome (prognostic factor)

ICU admission (BMI ≥ 30 kg/m^2)

Follow-up

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Kim 2020a *(Continued)*

Number of patients followed completely for the outcome: 2490

Number of obese patients followed completely for the outcome: 1154

Number of non-obese patients followed completely for the outcome: 1178

Univariable unadjusted analysis for obesity

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.25 (1.14, 1.37), 0.0013

Multivariable analysis for obesity

Modelling method: Log-linked Poisson

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking status, hypertension, obesity, diabetes, chronic lung disease, cardiovascular disease, neurologic disease, renal disease, immunosuppression, and outpatient use of an angiotensin receptor blocker

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.31 (1.16, 1.47), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Kim 2020b

Study characteristics

Notes	**English title**

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Kim 2020b *(Continued)*

Analysis of mortality and morbidity in COVID-19 patients with obesity using clinical epidemiological data from the Korean Center for Disease Control & Prevention

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 06/2020

Study design: Registry data

Study centre(s): NR

Number of centres, clinics or areas: NR

Study setting: NR

Number of participants recruited: 4027

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 2334

Age measure, value: NR

Inclusion criteria: Patients with confirmed cases of COVID-19 was released from isolation after achieving a complete recovery. Asymptomatic patients were determined to be completely recovered if the PCR results were negative two consecutive times with at least a 24-h interval between them at least seven days after a definitive diagnosis had been made. Symptomatic patients with confirmed cases were determined to be completely recovered if they had no fever without taking antipyretic drugs, the clinical manifestations were improved and the PCR results were negative two consecutive times with at least a 24-h interval between them at least seven days after a definitive diagnosis had been made.

Exclusion criteria: Participants who did not have records of symptoms or past medical histories were excluded. Participants who did not have recorded BMI values were excluded.

Smoking frequency: NR

Diabetes frequency: 492

Hypertension frequency: 829

Cardiovascular disease frequency: 172

Asthma frequency: 96

Chronic obstructive pulmonary disease frequency: 30

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 43

Cancer frequency: 107

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 25

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Kim 2020b *(Continued)*

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 1159

Prognostic factor(s): BMI ≥ 25 kg/m^2

Outcome(s)

Mortality

Severe COVID

Outcome (prognostic factor)

Mortality (BMI ≥ 25 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 4027

Number of obese patients followed completely for the outcome: 1159

Number of non-obese patients followed completely for the outcome: 2868

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.36 (0.9, 2.05), 0.149

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex, obesity, systolic blood pressure, diastolic blood pressure, heart rate, temperature, diabetes, hypertension, heart failure, chronic heart disease, asthma, chronic obstructive pulmonary disease, chronic kidney disease, cancer, chronic liver disease, rheumatic or autoimmune disease, dementia

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.71 (1.1, 2.66), 0.017

Outcome (prognostic factor)

Severe COVID (BMI ≥ 25 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 4027

Number of obese patients followed completely for the outcome: 1159

Number of non-obese patients followed completely for the outcome: 2868

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.72 (1.39, 2.12), < 0.001

Multivariable analysis for obesity

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Kim 2020b *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, obesity, systolic blood pressure, diastolic blood pressure, heart rate, temperature, diabetes, hypertension, heart failure, chronic heart disease, asthma, chronic obstructive pulmonary disease, chronic kidney disease, cancer, chronic liver disease, rheumatic or autoimmune disease, dementia

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.71 (1.32, 2.21), < 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	No	Appendix 3
Study Attrition Severe COVID	No	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Kim 2020c

Study characteristics	
Notes	**English title** BMI as a risk factor for clinical outcomes in patients hospitalized with COVID-19 in New York **Study setting** **Start of study recruitment (MM/YYYY):** 03/2020 **End of study recruitment (MM/YYYY):** 04/2020 **Study design:** NR **Study centre(s):** Multiple centres/clinics/areas within a country **Number of centres, clinics or areas:** 12

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Kim 2020c *(Continued)*

Study setting: Inpatient

Number of participants recruited: 10,861

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 4393

Age measure, value: Median (IQR), 65 (54-77)

Inclusion criteria: All adult patients admitted to 12 Northwell Health system acute-care hospitals in New York between March 1, 2020, and April 27, 2020, with a confirmed diagnosis of COVID-19 by a polymerase chain reaction of nasopharyngeal swabs

Exclusion criteria: NR

Smoking frequency: 1797 (including ex-smokers)

Diabetes frequency: 3995

Hypertension frequency: 6555

Cardiovascular disease frequency: 2379

Asthma frequency: 903

Chronic obstructive pulmonary disease frequency: 677

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 515

Cancer frequency: 937

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity class I (30-34.9 kg/m^2), obesity class II (35-39.9 kg/m^2), and obesity class III (≥ 40 kg/m^2)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 4090

Prognostic factor(s): 30 < BMI < 35

35 < BMI < 40

BMI > 40

Outcome(s)

Invasive mechanical ventilation

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Kim 2020c *(Continued)*

Mortality

Outcome (prognostic factor)

Invasive mechanical ventilation (30 < BMI < 35)

Follow-up

Number of patients followed completely for the outcome: 10,861

Number of obese patients followed completely for the outcome: 4090

Number of non-obese patients followed completely for the outcome: 6771

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable regression models, adjusting for patient characteristics and also secondary analysis using a Cox proportional-hazards model

The set of prognostic factors used for adjustment: Age, sex, race, hypertension, coronary artery disease, diabetes mellitus, heart failure, chronic kidney disease, end-stage renal disease, cancer, asthma, COPD, smoking status, hospital type

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.48 (1.27, 1.72), NR

Outcome (prognostic factor)

Invasive mechanical ventilation (35 < BMI < 40)

Follow-up

Number of patients followed completely for the outcome: 10,861

Number of obese patients followed completely for the outcome: 4090

Number of non-obese patients followed completely for the outcome: 6771

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable regression models, adjusting for patient characteristics and also secondary analysis using a Cox proportional-hazards model

The set of prognostic factors used for adjustment: Age, sex, race, hypertension, coronary artery disease, diabetes mellitus, heart failure, chronic kidney disease, end-stage renal disease, cancer, asthma, COPD, smoking status, hospital type

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.89 (1.56, 2.28), NR

Outcome (prognostic factor)

Invasive mechanical ventilation (BMI > 40)

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Kim 2020c *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 10,861

Number of obese patients followed completely for the outcome: 4090

Number of non-obese patients followed completely for the outcome: 6771

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable regression models, adjusting for patient characteristics and also secondary analysis using a Cox proportional-hazards model

The set of prognostic factors used for adjustment: Age, sex, race, hypertension, coronary artery disease, diabetes mellitus, heart failure, chronic kidney disease, end-stage renal disease, cancer, asthma, COPD, smoking status, hospital type

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.31 (1.88, 2.85), NR

Outcome (prognostic factor)

Mortality (30 < BMI < 35)

Follow-up

Number of patients followed completely for the outcome: 10,861

Number of obese patients followed completely for the outcome: 4090

Number of non-obese patients followed completely for the outcome: 6771

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable regression models, adjusting for patient characteristics and also secondary analysis using a Cox proportional-hazards model

The set of prognostic factors used for adjustment: Age, sex, race, hypertension, coronary artery disease, diabetes mellitus, heart failure, chronic kidney disease, end-stage renal disease, cancer, asthma, COPD, smoking status, hospital type

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.00 (0.87, 1.16), NR

Outcome (prognostic factor)

Mortality (35 < BMI < 40)

Follow-up

Number of patients followed completely for the outcome: 10,861

Number of obese patients followed completely for the outcome: 4090

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Kim 2020c *(Continued)*

Number of non-obese patients followed completely for the outcome: 6771

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable regression models, adjusting for patient characteristics and also secondary analysis using a Cox proportional-hazards model

The set of prognostic factors used for adjustment: Age, sex, race, hypertension, coronary artery disease, diabetes mellitus, heart failure, chronic kidney disease, end-stage renal disease, cancer, asthma, COPD, smoking status, hospital type

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.25 (1.03, 1.52), NR

Outcome (prognostic factor)

Mortality (BMI > 40)

Follow-up

Number of patients followed completely for the outcome: 10,861

Number of obese patients followed completely for the outcome: 4090

Number of non-obese patients followed completely for the outcome: 6771

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable regression models, adjusting for patient characteristics and also secondary analysis using a Cox proportional-hazards model

The set of prognostic factors used for adjustment: Age, sex, race, hypertension, coronary artery disease, diabetes mellitus, heart failure, chronic kidney disease, end-stage renal disease, cancer, asthma, COPD, smoking status, hospital type

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.61 (1.30, 2.00), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3

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Kim 2020c *(Continued)*

Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Klang 2020

Study characteristics

Notes

English title

Severe obesity as an independent risk factor for COVID-19 mortality in hospitalized patients younger than 50

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 5

Study setting: Inpatient

Number of participants recruited: 572 (cohort 1), 2834 (cohort 2)

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 175 (cohort 1), 1270 (cohort 2)

Age measure, value: NR

Inclusion criteria: All adult patients who were positive for COVID-19 by nasopharyngeal swab polymerase chain reaction test and were admitted to the hospital. Patients who were discharged or had died during the study period were included.

Exclusion criteria: Patients who were still hospitalised at the time of analysis and patients with missing BMI data

Smoking frequency: 76 (cohort 1), 717 (cohort 2)

Diabetes frequency: 153 (cohort 1), 1446 (cohort 2)

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Klang 2020 *(Continued)*

Hypertension frequency: 175 (cohort 1), 2124 (cohort 2)

Cardiovascular disease frequency: 67 (cohort 1), 1190 (cohort 2)

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 70 (cohort 1), 597 (cohort 2)

Cancer frequency: 39 (cohort 1), 491 (cohort 2)

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 79 (cohort 1), 730 (cohort 2)

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity was defined as BMI ≥ 30 kg/m^2; obesity groups included the following: BMI of 30 to < 40 and BMI ≥ 40

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 275 (cohort 1), 956 (cohort 2)

Prognostic factor(s): BMI of 30 to < 40

BMI ≥ 40

Outcome(s)

Mortality

Mechanical ventilation

Outcome (prognostic factor)

Mortality (BMI of 30 to < 40) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 572

Number of obese patients followed completely for the outcome: 275

Number of non-obese patients followed completely for the outcome: 297

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR, 0.313

Multivariable analysis for obesity

Modelling method: Logistic regression

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Klang 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age decile, male sex, CAD, CHF, HTN, DM, hyperlipidaemia, CKD, history of cancer, smoking (past or present), BMI 30-40, BMI ≥ 40, and race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.1 (0.5, 2.3), 0.755

Outcome (prognostic factor)

Mortality (BMI ≥ 40) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 572

Number of obese patients followed completely for the outcome: 275

Number of non-obese patients followed completely for the outcome: 297

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR, < 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age decile, male sex, CAD, CHF, HTN, DM, hyperlipidaemia, CKD, history of cancer, smoking (past or present), BMI 30-40, BMI ≥ 40, and race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.1 (2.3, 11.1), < 0.001

Outcome (prognostic factor)

Mortality (BMI of 30 to < 40) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 2834

Number of obese patients followed completely for the outcome: 956

Number of non-obese patients followed completely for the outcome: 1878

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR, 0.117

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age decile, male sex, CAD, CHF, HTN, DM, hyperlipidaemia, CKD, history of cancer, smoking (past or present), BMI 30-40, BMI ≥ 40, and race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.1 (0.9, 1.3), 0.421

Outcome (prognostic factor)

Mortality (BMI ≥ 40) (cohort 2)

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Klang 2020 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 2834

Number of obese patients followed completely for the outcome: 956

Number of non-obese patients followed completely for the outcome: 1878

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR, 0.532

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age decile, male sex, CAD, CHF, HTN, DM, hyperlipidaemia, CKD, history of cancer, smoking (past or present), BMI 30-40, BMI ≥ 40, and race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.6 (1.2, 2.3), 0.004

Outcome (prognostic factor)

Mechanical ventilation (BMI of 30 to < 40) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 572

Number of obese patients followed completely for the outcome: 275

Number of non-obese patients followed completely for the outcome: 297

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age decile, male sex, CAD, CHF, HTN, DM, hyperlipidaemia, CKD, history of cancer, smoking (past or present), BMI 30-40, BMI ≥ 40, and race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.5 (0.8, 2.7), 0.2

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 40) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 572

Number of obese patients followed completely for the outcome: 275

Number of non-obese patients followed completely for the outcome: 297

Univariable unadjusted analysis for obesity

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Klang 2020 *(Continued)*

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age decile, male sex, CAD, CHF, HTN, DM, hyperlipidaemia, CKD, history of cancer, smoking (past or present), BMI 30-40, BMI ≥ 40, and race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.5 (1.1, 2.1), 0.025

Outcome (prognostic factor)

Mechanical ventilation (BMI of 30 to < 40) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 2834

Number of obese patients followed completely for the outcome: 956

Number of non-obese patients followed completely for the outcome: 1878

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age decile, male sex, CAD, CHF, HTN, DM, hyperlipidaemia, CKD, history of cancer, smoking (past or present), BMI 30-40, BMI ≥ 40, and race

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.3 (1, 1.6), 0.016

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 40) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 2834

Number of obese patients followed completely for the outcome: 956

Number of non-obese patients followed completely for the outcome: 1878

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age decile, male sex, CAD, CHF, HTN, DM, hyperlipidaemia, CKD, history of cancer, smoking (past or present), BMI 30-40, BMI ≥ 40, and race

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Klang 2020 *(Continued)*

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.5 (1.1, 2.1), 0.025

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	No	Appendix 3
Study Attrition Mechanical ventilation	No	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Klineova 2020

Study characteristics

Notes

English title

Covid-19 infection in patients with multiple sclerosis: an observational study by the New York COVID-19 Neuroimmunology Consortium (NYCNIC)

Study setting

Start of study recruitment (MM/YYYY)

NR

End of study recruitment (MM/YYYY)

NR

Study design

prospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

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Klineova 2020 *(Continued)*

Number of centres/clinics/areas

5

Study setting

outpatient and inpatient

Number of participants recruited

349

Sampling method

unspecified

Participants

Female participants

(percentage), 70.8

Age measure, value

median (range), 45 (13, 76)

Inclusion criteria

Patients with MS or related disorders, who self-identified as diagnosed with COVID-19 by a healthcare provider (based on characteristic symptoms, radiographic findings and/or positive COVID-19 PCR/ serology when available) were included.

Exclusion criteria

NR

Smoking

NR

Diabetes

(unspecified)

Hypertension

(unspecified)

Cardiovascular diseases

(unspecified)

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

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Klineova 2020 *(Continued)*

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

NR

Threshold used for definition of obesity

NR

Measure of frequency

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Klineova 2020 *(Continued)*

NR

Frequency value

NR

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

hospitalisation

Outcome (prognostic factor)

Hopitalisation (obesity)

Outcome

Hospitalisation

Prognostic factor (category):

Obesity

Follow-up

Number of patients followed completely for this outcome

349

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, obesity, EDSS, race, ethnicity, comorbidities (cardiac, pulmonary, diabetes), smoking status, specific DMT

Effect measure for obesity

odds ratio

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Klineova 2020 *(Continued)*

	Effect measure value (95% CI)
	2.4 (1.1, 4.9)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Hospitalisation	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Kompaniyets 2021

Study characteristics	
Notes	**English title** Body mass index and risk for COVID-19–related hospitalization, intensive care unit admission, invasive mechanical ventilation, and death — United States, March–December 2020 **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 12/2020 **Study design** registry data **Study centre(s)** multiple centres/clinics/areas within a country **Number of centres/clinics/areas** 238 **Study setting** outpatient and inpatient **Number of participants recruited**

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Kompaniyets 2021 *(Continued)*

148,494

Sampling method

unspecified

Participants

Female participants

(absolute number), 79,624

Age measure, value

median (interquartile range), 55 (38, 70)

Inclusion criteria

aged >= 18 years with measured height and weight and an ED or inpatient encounter with an International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) code of U07.1 (COVID-19, virus identified) during April 1–December 31, 2020, or B97.29 (other coronavirus as the cause of diseases classified elsewhere; recommended before April 2020 release of U07.1)

Exclusion criteria

Heights and weights were excluded if they were substantially larger or smaller than expected (defined as height < 44 inches [112 cm] or > 90 inches [229 cm]; weight < 25 kg [55 lbs] or > 454 kg [1000 lbs]; and BMI < 12 kg/m^2 or > 110 kg/m^2

Smoking

NR

Diabetes

(unspecified)

Hypertension

(unspecified)

Cardiovascular diseases

(unspecified)

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

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Kompaniyets 2021 *(Continued)*

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity (body mass index ≥ 30 kg/m^2) is frequently categorised into three categories: class 1 (30.0–34.9 kg/m^2), class 2 (35.0–39.9 kg/m^2), and class 3 (≥ 40 kg/m^2). Class 3 obesity is sometimes referred to as "extreme" or "severe" obesity.

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

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Kompaniyets 2021 *(Continued)*

75,498

How many eligible outcomes reported?

4

How many eligible outcomes reported?

4

Outcome(s)

hospitalisation, ICU admission, mechanical ventilation, mortality

Outcome (prognostic factor)

Hospitalisation (BMI 30-34.9)

Outcome

Hospitalisation

Prognostic factor (category):

BMI 30-34.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

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Kompaniyets 2021 *(Continued)*

1.03 (1.01, 1.05)

Outcome (prognostic factor)

Hospitalisation (BMI 35-39.9)

Outcome

Hospitalisation

Prognostic factor (category):

BMI 35-39.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.06 (1.04, 1.08)

Outcome (prognostic factor)

Hospitalisation (BMI 40-44.9)

Outcome

Hospitalisation

Prognostic factor (category):

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Kompaniyets 2021 *(Continued)*

BMI 40-44.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.11 (1.08, 1.13)

Outcome (prognostic factor)

Hospitalisation (BMI ≥ 45)

Outcome

Hospitalisation

Prognostic factor (category):

BMI ≥ 45

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

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Kompaniyets 2021 *(Continued)*

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.2 (1.17, 1.23)

Outcome (prognostic factor)

ICU admission (BMI 30-34.9)

Outcome

ICU admission

Prognostic factor (category)

BMI 30-34.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

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Kompaniyets 2021 *(Continued)*

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

0.99 (0.96, 1.01)

Outcome (prognostic factor)

ICU admission (BMI 35-39.9)

Outcome

ICU admission

Prognostic factor (category):

BMI 35-39.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

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Kompaniyets 2021 *(Continued)*

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.01 (1.04, 0.98)

Outcome (prognostic factor)

ICU admission (BMI 40-44.9)

Outcome

ICU admission

Prognostic factor (category):

BMI 40-44.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

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Kompaniyets 2021 *(Continued)*

1.04 (1, 1.07)

Outcome (prognostic factor)

ICU admission (BMI ≥ 45)

Outcome

ICU admission

Prognostic factor (category):

BMI ≥ 45

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.12 (1.08, 1.16)

Outcome (prognostic factor)

Mechanical ventilation (BMI 30-34.9)

Outcome

Mechanical ventilation

Prognostic factor (category):

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Kompaniyets 2021 *(Continued)*

BMI 30-34.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.31 (1.22, 1.41)

Outcome (prognostic factor)

Mechanical ventilation (BMI 35-39.9)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI 35-39.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

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Kompaniyets 2021 *(Continued)*

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.45 (1.33, 1.57)

Outcome (prognostic factor)

Mechanical ventilation (BMI 40-44.9)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI 40-44.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

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Kompaniyets 2021 *(Continued)*

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.62 (1.48, 1.77)

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 45)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI ≥ 45

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

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Kompaniyets 2021 *(Continued)*

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.95 (1.77, 2.16)

Outcome (prognostic factor)

Mortality (BMI 30-34.9)

Outcome

Mortality

Prognostic factor (category):

BMI 30-34.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

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Kompaniyets 2021 *(Continued)*

1.04 (0.98, 1.1)

Outcome (prognostic factor)

Mortality (BMI 35-39.9)

Outcome

Mortality

Prognostic factor (category):

BMI 35-39.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.07 (1, 1.15)

Outcome (prognostic factor)

Mortality (BMI 40-44.9)

Outcome

Mortality

Prognostic factor (category):

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Kompaniyets 2021 *(Continued)*

BMI 40-44.9

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.24 (1.13, 1.36)

Outcome (prognostic factor)

Mortality (BMI ≥ 45)

Outcome

Mortality

Prognostic factor (category):

BMI ≥ 45

Follow-up

Number of patients followed completely for this outcome

148,494

Number of obese patients followed completely for this outcome

75,498

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Kompaniyets 2021 *(Continued)*

Number of non-obese patients followed completely for this outcome

72,996

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

adjusted for BMI category, underlying medical conditions (hypertension, diabetes, chronic kidney disease, asthma, coronary atherosclerosis and other heart disease, chronic obstructive pulmonary disease and bronchiectasis, and cancer), age, sex, race/ethnicity, payer type, hospital urbanicity, hospital census region, and admission month as controls

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.48 (1.35, 1.62)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	No	Appendix 3
Study Attrition Mechanical ventilation	No	Appendix 3
Study Attrition ICU admission	No	Appendix 3
Study Attrition Hospitalisation	No	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3

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Kompaniyets 2021 *(Continued)*

Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Confounding Bias Hospitalisation	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Krieger 2021

Study characteristics	
Notes	**English title** Emergency department characteristics and associations with intensive care admission among patients with coronavirus disease 2019 **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 06/2020 **Study design** retrospective cohort **Study centre(s)** multiple centres/clinics/areas within a country **Number of centres/clinics/areas** 3 **Study setting** inpatient **Number of participants recruited** 330 **Sampling method**

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Krieger 2021 *(Continued)*

unspecified

Participants

Female participants

(absolute number), 118

Age measure, value

median (interquartile range), 65 (53, 76)

Inclusion criteria

Patients were included in the study if they presented to an ED and had laboratory-confirmed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection during the study period.

Exclusion criteria

Missing data were excluded from the analyses.

Smoking

NR

Diabetes

(unspecified)

Hypertension

(unspecified)

Cardiovascular diseases

(unspecified)

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

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Krieger 2021 *(Continued)*

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(absolute number) 40

Differential values for various oxygenation methods (if indicated)

Nasal cannula (24), non-rebreather mask (9), non-invasive positive pressure ventilation (1), invasive mechanical ventilation (6)

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

BMI > 29

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

29

Measure of frequency

unspecified

Frequency value

NR

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

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Krieger 2021 *(Continued)*

ICU admission

Outcome (prognostic factor)

ICU admission (obesity)

Outcome

ICU admission

Prognostic factor (category):

Obesity

Follow-up

Number of patients followed completely for this outcome

330

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.01 (0.98, 1.04)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

NR

Effect measure value (95% CI)

1.65 (1.04, 2.62)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3

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Krieger 2021 *(Continued)*

Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias ICU admission	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Kuderer 2020

Study characteristics

Notes

English title

Clinical impact of COVID-19 on patients with cancer (CCC19): a cohort study

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Registry data

Study centre(s): International

Number of centres, clinics or areas: NR

Study setting: Outpatient

Number of participants recruited: 928

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 459

Age measure, value: Median (IQR), 66 (57-76)

Inclusion criteria: Patients who had baseline data entered onto the database between March 17 and April 16, 2020 and had follow-up data entered up until May 7, 2020. Patients eligible for inclusion were adults (aged 18 years or older), with a diagnosed invasive or haematological malignancy at any time, and a resident of the USA, Canada, or Spain.

Exclusion criteria: Patients with presumptive COVID-19 who did not have a laboratory confirmed SARS-CoV-2 infection were excluded and patients with non-invasive cancers including non-melanomatous skin cancer, in-situ carcinoma, or precursor haematological neoplasms were excluded from this analysis.

Smoking frequency: 369

Diabetes frequency: NR

Hypertension frequency: NR

Cardiovascular disease frequency: NR

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Kuderer 2020 *(Continued)*

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 928 (396 were active)

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 405

Other treatments (frequency): Hydroxychloroquine alone 89 (10%), azithromycin alone 93 (10%), azithromycin plus hydroxychloroquine 181 (20%)

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Some time after presentation

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): 172

Prognostic factor(s): Obesity

Outcome(s)

Mortality

Severe COVID

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 928

Number of obese patients followed completely for the outcome: 172

Number of non-obese patients followed completely for the outcome: 720

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds Ratio

Effect measure value (95% CI), P value: 0.84 (0.5, 1.41), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, smoking status, obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.99 (0.58, 1.71), NR

Outcome (prognostic factor)

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Kuderer 2020 *(Continued)*

Severe COVID (obesity)

Follow-up

Number of patients followed completely for the outcome: 928

Number of obese patients followed completely for the outcome: 172

Number of non-obese patients followed completely for the outcome: 720

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds Ratio

Effect measure value (95% CI), P value: 1.12 (0.77, 1.62), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, smoking status, obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.26 (0.8, 1.97), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias Severe COVID	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Li 2020

Study characteristics

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Li 2020 *(Continued)*

Notes

English title

Nutritional risk and therapy for severe and critical COVID-19 patients: a multicenter retrospective observational study

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 02/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 4

Study setting: Inpatient

Number of participants recruited: 523

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 273

Age measure, value: Mean (SD), 54.2 (15.9)

Inclusion criteria: Severely ill patients if they met any of the following criteria: 1. respiratory distress and respiratory rate was ≥ 30 times/min, 2. oxygen saturation in a resting state was ≤ 93%, 3. arterial partial pressure of oxygen (PaO2)/fraction of inspired oxygen (FiO2) was ≤ 300 mm Hg; critically ill patients if they met any of the following criteria: 1. respiratory failure and need for mechanical ventilation, 2. shock, and 3. other organ failure requiring ICU monitoring. Positive results for real-time polymerase chain reaction testing of respiratory or blood samples were defined as confirmed cases. The inclusion time was from January 2, 2020 to February 15, 2020 for discharged and dead patients.

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 94

Hypertension frequency: 130

Cardiovascular disease frequency: 38 (only CAD)

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

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Li 2020 *(Continued)*

Study's definition for obesity: BMI was reported continuously and also categorised to > 20.5 and ≤ 20.5

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 20.5

Obesity frequency (absolute number): 353

Prognostic factor(s): BMI > 20.5

Outcome(s)

Mortality

ICU admission

Outcome (prognostic factor)

Mortality (BMI > 20.5)

Follow-up

Number of patients followed completely for the outcome: 523

Number of obese patients followed completely for the outcome: 353

Number of non-obese patients followed completely for the outcome: 169

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.827 (0.768, 0.891), < 0.001

Comment: In categorised form BMI > 20.5 vs ≤ 20.5: OR = 0.304 (0.198, 0.466), < 0.001

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, gender, hypertension, diabetes mellitus and coronary artery disease, CR, PCT, ALC, cTnI, hs-CRP, LDL-c and FBG

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.992 (0.897, 1.097), 0.877

Outcome (prognostic factor)

ICU admission (BMI > 20.5)

Follow-up

Number of patients followed completely for the outcome: 523

Number of obese patients followed completely for the outcome: 353

Number of non-obese patients followed completely for the outcome: 169

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.791 (0.742, 0.844), < 0.001

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Li 2020 *(Continued)*

Comment: In categorised form BMI > 20.5 vs ≤ 20.5: OR = 0.353 (0.242, 0.516), < 0.001

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, gender, hypertension, diabetes mellitus and coronary artery disease, CR, PCT, ALC, cTnI, hs-CRP, LDL-c and FBG

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.956 (0.9, 1.106), 0.146

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Li 2021

Study characteristics

Notes

English title

Metabolic healthy obesity, vitamin D status, and risk of COVID-19

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

05/2020

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Li 2021 *(Continued)*

Study design

prospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

outpatient and inpatient

Number of participants recruited

353,299

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 192,001

Age measure, value

mean (standard deviation), 67.7 (8.1)

Inclusion criteria

We acquired the COVID-19 result data from March 16, 2020 to May 31, 2020 - for the baseline enrolment form UK biobank

Exclusion criteria

We excluded individuals whose locations were outside England, who died before the SARS-CoV-2 test, or who had missing data on the covariates included in the analysis.

Smoking

(absolute number), 33,996

Diabetes

(absolute number), 16,585

Hypertension

(absolute number), 96,247

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

Asthma

NR

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Li 2021 *(Continued)*

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

According to the categories of BMI (normal weight [BMI 18.5–24.9 kg/m^2], overweight [BMI 25.0–29.9 kg/m^2], obesity [BMI ≥ 30.0 kg/m^2]),

The time when obesity has been measured

some time after presentation

Main variable used for determination of obesity

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Li 2021 *(Continued)*

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

84,987

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

hospitalisation, severe COVID

Outcome (prognostic factor)

hospitalisation (BMI > 30)

Outcome

hospitalisation

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

353,299

Number of obese patients followed completely for this outcome

84,987

Number of non-obese patients followed completely for this outcome

268,312

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

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Li 2021 *(Continued)*

The set of prognostic factors used for adjustment

Covariates included relevant demographic (age, sex, ethnicity), socioeconomic (Townsend deprivation index, qualifications, employment), and behavioural (smoking status) factors and for metabolic syndrome components (triglyceride, high-density lipoprotein cholesterol, blood pressure, and glucose levels) and vitamin D

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.38 (1.26, 1.52)

Outcome (prognostic factor)

Severity (BMI > 30)

Outcome

Severity

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

353,299

Number of obese patients followed completely for this outcome

84,987

Number of non-obese patients followed completely for this outcome

268,312

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR (NR, NR)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Covariates included relevant demographic (age, sex, ethnicity), socioeconomic (Townsend deprivation index, qualifications, employment), and behavioural (smoking status) factors and for metabolic syndrome components (triglyceride, high-density lipoprotein cholesterol, blood pressure, and glucose levels), and vitamin D.

Effect measure for obesity

odds ratio

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Li 2021 *(Continued)*

	Effect measure value (95% CI)
	1.39 (1.12, 1.71)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	No	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Lohia 2021

Study characteristics

Notes

English title

Metabolic syndrome and clinical outcomes in patients infected with COVID-19: does age, sex, and race of the patient with metabolic syndrome matter?

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 06/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 4

Study setting: Inpatient

Number of participants recruited: 1871

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 906

Age measure, value: Median (IQR), 66 (54-75)

Inclusion criteria: Adult (≥ 18 years of age) patients with laboratory-confirmed COVID-19 diagnosis (either via nasopharyngeal or oropharyngeal swab) from 10 March to 30 June 2020 at an academic medical centre located in metropolitan Detroit

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Lohia 2021 *(Continued)*

Exclusion criteria: Any patient under the age of 18, readmission, ambulatory surgery patients, pregnant patients, patients who were transferred to an outside facility for other services such as extracorporeal membrane oxygenation (ECMO) therapy

Smoking frequency: NR

Diabetes frequency: 792

Hypertension frequency: 1485

Cardiovascular disease frequency: 645

Asthma frequency: 134

Chronic obstructive pulmonary disease frequency: 317

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 201

Cancer frequency: 173

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 879

Prognostic factor(s): Obesity

Outcome(s)

Mortality

ICU admission

Mechanical ventilation

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 1871

Number of obese patients followed completely for the outcome: 879

Number of non-obese patients followed completely for the outcome: 969

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

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Lohia 2021 *(Continued)*

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: age, sex, race, insurance, smoking status, and comorbidities including CAD, CHF, COPD, asthma, any malignancy, any liver disease, CKD, ESRD on haemodialysis, and any prior history of stroke

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.23 (0.98, 1.54), 0.08

Outcome (prognostic factor)

ICU admission (obesity)

Follow-up

Number of patients followed completely for the outcome: 1871

Number of obese patients followed completely for the outcome: 879

Number of non-obese patients followed completely for the outcome: 969

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: age, sex, race, insurance, smoking status, and comorbidities including CAD, CHF, COPD, asthma, any malignancy, any liver disease, CKD, ESRD on haemodialysis, and any prior history of stroke

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.17 (0.94, 1.45), 0.16

Outcome (prognostic factor)

Mechanical ventilation (obesity)

Follow-up

Number of patients followed completely for the outcome: 1871

Number of obese patients followed completely for the outcome: 879

Number of non-obese patients followed completely for the outcome: 969

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

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Lohia 2021 *(Continued)*

The set of prognostic factors used for adjustment: age, sex, race, insurance, smoking status, and comorbidities including CAD, CHF, COPD, asthma, any malignancy, any liver disease, CKD, ESRD on haemodialysis, and any prior history of stroke

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.37 (1.09, 1.72), 0.007

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	No	Appendix 3
Study Attrition Mechanical ventilation	No	Appendix 3
Study Attrition ICU admission	No	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Louapre 2020

Study characteristics

Notes

English title

Clinical characteristics and outcomes in patients with coronavirus Disease 2019 and Multiple Sclerosis

Study setting

Start of study recruitment (MM/YYYY): 03/2020

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Louapre 2020 *(Continued)*

End of study recruitment (MM/YYYY): 05/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres/clinics/areas: NR

Study setting: Outpatient and inpatient

Number of participants recruited: 347

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 249

Age measure, value: Mean (SD) 44.6 (12.8)

Inclusion criteria: Multiple sclerosis (MS) and at least 1 of the following 4 criteria: (1) a biologically confirmed COVID-19 diagnosis based on a positive result of a SARS-CoV-2 polymerase chain reaction (PCR) test on a nasopharyngeal swab; (2) typical thoracic computed tomography (CT) abnormalities (ground-glass opacities) in epidemic areas; (3) anosmia or ageusia of sudden onset in the absence of rhinitis or nasal obstruction; or (4) COVID-19–typical symptoms (triad of cough, fever, and asthenia) in an epidemic zone of COVID-19

Exclusion criteria: Patient's opposition to the use of his or her medical data

Smoking frequency: 33

Diabetes frequency: 16

Hypertension frequency: NR

Cardiovascular disease frequency: 23

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 15

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments absolute number (frequency): Interferon beta 20 (5.8%), glatiramer 33 (9.5%), teriflunomide 33 (9.5%), dimethylfumarate 35 (10.1%), natalizumab 57 (16.4%), fingolimod 42 (12.1%), ocrelizumab 38 (11.0%), rituximab 17 (4.9%), cladribine 3 (0.9%), alemtuzumab 1 (0.3%)

Prognostic factor(s)

Study's definition for obesity: Obesity (BMI > 30 kg/m^2)

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: 30

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Louapre 2020 *(Continued)*

Obesity frequency (absolute number): 24

Prognostic factor(s): BMI > 30 kg/m^2

Outcome(s)

Severe COVID (severity score of 3 or more that is hospitalisation or death from COVID-19), severe COVID-19 (severity score ≥ 4, hospitalised, requiring supplemental oxygen or higher severity)

Outcome (prognostic factor)

Severe COVID (severity score of 3 or more that is hospitalisation or death from COVID-19) (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 347

Number of obese patients followed completely for the outcome: 24

Number of non-obese patients followed completely for the outcome: 323

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.95 (1.25, 6.94), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.99 (1.03, 8.7), NR

Outcome (prognostic factor)

Severe COVID-19 (severity score ≥ 4, hospitalised, requiring supplemental oxygen or higher severity) (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 347

Number of obese patients followed completely for the outcome: 24

Number of non-obese patients followed completely for the outcome: 323

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.09 (1.72, 9.74), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.21 (1.65, 16.49), NR

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Louapre 2020 *(Continued)*

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Manohar 2021

Study characteristics	
Notes	**English title** Social and clinical determinants of COVID-19 outcomes: modeling real-world data from a pandemic epicenter **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 08/2020 **Study design** registry data **Study centre(s)** multiple centres/clinics/areas within a country **Number of centres/clinics/areas** 3 **Study setting** outpatient and inpatient **Number of participants recruited** 11,930 **Sampling method**

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Manohar 2021 *(Continued)*

consecutive participants

Participants

Female participants

(absolute number), 6051

Age measure, value

mean (not reported), 57.26

Inclusion criteria

COVID-confirmed patients from Weill Cornell Medicine (WCM), located in New York City in March to August 2020

Exclusion criteria

excluding those that were also confirmed as 'Not Detected' by PCR assay

Smoking

NR

Diabetes

(absolute number), type 2 = 2662

Hypertension

(absolute number), 4492

Cardiovascular diseases

(absolute number), 2315

Please indicate if additional information is available

HF = 994, CVD = 1321

Asthma

(absolute number), 1130

Chronic obstructive pulmonary disease

(absolute number), 536

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

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Manohar 2021 *(Continued)*

Cancer

(absolute number), 211

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

This variable was then categorised as '< 30 (non-obese)' or '30+ (obese)'

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

2403

How many eligible outcomes reported?

3

How many eligible outcomes reported?

3

Outcome(s)

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Manohar 2021 *(Continued)*

severe COVID, hospitalisation, mortality

Outcome (prognostic factor)

Severity (BMI > 30)

Outcome

Severity

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

11,930

Number of obese patients followed completely for this outcome

2403

Number of non-obese patients followed completely for this outcome

4918

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, race/ethnicity, DM, HTN, CVD, cancer, asthma, depression, obesity, smoking, NDI, hospital site, insurance type

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.91 (1.01, 1.42)

Outcome (prognostic factor)

Hospitalisation (BMI > 30)

Outcome

Hospitalisation

Prognostic factor (category):

BMI > 30

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Manohar 2021 *(Continued)*

Follow-up

Number of patients followed completely for this outcome

11,930

Number of obese patients followed completely for this outcome

2403

Number of non-obese patients followed completely for this outcome

4918

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, race/ethnicity, DM, HTN, CVD, cancer, asthma, depression, obesity, smoking, NDI, hospital site, insurance type

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.09 (0.89, 1.34)

Outcome (prognostic factor)

Mortality (BMI > 30)

Outcome

Mortality

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

11,930

Number of obese patients followed completely for this outcome

2403

Number of non-obese patients followed completely for this outcome

4918

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Manohar 2021 *(Continued)*

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, race/ethnicity, DM, HTN, CVD, cancer, asthma, depression, obesity, smoking, NDI, hospital site, insurance type

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.2 (1.02, 1.4)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	No	Appendix 3
Study Attrition Hospitalisation	No	Appendix 3
Study Attrition Severe COVID	No	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Unclear	Appendix 3
Outcome Measurement Hospitalisation	Unclear	Appendix 3
Outcome Measurement Severe COVID	Unclear	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3

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Manohar 2021 *(Continued)*

Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

McNeill 2021

Study characteristics

Notes

English title

The role of obesity in inflammatory markers in COVID-19 patients

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Prospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres/clinics/areas: 1

Study setting: Inpatient

Number of participants recruited: 781

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 328

Age measure, value: Mean (SD) 61 (17)

Inclusion criteria: Hospitalised patients with PCR-confirmed COVID-19 admitted to Massachusetts General Hospital from February 28 to April 27, 2020

Exclusion criteria: Patients with active cancer except non-melanoma skin cancers (n = 35), current pregnancy (n = 19), age < 18 years (n = 7), and those with missing lab values or covariates (n = 22)

Smoking frequency: 60

Diabetes frequency: 283

Hypertension frequency: 416

Cardiovascular disease frequency: 185

Asthma frequency: 106

Chronic obstructive pulmonary disease frequency: 90

Other pulmonary disease frequency: 51

Immunosuppression frequency: NR

Chronic kidney disease frequency: 137

Cancer frequency: NR

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McNeill 2021 *(Continued)*

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity (BMI ≥ 30 kg/m^2)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: 30

Obesity frequency (absolute number): 349

Prognostic factor(s): BMI > 30 kg/m^2

Outcome(s)

Mortality, ICU admission, mechanical ventilation

Outcome (prognostic factor)

Mortality (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 781

Number of obese patients followed completely for the outcome: 349

Number of non-obese patients followed completely for the outcome: 432

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, hypertension, diabetes mellitus, liver disease, kidney disease, smoking history and pulmonary disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.2 (1.31, 3.7), 0.003

Outcome (prognostic factor)

ICU admission (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 781

Number of obese patients followed completely for the outcome: 349

Number of non-obese patients followed completely for the outcome: 432

Univariable unadjusted analysis for obesity

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McNeill 2021 *(Continued)*

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, hypertension, diabetes mellitus, liver disease, kidney disease, smoking history and pulmonary disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.37 (0.93, 2.02), NR

Outcome (prognostic factor)

Mechanical ventilation (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 781

Number of obese patients followed completely for the outcome: 349

Number of non-obese patients followed completely for the outcome: 432

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, hypertension, diabetes mellitus, liver disease, kidney disease, smoking history and pulmonary disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.38 (0.9, 2.1), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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McNeill 2021 *(Continued)*

Mortality		
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Mehta 2021a

Study characteristics

Notes

English title

Risk factors associated with SARS-CoV-2 infections, hospitalization, and mortality among US nursing home residents

Study setting

Start of study recruitment (MM/YYYY)

04/2020

End of study recruitment (MM/YYYY)

09/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

15,038

Study setting

outpatient and inpatient

Number of participants recruited

137,119

Sampling method

consecutive participants

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Mehta 2021a *(Continued)*

Participants

Female participants

(absolute number), 90,501

Age measure, value

mean (standard deviation), 82.7 (9.2)

Inclusion criteria

We identified long-stay residents aged 65 years and older residing in nursing homes as of April 1, 2020. We identified nursing home stays based on the MDS data and excluded any skilled nursing facility care during that stay. We restricted nursing home residents to those with continuous enrolment in Medicare Parts A and B with no enrolment in health maintenance organisations from April 1, 2020, until SARS-CoV-2 diagnosis, death, or the study end date on September 30, 2020. We included characteristics if there were a priori reasons why they might be associated with increased risk of SARS-CoV-2 infection, such as a condition that might necessitate more physical contact by staff or that might interfere with following instructions on social distancing. We also included characteristics associated with risk of hospitalisation or death in prior studies.

Exclusion criteria

We excluded residents if they were diagnosed with SARS-CoV-2 before April 1, 2020 using ICD-10-CM codes of J12.89, J20.8, J40, J22 J98.8, J80 combined with B97.29, or U07.1 to identify SARS-CoV-2.

Smoking

NR

Diabetes

(absolute number), 49,546

Hypertension

NR

Cardiovascular diseases

(absolute number), 117,321

Please indicate if additional information is available

Heart disease included coronary artery disease, heart failure, and hypertension.

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

(absolute number), 39,530

Please indicate if additional information is available

Respiratory conditions included chronic obstructive pulmonary disease, respiratory failure, and shortness of breath.

Immunosuppression

NR

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Mehta 2021a *(Continued)*

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 25,780

Cancer

(absolute number), 9570

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity was not defined; they just report BMI in categories. But we counted BMI ≥ 30.

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

37,316

How many eligible outcomes reported?

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Mehta 2021a *(Continued)*

2

How many eligible outcomes reported?

2

Outcome(s)

hospitalisation, mortality

Outcome (prognostic factor)

hospitalisation (30 < BMI < 35 (obesity class 1))

Outcome

hospitalisation

Prognostic factor (category):

30 < BMI < 35 (obesity class 1)

Follow-up

Number of patients followed completely for this outcome

137,119

Number of obese patients followed completely for this outcome

37,316

Number of non-obese patients followed completely for this outcome

99,803

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

Age, sex, BMI, race/ethnicity, cognitive function, mood, hallucination, functional impairment, use of catheter or tube, prognosis of < 6 mos, cancer, heart disease, renal disease, diabetes, neurologic conditions, malnutrition, respiratory conditions

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.12 (1.08, 1.16)

Outcome (prognostic factor)

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Mehta 2021a *(Continued)*

hospitalisation (35 < BMI < 40 (obesity class 2))

Outcome

hospitalisation

Prognostic factor (category):

35 < BMI < 40 (obesity class 2)

Follow-up

Number of patients followed completely for this outcome

137,119

Number of obese patients followed completely for this outcome

37,316

Number of non-obese patients followed completely for this outcome

99,803

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

Age, sex, BMI, race/ethnicity, cognitive function, mood, hallucination, functional impairment, use of catheter or tube, prognosis of < 6 mos, cancer, heart disease, renal disease, diabetes, neurologic conditions, malnutrition, respiratory conditions

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.16 (1.11, 1.21)

Outcome (prognostic factor)

hospitalisation (40 < BMI < 45)

Outcome

hospitalisation

Prognostic factor (category):

40 < BMI < 45

Follow-up

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Mehta 2021a *(Continued)*

Number of patients followed completely for this outcome

137,119

Number of obese patients followed completely for this outcome

37,316

Number of non-obese patients followed completely for this outcome

99,803

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

Age, sex, BMI, race/ethnicity, cognitive function, mood, hallucination, functional impairment, use of catheter or tube, prognosis of < 6 mos, cancer, heart disease, renal disease, diabetes, neurologic conditions, malnutrition, respiratory conditions

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.24 (1.16, 1.32)

Outcome (prognostic factor)

hospitalisation (BMI > 45)

Outcome

hospitalisation

Prognostic factor (category):

BMI > 45

Follow-up

Number of patients followed completely for this outcome

137,119

Number of obese patients followed completely for this outcome

37,316

Number of non-obese patients followed completely for this outcome

99,803

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Mehta 2021a *(Continued)*

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

Age, sex, BMI, race/ethnicity, cognitive function, mood, hallucination, functional impairment, use of catheter or tube, prognosis of < 6 mos, cancer, heart disease, renal disease, diabetes, neurologic conditions, malnutrition, respiratory conditions

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.4 (1.28, 1.52)

Outcome (prognostic factor)

mortality (30 < BMI < 35 (obesity class 1))

Outcome

mortality

Prognostic factor (category)

30 < BMI < 35 (obesity class 1)

Follow-up

Number of patients followed completely for this outcome

137,119

Number of obese patients followed completely for this outcome

37,316

Number of non-obese patients followed completely for this outcome

99,803

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

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Mehta 2021a *(Continued)*

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

Age, sex, BMI, race/ethnicity, cognitive function, mood, hallucination, functional impairment, use of catheter or tube, prognosis of < 6 mos, cancer, heart disease, renal disease, diabetes, neurologic conditions, malnutrition, respiratory conditions

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.9 (0.87, 0.93)

Outcome (prognostic factor)

mortality (35 < BMI < 40 (obesity class 2))

Outcome

mortality

Prognostic factor (category):

35 < BMI < 40 (obesity class 2)

Follow-up

Number of patients followed completely for this outcome

137,119

Number of obese patients followed completely for this outcome

37,316

Number of non-obese patients followed completely for this outcome

99,803

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

Age, sex, BMI, race/ethnicity, cognitive function, mood, hallucination, functional impairment, use of catheter or tube, prognosis of < 6 mos, cancer, heart disease, renal disease, diabetes, neurologic conditions, malnutrition, respiratory conditions

Effect measure for obesity

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Mehta 2021a *(Continued)*

hazard ratio

Effect measure value (95% CI)

0.9 (0.86, 0.95)

Outcome (prognostic factor)

mortality (40 < BMI < 45)

Outcome

mortality

Prognostic factor (category):

40 < BMI < 45

Follow-up

Number of patients followed completely for this outcome

137,119

Number of obese patients followed completely for this outcome

37,316

Number of non-obese patients followed completely for this outcome

99,803

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

Age, sex, BMI, race/ethnicity, cognitive function, mood, hallucination, functional impairment, use of catheter or tube, prognosis of < 6 mos, cancer, heart disease, renal disease, diabetes, neurologic conditions, malnutrition, respiratory conditions

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.89 (0.83, 0.96)

Outcome (prognostic factor)

mortality (BMI > 45)

Outcome

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Mehta 2021a *(Continued)*

mortality

Prognostic factor (category):

BMI > 45

Follow-up

Number of patients followed completely for this outcome

137,119

Number of obese patients followed completely for this outcome

37,316

Number of non-obese patients followed completely for this outcome

99,803

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

Age, sex, BMI, race/ethnicity, cognitive function, mood, hallucination, functional impairment, use of catheter or tube, prognosis of < 6 mos, cancer, heart disease, renal disease, diabetes, neurologic conditions, malnutrition, respiratory conditions

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.05 (0.95, 1.16)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3

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Mehta 2021a *(Continued)*

Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Hospitalisation	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Mehta 2021b

Study characteristics

Notes

English title

Epicardial adipose tissue thickness is associated with increased severity and mortality related to SARS-CoV-2 infection

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

NR

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

NR

Number of participants recruited

748

Sampling method

consecutive participants

Participants

Female participants

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Mehta 2021b *(Continued)*

(absolute number), 278

Age measure, value

mean (standard deviation), 51.22 (13.62)

Inclusion criteria

This study included consecutive patients evaluated at the Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán (INCMNSZ), a COVID-19 reference centre in Mexico City between 17th March and 31st May 2020.

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 191

Hypertension

(absolute number), 212

Cardiovascular diseases

(proportion), 19

Please indicate if additional information is available

NR

Asthma

NRNR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 26

Cancer

NR

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Mehta 2021b *(Continued)*

Steroid administration

NR

Supplemental oxygen

(absolute number), 138

Differential values for various oxygenation methods (if indicated)

intubation

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

unspecified

Measure of frequency

absolute number

Frequency value

300

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

mortality, mechanical ventilation

Outcome (prognostic factor)

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Mehta 2021b *(Continued)*

Mortality (obesity)

Outcome

Mortality

Prognostic factor (category):

Obesity

Follow-up

Number of patients followed completely for this outcome

748

Number of obese patients followed completely for this outcome

300

Number of non-obese patients followed completely for this outcome

448

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.091 (0.93, 1.28)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, gender and comorbid conditions

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.262 (1.042, 1.529)

Outcome (prognostic factor)

invasive ventilation (obesity)

Outcome

invasive ventilation

Prognostic factor (category):

Obesity

Follow-up

Number of patients followed completely for this outcome

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Mehta 2021b *(Continued)*

748

Number of obese patients followed completely for this outcome

300

Number of non-obese patients followed completely for this outcome

448

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.408 (1.167, 1.705)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, gender and comorbid conditions

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.418 (1.149, 1.766)

Outcome (prognostic factor)

Mortality (visceral obesity (based on epicardial adipose tissue))

Outcome

Mortality

Prognostic factor (category):

visceral obesity (based on epicardial adipose tissue)

Follow-up

Number of patients followed completely for this outcome

748

Number of obese patients followed completely for this outcome

150

Number of non-obese patients followed completely for this outcome

598

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

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Mehta 2021b *(Continued)*

hazard ratio

Effect measure value (95% CI)

1.57 (1.123, 2.196)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, gender and comorbid conditions, BMI

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.409 (1.006, 1.975)

Outcome (prognostic factor)

invasive ventilation (visceral obesity (based on epicardial adipose tissue))

Outcome

invasive ventilation

Prognostic factor (category):

visceral obesity (based on epicardial adipose tissue)

Follow-up

Number of patients followed completely for this outcome

748

Number of obese patients followed completely for this outcome

150

Number of non-obese patients followed completely for this outcome

598

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.69 (1.094, 2.572)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

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Mehta 2021b *(Continued)*

age, gender and comorbid conditions, BMI

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.689 (1.078, 2.614)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Unclear	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Merzon 2022

Study characteristics

Notes

English title

The association between ADHD and the severity of COVID-19 infection

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

06/2020

Study design

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Merzon 2022 *(Continued)*

registry data

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

outpatient and inpatient

Number of participants recruited

1870

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 885

Age measure, value

mean (standard deviation), 29.03 (14.8)

Inclusion criteria

The study population included all the COVID-19 positive (COVID-19+) patients. Participants were limited to age range of 5 to 60-year-old

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 82

Hypertension

(absolute number), 102

Cardiovascular diseases

(absolute number), 53

Please indicate if additional information is available

NR

Asthma

(absolute number), 123

Chronic obstructive pulmonary disease

(absolute number), 6

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Merzon 2022 *(Continued)*

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity: BMI ≥ 30

The time when obesity has been measured

some time after presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

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Merzon 2022 *(Continued)*

NR

Measure of frequency

absolute number

Frequency value

330

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

hospitalisation

Outcome (prognostic factor)

hospitalisation (BMI ≥ 30)

Outcome

hospitalisation

Prognostic factor (category):

BMI ≥ 30

Follow-up

Number of patients followed completely for this outcome

1870

Number of obese patients followed completely for this outcome

330

Number of non-obese patients followed completely for this outcome

1016

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.62 (1.04, 2.53)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex, SES, depression/anxiety, schizophrenia, hypertension, asthma, COPD, obesity, smoking

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Merzon 2022 *(Continued)*

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.96 (0.57, 1.6)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Monteiro 2020

Study characteristics

Notes

English title

Obesity and smoking as risk factors for invasive mechanical ventilation in COVID-19 respiratory failure: a retrospective, observational cohort study

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres/clinics/areas: 2

Study setting: Inpatient

Number of participants recruited: 112

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 38

Age measure, value: Median (IQR), 61 (45-74)

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Monteiro 2020 *(Continued)*

Inclusion criteria: Hospitalised patients at RR-UCLA and SM-UCLA ≥ 18 years old with positive SARS-CoV-2 PCR testing from either nasal swab or mini-bronchoalveolar lavage (BAL) testing

Exclusion criteria: One patient who incidentally tested positive for COVID-19 but died from complications from a motor vehicle collision before COVID-directed inpatient management was initiated

Smoking frequency: 27

Diabetes frequency: 72

Hypertension frequency: 56

Cardiovascular disease frequency: 17

Asthma frequency: 13

Chronic obstructive pulmonary disease frequency: 6

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 19

Cancer frequency: 15

Steroid administration frequency: 11

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: NR

Obesity frequency (absolute number): 40

Prognostic factor(s): Obesity

Outcome(s)

Mechanical ventilation

Outcome (prognostic factor)

Mechanical ventilation (obesity)

Follow-up

Number of patients followed completely for the outcome: 112

Number of obese patients followed completely for the outcome: 40

Number of non-obese patients followed completely for the outcome: 72

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

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Monteiro 2020 *(Continued)*

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, DM, HTN, smoking, CAD, CKD

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.82 (1.74, 19.48), < 0.01

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Mostaghim 2020

Study characteristics

Notes

English title

Clinical outcomes and inflammatory marker levels in patients with Covid-19 and obesity at an inner-city safety net hospital

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres/clinics/areas: 1

Study setting: Inpatient

Number of participants recruited: 791

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 331

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Mostaghim 2020 *(Continued)*

Age measure, value: Median (IQR), 65 (20)

Inclusion criteria: Patients aged > 18 years who were hospitalised with a positive SARS-CoV-2 polymerase chain reaction (PCR) test between March 4 and May 1, 2020

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 223

Hypertension frequency: 348

Cardiovascular disease frequency: 56

Asthma frequency: 71

Chronic obstructive pulmonary disease frequency: 38

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 25

Cancer frequency: 6

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 572

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI 25 to < 30 kg/m^2 overweight, and BMI > 30 kg/m^2 obesity

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: 30

Obesity frequency (absolute number): 363

Prognostic factor(s): 30 < BMI < 35 (obesity class 1), 35 < BMI

Outcome(s)

ICU admission, mortality

Outcome (prognostic factor)

ICU admission (30 < BMI < 35 (obesity class 1))

Follow-up

Number of patients followed completely for the outcome: 786

Number of obese patients followed completely for the outcome: 358

Number of non-obese patients followed completely for the outcome: 428

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

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Mostaghim 2020 *(Continued)*

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Sex, maximum fiO2 requirements, IL-6 administration, and LDH

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.22 (1.06, 4.61), NR

Outcome (prognostic factor)

ICU admission (35 < BMI)

Follow-up

Number of patients followed completely for the outcome: 786

Number of obese patients followed completely for the outcome: 358

Number of non-obese patients followed completely for the outcome: 428

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Sex, maximum fiO2 requirements, IL-6 administration, and LDH

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.39 (1.07, 5.31), NR

Outcome (prognostic factor)

Mortality (35 < BMI)

Follow-up

Number of patients followed completely for the outcome: 786

Number of obese patients followed completely for the outcome: 358

Number of non-obese patients followed completely for the outcome: 428

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Sex, maximum fiO2 requirements, IL-6 administration, and LDH

Effect measure for obesity: Odds ratio

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Mostaghim 2020 *(Continued)*

Effect measure value (95% CI), P value: 4.27 (1.69,10.82), NR

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Motaib 2021

Study characteristics

Notes

English title

Obesity and disease severity among patients with COVID-19

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

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Motaib 2021 *(Continued)*

1

Study setting

inpatient

Number of participants recruited

107

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 43

Age measure, value

median (interquartile range), 53 (36, 64)

Inclusion criteria

We included all adult patients with laboratory-confirmed SARS-CoV-2 infection, using a reverse transcriptase-polymerase chain reaction assay, who were admitted to Sheikh Khalifa Ibn Zaid International University Hospital between March 20 and May 10, 2020.

Exclusion criteria

We excluded from our study pregnant women and those patients under the age of 18.

Smoking

NR

Diabetes

(absolute number), 16

Hypertension

(absolute number), 33

Cardiovascular diseases

(absolute number), 16

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

(absolute number), 9

Please indicate if additional information is available

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Motaib 2021 *(Continued)*

in terms of respiratory disease

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

NR

Supplemental oxygen

(absolute number), 13

Differential values for various oxygenation methods (if indicated)

in terms of invasive mechanical ventilation

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

According to the WHO classification, obesity was defined as having a body mass index (BMI) greater than or equal to 30 kg/m^2 (BMI ≥ 30 kg/m^2)

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

NR

Measure of frequency

absolute number

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Motaib 2021 *(Continued)*

Frequency value

24

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

ICU admission

Outcome (prognostic factor)

ICU admission (BMI ≥ 30)

Outcome

ICU admission

Prognostic factor (category):

BMI ≥ 30

Follow-up

Number of patients followed completely for this outcome

107

Number of obese patients followed completely for this outcome

24

Number of non-obese patients followed completely for this outcome

83

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.75 (1.08, 6.97)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, obesity, HTN, DM, CVD, other diseases, respiratory symptoms

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

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Motaib 2021 *(Continued)*

5.24 (1.05, 26.2)

Outcome (prognostic factor)

ICU admission (BMI ≥ 30)

Outcome

ICU admission

Prognostic factor (category):

BMI ≥ 30

Follow-up

Number of patients followed completely for this outcome

107

Number of obese patients followed completely for this outcome

24

Number of non-obese patients followed completely for this outcome

83

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.12 (1.1, 8.86)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, obesity, HTN, DM, CVD, respiratory, dyslipidaemia, other diseases, clinical symptoms

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

9.55 (1.36, 67.29)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3

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Motaib 2021 *(Continued)*

Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Muñoz-Rodríguez 2021

Study characteristics

Notes

English title

Characteristics and risk factors associated with mortality in a multicenter Spanish cohort of patients with COVID-19 pneumonia

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

prospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

14

Study setting

outpatient and inpatient

Number of participants recruited

12,126

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 5667

Age measure, value

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Muñoz-Rodríguez 2021 *(Continued)*

mean (standard deviation), 66.4 (17.3)

Inclusion criteria

Participants were adult patients (> 18 years old) transferred between hospitals or attended in the referral hospital, meeting one or more laboratory criteria and/or one or more clinical criteria of suspected COVID-19.

Exclusion criteria

Non-criteria inclusion for patients, subsequent admissions, transfers or duplicates for the same patient, and paediatric patient (< 18 years old) were excluded in our study.

Smoking

NR

Diabetes

NR

Hypertension

(absolute number), 6276

Cardiovascular diseases

(absolute number), 3006

Please indicate if additional information is available

with respect to cardiac pathology

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

(absolute number), 2735

Please indicate if additional information is available

with respect to respiratory pathology

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

(absolute number), 4785

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Muñoz-Rodríguez 2021 *(Continued)*

Supplemental oxygen

(absolute number), 1294

Differential values for various oxygenation methods (if indicated)

Invasive ventilation = 530, non-invasive ventilation = 764

Other treatment

absolute number

Dose if applicable

Antiretroviral treatment included 100 mg lopinavir/25 mg ritonavir, 200 mg emtricitabine/245 mg tenofovir disoproxil or 800 mg darunavir/150 mg cobicistat

Duration if applicable

NR

Percentage received this treatment

in absolute number, antiretroviral treatment = 3337; chloroquine = 7910; interferon B-1b = 292; azithromycin = 7741; tocilizumab = 370

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

other (please specify)

Threshold used for definition of obesity

NR

Measure of frequency

absolute number

Frequency value

2100

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (obesity)

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Muñoz-Rodríguez 2021 *(Continued)*

Outcome

Mortality

Prognostic factor (category):

Obesity

Follow-up

Number of patients followed completely for this outcome

12,126

Number of obese patients followed completely for this outcome

2100

Number of non-obese patients followed completely for this outcome

9086

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

sex, age, HBP, cardiac pathology, respiratory pathology, obesity, symptoms, clinical features, treatment

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.3 (1.1, 1.5)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Muñoz-Rodríguez 2021 *(Continued)*

Mortality		
Confounding Bias Mortality	No	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Nachega 2020

Study characteristics

Notes

English title

Clinical characteristics and outcomes of patients hospitalized for COVID-19 in Africa: early insights from the Democratic Republic of the Congo

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 07/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres/clinics/areas: 7

Study setting: Inpatient

Number of participants recruited: 766

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 262

Age measure, value: Median (IQR), 46 (34-58)

Inclusion criteria: All COVID-19 patients admitted at the seven largest health facilities in Kinshasa (one private, two faith-based Catholic, and four public)

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 107

Hypertension frequency: 194

Cardiovascular disease frequency: 30

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 7

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Nachega 2020 *(Continued)*

Cancer frequency: 5

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (absolute number): Chloroquine (630), azithromycin (742)

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: NR

Threshold used for definition of obesity: NR

Obesity frequency (absolute number): 39

Prognostic factor(s): Obesity

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 764

Number of obese patients followed completely for the outcome: 39

Number of non-obese patients followed completely for the outcome: 725

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.87 (2.86, 6.56), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, hypertension, diabetes mellitus, heart disease, chronic kidney disease (CKD), cancer, chloroquine/azithromycin-based treatment vs. other

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.3 (1.24, 4.27), 0.009

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3

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Nachega 2020 *(Continued)*

Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Nakeshbandi 2020

Study characteristics

Notes

English title

The impact of obesity on COVID-19 complications: a retrospective cohort study

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres/clinics/areas: 1

Study setting: Inpatient

Number of participants recruited: 504 (cohort 1), 263 (cohort 2), 241 (cohort 3), 155 (cohort 4), 316 (cohort 5)

Sampling method: NR

Participants

Female participants (absolute number): 241 (cohort 1), 0 (cohort 2), 241 (cohort 3), NR (cohort 4), NR (cohort 5)

Age measure, value: Mean (SD) 68 (15) (cohort 1), NR (cohort 2), NR (cohort 3), NR (cohort 4), NR (cohort 5)

Inclusion criteria: The population included patients 18 years of age or older who were admitted from March 10th to April 13th 2020.

Exclusion criteria: Patients were excluded from the study if their COVID-19 test was negative; if body mass index (BMI) was not recorded in the electronic medical record or if the patient was underweight (defined as a BMI < 18.50 kg/m^2); and if they were still admitted to the hospital at the end of the study period.

Smoking frequency: 71 (cohort 1), NR (cohort 2), NR (cohort 3), NR (cohort 4), NR (cohort 5)

Diabetes frequency: 269 (cohort 1), NR (cohort 2), NR (cohort 3), NR (cohort 4), NR (cohort 5)

Hypertension frequency: 416 (cohort 1), NR (cohort 2), NR (cohort 3), NR (cohort 4), NR (cohort 5)

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Nakeshbandi 2020 *(Continued)*

Cardiovascular disease frequency: 96 (cohort 1), NR (cohort 2), NR (cohort 3), NR (cohort 4), NR (cohort 5)

Asthma frequency: 41 (cohort 1), NR (cohort 2), NR (cohort 3), NR (cohort 4), NR (cohort 5)

Chronic obstructive pulmonary disease frequency: 41 (cohort 1), NR (cohort 2), NR (cohort 3), NR (cohort 4), NR (cohort 5)

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 81 (cohort 1), NR (cohort 2), NR (cohort 3), NR (cohort 4), NR (cohort 5)

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Normal (BMI 18.50–24.99 kg/m^2), overweight (BMI 25.00–29.99 kg/m^2), and obese (BMI ≥ 30.00 kg/m^2)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition of obesity: 30

Obesity frequency (absolute number): 215 (cohort 1), 95 (cohort 2), 120 (cohort 3), 93 (cohort 4), 105 (cohort 5)

Prognostic factor(s): BMI 25.00–29.99 kg/m^2, BMI > 30 kg/m^2

Outcome(s)

Mortality, mechanical ventilation

Outcome (prognostic factor)

Mortality (BMI 25.00–29.99 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 504 (cohort 1), 263 (cohort 2), 241 (cohort 3), 155 (cohort 4), 316 (cohort 5)

Number of obese patients followed completely for the outcome: 215 (cohort 1), 95 (cohort 2), 120 (cohort 3), 93 (cohort 4), 105 (cohort 5)

Number of non-obese patients followed completely for the outcome: 289 (cohort 1), 168 (cohort 2), 121 (cohort 3), 62 (cohort 4), 211 (cohort 5)

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

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Nakeshbandi 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, sex, diabetes mellitus, hypertension, and the quick sequential organ failure assessment (QSOFA) score measured on patient admission

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.4 (1.1, 1.9), 0.003 (cohort 1), 1.5 (1.1, 2.0), 0.02 (cohort 2), 1.6 (1.0, 2.6), 0.03 (cohort 3), 1.05 (0.44, 2.5), 0.91 (cohort 4), 1.5 (1.2, 2.0), 0.002 (cohort 5)

Outcome (prognostic factor)

Mortality (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 504 (cohort 1), 263 (cohort 2), 241 (cohort 3), 155 (cohort 4), 316 (cohort 5)

Number of obese patients followed completely for the outcome: 215 (cohort 1), 95 (cohort 2), 120 (cohort 3), 93 (cohort 4), 105 (cohort 5)

Number of non-obese patients followed completely for the outcome: 289 (cohort 1), 168 (cohort 2), 121 (cohort 3), 62 (cohort 4), 211 (cohort 5)

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, diabetes mellitus, hypertension, and the quick sequential organ failure assessment (QSOFA) score measured on patient admission

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.3 (1.0, 1.7), 0.04 (cohort 1), 1.4 (1.0, 2.0), 0.03 (cohort 2), 1.2 (0.77, 1.9), 0.40 (cohort 3), 1.5 (0.77, 2.9), 0.23 (cohort 4), 1.3 (0.94, 1.7), 0.12 (cohort 5)

Outcome (prognostic factor)

Mechanical ventilation (BMI 25.00–29.99 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 504 (cohort 1), 263 (cohort 2), 241 (cohort 3), 155 (cohort 4), 316 (cohort 5)

Number of obese patients followed completely for the outcome: 215 (cohort 1), 95 (cohort 2), 120 (cohort 3), 93 (cohort 4), 105 (cohort 5)

Number of non-obese patients followed completely for the outcome: 289 (cohort 1), 168 (cohort 2), 121 (cohort 3), 62 (cohort 4), 211 (cohort 5)

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

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Nakeshbandi 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, sex, diabetes mellitus, hypertension, and the quick sequential organ failure assessment (QSOFA) score measured on patient admission

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 2.0 (1.2, 3.3), 0.0 (cohort 1), 1.6 (0.84, 3.2), 0.15 (cohort 2), 2.7 (1.0, 6.9), 0.04 (cohort 3), 2.3 (0.72, 7.1), 0.16 (cohort 4), 1.8 (0.97, 3.2), 0.06 (cohort 5)

Outcome (prognostic factor)

Mechanical ventilation (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 504 (cohort 1), 263 (cohort 2), 241 (cohort 3), 155 (cohort 4), 316 (cohort 5)

Number of obese patients followed completely for the outcome: 215 (cohort 1), 95 (cohort 2), 120 (cohort 3), 93 (cohort 4), 105 (cohort 5)

Number of non-obese patients followed completely for the outcome: 289 (cohort 1), 168 (cohort 2), 121 (cohort 3), 62 (cohort 4), 211 (cohort 5)

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, diabetes mellitus, hypertension, and the quick sequential organ failure assessment (QSOFA) score measured on patient admission

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 2.4 (1.5, 4.0), < 0.001 (cohort 1), 2.5 (1.4, 4.5), 0.003 (cohort 2), 2.3 (0.93, 5.9), 0.07 (cohort 3), 3.0 (1.1, 8.0), 0.03 (cohort 4), 2.1 (1.1, 3.8), 0.02 (cohort 5)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias	Yes	Appendix 3

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Nakeshbandi 2020 *(Continued)*

Mortality		
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Neveu 2021

Study characteristics

Notes

English title

COVID-19 and obesity in Atlanta

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

retrospective cohort

Study centre(s)

unspecified

Number of centres/clinics/areas

NR

Study setting

inpatient

Number of participants recruited

285

Sampling method

unspecified

Participants

Female participants

NR

Age measure, value

NR()

Inclusion criteria

patients admitted with COVID-19 within the Emory Healthcare System between March 6, 2020 and May 5, 2020 who spent time in the ICU during their hospitalisation

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Neveu 2021 *(Continued)*

Exclusion criteria

NR

Smoking

NR

Diabetes

NR

Hypertension

NR

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

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Neveu 2021 *(Continued)*

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

BMI > 30

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

149

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (BMI continuous (per unspecified kg/m^2))

Outcome

mortality

Prognostic factor (category):

BMI continuous (per unspecified kg/m^2)

Follow-up

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Neveu 2021 *(Continued)*

Number of patients followed completely for this outcome

285

Number of obese patients followed completely for this outcome

149

Number of non-obese patients followed completely for this outcome

136

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

severity of illness as indicated by sequential organ failure assessment score and age

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.94 (0.90, 0.98)

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

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Newton 2020

Study characteristics

Notes

English title

Factors associated with clinical severity in emergency department patients presenting with symptomatic SARS-CoV-2 infection.

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 08/2020

Study design: Case-series

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Outpatient and inpatient

Number of participants recruited: 993

Sampling method: NR

Participants

Female participants (absolute number): 504

Age measure, value: Mean (SD), 52.09 (18.1)

Inclusion criteria: Patients were included in this analysis if they presented to the ED with a chief complaint(s) consistent with COVID-19 and they tested positive for SARS-CoV-2 by nasopharyngeal swab using a polymerase chain reaction (PCR) platform.

Exclusion criteria: Patients with positive SARS-CoV-2 results who were tested by protocol for another condition unrelated to COVID-19 such as trauma, intoxication, poisoning, suicidality, involuntary commitment, or isolated complaints highly unlikely to be related to COVID-19 (e.g. suture removal) were not included in this analysis. Additionally, asymptomatic, swab-positive patients tested for reasons other than a clinician's suspicion of COVID-19 disease were not included in this study.

Smoking frequency: 110

Diabetes frequency: 246

Hypertension frequency: 434

Cardiovascular disease frequency: 57

Asthma frequency: 134

Chronic obstructive pulmonary disease frequency: 57

Other pulmonary disease frequency: 12

Immunosuppression frequency: 37

Chronic kidney disease frequency: NR

Cancer frequency: 53

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

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Newton 2020 *(Continued)*

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): 232

Prognostic factor(s): Obesity

Outcome(s)

Hospitalisation (composite of hospitalisation or death)

ICU admission (composite of ICU care or death)

Outcome (prognostic factor)

Hospitalisation (obesity)

Follow-up

Number of patients followed completely for the outcome: 993

Number of obese patients followed completely for the outcome: 232

Number of non-obese patients followed completely for the outcome: 760

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, race, ethnicity, health insurance, and co-morbidities with need for hospitalisation

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.69 (1.13, 2.53), 0.0111

Outcome (prognostic factor)

ICU admission (obesity)

Follow-up

Number of patients followed completely for the outcome: 993

Number of obese patients followed completely for the outcome: 232

Number of non-obese patients followed completely for the outcome: 760

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

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Newton 2020 *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, race, ethnicity, health insurance, and co-morbidities with need for hospitalisation

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.35 (0.66, 2.78), 0.4136

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement ICU admission	Unclear	Appendix 3
Outcome Measurement Hospitalisation	Unclear	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Nicholson 2021

Study characteristics

Notes

English title

Estimating risk of mechanical ventilation and in-hospital mortality among adult COVID-19 patients admitted to Mass General Brigham: the VICE and DICE scores

Study setting

Start of study recruitment (MM/YYYY)

NR

End of study recruitment (MM/YYYY)

05/2020

Study design

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Nicholson 2021 *(Continued)*

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

5

Study setting

inpatient

Number of participants recruited

1042

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 450

Age measure, value

median (interquartile range), 64 (53, 75)

Inclusion criteria

Only laboratory-confirmed cases of those that were sufficiently ill to require hospital admission were included.

Exclusion criteria

We excluded children (those younger than 18 years of age) from the study. Patients that were treated with comfort measures only (CMO) on arrival (n = 95) to the hospital were excluded from the study.

Smoking

NR

Diabetes

(absolute number), 443

Hypertension

(absolute number), 588

Cardiovascular diseases

(absolute number), 182

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

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Nicholson 2021 *(Continued)*

(absolute number),123

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 174

Cancer

(absolute number), 166

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

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Nicholson 2021 *(Continued)*

Threshold used for definition of obesity

NR

Measure of frequency

NR

Frequency value

NR

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (BMI continuous (per unspecified kg/m^2))

Outcome

mortality

Prognostic factor (category):

BMI continuous (per unspecified kg/m^2)

Follow-up

Number of patients followed completely for this outcome

1042

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.98 (0.95, 1.00)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

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Nicholson 2021 *(Continued)*

Age (for every 10 years), sex, coronary artery disease, diabetes mellitus, statin (chronic use), SpO2:FiO2 ratio (for every 100 increase), body mass index, neut:lymph ratio (for 10x increase), platelets (for every 50×109/L increase), procalcitonin (ng/mL)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.067 (1.017, 1.120)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Nyabera 2020

Study characteristics

Notes

English title

The association between BMI and inpatient mortality outcomes in older adults with COVID- 19

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 290

Sampling method: NR

Participants

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Nyabera 2020 *(Continued)*

Female participants (absolute number): 140

Age measure, value: Mean (SD), 77.6 (8.3)

Inclusion criteria: Older adults (> 65 years) with laboratory-confirmed COVID-19 infection via polymerase chain reaction (PCR) admitted to a community teaching hospital in New York City between February 1st, 2020 and April 30th, 2020

Exclusion criteria: Patients were excluded from the study if they did not have a BMI documented or transferred to another acute care facility to continue care.

Smoking frequency: NR

Diabetes frequency: 150

Hypertension frequency: 236

Cardiovascular disease frequency: 80

Asthma frequency: 18

Chronic obstructive pulmonary disease frequency: 19

Other pulmonary disease frequency: 11 (obstructive sleep apnoea)

Immunosuppression frequency: NR

Chronic kidney disease frequency: 37

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI (kg/m^2) was analysed as a categorical variable. BMI was divided into six categories: BMI < 18.5, BMI 18.5-25.9, BMI 26-29.9, BMI 30-35.9, BMI 36-40, and BMI > 40.

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 89

Prognostic factor(s): 25 < BMI < 30 kg/m^2 (overweight)

30 < BMI < 35 kg/m^2 (obesity class 1)

35 < BMI < 40 kg/m^2 (obesity class 2)

BMI > 40 kg/m^2 (obesity class 3)

Outcome(s)

Mortality

Mechanical ventilation

Outcome (prognostic factor)

Mortality (25 < BMI < 30 kg/m^2 (overweight))

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Nyabera 2020 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 290

Number of obese patients followed completely for the outcome: 89

Number of non-obese patients followed completely for the outcome: 201

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, CAD, COPD, DM, ESRD, hypertension

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.47 (0.15, 1.46), 0.19

Outcome (prognostic factor)

Mortality (30 < BMI < 35 kg/m^2 (obesity class 1))

Follow-up

Number of patients followed completely for the outcome: 290

Number of obese patients followed completely for the outcome: 89

Number of non-obese patients followed completely for the outcome: 201

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, CAD, COPD, DM, ESRD, hypertension

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.63 (0.20, 2.02), 0.44

Outcome (prognostic factor)

Mortality (35 < BMI < 40 kg/m^2 (obesity class 2))

Follow-up

Number of patients followed completely for the outcome: 290

Number of obese patients followed completely for the outcome: 89

Number of non-obese patients followed completely for the outcome: 201

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

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Nyabera 2020 *(Continued)*

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, CAD, COPD, DM, ESRD, hypertension

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.00 (0.25, 4.03), 1.00

Outcome (prognostic factor)

Mortality (BMI > 40 kg/m^2 (obesity class 3))

Follow-up

Number of patients followed completely for the outcome: 290

Number of obese patients followed completely for the outcome: 89

Number of non-obese patients followed completely for the outcome: 201

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, CAD, COPD, DM, ESRD, hypertension

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.50 (0.13, 1.85), 0.30

Outcome (prognostic factor)

Mechanical ventilation (25 < BMI < 30 kg/m^2 (overweight))

Follow-up

Number of patients followed completely for the outcome: 290

Number of obese patients followed completely for the outcome: 89

Number of non-obese patients followed completely for the outcome: 201

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, CAD, COPD, DM, ESRD, hypertension

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.26 (0.05, 1.44), 0.12

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Nyabera 2020 *(Continued)*

Outcome (prognostic factor)

Mechanical ventilation (30 < BMI < 35 kg/m^2 (obesity class 1))

Follow-up

Number of patients followed completely for the outcome: 290

Number of obese patients followed completely for the outcome: 89

Number of non-obese patients followed completely for the outcome: 201

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, CAD, COPD, DM, ESRD, hypertension

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.17 (0.03, 1.01), 0.05

Outcome (prognostic factor)

Mechanical ventilation (35 < BMI < 40 kg/m^2 (obesity class 2))

Follow-up

Number of patients followed completely for the outcome: 290

Number of obese patients followed completely for the outcome: 89

Number of non-obese patients followed completely for the outcome: 201

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, CAD, COPD, DM, ESRD, hypertension

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.47 (0.07, 3.36), 0.45

Outcome (prognostic factor)

Mortality (BMI > 40 kg/m^2 (obesity class 3))

Follow-up

Number of patients followed completely for the outcome: 290

Number of obese patients followed completely for the outcome: 89

Number of non-obese patients followed completely for the outcome: 201

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Nyabera 2020 *(Continued)*

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, CAD, COPD, DM, ESRD, hypertension

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.74 (0.11, 4.96), 0.75

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Olivas-Martínez 2021

Study characteristics

Notes

English title

In-hospital mortality from severe COVID-19 in a tertiary care center in Mexico City; causes of death, risk factors and the impact of hospital saturation

Study setting

Start of study recruitment (MM/YYYY)

02/2020

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Olivas-Martínez 2021 *(Continued)*

End of study recruitment (MM/YYYY)

06/2020

Study design

prospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

800

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 312

Age measure, value

mean(standard deviation), 51.9 (13.9)

Inclusion criteria

All patients included in this cohort had a positive real-time reverse transcription-polymerase chain reaction (PCR) either from a naso/oropharyngeal swab or from a tracheal aspirate by a procedure previously described, chest computed tomography scan compatible with diagnosis of COVID-19 pneumonia, routine blood workup (including complete blood count, inflammatory markers, metabolic panel and arterial blood gas analysis) and required hospital admission due to hypoxaemia.

Exclusion criteria

143 patients (14%) did not meet inclusion criteria due to negative or indeterminate SARS-CoV-2 PCR results, we excluded 62 patients due to inter-hospital transfer and unknown clinical outcome (transfer to another hospital with available ICU beds owing to clinical deterioration) and 13 patients that were discharged against medical advice.

Smoking

NR

Diabetes

(absolute number), 209

Hypertension

(absolute number), 240

Cardiovascular diseases

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Olivas-Martínez 2021 *(Continued)*

(absolute number), 37

Please indicate if additional information is available

NR

Asthma

(absolute number), 11

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

(absolute number), 7

Please indicate if additional information is available

Chronic lung disease

Immunosupression

(absolute number), 48

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 24

Cancer

NR

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

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Olivas-Martínez 2021 *(Continued)*

Study's definition for obesity

Obesity (BMI > 30 kg/m^2)

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

357 out of 797

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (BMI > 30)

Outcome

mortality

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

800

Number of obese patients followed completely for this outcome

357

Number of non-obese patients followed completely for this outcome

440

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

relative risk

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Olivas-Martínez 2021 *(Continued)*

Effect measure value (95% CI)

1.42 (0.99, 2.03)

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

age and gender

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.62 (1.14, 2.32)

Outcome (prognostic factor)

mortality (BMI > 40)

Outcome

mortality

Prognostic factor (category):

BMI > 40

Follow-up

Number of patients followed completely for this outcome

800

Number of obese patients followed completely for this outcome

43

Number of non-obese patients followed completely for this outcome

754

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

relative risk

Effect measure value (95% CI)

2.24 (1.38, 3.61)

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

age and gender

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Olivas-Martínez 2021 *(Continued)*

Effect measure for obesity

relative risk

Effect measure value (95% CI)

2.41 (1.53, 3.81)

Outcome (prognostic factor)

mortality(BMI > 40)

Outcome

mortality

Prognostic factor (category):

BMI > 40

Follow-up

Number of patients followed completely for this outcome

800

Number of obese patients followed completely for this outcome

43

Number of non-obese patients followed completely for this outcome

754

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

relative risk

Effect measure value (95% CI)

3.15 (1.51, 6.55)

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

age and gender

Effect measure for obesity

relative risk

Effect measure value (95% CI)

3.38 (1.63, 7.00)

Outcome (prognostic factor)

mortality (BMI 35 to 40)

Outcome

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Olivas-Martínez 2021 *(Continued)*

mortality

Prognostic factor (category):

BMI 35 to 40

Follow-up

Number of patients followed completely for this outcome

800

Number of obese patients followed completely for this outcome

84

Number of non-obese patients followed completely for this outcome

713

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.47 (0.66, 3.26)

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

age and gender

Effect measure for obesity

relative risk

Effect measure value (95% CI)

2.02 (0.94, 4.34)

Outcome (prognostic factor)

mortality (BMI 30 to 35)

Outcome

mortality

Prognostic factor (category)

BMI 30 to 35

Follow-up

Number of patients followed completely for this outcome

800

Number of obese patients followed completely for this outcome

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Olivas-Martínez 2021 *(Continued)*

223

Number of non-obese patients followed completely for this outcome

574

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.64 (0.85, 3.17)

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

age and gender

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.7 (0.89, 3.21)

Outcome (prognostic factor)

mortality (BMI 25 to 30)

Outcome

mortality

Prognostic factor (category):

BMI 25 to 30

Follow-up

Number of patients followed completely for this outcome

800

Number of obese patients followed completely for this outcome

290

Number of non-obese patients followed completely for this outcome

507

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

relative risk

Effect measure value (95% CI)

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Olivas-Martínez 2021 *(Continued)*

1.36 (0.71, 2.64)

Multivariable (adjusted) analysis for obesity

Modelling method

other (please specify)

The set of prognostic factors used for adjustment

age and gender

Effect measure for obesity

relative risk

Effect measure value (95% CI)

1.37 (0.72, 2.63)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Omrani 2020

Study characteristics

Notes

English title

The first consecutive 5000 patients with Coronavirus Disease 2019 from Qatar; a nation-wide cohort study

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

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Omrani 2020 *(Continued)*

Study setting: Outpatient and inpatient

Number of participants recruited: 5000

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 564

Age measure, value: Median (IQR), 35 (28, 43)

Inclusion criteria: The first consecutive 5000 patients with RT-PCR-confirmed COVID-19 who would complete 60 days of follow up from date of diagnosis

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 470

Hypertension frequency: 476

Cardiovascular disease frequency: 61

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 156

Immunosuppression frequency: NR

Chronic kidney disease frequency: 44

Cancer frequency: 31

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Body mass index (BMI), defined as body weight in kilograms divided by squared height in metres

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: Not applicable

Obesity frequency (absolute number): NR

Prognostic factor(s): BMI (per 1 kg/m^2 increase)

Outcome(s)

ICU admission

Outcome (prognostic factor)

ICU admission (BMI (per one kg/m^2 increase))

Follow-up

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Omrani 2020 *(Continued)*

Number of patients followed completely for the outcome: 1409

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.067 (1.033, 1.102), < 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: The final multivariable logistic regression model included age, male sex, body mass index (BMI), defined as body weight in kilograms divided by squared height in metres, and co-existing diabetes mellitus, systemic hypertension, coronary artery disease, chronic liver disease, and chronic kidney disease.

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.067 (1.027, 1.108), 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition ICU admission	No	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Pablos 2020

Study characteristics

Notes

English title

Clinical outcomes of hospitalized patients with COVID-19 and chronic inflammatory and autoimmune rheumatic diseases: a multicentric matched cohort study

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 04/2020

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Pablos 2020 *(Continued)*

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 5

Study setting: Inpatient

Number of participants recruited: 456

Sampling method: NR

Participants

Female participants (absolute number): 133

Age measure, value: Mean (SD), 64 (17.74)

Inclusion criteria: The rheumatology cohort included all adult patients diagnosed with chronic inflammatory arthritis (IA), including rheumatoid arthritis, psoriatic arthritis (PsA) and spondylarthritis (SpA); CTD, including systemic lupus erythematosus (SLE), Sjögren's syndrome (SS), systemic sclerosis, polymyalgia rheumatica (PMR), vasculitis and so on (online supplementary table S1) with a PCR + COVID-19 diagnosis. The control cohort was assembled from the Microbiology databases of the participating centres matched on a 1:1 basis with the rheumatic cohort on the date of COVID-19 diagnosis ('index date'), sex and age, and blinded to outcome or other variables.

Exclusion criteria: In the control cohort, patients with CTD were excluded.

Smoking frequency: NR

Diabetes frequency: 85

Hypertension frequency: 210

Cardiovascular disease frequency: 106

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 93

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: 110

Supplemental oxygen administration frequency: 260

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: Unspecified

Threshold used for definition: NR

Obesity frequency (absolute number): 109

Prognostic factor(s): Obesity

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Pablos 2020 *(Continued)*

Outcome(s)

Severe COVID

Outcome (prognostic factor)

Severe COVID (obesity)

Follow-up

Number of patients followed completely for the outcome: 456

Number of obese patients followed completely for the outcome: 109

Number of non-obese patients followed completely for the outcome: 342

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.78 (1.13, 2.81), 0.013

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Adjusted for selected comorbidities and glucocorticoids use

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.47 (0.86, 2.51), 0.164

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Palaiodimos 2020

Study characteristics	
Notes	**English title**

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Palaiodimos 2020 *(Continued)*

Severe obesity, increasing age and male sex are independently associated with worse in-hospital outcomes, and higher in-hospital mortality, in a cohort of patients with COVID-19 in the Bronx, New York

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 03/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 200

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 102

Age measure, value: Median (IQR), 64 (50-73.5)

Inclusion criteria: The first patients who presented to the emergency room (ER) and were admitted to the inpatient medicine service or the intensive care unit (ICU) with laboratory-confirmed COVID-19

Exclusion criteria: 1. Discharge home directly from the ER, 2. Transfer to the centre after having received care in other institutions, 3. Admission for non-COVID-19 related reasons or non-medical reasons (e.g. patients admitted because of a fracture, clinically stable patients residing in group homes unable to self-isolate)

Smoking frequency: 65

Diabetes frequency: 79

Hypertension frequency: 152

Cardiovascular disease frequency: 34

Asthma frequency: 27

Chronic obstructive pulmonary disease frequency: 28

Other pulmonary disease frequency: NR

Immunosuppression frequency: 5

Chronic kidney disease frequency: 58

Cancer frequency: 11

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): 17 (immunosuppressive therapy)

Prognostic factor(s)

Study's definition for obesity: Three groups based on the BMI: BMI < 25 kg/m^2, BMI 25–34 kg/m^2, and BMI ≥ 35 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

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Palaiodimos 2020 *(Continued)*

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 162

Prognostic factor(s): BMI ≥ 35

Outcome(s)

Mortality

Mechanical ventilation

Outcome (prognostic factor)

Mortality (BMI ≥ 35) (model 1)

Follow-up

Number of patients followed completely for the outcome: 200

Number of obese patients followed completely for the outcome: 162

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.56 (1.18, 5.57), 0.018

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.35 (1.43, 7.87), 0.005

Outcome (prognostic factor)

Mortality (BMI ≥ 35) (model 2)

Follow-up

Number of patients followed completely for the outcome: 200

Number of obese patients followed completely for the outcome: 162

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.56 (1.18, 5.57), 0.018

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, heart failure, coronary artery disease, CKD or ESRD, COPD

Effect measure for obesity: Odds ratio

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Palaiodimos 2020 *(Continued)*

Effect measure value (95% CI), P value: 3.94 (1.56, 9.92), 0.004

Outcome (prognostic factor)

Mortality (BMI ≥ 35) (model 3)

Follow-up

Number of patients followed completely for the outcome: 200

Number of obese patients followed completely for the outcome: 162

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.56 (1.18, 5.57), 0.018

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, heart failure, coronary artery disease, CKD or ESRD, COPD, diabetes, current or former smoker

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.78 (1.45, 9.83), 0.006

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 35) (model 1)

Follow-up

Number of patients followed completely for the outcome: 200

Number of obese patients followed completely for the outcome: 162

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.72 (1.24, 5.96), 0.012

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.19 (1.42, 7.17), 0.005

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 35) (model 2)

Follow-up

Number of patients followed completely for the outcome: 200

Number of obese patients followed completely for the outcome: 162

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Palaiodimos 2020 *(Continued)*

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.72 (1.24, 5.96), 0.012

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, heart failure, coronary artery disease, CKD or ESRD, COPD

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.06 (1.72, 9.57), 0.001

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 35) (model 3)

Follow-up

Number of patients followed completely for the outcome: 200

Number of obese patients followed completely for the outcome: 162

Number of non-obese patients followed completely for the outcome: 38

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.72 (1.24, 5.96), 0.012

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, heart failure, coronary artery disease, CKD or ESRD, COPD, diabetes, current or former smoker

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.87 (1.47, 10.18), 0.006

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Palaiodimos 2020 *(Continued)*

Mortality		
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Parikh 2020

Study characteristics	
Notes	**English title** ICU outcomes in Covid-19 patients with obesity **Study setting** **Start of study recruitment (MM/YYYY):** 03/2020 **End of study recruitment (MM/YYYY):** 05/2020 **Study design:** Retrospective cohort **Study centre(s):** Single centre/clinic/area within a country **Number of centres, clinics or areas:** 1 **Study setting:** Inpatient **Number of participants recruited:** 160 **Sampling method:** Consecutive participants **Participants** **Female participants (absolute number):** 55 **Age measure, value:** Mean (SD), 60.35 (16.48) **Inclusion criteria:** Adult patients with laboratory-confirmed SARS-CoV-2 who were admitted to the ICU **Exclusion criteria:** NR **Smoking frequency:** 61 (including ex-smokers) **Diabetes frequency:** 74 **Hypertension frequency:** 106 **Cardiovascular disease frequency:** 39 **Asthma frequency:** 19 **Chronic obstructive pulmonary disease frequency:** 15 **Other pulmonary disease frequency:** NR

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Parikh 2020 *(Continued)*

Immunosuppression frequency: 6

Chronic kidney disease frequency: 39

Cancer frequency: 18

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): Tocilizumab (40), anakinra (16), sarilumab (32), remdesivir (2), self-prone (spontaneously breathing) (67), vasopressors (74), tracheostomy (7)

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 83

Prognostic factor(s): BMI ≥ 30

Outcome(s)

In-hospital death

Length of stay

Length of ICU stay

Mechanical ventilation

Outcome (prognostic factor)

In-hospital death (BMI ≥ 30)

Follow-up

Number of patients followed completely for the outcome: 160

Number of obese patients followed completely for the outcome: 83

Number of non-obese patients followed completely for the outcome: 77

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.8 (0.4, 2.5), 0.501

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, sex

Effect measure for obesity: odds ratio

Effect measure value (95% CI), P value: 1.2 (0.6, 2.6), 0.637

Outcome (prognostic factor)

Length of stay (BMI ≥ 30)

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Parikh 2020 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 160

Number of obese patients followed completely for the outcome: 83

Number of non-obese patients followed completely for the outcome: 77

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.8 (0.5, 1.4), 0.391

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, asthma, sex

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.2 (0.7, 2.2), 0.481

Outcome (prognostic factor)

Length of ICU stay (BMI ≥ 30)

Follow-up

Number of patients followed completely for the outcome: 160

Number of obese patients followed completely for the outcome: 83

Number of non-obese patients followed completely for the outcome: 77

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.7 (0.4, 1.3), 0.254

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, asthma, sex

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.9 (0.5, 1.7), 0.85

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 30)

Follow-up

Number of patients followed completely for the outcome: 160

Number of obese patients followed completely for the outcome: 83

Number of non-obese patients followed completely for the outcome: 77

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

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Parikh 2020 *(Continued)*

Effect measure value (95% CI), P value: 2 (1.1, 3.8), 0.029

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.6 (0.8, 3.1), 0.21

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Unclear	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Confounding Bias Hospitalisation	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

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Parra-Bracamonte 2020

Study characteristics

Notes

English title

Clinical characteristics and risk factors for mortality of patients with COVID-19 in a large data set from Mexico

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 07/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 475

Study setting: Outpatient and inpatient

Number of participants recruited: 331,298

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 153,141

Age measure, value: Median (IQR), 44 (33-56)

Inclusion criteria: Positive cases to COVID-19 who were diagnosed using real-time PCR and were officialised by the National Network for Epidemiologic Surveillance

Exclusion criteria: NR

Smoking frequency: 24,484

Diabetes frequency: 53,712

Hypertension frequency: 66,170

Cardiovascular disease frequency: 7351

Asthma frequency: 8983

Chronic obstructive pulmonary disease frequency: 5458

Other pulmonary disease frequency: NR

Immunosuppression frequency: 4196

Chronic kidney disease frequency: 6895

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): ICU (7904), intubated (9237)

Prognostic factor(s)

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Parra-Bracamonte 2020 *(Continued)*

Study's definition for obesity: BMI > 30 kg/m^2

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 63,459

Prognostic factor(s): BMI > 30 kg/m^2

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 328,922

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.47 (1.507,,1.433), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, asthma, CKD, COPD, HTN, hospitalisation, immunosuppression, sex, smoking habits, other complications

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.223 (1.275, 1.173), < 0.0001

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	No	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3

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Parra-Bracamonte 2020 *(Continued)*

Statistical Analysis Bias	Yes	Appendix 3

Pattou Lille 2020

Study characteristics

Notes

English title

Association of BMI with outcomes in critically ill patients with COVID-19: multicenter cohort study

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

retrospective cohort

Study centre(s)

international

Number of centres/clinics/areas

21

Study setting

inpatient

Number of participants recruited

1461

Sampling method

unspecified

Participants

Female participants

(absolute number), 392

Age measure, value

median (interquartile range), 64 (40.9, 72.0)

Inclusion criteria

COVID-19 patients admitted in intensive care

Exclusion criteria

NR

Smoking

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Pattou Lille 2020 *(Continued)*

NR

Diabetes

NR

Hypertension

NR

Cardiovascular diseases

NR

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

NR

Cancer

NR

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

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Pattou Lille 2020 *(Continued)*

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

NR

Measure of frequency

NR

Frequency value

NR

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

mechanical ventilation, mortality

Outcome (prognostic factor)

mechanical ventilation (BMI continuous (per 5 kg/m^2))

Outcome

mechanical ventilation

Prognostic factor (category):

BMI continuous (per 5 kg/m^2)

Follow-up

Number of patients followed completely for this outcome

1461

Number of obese patients followed completely for this outcome

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Pattou Lille 2020 *(Continued)*

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex, and diabetes, hypertension, hyperlipidaemia, and current smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.27 (1.12, 1.45)

Outcome (prognostic factor)

mortality (BMI > 40)

Outcome

mortality

Prognostic factor (category):

BMI > 40

Follow-up

Number of patients followed completely for this outcome

1461

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

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Pattou Lille 2020 *(Continued)*

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, and diabetes, hypertension, hyperlipidaemia, and current smoking

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.68 (1.06, 2.64)

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Pena 2021

Study characteristics

Notes

English title

Hypertension, diabetes and obesity, major risk factors for death in patients with COVID-19 in Mexico

Study setting

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Pena 2021 *(Continued)*

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 11/2020

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres/clinics/areas: 1799

Study setting: Outpatient and inpatient

Number of participants recruited: 202,446 (cohort 1), 121,225 (cohort 2)

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 106,150 (cohort 1), 48,705 (cohort 2)

Age measure, value: NR

Inclusion criteria: Patients with a positive test for SARS-CoV-2 infection by real-time reverse transcription polymerase chain reaction

Exclusion criteria: NR

Smoking frequency: 13,199 (cohort 1), 9159 (cohort 2)

Diabetes frequency: 17,835 (cohort 1), 40,071 (cohort 2)

Hypertension frequency: 26,943 (cohort 1), 48,869 (cohort 2)

Cardiovascular disease frequency: 1817 (cohort 1), 5187 (cohort 2)

Asthma frequency: 5816 (cohort 1), 2691 (cohort 2)

Chronic obstructive pulmonary disease frequency: 1302 (cohort 1), 4742 (cohort 2)

Other pulmonary disease frequency: NR

Immunosuppression frequency: 1364 (cohort 1), 3057 (cohort 2)

Chronic kidney disease frequency: 1456 (cohort 1), 7922 (cohort 2)

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: NR

Threshold used for definition of obesity: NR

Obesity frequency (absolute number): 32,335 (cohort 1), 26,182 (cohort 2)

Prognostic factor(s): Obesity

Outcome(s)

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Pena 2021 *(Continued)*

Mortality

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 202,448 (cohort 1), 52,868 (cohort 2)

Number of obese patients followed completely for the outcome: 32,335 (cohort 1), 26,182 (cohort 2)

Number of non-obese patients followed completely for the outcome: 170,113 (cohort 1), 26,686 (cohort 2)

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.4 (4.41, 6.58), NR (cohort 1), 1.56 (1.49, 1.62), NR (cohort 2)

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, CKD, DM, HTN, IS, sex, smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.85 (1.51, 2.27), < 0.001 (cohort 1), 1.28 (1.22, 1.34), < 0.001 (cohort 2)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Pepe 2021

Study characteristics

Notes

English title

Clinical presentation, therapeutic approach, and outcome of young patients admitted for COVID-19, with respect to the elderly counterpart

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Pepe 2021 *(Continued)*

Study setting

Start of study recruitment (MM/YYYY)

NR

End of study recruitment (MM/YYYY)

05/2020

Study design

registry data

Study centre(s)

international

Number of centres/clinics/areas

39 centres in 31 cities and seven countries

Study setting

inpatient

Number of participants recruited

5868 (the number of patients < 65 was 2676)

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 1087

Age measure, value

mean (standard deviation), 49.63 (10.44)

Inclusion criteria

hospitalised patients over 18 years old with confirmed or highly suspected SARS-CoV-2 infection from 39 centres in 31 cities and seven countries who completed their hospital course were finally included in the HOPE registry by May 05, 2020.

Exclusion criteria

There were no exclusion criteria, except for patients' explicit refusal to participate, exclusion of 122 patients from the analysis for incompleteness of demographic data or because aged < 18 years

Smoking

NR

Diabetes

(absolute number), 243

Hypertension

(absolute number), 698

Cardiovascular diseases

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Pepe 2021 *(Continued)*

(absolute number), 209

Please indicate if additional information is available

NR

Asthma

(absolute number), 167

Chronic obstructive pulmonary disease

(absolute number), 67

Other pulmonary diseases

(absolute number), 96

Please indicate if additional information is available

Interstitial
Restrictive
Other

Immunosuppression

(absolute number), 161

Please indicate if additional information is available

out of 2523

Chronic kidney disease

(absolute number), 58

Cancer

(absolute number), 149

Steroid administration

(absolute number), 564 out of 2595

Supplemental oxygen

(absolute number), 1575 out of 2615

Differential values for various oxygenation methods (if indicated)

High-flow nasal cannula: 445/2593

Non-invasive mechanical ventilation: 306/2615

Invasive mechanical ventilation: 218/2599

Other treatment

Aspirin 165/2643 (6.2%)
Other antiplatelet drug 29/2627 (1.1%)

Oral anticoagulation 58/2631 (2.2%)

ACE/ARBs 524/2649 (19.8%)
Beta blockers 199/2639 (7.5%)
Beta agonist inhalation therapy 158/2643 (6.0%)

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Pepe 2021 *(Continued)*

Glucocorticoids inhalation therapy 136/2650 (5.1%)

D vitamin supplement 114/2641 (4.3%)

Benzodiazepines 226/2644 (8.5%)
Antidepressants 187/2640 (7.1%)

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

NR

Measure of frequency

NR

Frequency value

NR

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (BMI continuous (per 10 kg/m^2))

Outcome

mortality

Prognostic factor (category):

BMI continuous (per 10 kg/m^2)

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Pepe 2021 *(Continued)*

Follow-up

Number of patients followed completely for this outcome

2676

Number of obese patients followed completely for this outcome

440

Number of non-obese patients followed completely for this outcome

1774

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age (10 years increase), body mass index (10 units increase), cancer, severe dyspnoea, tachypnoea, chest X-ray bilateral abnormalities, creatinine > 1.5 mg/dL, lymphocyte < 1500/mL

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.03 (1, 1.06)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Petersen 2020

Study characteristics

Notes

English title

Obesity and COVID-19: the role of visceral adipose tissue

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Outpatient and inpatient

Number of participants recruited: 30

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 12

Age measure, value: Mean (SD), 65.6 (13.1)

Inclusion criteria: NR

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: NR

Hypertension frequency: NR

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

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Petersen 2020 *(Continued)*

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s):

Visceral fat area

Upper abdominal circumference

Visceral fat area/total fat area

Outcome(s)

ICU admission

Mechanical ventilation

Outcome (prognostic factor)

ICU admission (visceral fat area)

Follow-up

Number of patients followed completely for the outcome: 30

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 22.53 (2.01, 573.72), NR

Outcome (prognostic factor)

Mechanical ventilation (visceral fat area)

Follow-up

Number of patients followed completely for the outcome: 30

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

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Petersen 2020 *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 16.11 (1.46, 642.48), NR

Outcome (prognostic factor)

ICU admission (upper abdominal circumference)

Follow-up

Number of patients followed completely for the outcome: 30

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.13 (1.02, 1.30), NR

Outcome (prognostic factor)

Mechanical ventilation (upper abdominal circumference)

Follow-up

Number of patients followed completely for the outcome: 30

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.25 (1.05, 1.68), NR

Outcome (prognostic factor)

ICU admission (visceral fat area/total fat area)

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Petersen 2020 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 30

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.04 (0.52, 12.00), NR

Outcome (prognostic factor)

Mechanical ventilation (visceral fat area/total fat area)

Follow-up

Number of patients followed completely for the outcome: 30

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.01 (0.00, 120.49), NR

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3

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Petersen 2020 *(Continued)*

Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Confounding Bias ICU admission	No	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Petrilli 2020

Study characteristics

Notes

English title

Factors associated with hospital admission and critical illness among 5279 people with coronavirus disease 2019 in New York City: Prospective cohort study

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Prospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 264

Study setting: Outpatient and inpatient

Number of participants recruited: 5279

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 2664

Age measure, value: Median (IQR), 54 (38-66)

Inclusion criteria: Confirmed COVID-19, defined as a positive result on real time reverse transcriptase polymerase chain reaction

Exclusion criteria: Patients who died in the emergency department before vital signs or laboratory results could be collected, patients who were not admitted to hospital, patients with missing all data besides age and sex, patients with no previous visits within the health system

Smoking frequency: 1190 (including ex-smokers)

Diabetes frequency: 1195

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Petrilli 2020 *(Continued)*

Hypertension frequency: 2256

Cardiovascular disease frequency: 1071

Asthma or chronic obstructive pulmonary disease frequency: 786

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 647

Cancer frequency: 403

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI > 30

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 1865

Prognostic factor(s): BMI 30-39.9

BMI ≥ 40

Outcome(s)

Hospitalisation

Outcome (prognostic factor)

Hospitalisation (BMI 30-39.9)

Follow-up

Number of patients followed completely for the outcome: 2741

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.6 (1.85, 1.38), < 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Week number, age, sex, race, smoking, BMI, CAD, HTN, HLP, HF, DM, asthma/COPD, CKD, cancer

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.8 (1.47, 2.2), < 0.001

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Petrilli 2020 *(Continued)*

Outcome (prognostic factor)

Hospitalisation (BMI ≥ 40)

Follow-up

Number of patients followed completely for the outcome: 2741

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.71 (2.19, 1.33), < 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Week number, age, sex, race, smoking, BMI, CAD, HTN, HLP, HF, DM, asthma/COPD, CKD, cancer

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.45 (NR), < 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Pettit 2020

Study characteristics

Notes

English title

Obesity is associated with increased risk for mortality among hospitalized patients with COVID-19

Study setting

Start of study recruitment (MM/YYYY): 03/2020

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Pettit 2020 *(Continued)*

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 238

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 125

Age measure, value: Mean (SD), 58.5 (17)

Inclusion criteria: All severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) positive patients admitted to the University of Chicago Medical Center, an 811-bed academic medical centre on the south side of Chicago, between March 1, 2020, and April 18, 2020, who had completed their hospital course (including deceased patients) were included in the analysis.

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 68

Hypertension frequency: 126

Cardiovascular disease frequency: 51

Asthma frequency: 63

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: 5

Chronic kidney disease frequency: 17

Cancer frequency: 27

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI was analysed as a categorical variable with values of BMI < 25 (normal weight), 25 to < 30 (overweight), 30 to < 35 (obesity, class 1), 35 to < 40 (obesity, class 2), or ≥ 40 (obesity, class 3)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 146

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Pettit 2020 *(Continued)*

Prognostic factor(s): BMI > 30 kg/m^2

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 238

Number of obese patients followed completely for the outcome: 146

Number of non-obese patients followed completely for the outcome: 92

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1 (0.8, 1.4), 0.9

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, CAD, cancer, CKD, DM, HF, HTN, hyperlipidaemia, sex, smoking, stroke, pulmonary disease, VTE

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.7 (1.1, 2.8), 0.016

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Pongpirul 2020

Study characteristics	
Notes	**English title**

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Pongpirul 2020 *(Continued)*

Clinical course and potential predictive factors for pneumonia of adult patients with Coronavirus Disease 2019 (COVID-19): a retrospective observational analysis of 193 confirmed cases in Thailand

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: NR

Study setting: Inpatient

Number of participants recruited: 193

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 80

Age measure, value: Median (IQR), 37 (29, 53)

Inclusion criteria: All adult patients aged > 18 years with laboratory-confirmed COVID-19 who were hospitalised at BIDI, between January 8 and April 16, 2020

Exclusion criteria: NR

Smoking frequency: 29

Diabetes frequency: 16

Hypertension frequency: 31

Cardiovascular disease frequency: 2

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 3

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 50

Other treatments (frequency): Chloroquine monotherapy (20) - chloroquine or hydroxychloroquine + boosted lopinavir or darunavir (36) - hydroxychloroquine + azithromycin (8) - chloroquine or hydroxychloroquine + boosted lopinavir or darunavir + azithromycin (5) - chloroquine or hydroxychloroquine + boosted lopinavir or darunavir + favipiravir (38) - chloroquine or hydroxychloroquine + boosted lopinavir or darunavir + azithromycin + favipiravir (12) - remdesivir (7) - antibiotics (27) - other (7)

Prognostic factor(s)

Study's definition for obesity: Obesity was classified as body mass index (BMI) ≥ 30 kg/m^2 according to World Health Organization (WHO) classification for overweight and obesity

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Pongpirul 2020 *(Continued)*

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 122

Prognostic factor(s): BMI > 30 kg/m^2

Outcome(s)

Pneumonia

Outcome (prognostic factor)

Pneumonia (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 193

Number of obese patients followed completely for the outcome: 22

Number of non-obese patients followed completely for the outcome: 171

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.55 (2.05, 15.06), 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, attended crowded places, CKD, DM, lymphocyte, platelets, sex, temperature

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 8.74 (2.06, 37.18), 0.003

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Pneumonia	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Pneumonia	Yes	Appendix 3
Confounding Bias Pneumonia	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Price-Haywood 2020

Study characteristics

Notes

English title

Hospitalization and mortality among Black patients and White patients with Covid-19

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 40

Study setting: Outpatient and inpatient (cohort 1), inpatient (cohort 2)

Number of participants recruited: 3481 (cohort 1), 1382 (cohort 2)

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 2087 (cohort 1), 705 (cohort 2)

Age measure, value: Mean (SD), 54.16 (16.81) (cohort 1), 62.5 (15.22) (cohort 2)

Inclusion criteria: Patients seen at an Ochsner Health facility between March 1 and April 11, 2020, who tested positive for SARS-CoV-2 on qualitative polymerase-chain-reaction assay

Exclusion criteria: Covid-19 positive patients who identified themselves as Asian, American-Indian or Alaska native, native Hawaiian or Pacific Islander, or Hispanic or who did not have a recorded race or ethnic group

Smoking frequency: NR

Diabetes frequency: 566 (cohort 1), NR (cohort 2)

Hypertension frequency: 1074 (cohort 1), NR (cohort 2)

Cardiovascular disease frequency: 139 (cohort 1), NR (cohort 2)

Asthma frequency: 142 (cohort 1), NR (cohort 2)

Chronic obstructive pulmonary disease frequency: 79 (cohort 1), NR (cohort 2)

Other pulmonary disease frequency: NR

Immunosuppression frequency: 7 (cohort 1), NR (cohort 2) (only HIV)

Chronic kidney disease frequency: 278 (cohort 1), NR (cohort 2)

Cancer frequency: 158 (cohort 1), NR (cohort 2)

Steroid administration frequency: 360 (cohort 1), NR (cohort 2)

Supplemental oxygen administration frequency: NR

Other treatments (frequency): Immune modulators (29), chemotherapy (31) (cohort 1), NR (cohort 2)

Prognostic factor(s)

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Price-Haywood 2020 *(Continued)*

Study's definition for obesity: BMI > 30 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 1727 (cohort 1), NR (cohort 2)

Prognostic factor(s): Obesity

Outcome(s)

Hospitalisation

Mortality

ICU duration

Outcome (prognostic factor)

Hospitalisation (obesity) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: NR

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Race, age, sex, Charlson Comorbidity Index, residence in low-income area, insurance, obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.43 (1.2, 1.71), NR

Outcome (prognostic factor)

Mortality (obesity) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: NR

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

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Price-Haywood 2020 *(Continued)*

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Race, age, sex, Charlson Comorbidity Index, residence in low-income area, insurance, obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.05 (0.83, 1.05), NR

Outcome (prognostic factor)

ICU duration (obesity) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: NR

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Race, age, sex, Charlson Comorbidity Index, residence in low-income area, insurance, obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.53 (1.24, 1.88), NR

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Unclear	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Price-Haywood 2020 *(Continued)*

Hospitalisation		
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Quan 2021

Study characteristics	
Notes	**English title** Impact of race and socioeconomic status on outcomes in patients hospitalized with COVID-19 **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 04/2020 **Study design** retrospective cohort **Study centre(s)** multiple centres/clinics/areas within a country **Number of centres/clinics/areas** 4 **Study setting** inpatient **Number of participants recruited** 2038 **Sampling method** unspecified **Participants** **Female participants** (absolute number), 1027 **Age measure, value**

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Quan 2021 *(Continued)*

mean (standard deviation), 63.96 (16.23)

Inclusion criteria

Eligible patients were adult patients admitted to four large hospitals within the Henry Ford Health System from March 12, 2020, to April 24, 2020, inclusive of these dates, and had a positive SARS-CoV-2 test by qualitative polymerase chain reaction.

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 652

Hypertension

(absolute number), 1494

Cardiovascular diseases

(absolute number), 308

Please indicate if additional information is available

NR

Asthma

NR

Chronic obstructive pulmonary disease

(absolute number), 294

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 357

Cancer

(absolute number), 136

Steroid administration

(absolute number), 1505

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Quan 2021 *(Continued)*

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

"Renal replacement therapy: 9.5
Hydroxychloroquine: 80.7
Systemic steroids: 73.8
Antibiotics: 81.8
Remdesivir: 1.44
Tocilizumab: 5.8
Treatment dose anticoagulation: 23.4"

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

NR

Measure of frequency

NR

Frequency value

NR

How many eligible outcomes reported?

3

How many eligible outcomes reported?

3

Outcome(s)

mortality, mechanical ventilation, ICU admission

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Quan 2021 *(Continued)*

Outcome (prognostic factor)

mortality (BMI > 35)

Outcome

mortality

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

2038

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Increased age, male sex, black race, increased comorbidity burden, obesity, and smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.96 (0.69, 1.32)

Outcome (prognostic factor)

mechanical ventilation (BMI > 35)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI > 35

Follow-up

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Quan 2021 *(Continued)*

Number of patients followed completely for this outcome

2038

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Increased age, male sex, black race, increased comorbidity burden, obesity, and smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.64 (1.26, 2.14)

Outcome (prognostic factor)

ICU admission (BMI > 35)

Outcome

ICU admission

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

2038

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

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Quan 2021 *(Continued)*

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Increased age, male sex, black race, increased comorbidity burden, obesity, and smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.51 (1.19, 1.94)

Outcome (prognostic factor)

mortality (BMI > 35)

Outcome

mortality

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

694

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

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Quan 2021 *(Continued)*

The set of prognostic factors used for adjustment

Increased age, male sex, black race, increased comorbidity burden, obesity, and smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.44 (0.23, 0.82)

Outcome (prognostic factor)

mechanical ventilation (BMI > 35)

Outcome

mechanical ventilation

Prognostic factor (category)

BMI > 35

Follow-up

Number of patients followed completely for this outcome

694

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Increased age, male sex, black race, increased comorbidity burden, obesity, and smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.42 (0.86, 2.34)

Outcome (prognostic factor)

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Quan 2021 *(Continued)*

ICU admission(BMI > 35)

Outcome

ICU admission

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

694

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Increased age, male sex, black race, increased comorbidity burden, income ($10,000 increase), group facility, obesity, and smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.26 (0.79, 2)

Outcome (prognostic factor)

mortality (BMI > 35)

Outcome

mortality

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

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Quan 2021 *(Continued)*

1209

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Increased age, male sex, black race, increased comorbidity burden, obesity, and smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.35 (0.9, 2.02)

Outcome (prognostic factor)

mechanical ventilation (BMI > 35)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

1209

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

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Quan 2021 *(Continued)*

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Increased age, male sex, black race, increased comorbidity burden, obesity, and smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.74 (1.26, 2.41)

Outcome (prognostic factor)

ICU admission (BMI > 35)

Outcome

ICU admission

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

1209

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

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Quan 2021 *(Continued)*

Increased age, male sex, black race, increased comorbidity burden, obesity, and smoking

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.62 (1.2, 2.2)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Rapp 2020

Study characteristics

Notes

English title

Male sex, severe obesity, older age, and chronic kidney disease are associated with COVID-19 severity and mortality in New York City

Study setting

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Rapp 2020 *(Continued)*

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

4062

Sampling method

unspecified

Participants

Female participants

(percentage), 42.6

Age measure, value

NR

Inclusion criteria

COVID-19 positive

Exclusion criteria

NR

Smoking

(absolute number), 1022

Diabetes

(absolute number), 964

Hypertension

(absolute number), 1431

Cardiovascular diseases

(absolute number), 539

Please indicate if additional information is available

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Rapp 2020 *(Continued)*

NR

Asthma

(absolute number), 196

Chronic obstructive pulmonary disease

(absolute number), 172

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 481

Cancer

(absolute number), 281

Steroid administration

NR

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

>= 35 kg/m^2 is severely obese

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Rapp 2020 *(Continued)*

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

>= 35 kg/m^2 is severely obese

Measure of frequency

absolute number

Frequency value

623

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (severely obese (BMI >= 35 kg/m^2))

Outcome

Mortality

Prognostic factor (category):

Severely obese (BMI >= 35 kg/m^2))

Follow-up

Number of patients followed completely for this outcome

4062

Number of obese patients followed completely for this outcome

623

Number of non-obese patients followed completely for this outcome

3025

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

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Rapp 2020 *(Continued)*

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age: (<40 (ref), 40-69, >= 70), BMI >= 35, CKD, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.53 (1.21, 1.94)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Recalde 2020

Study characteristics

Notes

English title

Body mass index and risk of COVID-19 diagnosis, hospitalisation, and death: a population-based multi-state cohort analysis including 2,524,926 people in Catalonia, Spain

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

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Recalde 2020 *(Continued)*

Number of participants recruited: 57,443

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 35,236

Age measure, value: Median (IQR), 48 (38-60)

Inclusion criteria: All adults (aged 18 years or older) registered in the SIDIAP as of the 1st March 2020 with a BMI recorded at an age equal or greater than 18 years. Individuals with at least one year of prior history available, without a previous clinical diagnosis or positive test result for COVID-19, who were not hospitalised or living in a nursing home on the 1st March 2020 (to have study participants representative of the community population) and who had information on both smoking and socioeconomic status

Exclusion criteria: Individuals who had less than a year of prior clinical history; who had a prior COVID-19 clinical diagnosis or positive test; who were hospitalised or living in a nursing home on March 1st; who had the unavailability of a BMI measurement; and who had missing data on smoking status and/or the MEDEA deprivation index

Smoking frequency: 47,340

Diabetes frequency: 4327

Hypertension frequency: 9923

Cardiovascular disease frequency: 7083

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 1622

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 2500

Cancer frequency: 3588

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity was defined based on World Health Organization (WHO) categories of BMI (underweight or normal weight [BMI < 18.5 kg/m^2 and between 18.5 and < 25 kg/m^2], overweight [BMI ≥ 25 and < 30 kg/m^2] and obesity [BMI ≥ 30 kg/m^2]).

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 15143

Prognostic factor(s): BMI = 16 kg/m^2

BMI = 19 kg/m^2

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Recalde 2020 *(Continued)*

BMI = 25 kg/m^2

BMI = 28 kg/m^2

BMI = 31 kg/m^2

BMI = 34 kg/m^2

BMI = 37 kg/m^2

BMI = 40 kg/m^2

BMI = 43 kg/m^2

BMI = 47 kg/m^2

BMI = 50 kg/m^2

Outcome(s)

Mortality

Hospitalisation

Outcome (prognostic factor)

Mortality (BMI = 16 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.90 (0.85, 0.96), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.28 (1.07, 1.52), NR

Outcome (prognostic factor)

Mortality (BMI = 19 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

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Recalde 2020 *(Continued)*

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.95 (0.92, 0.98), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.13 (1.04, 1.23), NR

Outcome (prognostic factor)

Mortality (BMI = 25 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.05 (1.02, 1.09), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.90 (0.84, 0.97), NR

Outcome (prognostic factor)

Mortality (BMI = 28 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.11 (1.02, 1.09), NR

Multivariable analysis for obesity

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Recalde 2020 *(Continued)*

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.88 (0.78, 0.99), NR

Outcome (prognostic factor)

Mortality (BMI = 31 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.17 (1.07, 1.29), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.93 (0.82, 1.05), NR

Outcome (prognostic factor)

Mortality (BMI = 34 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.24 (1.09, 1.40), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

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Recalde 2020 *(Continued)*

Effect measure value (95% CI), P value: 1.02 (0.89, 1.17), NR

Outcome (prognostic factor)

Mortality (BMI = 37 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.30 (1.12, 1.52), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.14 (0.97, 1.34), NR

Outcome (prognostic factor)

Mortality (BMI = 40 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.38 (1.14, 1.66), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.27 (1.03, 1.56), NR

Outcome (prognostic factor)

Mortality (BMI = 43 kg/m^2)

Follow-up

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Recalde 2020 *(Continued)*

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.45 (1.17, 1.80), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.42 (1.10, 1.83), NR

Outcome (prognostic factor)

Mortality (BMI = 47 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.56 (1.21, 2.01), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.64 (1.18, 2.27), NR

Outcome (prognostic factor)

Mortality (BMI = 50 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

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Recalde 2020 *(Continued)*

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.64 (1.23, 2.19), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.82 (1.24, 2.68), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 16 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.29 (0.26, 0.32), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.51 (0.46, 0.57), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 19 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.53 (0.51, 0.56), NR

Multivariable analysis for obesity

Modelling method: Cox regression

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Recalde 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.71 (0.68, 0.75), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 25 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.77 (1.69, 1.85), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.37 (1.31, 1.43), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 28 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.60 (2.42, 2.79), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.74 (1.61, 1.87), NR

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Recalde 2020 *(Continued)*

Outcome (prognostic factor)

Hospitalisation (BMI = 31 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.06 (2.83, 3.30), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.01 (1.86, 2.18), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 34 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.19 (2.96, 3.44), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.22 (2.06, 2.40), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 37 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

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Recalde 2020 *(Continued)*

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.26 (3.01, 3.53), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.43 (2.24, 2.64), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 40 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.32 (3.03, 3.63), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.66 (2.43, 2.91), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 43 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

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Recalde 2020 *(Continued)*

Effect measure value (95% CI), P value: 3.38 (3.05, 3.75), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.91 (2.62, 3.23), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 47 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.47 (3.06, 3.97), NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.27 (2.88, 3.72), NR

Outcome (prognostic factor)

Hospitalisation (BMI = 50 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 57,443

Number of obese patients followed completely for the outcome: 15,143

Number of non-obese patients followed completely for the outcome: 42,300

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.54 (3.06, 4.10), NR

Multivariable analysis for obesity

Modelling method: Cox regression

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Recalde 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, BMI (16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 47, 50 kg/m^2), MEDEA Deprivation Index (quintile 1, quintile 2, quintile 3, quintile 4, quintile 5), sex, smoking status

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.58 (3.09, 4.15), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias Hospitalisation	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Rechtman 2020

Study characteristics

Notes

English title

Vital signs assessed in initial clinical encounters predict COVID-19 mortality in an NYC hospital system

Study setting

Start of study recruitment (MM/YYYY): NR

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 53

Study setting: Outpatient and inpatient

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Rechtman 2020 *(Continued)*

Number of participants recruited: 8770

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 4004

Age measure, value: Median (IQR), 60 (44-72)

Inclusion criteria: all cases of confirmed SARS-CoV-2 positive by real time-polymerase chain reaction (RT-PCR) in nasopharyngeal or oropharyngeal swabs collected in outpatient, urgent care, emergency, and inpatient facilities

Exclusion criteria: Patients with oxygen saturation inferior to 40% were excluded.

Smoking frequency: 1853

Diabetes frequency: 1631

Hypertension frequency: 2281

Cardiovascular disease frequency: NR

Asthma frequency: 394

Chronic obstructive pulmonary disease frequency: 222

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 753

Cancer frequency: 649

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity was defined based on ICD-10 coding E66

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 616

Prognostic factor(s): BMI (per kg/m^2 increase)

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI (per kg/m^2 increase))

Follow-up

Number of patients followed completely for the outcome: 8770

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Rechtman 2020 *(Continued)*

Number of obese patients followed completely for the outcome: 616

Number of non-obese patients followed completely for the outcome: 8154

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, BMI, sex, race (black, Hispanic, other/unknown), smoking, heart rate, temperature, respiratory rate, oxygen saturation, hypertension, chronic kidney disease, diabetes, COPD, HIV, cancer, obesity, asthma

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.03 (1.02, 1.04), NR

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Rodriguez-Gonzalez 2021

Study characteristics

Notes

English title

COVID-19 in hospitalised patients in Spain: a cohort study in Madrid

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 03/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

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Rodriguez-Gonzalez 2021 *(Continued)*

Number of centres, clinics or areas: 1

Study setting: Outpatient and inpatient

Number of participants recruited: 1255

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 530

Age measure, value: Median (IQR), 65 (51-77)

Inclusion criteria: The study sample included all consecutive acute COVID-19 cases in adults confirmed by PCR from 1 to 24 March 2020 who consequently received specific anti-COVID-19 treatment, either antiviral or immunosuppressive.

Exclusion criteria: patients with mild disease that did not require specific treatment and who were referred to primary care for follow-up were excluded.

Smoking frequency: 81

Diabetes frequency: 250

Hypertension frequency: 566

Cardiovascular disease frequency: 394

Asthma frequency: 98

Chronic obstructive pulmonary disease frequency: 99

Other pulmonary disease frequency: NR

Immunosuppression frequency: 86

Chronic kidney disease frequency: 148

Cancer frequency: 107

Steroid administration frequency: 317

Supplemental oxygen administration frequency: 1025

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity was defined as BMI > 30 kg/m^2

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 190

Prognostic factor(s): Obesity (BMI > 30 kg/m^2)

Outcome(s)

Mortality

Outcome (prognostic factor)

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Rodriguez-Gonzalez 2021 *(Continued)*

Mortality (obesity (BMI > 30 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 1208

Number of obese patients followed completely for the outcome: 170

Number of non-obese patients followed completely for the outcome: 1038

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.22 (0.90, 1.66), 0.1940

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, cardiovascular disease, creatine kinase, COPD, CRP, D-dimer 250-500, D-dimer 500-1000, D-dimer > 1000, diabetes mellitus, hypertension, lactate dehydrogenase, lymphocytopenia, oxygen saturation < 90%, renal impairment, sex

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.28 (0.89, 1.84), 0

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Rojas-Marte 2021

Study characteristics	
Notes	**English title** Outcomes in patients with COVID-19 disease and high oxygen requirements **Study setting** **Start of study recruitment (MM/YYYY)**

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Rojas-Marte 2021 *(Continued)*

03/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

398

Sampling method

unspecified

Participants

Female participants

(absolute number), 133

Age measure, value

mean (standard deviation), 65.8 (16.26)

Inclusion criteria

We identified patients 18 years of age and older who were admitted between March 19th and April 25th, 2020 with COVID-19 disease and high oxygen requirements. We considered patients to have a high oxygen requirement if they developed acute hypoxaemic respiratory failure and required intubation with mechanical ventilation or needed high-level oxygen supplementation (face mask at more than 10 L per minute, high-flow nasal cannula (HFNC), or non-rebreather (NRB) oxygen face mask) at the time of admission or during hospitalisation.

Exclusion criteria

We excluded patients not requiring high concentrations of oxygen, patients who died within 1 day of being admitted, and those who died during their emergency room stay.

Smoking

NR

Diabetes

(absolute number), 141

Hypertension

(absolute number), 237

Cardiovascular diseases

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Rojas-Marte 2021 *(Continued)*

(absolute number), 56

Please indicate if additional information is available

NR

Asthma

(absolute number), 32

Chronic obstructive pulmonary disease

(absolute number), 27

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 22

Cancer

NR

Steroid administration

(absolute number), 153

Supplemental oxygen

NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

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Rojas-Marte 2021 *(Continued)*

Study's definition for obesity

BMI > 30

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

167

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mechanical ventilation

Outcome (prognostic factor)

mechanical ventilation (BMI > 30)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

398

Number of obese patients followed completely for this outcome

167

Number of non-obese patients followed completely for this outcome

231

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

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Rojas-Marte 2021 *(Continued)*

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Comorbidities (obesity, dementia), vital signs (heart rate (per minute), respiratory rate (per minute)), laboratory values (platelet, serum sodium, C-reactive protein, ferritin, lactate dehydrogenase, glomerular filtration rate, troponin), treatment management (vasopressor, haemodialysis, blood transfusion, steroids, prophylactic anticoagulation, therapeutic anticoagulation, remdesivir, zinc, antibiotics for suspected bacterial infection), complications (diagnosis of bacteraemia/fungaemia)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

6.33 (1.45, 27.61)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Roomi 2020

Study characteristics

Notes

English title

Abstract 17292: Does morbid obesity worsen outcomes in COVID-19?

Study setting

Start of study recruitment (MM/YYYY)

NR

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Roomi 2020 *(Continued)*

End of study recruitment (MM/YYYY)

NR

Study design

retrospective cohort

Study centre(s)

unspecified

Number of centres/clinics/areas

NR

Study setting

inpatient

Number of participants recruited

NR

Sampling method

unspecified

Participants

Female participants

(percentage), 49

Age measure, value

mean (not reported), 62.2

Inclusion criteria

NR

Exclusion criteria

NR

Smoking

NR

Diabetes

(unspecified)

Hypertension

(unspecified)

Cardiovascular diseases

(unspecified)

Please indicate if additional information is available

NR

Asthma

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Roomi 2020 *(Continued)*

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified),

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

unspecified

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

BMI > 35

The time when obesity has been measured

before disease or right at presentation

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Roomi 2020 *(Continued)*

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

35

Measure of frequency

absolute number

Frequency value

39

How many eligible outcomes reported?

3

How many eligible outcomes reported?

3

Outcome(s)

mortality, mechanical ventilation, ICU admission

Outcome (prognostic factor)

mortality (BMI > 35)

Outcome

mortality

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

176

Number of obese patients followed completely for this outcome

39

Number of non-obese patients followed completely for this outcome

137

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.2 (1.3, 8.2)

Multivariable (adjusted) analysis for obesity

Modelling method

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Roomi 2020 *(Continued)*

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.9 (1.1, 6)

Outcome (prognostic factor)

ventilation (BMI > 35)

Outcome

ventilation

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

176

Number of obese patients followed completely for this outcome

39

Number of non-obese patients followed completely for this outcome

137

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.3 (1.6, 7)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.6 (1.17, 6.1)

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Roomi 2020 *(Continued)*

Outcome (prognostic factor)

ICU ad (BMI > 35)

Outcome

ICU ad

Prognostic factor (category):

BMI > 35

Follow-up

Number of patients followed completely for this outcome

176

Number of obese patients followed completely for this outcome

39

Number of non-obese patients followed completely for this outcome

137

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.2 (1.07, 4.6)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.7 (0.7, 3.9)

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3

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Roomi 2020 *(Continued)*

Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Unclear	Appendix 3
Outcome Measurement ICU admission	Unclear	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Confounding Bias ICU admission	No	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Rossi 2020

Study characteristics	
Notes	**English title** Obesity as a risk factor for unfavourable outcomes in critically ill patients affected by Covid-19 **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 03/2020 **Study design** prospective cohort **Study centre(s)** single centres/clinics/areas within a country **Number of centres/clinics/areas** 1 **Study setting** inpatient

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Rossi 2020 *(Continued)*

Number of participants recruited

95

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 17

Age measure, value

mean (standard deviation), 62.46 (11.74)

Inclusion criteria

NR

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 18

Hypertension

(absolute number), 44

Cardiovascular diseases

(absolute number), 5

Please indicate if additional information is available

IHD + HF

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(unspecified), NR

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

NR

Immunosuppression

(absolute number), 19

Please indicate if additional information is available

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Rossi 2020 *(Continued)*

NR

Chronic kidney disease

(absolute number), 15

Cancer

(absolute number), 3

Steroid administration

(unspecified), NR

Supplemental oxygen

(unspecified), NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

BMI in normal weight subjects (BMI < 27 kg/m^2), overweight (BMI between 27 and 29.9 kg/m^2) and subjects with obesity (BMI > 30)

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

35

How many eligible outcomes reported?

1

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Rossi 2020 *(Continued)*

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

Outcome

NR

Prognostic factor (category):

NR

Follow-up

Number of patients followed completely for this outcome

95

Number of obese patients followed completely for this outcome

35

Number of non-obese patients followed completely for this outcome

60

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex, smoking habit, hypertension, diabetes, congestive heart failure, chronic renal failure, immunodepression, cancer, chronic obstructive pulmonary disease, coronary heart disease

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

5.3 (1.26, 22.34)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3

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Rossi 2020 *(Continued)*

Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Rottoli 2020

Study characteristics

Notes

English title

How important is obesity as a risk factor for respiratory failure, intensive care admission and death in hospitalised COVID-19 patients? Results from a single Italian centre

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 482

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 180

Age measure, value: Mean (SD), 66.2 (16.8)

Inclusion criteria: Patients who had a confirmed COVID-19 diagnosis using a positive RT-PCR test on nasopharyngeal swabs

Exclusion criteria: Patients without an available BMI

Smoking frequency: 85

Diabetes frequency: 73

Hypertension frequency: 254

Cardiovascular disease frequency: 102

Asthma frequency: NR

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Rottoli 2020 *(Continued)*

Chronic obstructive pulmonary disease frequency: 63

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 55

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Normal weight, overweight and obesity classes were defined according to the WHO guidelines.

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 104

Prognostic factor(s):

BMI ≥ 35 kg/m^2

Obesity Class I (BMI of 30-35 kg/m^2)

BMI (per kg/m^2 increase)

Outcome(s)

Mortality

ICU admission

Outcome (prognostic factor)

Mortality (BMI ≥ 35 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 482

Number of obese patients followed completely for the outcome: 84

Number of non-obese patients followed completely for the outcome: 378

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (60-69, 70-79.9, ≥ 80), diabetes, hypertension, renal disease, sex, stroke

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Rottoli 2020 *(Continued)*

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.72 (1.00, 2.99), 0.051

Outcome (prognostic factor)

Mortality (Obesity Class I (BMI of 30-35 Kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 482

Number of obese patients followed completely for the outcome: 20

Number of non-obese patients followed completely for the outcome: 378

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (60-69, 70-79.9,≥ 80), diabetes, hypertension, renal disease, sex, stroke

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.21 (0.64, 2.27), 1

Outcome (prognostic factor)

Mortality (BMI (per kg/m^2 increase))

Follow-up

Number of patients followed completely for the outcome: 482

Number of obese patients followed completely for the outcome: 104

Number of non-obese patients followed completely for the outcome: 378

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (60-69, 70-79.9, ≥ 80), diabetes, hypertension, renal disease, sex, stroke

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.07 (1.02, 1.13), 0.007

Outcome (prognostic factor)

ICU admission (BMI ≥ 35 kg/m^2)

Follow-up

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Rottoli 2020 *(Continued)*

Number of patients followed completely for the outcome: 482

Number of obese patients followed completely for the outcome: 84

Number of non-obese patients followed completely for the outcome: 378

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (60-69, 70-79.9, ≥ 80), diabetes, hypertension, renal disease, sex, stroke

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 5.71 (2.53, 12.90), < 0.001

Outcome (prognostic factor)

ICU admission (Obesity Class I (BMI of 30-35 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 482

Number of obese patients followed completely for the outcome: 20

Number of non-obese patients followed completely for the outcome: 378

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (60-69, 70-79.9, ≥ 80), diabetes, hypertension, renal disease, sex, stroke

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.81 (2.22, 6.51), < 0.001

Outcome (prognostic factor)

ICU admission (BMI (per kg/m^2 increase))

Follow-up

Number of patients followed completely for the outcome: 482

Number of obese patients followed completely for the outcome: 104

Number of non-obese patients followed completely for the outcome: 378

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

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Rottoli 2020 *(Continued)*

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age (60-69, 70-79.9, ≥ 80), diabetes, hypertension, renal disease, sex, stroke

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.15 (1.10, 1.20), < 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Rubio-Rivas 2020

Study characteristics

Notes

English title

Predicting clinical outcome with phenotypic clusters in COVID-19 pneumonia: an analysis of 12,066 hospitalized patients from the Spanish registry SEMI-COVID-19

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 07/2020

Study design: Registry data

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Rubio-Rivas 2020 *(Continued)*

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 109

Study setting: Inpatient

Number of participants recruited: 12,066

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 5014

Age measure, value: Median (IQR), 68 (56-79)

Inclusion criteria: Hospitalised patients providing data of symptoms of COVID-19 upon admission were included in the registry. All included patients were diagnosed by polymerase chain reaction (PCR) test taken from a nasopharyngeal sample, sputum or bronchoalveolar lavage.

Exclusion criteria: NA

Smoking frequency: 567

Diabetes frequency: 2309

Hypertension frequency: 6030

Cardiovascular disease frequency: 1740

Asthma frequency: 869

Chronic obstructive pulmonary disease frequency: 786

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 696

Cancer frequency: 1196

Steroid administration frequency: 4343

Supplemental oxygen administration frequency: 2585

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): BMI (per kg/m^2 increase)

Outcome(s)

Mechanical ventilation

Mortality

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Rubio-Rivas 2020 *(Continued)*

ICU admission

Outcome (prognostic factor)

Mechanical ventilation (BMI (per kg/m^2 increase))

Follow-up

Number of patients followed completely for the outcome: 12,066

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, BMI, clusters (C2, C3, C4), hypertension, diabetes mellitus, hyperlipidaemia, COPD, ischaemic cardiomyopathy, chronic heart failure, chronic kidney disease, chronic hepatopathy, active cancer, Charlson's Index, heart rate at admission, respiratory rate at admission > 20 bpm, PaO2/FiO2 at admission, lymphocytes x10^6/L, CRP (mg/L), LDH (U/L), ALT (U/L), ferritin (mcg/L), D-dimer (ng/mL), remdesivir, tocilizumab, corticosteroids

Effect measure for obesity: odds ratio

Effect measure value (95% CI), P value: 1.05 (1.04, 1.05), < 0.001

Outcome (prognostic factor)

Mortality (BMI (per kg/m^2 increase))

Follow-up

Number of patients followed completely for the outcome: 12,066

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, BMI, clusters (C2, C3, C4), hypertension, diabetes mellitus, hyperlipidaemia, COPD, ischaemic cardiomyopathy, chronic heart failure, chronic kidney disease, chronic hepatopathy, active cancer, Charlson's Index, heart rate at admission, respiratory rate at admission >20 bpm, PaO2/FiO2 at admission, lymphocytes x10^6/L, CRP (mg/L), LDH (U/L), ALT (U/L), ferritin (mcg/L), D-dimer (ng/mL), remdesivir, tocilizumab, corticosteroids

Effect measure for obesity: odds ratio

Effect measure value (95% CI), P value: 1.04 (1.03, 1.05), < 0.001

Outcome (prognostic factor)

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Rubio-Rivas 2020 *(Continued)*

ICU admission (BMI (per kg/m^2 increase))

Follow-up

Number of patients followed completely for the outcome: 12,066

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, BMI, clusters (C2, C3, C4), hypertension, diabetes mellitus, hyperlipaemia, COPD, ischaemic cardiomyopathy, chronic heart failure, chronic kidney disease, chronic hepatopathy, active cancer, Charlson's Index, heart rate at admission, respiratory rate at admission >20 bpm, PaO2/FiO2 at admission, lymphocytes x10^6/L, CRP (mg/L), LDH (U/L), ALT (U/L), ferritin (mcg/L), D-dimer (ng/mL), remdesivir, tocilizumab, corticosteroids

Effect measure for obesity: odds ratio

Effect measure value (95% CI), P value: 1.02 (1.01, 1.03), < 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Mechanical ventilation	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias	Yes	Appendix 3

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Rubio-Rivas 2020 *(Continued)*

Mechanical ventilation		
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Sacco 2020

Study characteristics

Notes

English title

Overweight/obesity as the potentially most important lifestyle factor associated with signs of pneumonia in COVID-19

Study setting

Start of study recruitment (MM/YYYY): 05/2020

End of study recruitment (MM/YYYY): 07/2020

Study design: Prospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient

Number of participants recruited: 165

Sampling method: Random sample

Participants

Female participants (absolute number): 110

Age measure, value: NR

Inclusion criteria: Recent history of COVID-19 and an age of 18 years or older. Infection with SARS-CoV-2 had to be diagnosed by PCR from a nasopharyngeal swab or, in retrospect, by antibody testing. Additional inclusion criteria were permanent residence in Germany and online informed consent.

Exclusion criteria: Organ transplant and active chemo patients

Smoking frequency: 22

Diabetes frequency: NR

Hypertension frequency: NR

Cardiovascular disease frequency: 16

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 20

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

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Sacco 2020 *(Continued)*

Cancer frequency: 12

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 9

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Overweight/obese is ≥ 25 kg/m^2

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 63

Prognostic factor(s): Overweight/obese (BMI ≥ 25 kg/m^2)

Outcome(s)

Pneumonia

Outcome (prognostic factor)

Pneumonia (overweight/obese (BMI ≥ 25 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 165

Number of obese patients followed completely for the outcome: 63

Number of non-obese patients followed completely for the outcome: 102

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.68 (1.29, 5.59), 0.008

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, pulmonary disease, psychiatric disease

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.33 (1.06, 5.12), 0.036

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Pneumonia	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3

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Sacco 2020 *(Continued)*

Outcome Measurement Pneumonia	Unclear	Appendix 3
Confounding Bias Pneumonia	No	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Salari 2020

Study characteristics

Notes

English title

An investigation of risk factors of in-hospital death due to COVID-19: a case-control study in Rasht, Iran

Study setting

Start of study recruitment (MM/YYYY): 04/2020

End of study recruitment (MM/YYYY): 08/2020

Study design: Case-control

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 250

Sampling method: Non-random sample

Participants

Female participants (absolute number): 126

Age measure, value: Mean (SD), 59.6 (16.5)

Inclusion criteria: Adult COVID-19 patients aged older than 18 years who were admitted to Razi University hospital, the COVID-19 referral hospital in Rasht, Guilan, Northern Iran, from April 21 to August 21, 2020

Exclusion criteria: Subjects younger than 18 years and those without anthropometric or laboratory findings

Smoking frequency: NR

Diabetes frequency: 20

Hypertension frequency: 33

Cardiovascular disease frequency: 64

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

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Salari 2020 *(Continued)*

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): BMI quartile 4 (median = 30.12 kg/m^2)

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI quartile 4 (median = 30.12 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 250

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.66 (1.27, 5.58), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, length of hospitalisation, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.49 (1.15, 5.41), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3

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Salari 2020 *(Continued)*

Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Satman 2021

Study characteristics	
Notes	**English title** Unexpectedly lower mortality rates in COVID-19 patients with and without type 2 diabetes in Istanbul **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 05/2020 **Study design** registry data **Study centre(s)** multiple centres/clinics/areas within a country **Number of centres/clinics/areas** NR **Study setting** inpatient **Number of participants recruited** 203,465 **Sampling method** consecutive participants **Participants** **Female participants** (absolute number), 12,215 **Age measure, value** median (interquartile range), 53 (22)

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Satman 2021 *(Continued)*

Inclusion criteria

symptomatic COVID-19 cases with or without T2DM in Istanbul

Exclusion criteria

< 18 years or asymptomatic/mild (< 2 symptoms) cases

Smoking

NR

Diabetes

21,180

Hypertension

14,054

Cardiovascular diseases

1676

Please indicate if additional information is available

only HF

Asthma

6769

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

NR

Please indicate if additional information is available

NR

Chronic kidney disease

1217

Cancer

1409

Steroid administration

NR

Supplemental oxygen

NR

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Satman 2021 *(Continued)*

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

1128

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

hospitalisation, mortality

Outcome (prognostic factor)

hospitalisation (obesity)

Outcome

hospitalisation

Prognostic factor (category):

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Satman 2021 *(Continued)*

Obesity

Follow-up

Number of patients followed completely for this outcome

21,180

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.10 (0.93,1.31)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.47 (1.01, 2.21)

Outcome (prognostic factor)

hospitalisation (obesity)

Outcome

hospitalisation

Prognostic factor (category):

Obesity

Follow-up

Number of patients followed completely for this outcome

71,765

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

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Satman 2021 *(Continued)*

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.79 (1.37, 2.35)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.3 (0.1, 0.97)

Outcome (prognostic factor)

mortality (obesity)

Outcome

mortality

Prognostic factor (category):

Obesity

Follow-up

Number of patients followed completely for this outcome

21,180

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.09 (0.76, 1.57)

Multivariable (adjusted) analysis for obesity

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Satman 2021 *(Continued)*

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.83 (1.45, 5.53)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Schavemaker 2021

Study characteristics

Notes

English title

Associations of body mass index with ventilation management and clinical outcomes in invasively ventilated patients with ARDS related to COVID-19—insights from the PRoVENT-COVID study

Study setting

Start of study recruitment (MM/YYYY)

03/2020

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Schavemaker 2021 *(Continued)*

End of study recruitment (MM/YYYY)

06/2020

Study design

registry data

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

22

Study setting

inpatient

Number of participants recruited

1099

Sampling method

consecutive participants

Participants

Female participants

(absolute number),

Age measure, value

mean (standard deviation), 64.7 (14.8)

Inclusion criteria

1) age ≥ 18 years, (2) admitted to one of the participating ICUs, and (3) having received invasive ventilation for ARDS related to COVID-19

Exclusion criteria

if no BMI

Smoking

NR

Diabetes

(absolute number), 246

Hypertension

(absolute number), 374

Cardiovascular diseases

(absolute number), 48

Please indicate if additional information is available

HF

Asthma

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Schavemaker 2021 *(Continued)*

NR

Chronic obstructive pulmonary disease

(absolute number), 85

Other pulmonary diseases

NR

Please indicate if additional information is available

NR

Immunosuppression

(absolute number), 24

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 47

Cancer

(absolute number), 43

Steroid administration

(absolute number), 38

Supplemental oxygen

(absolute number)

Differential values for various oxygenation methods (if indicated)

all cases are ventilated

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

The categories of BMI were defined as underweight (BMI < 18.4 kg/m^2), normal-weight (18.5 ≤ BMI ≤ 24.9 kg/m^2), overweight (25.0 ≤ BMI ≤ 29.9 kg/m^2), and obese (BMI > 30 kg/m^2)

The time when obesity has been measured

before disease or right at presentation

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Schavemaker 2021 *(Continued)*

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

324

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

mortality (obesity)

Outcome

mortality

Prognostic factor (category):

obesity

Follow-up

Number of patients followed completely for this outcome

1099

Number of obese patients followed completely for this outcome

324

Number of non-obese patients followed completely for this outcome

775

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.78 (0.57, 1.09)

Multivariable (adjusted) analysis for obesity

Modelling method

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Schavemaker 2021 *(Continued)*

Cox regression

The set of prognostic factors used for adjustment

age, gender, body mass index, hypertension, heart failure, diabetes, chronic kidney disease, chronic obstructive pulmonary disease, active haematological neoplasia, active solid neoplasia, use of angiotensin converting enzyme inhibitor, and use of angiotensin II receptor blocker

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.89 (0.63, 1.25)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Shah 2020

Study characteristics

Notes

English title

Demographics, comorbidities and outcomes in hospitalized Covid-19 patients in rural southwest Georgia

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 3

Study setting: Inpatient

Number of participants recruited: 522

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Shah 2020 *(Continued)*

Sampling method: Non-random sample

Participants

Female participants (absolute number): 304

Age measure, value: Median (IQR), 63 (50-72)

Inclusion criteria: All hospitalised patients with confirmed Covid-19, who had an outcome, were included. The outcome was defined as either discharge from the hospital (home, nursing home, long-term care facility, skilled nursing facility, county jail) or death.

Exclusion criteria: Hospitalised patients who did not have an outcome by 6 May 2020 were excluded. The patients transferred to another hospital (due to the hospital being at full capacity or need for treatment not available at the facility) were not included as well.

Smoking frequency: 89

Diabetes frequency: 221

Hypertension frequency: 416

Cardiovascular disease frequency: 118

Asthma frequency: 68

Chronic obstructive pulmonary disease frequency: 47

Other pulmonary disease frequency: NR

Immunosuppression frequency: 29

Chronic kidney disease frequency: 78

Cancer frequency: 48

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity (BMI ≥ 30 kg/m^2); morbid obesity (BMI ≥ 40 kg/m^2)

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 347

Prognostic factor(s):

Obesity (BMI ≥ 30 kg/m^2)

Morbid obesity (BMI ≥ 40 kg/m^2)

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (obesity (BMI ≥ 30 kg/m^2))

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Shah 2020 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 522

Number of obese patients followed completely for the outcome: 347

Number of non-obese patients followed completely for the outcome: 175

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Asthma, age ≥ 65, black, BMI (30-40, ≥ 40), CAD, cancer, CHF, chronic liver disease, CKD, COPD, DM, hypertension, immunosuppression, sex, tobacco smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.49 (0.79, 2.77), 0.21

Outcome (prognostic factor)

Mortality (morbid obesity (BMI ≥ 40 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 522

Number of obese patients followed completely for the outcome: 134

Number of non-obese patients followed completely for the outcome: 384

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Asthma, age ≥ 65, black, BMI (30-40, ≥ 40), CAD, cancer, CHF, chronic liver disease, CKD, COPD, DM, hypertension, immunosuppression, sex, tobacco smoking

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.29 (1.11, 4.69), 0.02

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3

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Shah 2020 *(Continued)*

Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Sidhu 2020

Study characteristics

Notes

English title

Abstract 15852: Body mass index and fatal outcome in patients hospitalized for Covid 19

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

inpatient

Number of participants recruited

419

Sampling method

unspecified

Participants

Female participants

(absolute number), 217

Age measure, value

mean (standard deviation), 60.1 (15.5)

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Sidhu 2020 *(Continued)*

Inclusion criteria

NR

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 174

Hypertension

(absolute number), 237

Cardiovascular diseases

(absolute number), 48

Please indicate if additional information is available

HF

Asthma

NR

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 67

Cancer

(absolute number), 47

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

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Sidhu 2020 *(Continued)*

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

BMI > 40

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

40

Measure of frequency

absolute number

Frequency value

73

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

mortality, ICU admission

Outcome (prognostic factor)

mortality (BMI > 40)

Outcome

mortality

Prognostic factor (category):

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Sidhu 2020 *(Continued)*

BMI > 40

Follow-up

Number of patients followed completely for this outcome

419

Number of obese patients followed completely for this outcome

73

Number of non-obese patients followed completely for this outcome

284

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

(BMI), hypertension, diabetes, hyperlipidaemia, and CKD

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.9 (1.45, 10.5)

Outcome (prognostic factor)

ICU ad (BMI > 40)

Outcome

ICU ad

Prognostic factor (category):

BMI > 40

Follow-up

Number of patients followed completely for this outcome

419

Number of obese patients followed completely for this outcome

73

Number of non-obese patients followed completely for this outcome

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Sidhu 2020 *(Continued)*

284

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

(BMI), hypertension, diabetes, hyperlipidaemia, and CKD

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.2 (1.1, 9)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition ICU admission	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement ICU admission	Unclear	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

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Simonnet 2020

Study characteristics

Notes

English title

High prevalence of obesity in severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) requiring invasive mechanical ventilation

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 124

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 34

Age measure, value: Median (IQR), 60 (51-70)

Inclusion criteria: All patients admitted to intensive care for SARS-CoV-2 in Roger Salengro Hospital at Centre Hospitalier Universitaire de Lille (CHU Lille, France) between February 27, 2020, and April 5, 2020; SARS symptoms characterised by dyspnoea, increased respiratory frequency, decreased blood oxygen saturation, need for oxygen support therapy for at least 6L/min, throat swab PCR test positive

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 28

Hypertension frequency: 60

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

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Simonnet 2020 *(Continued)*

Study's definition for obesity: Lean (BMI from 18.5 to < 25 kg/m^2), overweight (BMI from 25 to < 30 kg/m^2), moderate obesity (BMI from 30 to < 35 kg/m^2), and severe obesity (BMI ≥ 35 kg/m^2)

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 59

Prognostic factor(s):

Overweight (BMI from 25 to < 30 kg/m^2)

Moderate obesity (BMI from 30 to < 35 kg/m^2)

Severe obesity (BMI ≥ 35 kg/m^2)

Outcome(s)

Mechanical ventilation

Outcome (prognostic factor)

Mechanical ventilation (overweight (BMI from 25 to < 30 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 124

Number of obese patients followed completely for the outcome: 59

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.72 (0.56, 5.23), 0.22

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, DM, dyslipidaemia, HTN, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.69 (0.52, 5.48), 0.22

Outcome (prognostic factor)

Mechanical ventilation (moderate obesity (BMI from 30 to < 35 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 124

Number of obese patients followed completely for the outcome: 59

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

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Simonnet 2020 *(Continued)*

Effect measure value (95% CI), P value: 3.38 (0.9, 12.72), 0.45

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, DM, dyslipidaemia, HTN, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.45 (0.83, 14.31), 0.48

Outcome (prognostic factor)

Mechanical ventilation (severe obesity (BMI ≥ 35 kg/m^2))

Follow-up

Number of patients followed completely for the outcome: 124

Number of obese patients followed completely for the outcome: 59

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 6.75 (1.76, 25.85), 0.015

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, DM, dyslipidaemia, HTN, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 7.36 (1.63, 33.14), 0.021

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Smati 2021a

Study characteristics

Notes

English title

Relationship between obesity and severe COVID-19 outcomes in patients with type 2 diabetes: results from the CORONADO study

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 68

Study setting: Inpatient

Number of participants recruited: 1965

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 698

Age measure, value: Mean (SD), 70.1 (12.5)

Inclusion criteria: Hospitalisation in a dedicated COVID-19 unit with COVID-19 diagnosis confirmed biologically (by SARS-CoV-2 PCR test) and/or clinically/radiologically (i.e. as ground-glass opacity and/or crazy paving on chest computed tomography scan); and a personal history of diabetes or newly diagnosed diabetes upon admission (i.e. HbA1c ≥ 48 mmol/mol [6.5%] during hospitalisation)

Exclusion criteria: Individuals with type 1 diabetes, other types of diabetes and those with newly diagnosed diabetes upon admission, as well underweight patients (BMI < 18.5 kg/m^2) to avoid interference caused by concomitant severe comorbidities

Smoking frequency: 656

Diabetes frequency: 1965

Hypertension frequency: 1556

Cardiovascular disease frequency: 214

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 194

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 195

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

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Smati 2021a *(Continued)*

Other treatments (frequency): Metformin (1163), sulphonylurea/glinides (585), DPP4 inhibitors (480), GLP1-RA (213), insulin (762), thiazide diuretics (393), beta blockers (729), ACE inhibitors (583), ARBs (581), ARBs and/or ACE inhibitors (1145), statins (975)

Prognostic factor(s)

Study's definition for obesity: Normal weight (18.5-24.9 kg/m^2), overweight (25-29.9 kg/m^2), class I obesity (30-34.9 kg/m^2) and class II/III obesity (≥35 kg/m^2)

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 805

Prognostic factor(s):

25 < BMI < 30 (overweight)

30 < BMI < 35 (obesity class 1)

BMI ≥ 35 (obesity class II/III)

Outcome(s)

Mechanical ventilation

Mortality

Outcome (prognostic factor)

Mechanical ventilation (25 < BMI < 30 (overweight))

Follow-up

Number of patients followed completely for the outcome: 1964

Number of obese patients followed completely for the outcome: 805

Number of non-obese patients followed completely for the outcome: 1159

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.57 (1.12, 2.20), 0.0091

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, COPD, hypertension, macro-vascular complications, microvascular complications, non-alcoholic fatty liver disease, routine treatment with insulin and GLP1-RA, sex, tobacco use, treated obstructive sleep apnoea

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.81 (1.02, 3.22), 0.436

Outcome (prognostic factor)

Mechanical ventilation (30 < BMI < 35 (obesity class 1))

Follow-up

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Smati 2021a *(Continued)*

Number of patients followed completely for the outcome: 1964

Number of obese patients followed completely for the outcome: 805

Number of non-obese patients followed completely for the outcome: 1159

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.94 (1.36, 2.76), 0.0003

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, COPD, hypertension, macro-vascular complications, microvascular complications, non-alcoholic fatty liver disease, routine treatment with insulin and GLP1-RA, sex, tobacco use, treated obstructive sleep apnoea

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.31 (1.27, 4.23), 0.064

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 35 (obesity class II/III))

Follow-up

Number of patients followed completely for the outcome: 1964

Number of obese patients followed completely for the outcome: 805

Number of non-obese patients followed completely for the outcome: 1159

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.63 (1.81, 3.83), < 0.0001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, COPD, hypertension, macro-vascular complications, microvascular complications, non-alcoholic fatty liver disease, routine treatment with insulin and GLP1-RA, sex, tobacco use, treated obstructive sleep apnoea

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.29 (1.15, 4.56), 0.019

Outcome (prognostic factor)

Mortality (25 < BMI < 30 (overweight))

Follow-up

Number of patients followed completely for the outcome: 1964

Number of obese patients followed completely for the outcome: 805

Number of non-obese patients followed completely for the outcome: 1159

Univariable unadjusted analysis for obesity

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Smati 2021a *(Continued)*

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.69 (0.47, 1.02), 0.0628

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, COPD, hypertension, macro-vascular complications, microvascular complications, non-alcoholic fatty liver disease, routine treatment with insulin and GLP1-RA, sex, tobacco use, treated obstructive sleep apnoea

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.23 (0.62, 2.44), 0.5493

Outcome (prognostic factor)

Mortality (30 < BMI < 35 (obesity class 1))

Follow-up

Number of patients followed completely for the outcome: 1964

Number of obese patients followed completely for the outcome: 805

Number of non-obese patients followed completely for the outcome: 1159

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.83 (0.55, 1.26), 0.3929

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, COPD, hypertension, macro-vascular complications, microvascular complications, non-alcoholic fatty liver disease, routine treatment with insulin and GLP1-RA, sex, tobacco use, treated obstructive sleep apnoea

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.26 (0.60, 2.66), 0.5369

Outcome (prognostic factor)

Mortality (BMI ≥ 35 (obesity class II/III))

Follow-up

Number of patients followed completely for the outcome: 1964

Number of obese patients followed completely for the outcome: 805

Number of non-obese patients followed completely for the outcome: 1159

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.76 (0.47, 1.24), 0.273

Multivariable analysis for obesity

Modelling method: Logistic regression

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Smati 2021a *(Continued)*

The set of prognostic factors used for adjustment: Age, COPD, hypertension, macro-vascular complications, microvascular complications, non-alcoholic fatty liver disease, routine treatment with insulin and GLP1-RA, sex, tobacco use, treated obstructive sleep apnoea

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.56 (0.60, 4.03), 0.3602

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Smati 2021b

Study characteristics

Notes

English title

Risk factors for hospitalization among patients with COVID-19 at a community ambulatory clinic in Massachusetts during the initial pandemic surge

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

04/2020

Study design

retrospective cohort

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Smati 2021b *(Continued)*

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

outpatient

Number of participants recruited

460

Sampling method

unspecified

Participants

Female participants

(absolute number), 292

Age measure, value

not reported

Inclusion criteria

Patients 18 years of age or older who had an initial visit from March 18, 2020 through April 25, 2020 at our ambulatory clinic and had a positive result of a nasopharyngeal swab for SARS-CoV-2 using the CDC 2019-Novel Coronavirus RT-PCR Diagnostic Panel kit were included in the analytic sample. Patients were considered hospitalised if they were admitted to any hospital, not limited to our network. Patients evaluated and discharged by emergency departments and patients hospitalised for childbirth were considered non-hospitalised for the purposes of our study.

Exclusion criteria

Patients who were initially evaluated in the emergency department were excluded.

Smoking

NR

Diabetes

(absolute number), 77

Hypertension

(absolute number), 125

Cardiovascular diseases

(absolute number), 23

Please indicate if additional information is available

CAD: 23

Asthma

(unspecified)

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Smati 2021b *(Continued)*

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(absolute number), 95

Please indicate if additional information is available

Chronic Lung Disease: 95

Immunosuppression

(absolute number), 21

Please indicate if additional information is available

currently taking immunosuppressive medication or asplenia, HIV, autoimmune rheumatologic disease, or diagnosis of cancer since 2019

Chronic kidney disease

(absolute number), 14

Cancer

(unspecified)

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obese (BMI >= 30 kg/m^2)

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

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Smati 2021b *(Continued)*

BMI

Threshold used for definition of obesity

>= 30 kg/m^2

Measure of frequency

absolute number

Frequency value

233

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

hospitalisation

Outcome (prognostic factor)

Hospitalisation (obese (BMI >= 30))

Outcome

Hospitalisation

Prognostic factor (category):

Obese (BMI >= 30)

Follow-up

Number of patients followed completely for this outcome

460

Number of obese patients followed completely for this outcome

233

Number of non-obese patients followed completely for this outcome

227

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

7.64 (1.8, 32.4)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

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Smati 2021b *(Continued)*

The set of prognostic factors used for adjustment

Age category, sex, and BMI of 25 or above (combined overweight and obesity categories)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

7.32 (1.68, 31.97)

Outcome (prognostic factor)

Hospitalisation (overweight (BMI 25-29.9))

Outcome

Hospitalisation

Prognostic factor (category):

Overweight (BMI 25-29.9)

Follow-up

Number of patients followed completely for this outcome

460

Number of obese patients followed completely for this outcome

233

Number of non-obese patients followed completely for this outcome

227

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

6.23 (1.42, 27.31)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age category, sex, and BMI of 25 or above (combined overweight and obesity categories)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

5.9 (1.31, 26.65)

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Smati 2021b *(Continued)*

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Soares 2020

Study characteristics	
Notes	**English title** Risk factors for hospitalization and mortality due to COVID-19 in Espírito Santo state, Brazil **Study setting** **Start of study recruitment (MM/YYYY):** 02/2020 **End of study recruitment (MM/YYYY):** 06/2020 **Study design:** Retrospective cohort **Study centre(s):** Single centre/clinic/area within a country **Number of centres, clinics or areas:** 1 **Study setting:** Outpatient and inpatient **Number of participants recruited:** 10,713 **Sampling method:** Consecutive participants **Participants** **Female participants (absolute number):** 5909 **Age measure, value:** NR **Inclusion criteria:** Patients who had been confirmed for COVID-19, recovered or died from this disease, had their case closed and had complete information for explanatory variables (gender, age, race, comorbidities, and signs and symptoms) **Exclusion criteria:** Cases which were considered to be still open and those with incomplete information (gender, age, race, comorbidities, signs and symptoms) **Smoking frequency:** 209 **Diabetes frequency:** 1100

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Soares 2020 *(Continued)*

Hypertension frequency: NR

Cardiovascular disease frequency: 2541

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: All pulmonary diseases (521)

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Unspecified

Main variable used for determination of obesity: Other (please specify)

Threshold used for definition: NR

Obesity frequency (absolute number): 597

Prognostic factor(s):

Obesity

Outcome(s)

Hospitalisation

Mortality

Outcome (prognostic factor)

Hospitalisation (obesity)

Follow-up

Number of patients followed completely for the outcome: 10,713

Number of obese patients followed completely for the outcome: 597

Number of non-obese patients followed completely for the outcome: 10,116

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.04 (1.64, 2.52), < 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, CVD, DM, kidney disease, pulmonary diseases, race, sex, smoking

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Soares 2020 *(Continued)*

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.74 (1.35, 2.23), < 0.001

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 1152

Number of obese patients followed completely for the outcome: 113

Number of non-obese patients followed completely for the outcome: 1039

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: NR

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Hospitalisation	Unclear	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

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Sonmez 2021

Study characteristics

Notes

English title

Clinical characteristics and outcomes of COVID-19 in patients with type 2 diabetes in Turkey: a nationwide study (TurCoviDia)

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

inpatient

Number of participants recruited

18,426

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 10,446

Age measure, value

median (interquartile range), 61 (17)

Inclusion criteria

Adult patients with T2DM hospitalised and with confirmed COVID-19 infection from 11 March to 30 May 2020 in the Turkish Ministry of Health database

Exclusion criteria

We excluded subjects who received outpatient care (n = 85,317), patients with type 1 DM (n = 370), and those unclassified for the diagnosis of DM (n = 715). In the remaining population, there were 18,621 inpatients with T2DM diagnosis screened using the International Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) codes and 44,648 inpatients without T2DM diagnosis. Patients with a T2DM diagnosis without any glycosylated haemoglobin (HbA1c) measurement within the past 12 months (n = 9408) were excluded.

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Sonmez 2021 *(Continued)*

Smoking

NR

Diabetes

(absolute number), 9213

Hypertension

(absolute number), 13,689

Cardiovascular diseases

(absolute number), 10,353

Please indicate if additional information is available

CHD: 6886; PAD: 1501; HF: 1966

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 1131

Cancer

(absolute number), 843

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

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Sonmez 2021 *(Continued)*

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity was defined as BMI ≥ 30 kg/m^2.

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

>= 30 kg/m^2

Measure of frequency

absolute number

Frequency value

1214

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (obesity (BMI >= 30))

Outcome

Mortality

Prognostic factor (category):

Obesity (BMI >= 30)

Follow-up

Number of patients followed completely for this outcome

9213

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Sonmez 2021 *(Continued)*

Number of obese patients followed completely for this outcome

870

Number of non-obese patients followed completely for this outcome

8343

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, male, obesity, insulin treatment, CT findings of COVID-19, lymphopenia

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.36 (1.18, 4.74)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Sterling 2020

Study characteristics

Notes **English title**

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Sterling 2020 *(Continued)*

The Fibrosis-4 Index is associated with need for mechanical ventilation and 30-day mortality in patients admitted with coronavirus disease 2019

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 256

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 115

Age measure, value: Mean (SD), 58.5 (17.66)

Inclusion criteria: Confirmed COVID-19 by polymerase chain reaction (PCR)

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 47%

Hypertension frequency: NR

Cardiovascular disease frequency: 28

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 24%

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30 kg/m^2

The time when obesity has been measured: Unspecified

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 123

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Sterling 2020 *(Continued)*

Prognostic factor(s): BMI > 30 (obese)

Outcome(s)

Mechanical ventilation

Outcome (prognostic factor)

Mechanical ventilation (BMI > 30 (obese))

Follow-up

Number of patients followed completely for the outcome: 256

Number of obese patients followed completely for the outcome: 123

Number of non-obese patients followed completely for the outcome: 133

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR, < 0.0001

Multivariable analysis for obesity

Modelling method: NR

The set of prognostic factors used for adjustment: AST, BMI, DM, FIB-4, FIB-4 ≥ 2.6, FIB-4 ≥ 3.25, history of respiratory disease, obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.5 (1.98, 10.27), 0.0003

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Suleyman 2020

Study characteristics	
Notes	**English title**

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Suleyman 2020 *(Continued)*

Clinical characteristics and morbidity associated with coronavirus disease 2019 in a series of patients in metropolitan Detroit

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 03/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 14

Study setting: Outpatient and inpatient

Number of participants recruited: 463

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 259

Age measure, value: Mean (SD), 57.5 (16.8)

Inclusion criteria: SARS-CoV-2 infection confirmed by positive polymerase chain reaction testing of nasopharyngeal specimens

Exclusion criteria: Lack of demographic and baseline data

Smoking frequency: 160

Diabetes frequency: 178

Hypertension frequency: 295

Cardiovascular disease frequency: 108

Asthma frequency: 73

Chronic obstructive pulmonary disease frequency: 49

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 182

Cancer frequency: 49

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Severe obesity, defined as BMI ≥ 40

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 40

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Suleyman 2020 *(Continued)*

Obesity frequency (absolute number): 89

Prognostic factor(s): BMI ≥ 40 (obesity class 3)

Outcome(s)

ICU admission

Mechanical ventilation

Outcome (prognostic factor)

ICU admission (BMI ≥ 40 (obesity class 3))

Follow-up

Number of patients followed completely for the outcome: 355

Number of obese patients followed completely for the outcome: 75

Number of non-obese patients followed completely for the outcome: 280

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR, 0.06

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: African-American race, age, cancer, CKD, coronary artery disease, congestive heart failure, DM, hypertension, severe obesity, sex, tobacco use

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.0 (1.4, 3.6), 0.02

Outcome (prognostic factor)

Mechanical ventilation (BMI ≥ 40 (obesity class 3))

Follow-up

Number of patients followed completely for the outcome: 355

Number of obese patients followed completely for the outcome: 75

Number of non-obese patients followed completely for the outcome: 280

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: African-American race, age, cancer, CKD, coronary artery disease, congestive heart failure, DM, hypertension, severe obesity, sex, tobacco use

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.2 (1.7, 6), < 0.001

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Suleyman 2020 *(Continued)*

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	No	Appendix 3
Study Attrition ICU admission	No	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Suresh 2021

Study characteristics	
Notes	**English title** Association of obesity with illness severity in hospitalized patients with COVID-19: a retrospective cohort study **Study setting** **Start of study recruitment (MM/YYYY)** 03/2020 **End of study recruitment (MM/YYYY)** 04/2020 **Study design** retrospective cohort **Study centre(s)** single centres/clinics/areas within a country **Number of centres/clinics/areas** 1

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Suresh 2021 *(Continued)*

Study setting

inpatient

Number of participants recruited

1983

Sampling method

unspecified

Participants

Female participants

(absolute number), 990

Age measure, value

mean (standard deviation), 63.82 (16.55)

Inclusion criteria

Patients with SARS-CoV-2 infection confirmed by positive polymerase chain reaction testing of a nasopharyngeal specimen were included. The study cohort consisted of patients who were admitted and discharged to any of the 5 hospitals within the Henry Ford Health System between March 1 and April 30, 2020.

Exclusion criteria

Patients who were discharged directly from the emergency room or evaluated in outpatient clinics were not included in this study.

Smoking

NR

Diabetes

(absolute number), 760

Hypertension

(absolute number), 1345

Cardiovascular diseases

(absolute number), 572

Please indicate if additional information is available

NR

Asthma

(unspecified)

Chronic obstructive pulmonary disease

(unspecified)

Other pulmonary diseases

(unspecified)

Please indicate if additional information is available

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Suresh 2021 *(Continued)*

NR

Immunosuppression

(unspecified)

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified)

Cancer

(absolute number), 142

Steroid administration

(unspecified)

Supplemental oxygen

(unspecified)

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

Hydroxychloroquine (1586); remdesivir (17); tocilizumab (84); plasmapheresis (5)

Dose if applicable

NR

Duration if applicable

HCQ: 400 mg BID for 1 day then 200 mg BID for 4 days.

Percentage received this treatment

Hydroxychloroquine (1586); remdesivir (17); tocilizumab (84); plasmapheresis (5)

Prognostic factor(s)

Study's definition for obesity

Patients with obesity were stratified by obesity class based on BMI with class 1 obesity defined as BMI 30.0–34.9 kg/m^2, class 2 obesity defined as BMI 35.0–39.9 kg/m^2, and class 3 obesity defined as BMI equal to or greater than 40.0 kg/m^2.

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

Obese (BMI >= 30 kg/m^2)

Measure of frequency

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Suresh 2021 *(Continued)*

absolute number

Frequency value

1031

How many eligible outcomes reported?

3

How many eligible outcomes reported?

4

Outcome(s)

mortality, ICU admission, mechanical ventilation, hospitalisation

Outcome (prognostic factor)

Mortality (obese (BMI >= 30))

Outcome

Mortality

Prognostic factor (category):

Obese (BMI >= 30)

Follow-up

Number of patients followed completely for this outcome

1983

Number of obese patients followed completely for this outcome

1031

Number of non-obese patients followed completely for this outcome

952

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, race, medical comorbidities, treatments received

Effect measure for obesity

odds ratio

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Suresh 2021 *(Continued)*

Effect measure value (95% CI)

1.1 (0.83, 1.44)

Outcome (prognostic factor)

ICU admission (obese (BMI >= 30))

Outcome

ICU admission

Prognostic factor (category):

Obese (BMI >= 30)

Follow-up

Number of patients followed completely for this outcome

1983

Number of obese patients followed completely for this outcome

1031

Number of non-obese patients followed completely for this outcome

952

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, race, medical comorbidities, treatments received

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.37 (1.07, 1.76)

Outcome (prognostic factor)

Mechanical ventilation (obese (BMI >= 30))

Outcome

Mechanical ventilation

Prognostic factor (category):

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Suresh 2021 *(Continued)*

Obese (BMI >= 30)

Follow-up

Number of patients followed completely for this outcome

1983

Number of obese patients followed completely for this outcome

1031

Number of non-obese patients followed completely for this outcome

952

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, race, medical comorbidities, treatments received

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.37 (1.8, 1.04)

Outcome (prognostic factor)

Hospital admission (obese (BMI >= 30))

Outcome

Hospital admission

Prognostic factor (category):

Obese (BMI >= 30)

Follow-up

Number of patients followed completely for this outcome

1983

Number of obese patients followed completely for this outcome

1031

Number of non-obese patients followed completely for this outcome

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Suresh 2021 *(Continued)*

952

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, race, medical comorbidities, treatments received

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

0.91 (1.35, 0.62)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Unclear	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3

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Suresh 2021 *(Continued)*

Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Confounding Bias Hospitalisation	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Tartof 2020

Study characteristics

Notes

English title

Obesity and mortality among patients diagnosed with COVID-19: results from an integrated health care organization

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

Number of participants recruited: 6916 (cohort 1), 3111 (cohort 2), 3805 (cohort 3), 1722 (cohort 4), 5194 (cohort 5)

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 3805 (cohort 1), 0 (cohort 2), 920 (cohort 3), 2885 (cohort 4), 5194 (cohort 5)

Age measure, value: Mean (SD), 49.1 (16.6) (cohort 1), 49.3 (16.48) (cohort 2), 49 (16.76) (cohort 3), 70.6 (8.52) (cohort 4), 49.4 (8.34) (cohort 5)

Inclusion criteria: All KPSC members diagnosed with COVID-19 by diagnostic codes or positive laboratory test results from 13 February to 2 May 2020, with 6-month continuous membership

Exclusion criteria: Women who were pregnant at the time of diagnosis

Smoking frequency: 1469 (cohort 1), 881 (cohort 2), 588 (cohort 3), 578 (cohort 4), 891 (cohort 5)

Diabetes frequency: 1392 (cohort 1), 682 (cohort 2), 710 (cohort 3), 659 (cohort 4), 733 (cohort 5)

Hypertension frequency: 1693 (cohort 1), 792 (cohort 2), 901 (cohort 3), 943 (cohort 4), 750 (cohort 5)

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Tartof 2020 *(Continued)*

Cardiovascular disease frequency: 341 (cohort 1), 187 (cohort 2), 154 (cohort 3), 280 (cohort 4), 61 (cohort 5)

Asthma frequency: 1273 (cohort 1), 542 (cohort 2), 731 (cohort 3), 350 (cohort 4), 923 (cohort 5)

Chronic obstructive pulmonary disease frequency: 869 (cohort 1), 336 (cohort 2), 533 (cohort 3), 280 (cohort 4), 589 (cohort 5)

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 154 (cohort 1), 79 (cohort 2), 75 (cohort 3), 95 (cohort 4), 59 (cohort 5)

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Less than 18.5 kg/m^2 (underweight), 18.5 to 24 kg/m^2 (normal), 25 to 29 kg/m^2 (overweight), 30 to 34 kg/m^2 (obese class I), 35 to 39 kg/m^2 (obese class II), and greater than 40 kg/m^2 (obese class III or extreme obesity)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 3171 (cohort 1), 1422 (cohort 2), 1889 (cohort 3), 630 (cohort 4), 2541 (cohort 5)

Prognostic factor(s): less than 18.5 kg/m^2 (underweight), 18.5 to 24 kg/m^2 (normal), 25 to 29 kg/m^2 (overweight), 30 to 34 kg/m^2 (obese class I), 35 to 39 kg/m^2 (obese class II), and greater than 40 kg/m^2 (obese class III or extreme obesity)

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI < 18.5 kg/m^2) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 6916

Number of obese patients followed completely for the outcome: 3171

Number of non-obese patients followed completely for the outcome: 3544

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

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Tartof 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.81 (0.99, 3.3), NR

Outcome (prognostic factor)

Mortality (BMI 25-29 kg/m^2) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 6916

Number of obese patients followed completely for the outcome: 3171

Number of non-obese patients followed completely for the outcome: 3544

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 0.91 (0.62, 1.35), NR

Outcome (prognostic factor)

Mortality (BMI 30-34 kg/m^2) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 6916

Number of obese patients followed completely for the outcome: 3171

Number of non-obese patients followed completely for the outcome: 3544

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

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Tartof 2020 *(Continued)*

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.26 (0.82, 1.95), NR

Outcome (prognostic factor)

Mortality (BMI 35-39 kg/m^2) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 6916

Number of obese patients followed completely for the outcome: 3171

Number of non-obese patients followed completely for the outcome: 3544

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.16 (0.63, 2.17), NR

Outcome (prognostic factor)

Mortality (BMI 40-44 kg/m^2) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 6916

Number of obese patients followed completely for the outcome: 3171

Number of non-obese patients followed completely for the outcome: 3544

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 2.68 (1.43, 5.04), NR

Outcome (prognostic factor)

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Tartof 2020 *(Continued)*

Mortality (BMI ≥ 45 kg/m^2) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 6916

Number of obese patients followed completely for the outcome: 3171

Number of non-obese patients followed completely for the outcome: 3544

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 4.18 (2.12, 8.26), NR

Outcome (prognostic factor)

Mortality (BMI < 18.5 kg/m^2) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 3111

Number of obese patients followed completely for the outcome: 1429

Number of non-obese patients followed completely for the outcome: 1549

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.58 (0.6, 4.15), NR

Outcome (prognostic factor)

Mortality (BMI 25-29 kg/m^2) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 3111

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Tartof 2020 *(Continued)*

Number of obese patients followed completely for the outcome: 1429

Number of non-obese patients followed completely for the outcome: 1549

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 0.83 (0.47, 1.44), NR

Outcome (prognostic factor)

Mortality (BMI 30-34 kg/m^2) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 3111

Number of obese patients followed completely for the outcome: 1429

Number of non-obese patients followed completely for the outcome: 1549

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.35 (0.75, 2.43), NR

Outcome (prognostic factor)

Mortality (BMI 35-39 kg/m^2) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 3111

Number of obese patients followed completely for the outcome: 1429

Number of non-obese patients followed completely for the outcome: 1549

Univariable unadjusted analysis for obesity

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Tartof 2020 *(Continued)*

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.23 (0.51, 2.99), NR

Outcome (prognostic factor)

Mortality (BMI 40-44 kg/m^2) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 3111

Number of obese patients followed completely for the outcome: 1429

Number of non-obese patients followed completely for the outcome: 1549

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 4.81 (2.15, 10.78), NR

Outcome (prognostic factor)

Mortality (BMI ≥ 45 kg/m^2) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 3111

Number of obese patients followed completely for the outcome: 1429

Number of non-obese patients followed completely for the outcome: 1549

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

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Tartof 2020 *(Continued)*

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 10.04 (4.01, 25.09), NR

Outcome (prognostic factor)

Mortality (BMI < 18.5 kg/m^2) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 3805

Number of obese patients followed completely for the outcome: 1749

Number of non-obese patients followed completely for the outcome: 1995

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.5 (0.65, 3.48), NR

Outcome (prognostic factor)

Mortality (BMI 25-29 kg/m^2) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 3805

Number of obese patients followed completely for the outcome: 1749

Number of non-obese patients followed completely for the outcome: 1995

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, con-

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Tartof 2020 *(Continued)*

gestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.15 (0.64, 2.08), NR

Outcome (prognostic factor)

Mortality (BMI 30-34 kg/m^2) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 3805

Number of obese patients followed completely for the outcome: 1749

Number of non-obese patients followed completely for the outcome: 1995

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.34 (0.67, 2.67), NR

Outcome (prognostic factor)

Mortality (BMI 35-39 kg/m^2) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 3805

Number of obese patients followed completely for the outcome: 1749

Number of non-obese patients followed completely for the outcome: 1995

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

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Tartof 2020 *(Continued)*

Effect measure value (95% CI), P value: 1.27 (0.51, 3.16), NR

Outcome (prognostic factor)

Mortality (BMI 40-44 kg/m^2) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 3805

Number of obese patients followed completely for the outcome: 1749

Number of non-obese patients followed completely for the outcome: 1995

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.6 (0.51, 5), NR

Outcome (prognostic factor)

Mortality (BMI ≥ 45 kg/m^2) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 3805

Number of obese patients followed completely for the outcome: 1749

Number of non-obese patients followed completely for the outcome: 1995

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.98 (0.63, 6.02), NR

Outcome (prognostic factor)

Mortality (BMI < 18.5 kg/m^2) (cohort 4)

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Tartof 2020 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 1722

Number of obese patients followed completely for the outcome: 630

Number of non-obese patients followed completely for the outcome: 1081

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.81 (0.99, 3.32), NR

Outcome (prognostic factor)

Mortality (BMI 25-29 kg/m^2) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 1722

Number of obese patients followed completely for the outcome: 630

Number of non-obese patients followed completely for the outcome: 1081

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.03 (0.65, 1.55), NR

Outcome (prognostic factor)

Mortality (BMI 30-34 kg/m^2) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 1722

Number of obese patients followed completely for the outcome: 630

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Tartof 2020 *(Continued)*

Number of non-obese patients followed completely for the outcome: 1081

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.41 (0.88, 2.26), NR

Outcome (prognostic factor)

Mortality (BMI 35-39 kg/m^2) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 1722

Number of obese patients followed completely for the outcome: 630

Number of non-obese patients followed completely for the outcome: 1081

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.24 (0.58, 2.62), NR

Outcome (prognostic factor)

Mortality (BMI 40-44 kg/m^2) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 1722

Number of obese patients followed completely for the outcome: 630

Number of non-obese patients followed completely for the outcome: 1081

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

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Tartof 2020 *(Continued)*

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.25 (0.43, 3.61), NR

Outcome (prognostic factor)

Mortality (BMI ≥ 45 kg/m^2) (cohort 4)

Follow-up

Number of patients followed completely for the outcome: 1722

Number of obese patients followed completely for the outcome: 630

Number of non-obese patients followed completely for the outcome: 1081

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 3.03 (1.15, 8), NR

Outcome (prognostic factor)

Mortality (BMI < 18.5 kg/m^2) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 5194

Number of obese patients followed completely for the outcome: 2541

Number of non-obese patients followed completely for the outcome: 2463

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

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Tartof 2020 *(Continued)*

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: NR (NR, NR), NR

Outcome (prognostic factor)

Mortality (BMI 25-29 kg/m^2) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 5194

Number of obese patients followed completely for the outcome: 2541

Number of non-obese patients followed completely for the outcome: 2463

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.56 (0.3, 8.24), NR

Outcome (prognostic factor)

Mortality (BMI 30-34 kg/m^2) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 5194

Number of obese patients followed completely for the outcome: 2541

Number of non-obese patients followed completely for the outcome: 2463

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

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Tartof 2020 *(Continued)*

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 1.89 (0.36, 9.78), NR

Outcome (prognostic factor)

Mortality (BMI 35-39 kg/m^2) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 5194

Number of obese patients followed completely for the outcome: 2541

Number of non-obese patients followed completely for the outcome: 2463

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 3.37 (0.59, 19.21), NR

Outcome (prognostic factor)

Mortality (BMI 40-44 kg/m^2) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 5194

Number of obese patients followed completely for the outcome: 2541

Number of non-obese patients followed completely for the outcome: 2463

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 17.4 (3.37, 87.27), NR

Outcome (prognostic factor)

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Tartof 2020 *(Continued)*

Mortality (BMI ≥ 45 kg/m^2) (cohort 5)

Follow-up

Number of patients followed completely for the outcome: 5194

Number of obese patients followed completely for the outcome: 2541

Number of non-obese patients followed completely for the outcome: 2463

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Multivariable Poisson regression

The set of prognostic factors used for adjustment: Age, sex, race/ethnicity, smoking, metastatic tumour/cancer, hyperlipidaemia, myocardial infarction, other immune condition, organ transplant, congestive heart failure, peripheral vascular disease, cerebrovascular disease, chronic pulmonary disease, renal disease, hypertension, asthma, DM

Effect measure for obesity: Relative risk

Effect measure value (95% CI), P value: 12.25 (2.28, 66.77), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Tchang 2021

Study characteristics

Notes

English title

The independent risk of obesity and diabetes and their interaction in COVID-19: a retrospective cohort study

Study setting

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Tchang 2021 *(Continued)*

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

05/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

3

Study setting

inpatient

Number of participants recruited

3533

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 1455

Age measure, value

median (interquartile range), 65 (53, 77)

Inclusion criteria

All adult patients (≥ 18 years old) with COVID-19 confirmed by reverse transcriptase-polymerase chain reaction (RT-PCR) who had a documented BMI 3 months prior to or at admission were included.

Exclusion criteria

Multiple visits from one patient were considered as one COVID-19 episode. Patients who were discharged from the emergency department with or without admission to the observation unit were excluded.

Smoking

NR

Diabetes

(absolute number), 1134

Hypertension

(absolute number), 1962

Cardiovascular diseases

(absolute number), 1006

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Tchang 2021 *(Continued)*

Please indicate if additional information is available

520 CAD; 246 CHF; 240 cerebrovascular accident

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(unspecified), NR

Other pulmonary diseases

(absolute number), 587

Please indicate if additional information is available

Pulmonary disease included chronic obstructive pulmonary disease, asthma, interstitial lung disease, obstructive sleep apnoea, pulmonary hypertension, cystic fibrosis, and pneumothorax.

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 356

Cancer

(absolute number), 160

Steroid administration

(unspecified), NR

Supplemental oxygen

(unspecified), NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

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Tchang 2021 *(Continued)*

BMI categories were defined according to the World Health Organization, including race-specific thresholds for Asian populations (overweight = 23.0-27.4 kg/m^2, mild obesity = 27.5-32.4, moderate obesity = 32.5-37.4, and severe obesity= ≥ 37.5)

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

BMI > 30 (27.5 for Asian populations)

Measure of frequency

absolute number

Frequency value

1256

How many eligible outcomes reported?

3

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (overweight)

Outcome

Mortality

Prognostic factor (category):

Overweight

Follow-up

Number of patients followed completely for this outcome

3533

Number of obese patients followed completely for this outcome

1231

Number of non-obese patients followed completely for this outcome

1046

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

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Tchang 2021 *(Continued)*

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, race, smoking status, hypertension, pulmonary disease, chronic kidney disease, end-stage renal disease, and cardiovascular disease

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

NR

Outcome (prognostic factor)

Mortality (obese)

Outcome

Mortality

Prognostic factor (category):

Obese

Follow-up

Number of patients followed completely for this outcome

3533

Number of obese patients followed completely for this outcome

1256

Number of non-obese patients followed completely for this outcome

1046

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

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Tchang 2021 *(Continued)*

age, sex, race, smoking status, hypertension, pulmonary disease, chronic kidney disease, end-stage renal disease, and cardiovascular disease

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.03 (0.85, 1.25)

Outcome (prognostic factor)

Mortality (mild obesity)

Outcome

Mortality

Prognostic factor (category):

Mild obesity

Follow-up

Number of patients followed completely for this outcome

3533

Number of obese patients followed completely for this outcome

777

Number of non-obese patients followed completely for this outcome

1046

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, race, smoking status, hypertension, pulmonary disease, chronic kidney disease, end-stage renal disease, and cardiovascular disease

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

NR

Outcome (prognostic factor)

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Tchang 2021 *(Continued)*

Mortality (moderate obesity)

Outcome

Mortality

Prognostic factor (category):

Moderate obesity

Follow-up

Number of patients followed completely for this outcome

3533

Number of obese patients followed completely for this outcome

290

Number of non-obese patients followed completely for this outcome

1046

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, race, smoking status, hypertension, pulmonary disease, chronic kidney disease, end-stage renal disease, and cardiovascular disease

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

NR

Outcome (prognostic factor)

Mortality (severe obesity)

Outcome

Mortality

Prognostic factor (category)

Severe obesity

Follow-up

Number of patients followed completely for this outcome

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Tchang 2021 *(Continued)*

3533

Number of obese patients followed completely for this outcome

189

Number of non-obese patients followed completely for this outcome

1046

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, race, smoking status, hypertension, pulmonary disease, chronic kidney disease, end-stage renal disease, and cardiovascular disease

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.42 (0.99, 2.04)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Thomson 2020

Study characteristics

Notes

English title

Clinical characteristics and outcomes of critically ill patients with COVID-19 admitted to an intensive care unit in London: a prospective observational cohort study

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Prospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 156

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 44

Age measure, value: Median (IQR), 62 (54, 70)

Inclusion criteria: All patients with laboratory-confirmed SARS-CoV-2 infection admitted to the ICU from the first case until the cut-off date for this study, 6 May 2020

Exclusion criteria: NR

Smoking frequency: 117

Diabetes frequency: 52

Hypertension frequency: 81

Cardiovascular disease frequency: 26

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 19

Immunosuppression frequency: NR

Chronic kidney disease frequency: 23

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Overweight or obese (BMI ≥ 25 kg/m^2)

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Thomson 2020 *(Continued)*

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 25

Obesity frequency (absolute number): 80

Prognostic factor(s): (BMI ≥ 25 kg/m^2)

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI ≥ 25 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 156

Number of obese patients followed completely for the outcome: 89

Number of non-obese patients followed completely for the outcome: 67

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.9 (0.87, 4.33), 0.1

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, ethnicity, lowest P/F ratio on first ICU day, PaCO2 at time of lowest P/F ratio

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.06 (1.16, 8.74), < 0.029

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	No	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

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Toussie 2020

Study characteristics

Notes

English title

Clinical and chest radiography features determine patient outcomes in young and middle-aged adults with COVID-19

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 03/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Outpatient and inpatient

Number of participants recruited: 338

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 129

Age measure, value: Median (IQR), 39 (31, 45)

Inclusion criteria: All chest radiograph examinations performed during the study period

Exclusion criteria: Patients older than 50 years or younger than 21 years, cases with duplicate medical record numbers, unconfirmed results for COVID-19 reverse transcriptase polymerase chain reaction

Smoking frequency: 51

Diabetes frequency: 39

Hypertension frequency: 54

Cardiovascular disease frequency: NR

Asthma frequency: 46

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: 7

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

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Toussie 2020 *(Continued)*

Study's definition for obesity: Normal (< 25), overweight (26–30), obese (31–40), morbidly obese (> 40)

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 133

Prognostic factor(s):

overweight (BMI 26–30) adjusted for chest radiographic severity score ≥ 2,

overweight (BMI 26–30) adjusted for chest radiographic severity score 0-6,

obese (31–40) adjusted for chest radiographic severity score ≥ 2,

obese (31–40) adjusted for chest radiographic severity score 0-6,

BMI > 40 (obesity class 3) adjusted for chest radiographic severity score ≥ 2,

BMI > 40 (obesity class 3) adjusted for chest radiographic severity score 0-6,

overweight (BMI 26–30),

obese (31–40),

BMI > 40 (obesity class 3)

Outcome(s)

Hospitalisation

Mechanical ventilation

Length of hospitalisation

Outcome (prognostic factor)

Hospitalisation (overweight (BMI 26–30) adjusted for chest radiographic severity score ≥ 2)

Follow-up

Number of patients followed completely for the outcome: 388

Number of obese patients followed completely for the outcome: 133

Number of non-obese patients followed completely for the outcome: 180

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.4 (0.72, 2.6), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.5 (0.68, 3.1), NR

Outcome (prognostic factor)

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Toussie 2020 *(Continued)*

Hospitalisation (overweight (BMI 26–30) adjusted for Chest Radiographic Severity Score 0-6)

Follow-up

Number of patients followed completely for the outcome: 388

Number of obese patients followed completely for the outcome: 133

Number of non-obese patients followed completely for the outcome: 180

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.4 (0.72, 2.6), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.4 (0.65, 3), NR

Outcome (prognostic factor)

Hospitalisation (obese (31–40) adjusted for chest radiographic severity score ≥ 2)

Follow-up

Number of patients followed completely for the outcome: 388

Number of obese patients followed completely for the outcome: 133

Number of non-obese patients followed completely for the outcome: 180

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3 (1.6, 5.6), < 0.05

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.4 (1.1, 5.4), < 0.05

Outcome (prognostic factor)

Hospitalisation (obese (31–40) adjusted for chest radiographic severity score 0-6)

Follow-up

Number of patients followed completely for the outcome: 388

Number of obese patients followed completely for the outcome: 133

Number of non-obese patients followed completely for the outcome: 180

Univariable unadjusted analysis for obesity

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Toussie 2020 *(Continued)*

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3 (1.6, 5.6), < 0.05

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.5 (1.1, 5.4), < 0.05

Outcome (prognostic factor)

Hospitalisation (BMI > 40 (obesity class 3) adjusted for chest radiographic severity score ≥ 2)

Follow-up

Number of patients followed completely for the outcome: 388

Number of obese patients followed completely for the outcome: 133

Number of non-obese patients followed completely for the outcome: 180

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.3 (1.8, 10), < 0.05

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.6 (1.2, 11), < 0.05

Outcome (prognostic factor)

Hospitalisation (BMI > 40 (obesity class 3) adjusted for chest radiographic severity score 0-6)

Follow-up

Number of patients followed completely for the outcome: 388

Number of obese patients followed completely for the outcome: 133

Number of non-obese patients followed completely for the outcome: 180

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.3 (1.8, 10), < 0.05

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

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Toussie 2020 *(Continued)*

Effect measure value (95% CI), P value: 3.6 (1.2, 10.9), < 0.05

Outcome (prognostic factor)

Mechanical ventilation (overweight (BMI 26–30) adjusted for chest radiographic severity score ≥ 2)

Follow-up

Number of patients followed completely for the outcome: 145

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.83 (0.18, 3.9), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.1 (0.21, 7), NR

Outcome (prognostic factor)

Mechanical ventilation (overweight (BMI 26–30) adjusted for chest radiographic severity score 0-6)

Follow-up

Number of patients followed completely for the outcome: 145

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.83 (0.18, 3.9), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.3 (0.22, 9.3), NR

Outcome (prognostic factor)

Mechanical ventilation (obese (31–40) adjusted for chest radiographic severity score ≥ 2)

Follow-up

Number of patients followed completely for the outcome: 145

Number of obese patients followed completely for the outcome: 80

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Toussie 2020 *(Continued)*

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.7 (0.42, 6.5), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.1 (0.5, 12), NR

Outcome (prognostic factor)

Mechanical ventilation (obese (31–40) adjusted for chest radiographic severity score 0-6)

Follow-up

Number of patients followed completely for the outcome: 145

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.7 (0.42, 6.5), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.2 (0.46, 13), NR

Outcome (prognostic factor)

Mechanical ventilation (BMI > 40 (obesity class 3) adjusted for chest radiographic severity score ≥ 2)

Follow-up

Number of patients followed completely for the outcome: 145

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.6 (0.81, 16), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

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Toussie 2020 *(Continued)*

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.1 (0.5, 12), NR

Outcome (prognostic factor)

Mechanical ventilation (BMI > 40 (obesity class 3) adjusted for chest radiographic severity score 0-6)

Follow-up

Number of patients followed completely for the outcome: 145

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.6 (0.81, 16), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Chest radiographic severity score ≥ 2

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5.9 (0.97, 45), NR

Outcome (prognostic factor)

Length of hospitalisation (BMI 26–30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 145

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.8 (0.25, 2.3), NR

Multivariable analysis for obesity

Modelling method: NR

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Outcome (prognostic factor)

Length of hospitalisation (BMI 31–40 kg/m^2)

Follow-up

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Toussie 2020 *(Continued)*

Number of patients followed completely for the outcome: 145

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.3 (0.48, 3.6), NR

Multivariable analysis for obesity

Modelling method: NR

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Outcome (prognostic factor)

Length of hospitalisation (BMI > 40 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 145

Number of obese patients followed completely for the outcome: 80

Number of non-obese patients followed completely for the outcome: 65

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.5 (0.43, 5.1), NR

Multivariable analysis for obesity

Modelling method: NR

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3

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Toussie 2020 *(Continued)*

Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Mechanical ventilation	No	Appendix 3
Confounding Bias Hospitalisation	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Tsai 2021

Study characteristics	
Notes	**English title** COVID-19 associated mortality and cardiovascular disease outcomes among US women veterans **Study setting** **Start of study recruitment (MM/YYYY)** 02/2020 **End of study recruitment (MM/YYYY)** 11/2020 **Study design** retrospective cohort **Study centre(s)** multiple centres/clinics/areas within a country **Number of centres/clinics/areas** NR **Study setting** outpatient and inpatient **Number of participants recruited** 8308 **Sampling method** unspecified **Participants** **Female participants** (percentage), 100

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Tsai 2021 *(Continued)*

Age measure, value

mean (standard deviation), 48.62 (12.66)

Inclusion criteria

Women patients who were tested for SARS-COV-2 infection at US Veterans Affairs (VA) Health Care between February 24 and November 25, 2019 from the VA COVID-19 database

Exclusion criteria

Not eligible for VA healthcare, missing data on baseline covariates, inconsistent death and cardiovascular event data entered

Smoking

NR

Diabetes

(absolute number), 1591

Hypertension

(absolute number), NR

Cardiovascular diseases

(absolute number), 1351

Please indicate if additional information is available

NR

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(absolute number), 624

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

NR

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 347

Cancer

(unspecified), NR

Steroid administration

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Tsai 2021 *(Continued)*

(unspecified), NR

Supplemental oxygen

(unspecified), NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

obesity (BMI > 30)

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

obesity (BMI > 30)

Measure of frequency

unspecified

Frequency value

NR

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

mortality

Outcome (prognostic factor)

Mortality (obesity (BMI > 30))

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Tsai 2021 *(Continued)*

Outcome

Mortality

Prognostic factor (category):

Obesity (BMI > 30)

Follow-up

Number of patients followed completely for this outcome

8308

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

Age, race, diabetes, current smoking status, CVD, COPD, CKD, and anticoagulant medication

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.15 (1.05, 1.25)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3

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Tsai 2021 *(Continued)*

Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Van Zelst 2020

Study characteristics

Notes

English title

Analyses of abdominal adiposity and metabolic syndrome as risk factors for respiratory distress in COVID-19

Study setting

Start of study recruitment (MM/YYYY): 04/2020

End of study recruitment (MM/YYYY): 05/2020

Study design: Prospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Outpatient and inpatient

Number of participants recruited: 166

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 92

Age measure, value: Median (IQR), NR

Inclusion criteria: Consecutive patients, aged ≥ 18 years, presenting with respiratory symptoms or fever suspected of having COVID-19

Exclusion criteria: Patients with a 'do not resuscitate/intubate' order, patients unable to stand upright (due to respiratory distress or pre-existent comorbidities) or patients without measurements of hip and waist circumference were excluded.

Smoking frequency: NR

Diabetes frequency: 44

Hypertension frequency: 47

Cardiovascular disease frequency: 36

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 53

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

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Van Zelst 2020 *(Continued)*

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 65

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Abdominal adiposity, defined as a waist circumference ≥ 102 cm in men and ≥ 88 cm in women, measured in the upright position

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: waist circumference

Threshold used for definition: waist circumference ≥ 102 cm in men and ≥ 88 cm in women

Obesity frequency (absolute number): 105

Prognostic factor(s): Abdominal adiposity

BMI

Waist-hip ratio

Outcome(s)

Severe COVID

Length of hospitalisation

Outcome (prognostic factor)

Severe COVID (abdominal adiposity)

Follow-up

Number of patients followed completely for the outcome: 166

Number of obese patients followed completely for the outcome: 105

Number of non-obese patients followed completely for the outcome: 61

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 3.5 (1.23, 9.93), 0.019

Multivariable analysis for obesity

Modelling method: NR

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Outcome (prognostic factor)

Severe COVID (BMI)

Follow-up

Number of patients followed completely for the outcome: 166

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Van Zelst 2020 *(Continued)*

Number of obese patients followed completely for the outcome: 105

Number of non-obese patients followed completely for the outcome: 61

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.11 (1.02, 1.21), 0.016

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.11 (1.02, 1.2), 0.014

Outcome (prognostic factor)

Severe COVID (waist-hip ratio)

Follow-up

Number of patients followed completely for the outcome: 166

Number of obese patients followed completely for the outcome: 105

Number of non-obese patients followed completely for the outcome: 61

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.11 (1.05, 1.18), 0.001

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.11 (1.02, 1.2), 0.014

Outcome (prognostic factor)

Length of hospitalisation (abdominal adiposity)

Follow-up

Number of patients followed completely for the outcome: 166

Number of obese patients followed completely for the outcome: 105

Number of non-obese patients followed completely for the outcome: 61

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.77 (0.47, 1.27), 0.3

Multivariable analysis for obesity

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Van Zelst 2020 *(Continued)*

Modelling method: NR

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Outcome (prognostic factor)

Length of hospitalisation (BMI)

Follow-up

Number of patients followed completely for the outcome: 166

Number of obese patients followed completely for the outcome: 105

Number of non-obese patients followed completely for the outcome: 61

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.97 (0.93, 1.01), 0.12

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.97 (0.92, 1.01), 0.012

Outcome (prognostic factor)

Length of hospitalisation (waist-hip ratio)

Follow-up

Number of patients followed completely for the outcome: 166

Number of obese patients followed completely for the outcome: 105

Number of non-obese patients followed completely for the outcome: 61

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.98 (0.95, 0.99), 0.04

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 0.98 (0.95, 1.2), 0.29

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Van Zelst 2020 *(Continued)*

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Hospitalisation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Hospitalisation	No	Appendix 3
Confounding Bias Severe COVID	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Vousden 2021

Study characteristics	
Notes	**English title** The incidence, characteristics and outcomes of pregnant women hospitalized with symptomatic and asymptomatic SARS-CoV-2 infection in the UK from March to September 2020: a national cohort study using the UK Obstetric Surveillance System (UKOSS) (preprint) **Study setting** **Start of study recruitment (MM/YYYY):** 03/2020 **End of study recruitment (MM/YYYY):** 08/2020 **Study design:** Prospective cohort **Study centre(s):** Multiple centres/clinics/areas within a country **Number of centres, clinics or areas:** 194 **Study setting:** Inpatient **Number of participants recruited:** 1148 (cohort 1), 722 (cohort 2), 426 (cohort 3) **Sampling method:** Consecutive participants **Participants** **Female participants (absolute number):** 2296

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Vousden 2021 *(Continued)*

Age measure, value: Median (IQR), NR

Inclusion criteria: Women who were hospitalised from 1st March 2020 to 31st August 2020. Hospital admission was defined as a hospital stay of 24 hours or longer for any cause, or admission of any duration to give birth. Women were taken as confirmed SARS-CoV-2 if they were hospitalised during pregnancy or within two days of giving birth and had a positive test during or within seven days of admission, or they were symptomatic and had evidence of pneumonia on imaging which was typical of SARS-CoV-2.

Exclusion criteria: Women were excluded if they did not meet this case definition.

Smoking frequency: 99 (cohort 1), 42 (cohort 2), 57 (cohort 3)

Diabetes frequency: 28 (cohort 1), 22 (cohort 2), 6 (cohort 3)

Hypertension frequency: 26 (cohort 1), 24 (cohort 2), 2 (cohort 3)

Cardiovascular disease frequency: 21 (cohort 1), 13 (cohort 2), 8 (cohort 3)

Asthma frequency: 77 (cohort 1), 49 (cohort 2), 28 (cohort 3)

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): 345 (cohort 1), 235 (cohort 2), 110 (cohort 3)

Prognostic factor(s): Overweight

Obese

Outcome(s)

Hospitalisation

Outcome (prognostic factor)

Hospitalisation (overweight) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 1148

Number of obese patients followed completely for the outcome: 345

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Vousden 2021 *(Continued)*

Number of non-obese patients followed completely for the outcome: 757

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.58 (1.26, 1.99), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Any previous medical problem, BMI, ethnicity, smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.52 (1.18, 1.95), NR

Outcome (prognostic factor)

Hospitalisation (obese) (cohort 1)

Follow-up

Number of patients followed completely for the outcome: 1148

Number of obese patients followed completely for the outcome: 345

Number of non-obese patients followed completely for the outcome: 757

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.83 (1.45, 2.33), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Any previous medical problem, BMI, ethnicity, smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.75 (1.33, 2.27), NR

Outcome (prognostic factor)

Hospitalisation (overweight) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 722

Number of obese patients followed completely for the outcome: 235

Number of non-obese patients followed completely for the outcome: 458

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2 (1.54, 2.58), NR

Multivariable analysis for obesity

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Vousden 2021 *(Continued)*

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Any previous medical problem, BMI, ethnicity, smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.86 (1.39, 2.48), NR

Outcome (prognostic factor)

Hospitalisation (obese) (cohort 2)

Follow-up

Number of patients followed completely for the outcome: 722

Number of obese patients followed completely for the outcome: 235

Number of non-obese patients followed completely for the outcome: 458

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.31 (1.77, 3.01), NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Any previous medical problem, BMI, ethnicity, smoking

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.07 (1.53, 2.79), NR

Outcome (prognostic factor)

Hospitalisation (overweight) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 426

Number of obese patients followed completely for the outcome: 110

Number of non-obese patients followed completely for the outcome: 299

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.1 (1.27, 1.48), NR

Multivariable analysis for obesity

Modelling method: NR

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: NR

Effect measure value (95% CI), P value: 1.52 (1.18, 1.95), NR

Outcome (prognostic factor)

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Vousden 2021 *(Continued)*

Hospitalisation (obese) (cohort 3)

Follow-up

Number of patients followed completely for the outcome: 426

Number of obese patients followed completely for the outcome: 110

Number of non-obese patients followed completely for the outcome: 299

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.27 (0.94, 1.72), NR

Multivariable analysis for obesity

Modelling method: NR

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Hospitalisation	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Hospitalisation	Yes	Appendix 3
Confounding Bias Hospitalisation	Unclear	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Wang 2020a

Study characteristics

Notes

English title

Hospitalized COVID-19 patients of the Mount Sinai Health System: a retrospective observational study using the electronic medical records

Study setting

Start of study recruitment (MM/YYYY): 02/2020

End of study recruitment (MM/YYYY): 04/2020

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Wang 2020a *(Continued)*

Study design: Registry data

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 5

Study setting: Inpatient

Number of participants recruited: 3273

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 1068

Age measure, value: Median (IQR), NR

Inclusion criteria: Our study population comprised COVID-19 patients as defined above as of 15 April 2020 (table 1). We next selected COVID-19 patients who were admitted as inpatients and stayed at least 1 day in the hospital to study prognosis.

Exclusion criteria: Patients with unknown race/ethnicity information

Smoking frequency: 559

Diabetes frequency: 787

Hypertension frequency: NR

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 172

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): 199

Prognostic factor(s): BMI continuous

Obesity

Outcome(s)

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Wang 2020a *(Continued)*

Mortality

Outcome (prognostic factor)

Mortality (BMI continuous)

Follow-up

Number of patients followed completely for the outcome: 2448

Number of obese patients followed completely for the outcome: 199

Number of non-obese patients followed completely for the outcome: 2249

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: duration of stay, demographic factors (age, sex, race and BMI), smoking status, vital signs (temperature, O2 saturation, heart rate, respiratory rate and BP), comorbidities (asthma, COPD, hypertension, obesity, diabetes, HIV and cancer), intensive care unit (ICU) admission and common laboratory tests (white cell count (WCC), creatinine and ALT)

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 1.02 (1, 1.03), 0.021

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 2448

Number of obese patients followed completely for the outcome: 199

Number of non-obese patients followed completely for the outcome: 2249

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: duration of stay, demographic factors (age, sex, race and BMI), smoking status, vital signs (temperature, O2 saturation, heart rate, respiratory rate and BP), comorbidities (asthma, COPD, hypertension, obesity, diabetes, HIV and cancer), intensive care unit (ICU) admission and common laboratory tests (white cell count (WCC), creatinine and ALT)

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 0.99 (-0.94, 0.996), 0.946

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Wang 2020a *(Continued)*

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Wang 2020b

Study characteristics	
Notes	**English title** Overweight and obesity are risk factors of severe illness in patients with COVID-19 **Study setting** **Start of study recruitment (MM/YYYY):** 01/2020 **End of study recruitment (MM/YYYY):** 02/2020 **Study design:** Retrospective cohort **Study centre(s):** Multiple centres/clinics/areas within a country **Number of centres, clinics or areas:** 10 **Study setting:** Inpatient **Number of participants recruited:** 297 **Sampling method:** Consecutive participants **Participants** **Female participants (absolute number):** 133 **Age measure, value:** Median (IQR), NR **Inclusion criteria:** Patients with COVID-19 from 10 medical centres in 10 cities of Jiangsu, China, diagnosed by clinical manifestation, CT scan, RT-PCR **Exclusion criteria:** Lack of BMI data, being under 12 years old **Smoking frequency:** NR **Diabetes frequency:** 25 **Hypertension frequency:** 48

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Wang 2020b *(Continued)*

Cardiovascular disease frequency: 6

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 12

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 4

Steroid administration frequency: NR

Supplemental oxygen administration frequency: 172

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: According to criterion of guidelines for prevention and control of overweight and obesity in Chinese adults, 24 ≤ BMI < 28 and BMI ≥ 28 was defined as overweight and obesity, respectively.

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 28

Obesity frequency (absolute number): 40

Prognostic factor(s): BMI 24-28 kg/m^2

BMI ≥ 28 kg/m^2

Outcome(s)

Severe COVID

Outcome (prognostic factor)

Severe COVID (BMI 24-28 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 297

Number of obese patients followed completely for the outcome: 40

Number of non-obese patients followed completely for the outcome: 257

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 5 (1.61, 15.51), 0.005

Multivariable analysis for obesity

Modelling method: It was stated that multivariate logistic and Cox regression analysis were used.

The set of prognostic factors used for adjustment: Age, cardiovascular diseases, chronic lung diseases, hypertension, type 2 diabetes, malignant tumours, sex

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Wang 2020b *(Continued)*

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 4.16 (1.29, 13.4), 0.017

Outcome (prognostic factor)

Severe COVID (obesity)

Follow-up

Number of patients followed completely for the outcome: 297

Number of obese patients followed completely for the outcome: 40

Number of non-obese patients followed completely for the outcome: 257

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 11.33 (3.32, 38.58), < 0.001

Multivariable analysis for obesity

Modelling method: It was stated that multivariate logistic and Cox regression analysis were used.

The set of prognostic factors used for adjustment: Age, cardiovascular diseases, chronic lung diseases, hypertension, type 2 diabetes, malignant tumours, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 9.02 (2.52, 32.29), 0.001

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Wang 2021a

Study characteristics	
Notes	**English title**

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Wang 2021a *(Continued)*

Clinical characteristics and outcome of novel coronavirus pneumonia patients with different body mass index

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 03/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 541

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 245

Age measure, value: Median (IQR), 52 (43-63)

Inclusion criteria: Confirmed COVID-19 patients

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 47

Hypertension frequency: 134

Cardiovascular disease frequency: 29

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 4

Cancer frequency: 94

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: using BMI, Chinese Obese National Guideline 2004: normal weight: 18.5-23.9 kg/m^2, overweight 24 to 27.9kg/m^2, obesity ≥ 28 kg/m^2

The time when obesity has been measured: some time after presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 28

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Wang 2021a *(Continued)*

Obesity frequency (absolute number): 60

Prognostic factor(s): BMI continuous

Outcome(s)

Severe COVID

Outcome (prognostic factor)

Mortality (BMI continuous)

Follow-up

Number of patients followed completely for the outcome: NR

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.083 (1.021, 1.148), 0.0077

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: age, gender and underlying diseases (diabetes, hypertension, coronary heart disease, cerebrovascular disease, chronic kidney disease)

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.079 (1.01, 1.15), 0.025

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Severe COVID	No	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Severe COVID	No	Appendix 3
Confounding Bias Severe COVID	No	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Wang 2021b

Study characteristics

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Wang 2021b *(Continued)*

Notes

English title

Risk factors of coronavirus disease 2019-related mortality and optimal treatment regimens: a retrospective study

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

03/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

97

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 46

Age measure, value

mean (standard deviation), 62.74 (11.09)

Inclusion criteria

A retrospective cohort study analysis was performed on 116 patients with COVID-19 and a positive SARS-CoV-2 test who were admitted to Wuhan Union Hospital from February 2020 to March 2020. All the patients met the diagnostic and typing criteria in the “Diagnosis and Treatment Plan for Novel Coronavirus Pneumonia (trial version 8)” issued by the National Health Commission.

Exclusion criteria

Nineteen patients were excluded for the following reasons: (1) age less than 18 years or more than 85 years; (2) pregnant; (3) lack of complete data.

Smoking

NR

Diabetes

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Wang 2021b *(Continued)*

(absolute number), 21

Hypertension

(absolute number), 38

Cardiovascular diseases

(absolute number), 19

Please indicate if additional information is available

NR

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(unspecified), NR

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

NR

Immunosuppression

(absolute number), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), NR

Cancer

(absolute number), 1

Steroid administration

(unspecified), NR

Supplemental oxygen

(unspecified), NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

Oseltamivir: 29; arbidol hydrochloride: 16; other antiviral: 12; gammaglobulin: 49

Dose if applicable

NR

Duration if applicable

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Wang 2021b *(Continued)*

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

NR

Threshold used for definition of obesity

NR

Measure of frequency

NR

Frequency value

NR

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (BMI (continuous))

Outcome

Mortality

Prognostic factor (category):

BMI (continuous)

Follow-up

Number of patients followed completely for this outcome

97

Number of obese patients followed completely for this outcome

NR

Number of non-obese patients followed completely for this outcome

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Wang 2021b *(Continued)*

NR

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.336 (1.112, 1.607)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, BMI, neutrophils, prothrombin, total bilirubin, direct bilirubin, urea nitrogen, hypersensitive c-reactive protein

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.344 (1.014, 1.783)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Wu 2021

Study characteristics

Notes

English title

Association of body mass index with severity and mortality of COVID-19 pneumonia: a two-center, retrospective cohort study from Wuhan, China

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Wu 2021 *(Continued)*

Study setting

Start of study recruitment (MM/YYYY)

01/2020

End of study recruitment (MM/YYYY)

03/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

2

Study setting

inpatient

Number of participants recruited

1091

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 582

Age measure, value

median (interquartile range), 59 (49, 67)

Inclusion criteria

The cohort consisted of 1171 adult patients aged 21 to 93 years old with confirmed COVID-19 pneumonia who were admitted between January 1 to March 1, 2020 and who died or were discharged before March 30, 2020.

Exclusion criteria

missing data on BMI, missing data on the outcomes

Smoking

NR

Diabetes

(absolute number), 137

Hypertension

(absolute number), 288

Cardiovascular diseases

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Wu 2021 *(Continued)*

(absolute number), 82

Please indicate if additional information is available

NR

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

NR

Other pulmonary diseases

(absolute number), 57

Please indicate if additional information is available

chronic lung disease

Immunosupression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified), NR

Cancer

(absolute number), 40

Steroid administration

(unspecified), NR

Supplemental oxygen

(absolute number), 901

Differential values for various oxygenation methods (if indicated)

Nasal cannula, 607 (57.3)
NPPV, 176 (16.2)
HFNC, 87 (8.0)
IMV, 31 (2.8)

Other treatment

not reported

Dose if applicable

not reported

Duration if applicable

not reported

Percentage received this treatment

not reported

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Wu 2021 *(Continued)*

Prognostic factor(s)

Study's definition for obesity

BMI was categorised by the definitions as follows: 1) underweight (BMI < 18.5 kg/m^2); 2) normal weight (BMI 18.5–23 kg/m^2); 3) overweight (BMI 23–25 kg/m^2); 4) obesity (BMI ≥ 25 kg/m^2) according to the World Health Organization recommendations for Asian populations. The validity of this definition has been confirmed previously.

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

25

Measure of frequency

absolute number

Frequency value

285

How many eligible outcomes reported?

4

How many eligible outcomes reported?

4

Outcome(s)

mortality, ICU admission, mechanical ventilation, severe COVID

Outcome (prognostic factor)

mortality (BMI < 18.5)

Outcome

mortality

Prognostic factor (category):

BMI < 18.5

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

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Wu 2021 *(Continued)*

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

3.71 (1.27, 10.79)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

3.85 (1.26, 11.76)

Outcome (prognostic factor)

mortality (BMI 23 to 25)

Outcome

mortality

Prognostic factor (category):

BMI 23 to 25

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.57 (0.15, 2.10)

Multivariable (adjusted) analysis for obesity

Modelling method

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Wu 2021 *(Continued)*

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.53 (0.14, 2.00)

Outcome (prognostic factor)

mortality (BMI > 25)

Outcome

mortality

Prognostic factor (category):

BMI > 25

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

2.50 (1.08, 5.79)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

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Wu 2021 *(Continued)*

1.74 (0.73, 4.21)

Outcome (prognostic factor)

ICU admission (BMI < 18.5)

Outcome

ICU admission

Prognostic factor (category):

BMI < 18.5

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

1.94 (0.95, 3.97)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

2.17 (0.94, 5.05)

Outcome (prognostic factor)

ICU admission (BMI 23 to 25)

Outcome

ICU admission

Prognostic factor (category)

BMI 23 to 25

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Wu 2021 *(Continued)*

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.93 (0.51, 1.70)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.84 (0.42, 1.68)

Outcome (prognostic factor)

ICU admission (BMI > 25)

Outcome

ICU admission

Prognostic factor (category):

BMI > 25

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

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Wu 2021 *(Continued)*

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

2.78 (1.78, 4.34)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

2.62 (1.52, 4.49)

Outcome (prognostic factor)

mechanical ventilation (BMI < 18.5)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI < 18.5

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

NA

Multivariable (adjusted) analysis for obesity

Modelling method

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Wu 2021 *(Continued)*

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

NA

Outcome (prognostic factor)

mechanical ventilation (BMI 23 to 25)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI 23 to 25

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.88 (0.27, 2.83)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

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Wu 2021 *(Continued)*

0.85 (0.24, 2.98)

Outcome (prognostic factor)

mechanical ventilation (BMI > 25)

Outcome

mechanical ventilation

Prognostic factor (category):

BMI > 25

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

3.11 (1.40, 6.88)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

2.85 (1.15, 7.05)

Outcome (prognostic factor)

severe COVID (ARDS) (BMI < 18.5)

Outcome

severe COVID (ARDS)

Prognostic factor (category):

BMI < 18.5

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Wu 2021 *(Continued)*

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.28 (0.04, 2.07)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.23 (0.03, 1.85)

Outcome (prognostic factor)

Severe COVID (ARDS) (BMI 23 to 25)

Outcome

Severe COVID (ARDS)

Prognostic factor (category):

BMI 23 to 25

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

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Wu 2021 *(Continued)*

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.80 (0.35, 1.82)

Multivariable (adjusted) analysis for obesity

Modelling method

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

0.70 (0.29, 1.73)

Outcome (prognostic factor)

severe COVID (BMI > 25)

Outcome

severe COVID

Prognostic factor (category):

BMI > 25

Follow-up

Number of patients followed completely for this outcome

1091

Number of obese patients followed completely for this outcome

285

Number of non-obese patients followed completely for this outcome

806

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

3.44 (2.00, 5.94)

Multivariable (adjusted) analysis for obesity

Modelling method

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Wu 2021 *(Continued)*

Cox regression

The set of prognostic factors used for adjustment

age, sex, neutrophil counts, lymphocyte counts, platelet counts, high-sensitivity C-reactive protein (hs-CRP), and cancer (yes/no)

Effect measure for obesity

hazard ratio

Effect measure value (95% CI)

3.16 (1.69, 5.88)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Mortality	Unclear	Appendix 3
Confounding Bias Mechanical ventilation	Unclear	Appendix 3
Confounding Bias ICU admission	Unclear	Appendix 3
Confounding Bias Severe COVID	Unclear	Appendix 3

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Wu 2021 *(Continued)*

Statistical Analysis Bias	Yes	Appendix 3

Xie 2021

Study characteristics

Notes

English title

Metabolic syndrome and COVID-19 mortality among adult black patients in New Orleans

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 2

Study setting: Inpatient

Number of participants recruited: 287

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 163

Age measure, value: Mean (SD), 61.5 (15.2)

Inclusion criteria: All hospitalised patients with COVID-19 (confirmed by SARS-CoV-2 PCR) at two tertiary academic hospitals in New Orleans, LA, from 30 March to 5 April 2020

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 154

Hypertension frequency: 230

Cardiovascular disease frequency: 41

Asthma frequency: 30

Chronic obstructive pulmonary disease frequency: 29

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

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Xie 2021 *(Continued)*

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Obesity (BMI > 30 kg/m^2)

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): 250

Prognostic factor(s): Obesity (BMI > 30 kg/m^2)

Outcome(s)

Mortality

Mechanical ventilation

ICU admission

Outcome (prognostic factor)

Mortality (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 287

Number of obese patients followed completely for the outcome: 250

Number of non-obese patients followed completely for the outcome: 37

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, Charlson Comorbidity Index, individual hospital site, race, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.67 (0.829, 3.31), NR

Outcome (prognostic factor)

Mechanical ventilation (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 287

Number of obese patients followed completely for the outcome: 250

Number of non-obese patients followed completely for the outcome: 37

Univariable unadjusted analysis for obesity

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Xie 2021 *(Continued)*

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, Charlson Comorbidity Index, individual hospital site, race, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.36 (1.31, 4.22), NR

Outcome (prognostic factor)

ICU admission (BMI > 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 287

Number of obese patients followed completely for the outcome: 250

Number of non-obese patients followed completely for the outcome: 37

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, Charlson Comorbidity Index, individual hospital site, race, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 2.18 (1.23, 3.82), NR

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement	Yes	Appendix 3

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Xie 2021 *(Continued)*
Mortality

Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Xu 2020

Study characteristics

Notes

English title

Analysis of the clinical characteristics and early warning model construction of severe/critical coronavirus disease 2019 patients

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 02/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 155

Sampling method: NR

Participants

Female participants (absolute number): 68

Age measure, value: Mean (SD), 42 (15.42)

Inclusion criteria: Specimens of sputum, pharyngeal swabs or lower respiratory tract secretions of the suspected cases were tested as positive for 2019-nCoV nucleic acid by reverse transcription-polymerase chain reaction. Complete clinical and epidemiological data. No history of treatment related to COVID-19 outside the hospital

Exclusion criteria: NR

Smoking frequency: 21

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Xu 2020 *(Continued)*

Diabetes frequency: 9

Hypertension frequency: 11

Cardiovascular disease frequency: 2

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: 2

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: 1

Cancer frequency: 3

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: BMI ≥ 30 kg/m^2

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: 30

Obesity frequency (absolute number): NR

Prognostic factor(s): BMI ≥ 30 kg/m^2

Outcome(s)

Severe COVID

Outcome (prognostic factor)

Severe COVID (BMI ≥ 30 kg/m^2)

Follow-up

Number of patients followed completely for the outcome: 155

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age ≥ 60, concomitant baseline diseases, persistent high fever, SpO2 < 0.95, tachypnoea, multiple pulmonary lobe lesions, WBC < 2.0 × 109/L and/or

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Xu 2020 *(Continued)*

LYM < 0.4 × 109/L, CD4 + T-lymphocytes < 470/ul, CD8 + T-lymphocytes < 287/ul, IL-6 ≥ 30 ng/L, CRP ≥ 31 mg/L, SAA ≥ 100 mg/L

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.22 (0.68, 1.98), 0.214

Item	Authors' judgement	Support for judgement
Study Participation	No	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	No	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Yates 2021a

Study characteristics

Notes

English title

Obesity, walking pace and risk of severe COVID-19 and mortality: analysis of UK Biobank

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

08/2020

Study design

registry data

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

22

Study setting

inpatient

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Yates 2021a *(Continued)*

Number of participants recruited

412,596

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 227,214

Age measure, value

median (interquartile range), reported for each group separately:
Normal Weight: 67 (60, 73)
Overweight: 69 (61, 74)
Obese: 69 (61, 74)

Inclusion criteria

Those from English centres and alive as of 16th March and thus covered by the linkage system, COVID-19 positive, hospitalised

Exclusion criteria

NR

Smoking

NR

Diabetes

(unspecified), NR

Hypertension

(unspecified), NR

Cardiovascular diseases

(unspecified), NR

Please indicate if additional information is available

NR

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(unspecified), NR

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

NR

Immunosuppression

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Yates 2021a *(Continued)*

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified), NR

Cancer

(unspecified), NR

Steroid administration

(unspecified), NR

Supplemental oxygen

(unspecified), NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

normal weight (18.5–24.9 kg/m^2), overweight (25–29.9 kg/m^2), and obese (≥ 30 kg/m^2)

The time when obesity has been measured

before disease or right at presentation

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

98,737

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Yates 2021a *(Continued)*

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

mortality, severe COVID

Outcome (prognostic factor)

mortality (BMI 25 to 30)

Outcome

mortality

Prognostic factor (category):

BMI 25 to 30

Follow-up

Number of patients followed completely for this outcome

412,596

Number of obese patients followed completely for this outcome

98,737

Number of non-obese patients followed completely for this outcome

313,859

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, ethnicity, social deprivation, number of reported illnesses per person, and the follow-up time from baseline to data collection

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.19 (1.61, 0.88)

Outcome (prognostic factor)

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Yates 2021a *(Continued)*

mortality (BMI > 30)

Outcome

mortality

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

412,596

Number of obese patients followed completely for this outcome

98,737

Number of non-obese patients followed completely for this outcome

313,859

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, sex, ethnicity, social deprivation, number of reported illnesses per person, and the follow-up time from baseline to data collection

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.82 (1.33, 2.49)

Outcome (prognostic factor)

severe COVID (BMI 25 to 30)

Outcome

severe COVID

Prognostic factor (category):

BMI 25 to 30

Follow-up

Number of patients followed completely for this outcome

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Yates 2021a *(Continued)*

412,596

Number of obese patients followed completely for this outcome

98,737

Number of non-obese patients followed completely for this outcome

313,859

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex, ethnicity, social deprivation, number of reported illnesses per person, and the follow-up time from baseline to data collection

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.26 (1.07, 1.48)

Outcome (prognostic factor)

severe COVID (BMI > 30)

Outcome

severe COVID

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

412,596

Number of obese patients followed completely for this outcome

98,737

Number of non-obese patients followed completely for this outcome

313,859

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

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Yates 2021a *(Continued)*

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

age, sex, ethnicity, social deprivation, number of reported illnesses per person, and the follow-up time from baseline to data collection

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.49 (1.25, 1.79)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Yates 2021b

Study characteristics

Notes	**English title**

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Yates 2021b *(Continued)*

Obesity, ethnicity and risk of critical care, mechanical ventilation and mortality in patients admitted to hospital with COVID-19: analysis of the ISARIC CCP-UK cohort

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

10/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

NR

Study setting

inpatient

Number of participants recruited

65,932

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 29,217

Age measure, value

median (interquartile range), reported for each race separately:
White: 76 (63, 85)
South Asian: 59 (44, 73)
Black: 59 (47, 75)
Other: 61 (47, 76)

Inclusion criteria

For this study, we included participants with a coding of "Proven or high likelihood of infection with a pathogen of Public Health Interest," reflecting that a preparedness protocol cannot assume a diagnostic test will be available for an emergent pathogen. Participants were included in the analysis if information was available on hospital admittance date from the emergence of the COVID-19 pandemic in the United Kingdom (UK) (February 6, 2020), confirmed COVID-19 positive, complete outcome data (discharge/in-hospital mortality, ethnicity)

Exclusion criteria

NR

Smoking

NR

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Yates 2021b *(Continued)*

Diabetes

(absolute number), 9914

Hypertension

(unspecified), NR

Cardiovascular diseases

(absolute number), 20,660

Please indicate if additional information is available

Chronic heart disease

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(unspecified), NR

Other pulmonary diseases

(absolute number), 11,270

Please indicate if additional information is available

Chronic pulmonary disease

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 10,901

Cancer

(absolute number), 6451

Steroid administration

(absolute number), 10,046

Supplemental oxygen

(unspecified), NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

Antiviral treatment

Dose if applicable

NR

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Yates 2021b *(Continued)*

Duration if applicable

NR

Percentage received this treatment

Absolute number = 3955

Prognostic factor(s)

Study's definition for obesity

Obesity was coded as yes or no on assessment from the attending clinician. Clinical assessment was based on objective measurement of obesity, such as BMI (BMI ≥ 30 kg/m^2) or abdominal girth, or on clinical judgement.

The time when obesity has been measured

some time after presentation

Main variable used for determination of obesity

other (please specify)

Threshold used for definition of obesity

NA

Measure of frequency

absolute number

Frequency value

6638

How many eligible outcomes reported?

3

How many eligible outcomes reported?

3

Outcome(s)

mortality, ICU admission, mechanical ventilation

Outcome (prognostic factor)

Mortality (BMI > 30)

Outcome

Mortality

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,932

Number of obese patients followed completely for this outcome

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Yates 2021b *(Continued)*

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.23 (1.15, 1.32)

Outcome (prognostic factor)

Mortality (BMI > 30)

Outcome

Mortality

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,932

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

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Yates 2021b *(Continued)*

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.34 (1.03, 1.76)

Outcome (prognostic factor)

Mortality (BMI > 30)

Outcome

Mortality

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,932

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

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Yates 2021b *(Continued)*

odds ratio

Effect measure value (95% CI)

1.98 (1.46, 2.68)

Outcome (prognostic factor)

Mortality (BMI > 30)

Outcome

Mortality

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,932

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.22 (0.91, 1.62)

Outcome (prognostic factor)

ICU admission (BMI > 30)

Outcome

ICU admission

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Yates 2021b *(Continued)*

Prognostic factor (category)

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,080

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.20 (2.03, 2.38)

Outcome (prognostic factor)

ICU admission (BMI > 30)

Outcome

ICU admission

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,080

Number of obese patients followed completely for this outcome

6638

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Yates 2021b *(Continued)*

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.72 (1.32, 2.26)

Outcome (prognostic factor)

ICU admission (BMI > 30)

Outcome

ICU admission

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,080

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

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Yates 2021b *(Continued)*

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.50 (1.95, 3.20)

Outcome (prognostic factor)

ICU admission (BMI > 30)

Outcome

ICU admission

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,080

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

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Yates 2021b *(Continued)*

Effect measure value (95% CI)

2.00 (1.66, 2.42)

Outcome (prognostic factor)

Mechanical ventilation (BMI > 30)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,080

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.27 (2.06, 2.49)

Outcome (prognostic factor)

Mechanical ventilation (BMI > 30)

Outcome

Mechanical ventilation

Prognostic factor (category):

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Yates 2021b *(Continued)*

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,080

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.79 (1.27, 2.52)

Outcome (prognostic factor)

Mechanical ventilation (BMI > 30)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,080

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

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Yates 2021b *(Continued)*

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.56 (1.95, 3.37)

Outcome (prognostic factor)

Mechanical ventilation (BMI > 30)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

65,080

Number of obese patients followed completely for this outcome

6638

Number of non-obese patients followed completely for this outcome

48,830

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

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Yates 2021b *(Continued)*

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, cancer, chronic heart disease, CKD, chronic pulmonary disease, diabetes, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.92 (1.56, 2.37)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Yazdanpanah 2021

Study characteristics

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Yazdanpanah 2021 *(Continued)*

Notes

English title

Impact on disease mortality of clinical, biological, and virological characteristics at hospital admission and overtime in COVID-19 patients

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 03/2020

Study design: Prospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 25

Study setting: Inpatient

Number of participants recruited: 246

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 107

Age measure, value: Median (IQR), 62 (50, 73)

Inclusion criteria: All hospitalised confirmed COVID-19 patients

Exclusion criteria: NR

Smoking frequency: 13

Diabetes frequency: 39

Hypertension frequency: 73

Cardiovascular disease frequency: 48

Asthma frequency: 23

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 21

Immunosuppression frequency: NR

Chronic kidney disease frequency: 16

Cancer frequency: 14

Steroid administration frequency: 8

Supplemental oxygen administration frequency: 61

Other treatments (frequency): Remdesivir (4%), hydroxychloroquine (3%), lopinavir/ritonavir (27%)

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Some time after presentation

Main variable used for determination of obesity: BMI

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Yazdanpanah 2021 *(Continued)*

Threshold used for definition: NR

Obesity frequency (absolute number): 44

Prognostic factor(s): Obesity

Outcome(s)

Mortality

Outcome (prognostic factor)

Mortality (obesity)

Follow-up

Number of patients followed completely for the outcome: 246

Number of obese patients followed completely for the outcome: 44

Number of non-obese patients followed completely for the outcome: 202

Univariable unadjusted analysis for obesity

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 2.34 (1.23, 4.44), 0.009

Multivariable analysis for obesity

Modelling method: Cox regression

The set of prognostic factors used for adjustment: Age, sex

Effect measure for obesity: Hazard ratio

Effect measure value (95% CI), P value: 3.32 (1.7, 6.52), < 0.01

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Yi 2020

Study characteristics

Notes

English title

Risk factors and clinical features of deterioration in COVID-19 patients in Zhejiang, China: a single-centre, retrospective study

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 02/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: 1

Study setting: Inpatient

Number of participants recruited: 100

Sampling method: NR

Participants

Female participants (absolute number): 37

Age measure, value: Median (IQR), 54 (42, 64)

Inclusion criteria: All patients diagnosed with SARS-CoV-2 who were admitted to the First Affiliated Hospital of Zhejiang University School of Medicine between January 19, 2020, and February 19, 2020

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 11

Hypertension frequency: 37

Cardiovascular disease frequency: 4

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: 81

Supplemental oxygen administration frequency: 100

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: Before disease or right at presentation

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Yi 2020 *(Continued)*

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): BMI continuous

Outcome(s)

Severe COVID

Outcome (prognostic factor)

Severe COVID (BMI continuous)

Follow-up

Number of patients followed completely for the outcome: 100

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, sex, hypertension, IL-6, T-lymphocyte count, B-lymphocyte count, glucocorticoid treatment and artificial liver support

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.24 (1.006, 1.52), < 0.044

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

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Yoshida 2021

Study characteristics

Notes

English title

Clinical characteristics and outcomes in women and men hospitalized for coronavirus disease 2019 in New Orleans

Study setting

Start of study recruitment (MM/YYYY)

02/2020

End of study recruitment (MM/YYYY)

07/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

2

Study setting

inpatient

Number of participants recruited

776

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 406

Age measure, value

mean (standard deviation), 60.5 (16.1)

Inclusion criteria

All adults (> 18 years) hospitalised with confirmed SARS-CoV-2 (COVID-19) infection on admission were included.

Exclusion criteria

NR

Smoking

NR

Diabetes

(absolute number), 273

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Yoshida 2021 *(Continued)*

Hypertension

(absolute number), 573

Cardiovascular diseases

(absolute number), 154

Please indicate if additional information is available

NR

Asthma

(absolute number), 83

Chronic obstructive pulmonary disease

(absolute number), 140

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

NR

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 126

Cancer

(unspecified), NR

Steroid administration

(unspecified), NR

Supplemental oxygen

(unspecified), NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

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Yoshida 2021 *(Continued)*

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

non-obese (< 30 kg/m^2) normal BMI (< 24.9 kg/m^2) obesity (BMI ≥ 30 kg/m^2) morbid obesity (BMI > 40 kg/m^2)

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

30

Measure of frequency

absolute number

Frequency value

409

How many eligible outcomes reported?

3

How many eligible outcomes reported?

3

Outcome(s)

Mortality, ICU admission, mechanical ventilation

Outcome (prognostic factor)

Mortality (BMI 25 to 30)

Outcome

Mortality

Prognostic factor (category):

BMI 25 to 30

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

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Yoshida 2021 *(Continued)*

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

0.71 (0.4, 1.27)

Outcome (prognostic factor)

Mortality (BMI 30 to 35)

Outcome

Mortality

Prognostic factor (category):

BMI 30 to 35

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

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Yoshida 2021 *(Continued)*

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

0.85 (0.46, 1.58)

Outcome (prognostic factor)

Mortality (BMI 35 to 40)

Outcome

Mortality

Prognostic factor (category):

BMI 35 to 40

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

1.14 (0.58, 2.26)

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Yoshida 2021 *(Continued)*

Outcome (prognostic factor)

Mortality (BMI > 40)

Outcome

Mortality

Prognostic factor (category):

BMI > 40

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

1.64 (0.85, 3.17)

Outcome (prognostic factor)

ICU admission (BMI 25 to 30)

Outcome

ICU admission

Prognostic factor (category)

BMI 25 to 30

Follow-up

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Yoshida 2021 *(Continued)*

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

1.09 (0.67, 1.77)

Outcome (prognostic factor)

ICU admission (BMI 30 to 35)

Outcome

ICU admission

Prognostic factor (category):

BMI 30 to 35

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

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Yoshida 2021 *(Continued)*

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

1.21 (0.72, 2.02)

Outcome (prognostic factor)

ICU admission (BMI 35 to 40)

Outcome

ICU admission

Prognostic factor (category):

BMI 35 to 40

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

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Yoshida 2021 *(Continued)*

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

1.69 (0.96, 2.96)

Outcome (prognostic factor)

ICU admission (BMI > 40)

Outcome

ICU admission

Prognostic factor (category):

BMI > 40

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

2.48 (1.43, 4.29)

Outcome (prognostic factor)

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Yoshida 2021 *(Continued)*

Mechanical ventilation (BMI 25 to 30)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI 25 to 30

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

1.06 (0.59, 1.91)

Outcome (prognostic factor)

Mechanical ventilation (BMI 30 to 35)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI 30 to 35

Follow-up

Number of patients followed completely for this outcome

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Yoshida 2021 *(Continued)*

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

1.83 (1.01, 3.30)

Outcome (prognostic factor)

Mechanical ventilation (BMI 35 to 40)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI 35 to 40

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

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Yoshida 2021 *(Continued)*

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

2.68 (1.42, 5.06)

Outcome (prognostic factor)

Mechanical ventilation (BMI > 40)

Outcome

Mechanical ventilation

Prognostic factor (category):

BMI > 40

Follow-up

Number of patients followed completely for this outcome

776

Number of obese patients followed completely for this outcome

409

Number of non-obese patients followed completely for this outcome

367

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

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Yoshida 2021 *(Continued)*

age, sex, hospital site, and the Charlson Comorbidity Index

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

3.85 (3.89, 4.47)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Mortality	Unclear	Appendix 3
Study Attrition Mechanical ventilation	Unclear	Appendix 3
Study Attrition ICU admission	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Mechanical ventilation	Yes	Appendix 3
Outcome Measurement ICU admission	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Mechanical ventilation	Yes	Appendix 3
Confounding Bias ICU admission	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Yu 2020a

Study characteristics

Notes

English title

An analysis of clinical features and influencing factors of patients with new coronavirus pneumonia

Study setting

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Yu 2020a *(Continued)*

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 03/2020

Study design: Retrospective cohort

Study centre(s): Single centre/clinic/area within a country

Number of centres, clinics or areas: NR

Study setting: Inpatient

Number of participants recruited: 129

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 60

Age measure, value: Mean (SD), 48 (16.64)

Inclusion criteria: All patients with combined COVID-19 cases and have complete data in patients' charts

Exclusion criteria: Incomplete data in patient's chart

Smoking frequency: 19

Diabetes frequency: 24

Hypertension frequency: 34

Cardiovascular disease frequency: 14

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: 9

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: 3

Steroid administration frequency: 35

Supplemental oxygen administration frequency: 7

Other treatments (frequency): 74 cases used antibiotics

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: BMI

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): BMI continuous

Outcome(s)

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Yu 2020a *(Continued)*

Severe COVID

Outcome (prognostic factor)

Severe COVID (BMI continuous)

Follow-up

Number of patients followed completely for the outcome: 129

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Baseline disease, hospitalised days, BMI (kg/m^2), lymphocyte counts (10(9)/L), platelets (10(9)/L), ALB (g/L), BUN (mmol/L), serum creatinine (umol/L), creatine kinase (U/L) LDH (U/L), D-D (mg/L), IL-6 (pg/mL), number of lung lobes involved (days), imaging improvement time (days), nucleic acid positive time (days)

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.35 (1.67, 1.09), < 0.005

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Unclear	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Yu 2020b

Study characteristics

Notes

English title

Association between clinical manifestations and prognosis in patients with COVID-19

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Yu 2020b *(Continued)*

Study setting

Start of study recruitment (MM/YYYY): 01/2020

End of study recruitment (MM/YYYY): 02/2020

Study design: Retrospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: 3

Study setting: Inpatient

Number of participants recruited: 95

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 42

Age measure, value: Mean (SD), 38.3 (18.78)

Inclusion criteria: Positive PCR test for Covid-19

Exclusion criteria: NR

Smoking frequency: 8

Diabetes frequency: NR

Hypertension frequency: NR

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: NR

The time when obesity has been measured: NR

Main variable used for determination of obesity: NR

Threshold used for definition: NR

Obesity frequency (absolute number): NR

Prognostic factor(s): Obesity

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Yu 2020b *(Continued)*

Outcome(s)

Pneumonia

Outcome (prognostic factor)

Pneumonia (obesity)

Follow-up

Number of patients followed completely for the outcome: 95

Number of obese patients followed completely for the outcome: NR

Number of non-obese patients followed completely for the outcome: NR

Univariable unadjusted analysis for obesity

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.29 (1.1, 1.5), 0.002

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: NR

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.32 (1.03, 1.69), < 0.024

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Pneumonia	Yes	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Pneumonia	Yes	Appendix 3
Confounding Bias Pneumonia	No	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

Zaferani Arani 2021

Study characteristics

Notes

English title

Understanding the clinical and demographic characteristics of second coronavirus spike in 192 patients in Tehran, Iran: a retrospective study

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Zaferani Arani 2021 *(Continued)*

Study setting

Start of study recruitment (MM/YYYY)

06/2020

End of study recruitment (MM/YYYY)

07/2020

Study design

retrospective cohort

Study centre(s)

multiple centres/clinics/areas within a country

Number of centres/clinics/areas

2

Study setting

inpatient

Number of participants recruited

192

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 88

Age measure, value

mean (standard deviation), 54.6 (17.2)

Inclusion criteria

visiting patients with positive COVID-19 test

Exclusion criteria

NA

Smoking

NR

Diabetes

NR

Hypertension

(unspecified), NR

Cardiovascular diseases

(absolute number), 24

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Zaferani Arani 2021 *(Continued)*

Please indicate if additional information is available

Coronary heart disease

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(unspecified), NR

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

NR

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(unspecified), NR

Cancer

(unspecified), NR

Steroid administration

(unspecified), NR

Supplemental oxygen

(unspecified), NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

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Zaferani Arani 2021 *(Continued)*

NR

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

other (please specify)

Threshold used for definition of obesity

NR

Measure of frequency

absolute number

Frequency value

34

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

severe COVID

Outcome (prognostic factor)

severe COVID (BMI continuous (per 1 kg/m^2))

Outcome

severe COVID

Prognostic factor (category):

BMI continuous (per 1 kg/m^2)

Follow-up

Number of patients followed completely for this outcome

192

Number of obese patients followed completely for this outcome

34

Number of non-obese patients followed completely for this outcome

158

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

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Zaferani Arani 2021 *(Continued)*

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.218 (1.435, 1.034)

Item	Authors' judgement	Support for judgement
Study Participation	Unclear	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	Unclear	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Unclear	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Zamoner 2021

Study characteristics

Notes

English title

Acute kidney injury in COVID-19: 90 days of the pandemic in a Brazilian public hospital

Study setting

Start of study recruitment (MM/YYYY)

03/2020

End of study recruitment (MM/YYYY)

NR

Study design

prospective cohort

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Zamoner 2021 *(Continued)*

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

Number of participants recruited

101

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 46

Age measure, value

mean (standard deviation), 57.89 (15.8)

Inclusion criteria

Hospitalised patients diagnosed with COVID-19, confirmed by real-time polymerase chain reaction (RT-PCR) for SARS-Cov-2, performed in clinical wards and intensive care units (ICUs) of a public and tertiary university hospital in São Paulo, Brazil, beginning 25 March 2020

Exclusion criteria

Patients with chronic kidney disease stages IV and V, kidney transplant patients, and individuals under 18 years old were excluded.

Smoking

NR

Diabetes

(absolute number), 34

Hypertension

(absolute number), 54

Cardiovascular diseases

(absolute number), 19

Please indicate if additional information is available

NR

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(unspecified), NR

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Zamoner 2021 *(Continued)*

Other pulmonary diseases

(unspecified), NR

Please indicate if additional information is available

NR

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 10

Cancer

(unspecified), NR

Steroid administration

(absolute number), 12

Supplemental oxygen

(unspecified), NR

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

NR

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

NR

Prognostic factor(s)

Study's definition for obesity

Obesity was defined by WHO by body mass index (BMI) ≥ 30 kg/m^2

The time when obesity has been measured

unspecified

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

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Zamoner 2021 *(Continued)*

30

Measure of frequency

absolute number

Frequency value

22

How many eligible outcomes reported?

2

How many eligible outcomes reported?

2

Outcome(s)

mortality, severe COVID

Outcome (prognostic factor)

Mortality (BMI > 30)

Outcome

Mortality

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

101

Number of obese patients followed completely for this outcome

22

Number of non-obese patients followed completely for this outcome

79

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

NR

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Zamoner 2021 *(Continued)*

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.28 (1.04, 11.52)

Outcome (prognostic factor)

Severe COVID-19 (acute kidney injury) (BMI > 30)

Outcome

Severe COVID-19 (acute kidney injury)

Prognostic factor (category):

BMI > 30

Follow-up

Number of patients followed completely for this outcome

101

Number of obese patients followed completely for this outcome

22

Number of non-obese patients followed completely for this outcome

79

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

NR

Effect measure value (95% CI)

NR

Multivariable (adjusted) analysis for obesity

Modelling method

Logistic regression

The set of prognostic factors used for adjustment

Not stated (only those significant from univariable analysis with P < 0.20)

Effect measure for obesity

Odds ratio

Effect measure value (95% CI)

1.98 (1.04, 2.76)

Item	Authors' judgement	Support for judgement

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Zamoner 2021 *(Continued)*

Study Participation	Yes	Appendix 3
Study Attrition Mortality	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Mortality	Yes	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Mortality	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	No	Appendix 3

Zhang 2021

Study characteristics

Notes

English title

The association between obesity and severity in patients with coronavirus disease 2019: a retrospective, single-center study, Wuhan

Study setting

Start of study recruitment (MM/YYYY)

01/2020

End of study recruitment (MM/YYYY)

02/2020

Study design

retrospective cohort

Study centre(s)

single centres/clinics/areas within a country

Number of centres/clinics/areas

1

Study setting

inpatient

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Zhang 2021 *(Continued)*

Number of participants recruited

463

Sampling method

consecutive participants

Participants

Female participants

(absolute number), 239

Age measure, value

median (interquartile range), reported for each group separately:
Normal Weight: 62
Overweight: 59
Obese: 63 (reported for each group separately:
Normal Weight: 49, 68
Overweight: 50, 67
Obese: 45, 68)

Inclusion criteria

Consecutive COVID-19 in-hospital patients were recruited in Renmin Hospital of Wuhan University from January 2, 2020 to February 20, 2020

Exclusion criteria

patients without BMI data or BMI < 18.5, pregnancy, acute myocardial infarction, malignancy and transplantation

Smoking

NR

Diabetes

(absolute number), 51

Hypertension

(absolute number), 126

Cardiovascular diseases

(absolute number), 27

Please indicate if additional information is available

Coronary artery disease

Asthma

(unspecified), NR

Chronic obstructive pulmonary disease

(unspecified), NR

Other pulmonary diseases

(absolute number), 14

Please indicate if additional information is available

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Zhang 2021 *(Continued)*

COPD/asthma stated together

Immunosuppression

(unspecified), NR

Please indicate if additional information is available

NR

Chronic kidney disease

(absolute number), 8

Cancer

(unspecified), NR

Steroid administration

(absolute number), 198

Supplemental oxygen

(absolute number), 411

Differential values for various oxygenation methods (if indicated)

NR

Other treatment

Antiviral therapy
Antibacterial therapy
Antifungal therapy
Glucocorticoid therapy
Immunoglobulin therapy
Traditional Chinese medicine

Dose if applicable

NR

Duration if applicable

NR

Percentage received this treatment

Antiviral therapy 96.7
Antibacterial therapy 81.6
Antifungal therapy 1.7
Glucocorticoid therapy 42.7
Immunoglobulin therapy 50.3
Traditional Chinese medicine 75.1

Prognostic factor(s)

Study's definition for obesity

According to the Chinese-specific cut-offs for general adiposity, BMI 18.5–23.9 kg/m^2 is defined as normal weight, BMI 24.0–27.9 kg/m^2 as overweight and BMI > 28.0 kg/m^2 as general obesity.

The time when obesity has been measured

some time after presentation

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Zhang 2021 *(Continued)*

Main variable used for determination of obesity

BMI

Threshold used for definition of obesity

28

Measure of frequency

absolute number

Frequency value

42

How many eligible outcomes reported?

1

How many eligible outcomes reported?

1

Outcome(s)

Severe COVID

Outcome (prognostic factor)

Severe and critical COVID-19 (BMI 24 to 28)

Outcome

Severe and critical COVID-19

Prognostic factor (category):

BMI 24 to 28

Follow-up

Number of patients followed completely for this outcome

463

Number of obese patients followed completely for this outcome

42

Number of non-obese patients followed completely for this outcome

421

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.409 (0.944, 2.104)

Multivariable (adjusted) analysis for obesity

Modelling method

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Zhang 2021 *(Continued)*

logistic regression

The set of prognostic factors used for adjustment

sex, age and comorbidities (e.g. hypertension, diabetes, coronary artery disease, arrhythmia, cerebrovascular disease, COPD, asthma, chronic renal disease and chronic liver disease)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.443 (0.953, 2.185)

Outcome (prognostic factor)

Severe and critical COVID-19 (BMI > 28)

Outcome

Severe and critical COVID-19

Prognostic factor (category):

BMI > 28

Follow-up

Number of patients followed completely for this outcome

463

Number of obese patients followed completely for this outcome

42

Number of non-obese patients followed completely for this outcome

421

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

3.096 (1.376, 6.970)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

sex, age and comorbidities (e.g. hypertension, diabetes, coronary artery disease, arrhythmia, cerebrovascular disease, COPD, asthma, chronic renal disease and chronic liver disease)

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

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Zhang 2021 *(Continued)*

3.586 (1.550, 8.298)

Outcome (prognostic factor)

mechanical ventilation or ICU admission (BMI 24 to 28)

Outcome

mechanical ventilation or ICU admission

Prognostic factor (category):

BMI 24 to 28

Follow-up

Number of patients followed completely for this outcome

463

Number of obese patients followed completely for this outcome

42

Number of non-obese patients followed completely for this outcome

421

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.25 (0.65, 2.401)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, arrythmia, diabetes, coronary artery disease, cerebrovascular disease, COPD, asthma, CKD, chronic liver disease, hypertension, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.231 (0.622, 2.434)

Outcome (prognostic factor)

mechanical ventilation or ICU admission (BMI > 28)

Outcome

mechanical ventilation or ICU admission

Prognostic factor (category):

BMI > 28

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Zhang 2021 *(Continued)*

Follow-up

Number of patients followed completely for this outcome

463

Number of obese patients followed completely for this outcome

42

Number of non-obese patients followed completely for this outcome

421

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.422 (0.505, 4.006)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, arrythmia, diabetes, coronary artery disease, cerebrovascular disease, COPD, asthma, CKD, chronic liver disease, hypertension, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.299 (0.44, 3.838)

Outcome (prognostic factor)

Critical COVID-19 (BMI 24 to 28)

Outcome

Critical COVID-19

Prognostic factor (category)

BMI 24 to 28

Follow-up

Number of patients followed completely for this outcome

463

Number of obese patients followed completely for this outcome

42

Number of non-obese patients followed completely for this outcome

421

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Zhang 2021 *(Continued)*

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.25 (0.65, 2.401)

Multivariable (adjusted) analysis for obesity

Modelling method

logistic regression

The set of prognostic factors used for adjustment

Age, arrythmia, diabetes, coronary artery disease, cerebrovascular disease, COPD, asthma, CKD, chronic liver disease, hypertension, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.24 (0.629, 2.445)

Outcome (prognostic factor)

Critical COVID-19 (BMI > 28)

Outcome

Critical COVID-19

Prognostic factor (category):

BMI > 28

Follow-up

Number of patients followed completely for this outcome

463

Number of obese patients followed completely for this outcome

42

Number of non-obese patients followed completely for this outcome

421

Univariable (unadjusted) analysis for obesity

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

2.105 (0.833, 5.317)

Multivariable (adjusted) analysis for obesity

Modelling method

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Zhang 2021 *(Continued)*

logistic regression

The set of prognostic factors used for adjustment

Age, arrythmia, diabetes, coronary artery disease, cerebrovascular disease, COPD, asthma, CKD, chronic liver disease, hypertension, sex

Effect measure for obesity

odds ratio

Effect measure value (95% CI)

1.973 (0.744, 5.231)

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Unclear	Appendix 3
Prognostic Factor Measurement	No	Appendix 3
Outcome Measurement Severe COVID	Yes	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Yes	Appendix 3

Zhu 2020

Study characteristics

Notes

English title

Association of obesity and its genetic predisposition with the risk of severe COVID-19: analysis of population-based cohort data

Study setting

Start of study recruitment (MM/YYYY): 03/2020

End of study recruitment (MM/YYYY): 04/2020

Study design: Prospective cohort

Study centre(s): Multiple centres/clinics/areas within a country

Number of centres, clinics or areas: NR

Study setting: Inpatient

Number of participants recruited: 641

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Zhu 2020 *(Continued)*

Sampling method: Consecutive participants

Participants

Female participants (absolute number): 278

Age measure, value: Mean (SD), NR

Inclusion criteria: NR

Exclusion criteria: NR

Smoking frequency: NR

Diabetes frequency: 61

Hypertension frequency: NR

Cardiovascular disease frequency: NR

Asthma frequency: NR

Chronic obstructive pulmonary disease frequency: NR

Other pulmonary disease frequency: NR

Immunosuppression frequency: NR

Chronic kidney disease frequency: NR

Cancer frequency: NR

Steroid administration frequency: NR

Supplemental oxygen administration frequency: NR

Other treatments (frequency): NR

Prognostic factor(s)

Study's definition for obesity: Underweight (< 18.5 kg/m^2), normal weight (18.5–24.9 kg/m^2), overweight (25.0–29.9 kg/m^2), class I obesity (30.0–34.9 kg/m^2), class II obesity (35.0–39.9 kg/m^2), and class III obesity (≥ 40.0 kg/m^2 [severe obesity])

The time when obesity has been measured: Before disease or right at presentation

Main variable used for determination of obesity: BMI

Threshold used for definition: BMI ≥ 30 kg/m^2

Obesity frequency (absolute number): 226

Prognostic factor(s):

30 < BMI < 35 (obesity class 1)

35 < BMI < 40 (obesity class 2)

BMI > 40 (obesity class 3)

Outcome(s)

Severe COVID

Outcome (prognostic factor)

Severe COVID (30 < BMI < 35 (obesity class 1))

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Zhu 2020 *(Continued)*

Follow-up

Number of patients followed completely for the outcome: 641

Number of obese patients followed completely for the outcome: 226

Number of non-obese patients followed completely for the outcome: 415

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, CVD, ethnicity, DM, HTN, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.08 (0.55, 1.66), 0.78

Outcome (prognostic factor)

Severe COVID (35 < BMI < 40 (obesity class 2))

Follow-up

Number of patients followed completely for the outcome: 641

Number of obese patients followed completely for the outcome: 226

Number of non-obese patients followed completely for the outcome: 415

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, CVD, ethnicity, DM, HTN, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.88 (1.26, 2.51), 0.05

Outcome (prognostic factor)

Severe COVID (BMI > 40 (obesity class 3))

Follow-up

Number of patients followed completely for the outcome: 641

Number of obese patients followed completely for the outcome: 226

Number of non-obese patients followed completely for the outcome: 415

Univariable unadjusted analysis for obesity

Effect measure for obesity: NR

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Zhu 2020 *(Continued)*

Effect measure value (95% CI), P value: NR

Multivariable analysis for obesity

Modelling method: Logistic regression

The set of prognostic factors used for adjustment: Age, CVD, ethnicity, DM, HTN, sex

Effect measure for obesity: Odds ratio

Effect measure value (95% CI), P value: 1.22 (0.23, 2.21), 0.69

Item	Authors' judgement	Support for judgement
Study Participation	Yes	Appendix 3
Study Attrition Severe COVID	Yes	Appendix 3
Prognostic Factor Measurement	Yes	Appendix 3
Outcome Measurement Mortality	Unclear	Appendix 3
Confounding Bias Severe COVID	Yes	Appendix 3
Statistical Analysis Bias	Unclear	Appendix 3

ACEI: Angiotensin-converting enzyme inhibitor
AKI: Acute kidney injury
ALB: Albumin
ALC: Absolute lymphocyte count
ALT: Alanine transaminase
APACHEII: Acute Physiology and Chronic Health Evaluation II
ARB: Angiotensin receptor blocker
ARDS: Acute respiratory distress syndrome
ASAT: Aspartate aminotransferase
AST: Aspartate aminotransferase
AZI: Azithromycin
BAL: Mini-bronchoalveolar lavage
BID: Twice daily
BMI: Body mass index
BP: Blood pressure
BUN: Blood urea nitrogen
CAD: Coronary artery disease
CBC: Complete blood count
CCI: Charlson Comorbidity Index
CD4: Cluster of differentiation 4
CHD: Coronary heart disease
CHF: Congestive heart failure
CI: Confidence interval
CK: Creatine kinase
CKD: Chronic kidney disease
CMO: Comfort measures only
COPD: Chronic obstructive pulmonary disease
COVID-19: Coronavirus disease 2019

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CR: Creatinine
CRP: C-reactive protein
CT: Computed tomography
CTD: Connective tissue diseases
cTnI: Cardiac troponin
CVD: Cardiovascular disease
DBP: Diastolic blood pressure
D-D: D-dimer
DLP: Dyslipidaemia
DNI: Do not intubate
DNR: Do not resuscitate
DM: Diabetes mellitus
DMT: Disease modifying therapies
ECMO: Extracorporeal membrane oxygenation
ED: Emergency department
EDSS: Expanded disability status scale
eGFR: Estimated glomerular filtration rate
ER: Emergency room
ESF: Enhanced surveillance form
ESRD: End stage renal disease
FIB-4: Fibrosis Index Based on 4 Factors
fiO2: Fraction of inspired oxygen
FBG: Fasting blood glucose
FPG: Fasting plasma glucose
GCS: Glasgow Coma scale
GLM: Generalised linear model
GLP1-RA: Glucagon-like peptide-1 receptor agonists
GP: General practice
Hb: Haemoglobin
HbA1c: Glycated haemoglobin
HCQ: Hydroxychloroquine
HF: Heart failure
HFNC: High-flow nasal cannula
HIV: Human immunodeficiency virus
HLP: Hyperlipidaemia
hs-CRP: High-sensitivity C-reactive protein
HTN: Hypertension
IA: Inflammatory arthritis
ICD-10(-CM): International Classification of Diseases, Tenth Revision, Clinical Modification
ICU: Intensive care unit
IG: Immature granulocytes
IHD: Ischaemic heart disease
IL-6: Interleukin 6
IMV: Invasive mechanical ventilation
INR: International normalised ratio
IQR: Interquartile range
IRMD: Rheumatic and inflammatory diseases
IS: Immunosuppression
KPSC: Kaiser Permanente Southern California
LDH: Lactate dehydrogenase
LDL(-c): Low-density lipoprotein cholesterol
LVEF: Left ventricular ejection fraction
LYM: Lymphocytes
MAD: Median absolute deviation
MDRD: Modification of Diet in Renal Disease
MDS: Minimum dataset
MEDEA: Mortalidad en áreas pequeñas Españolas y Desigualdades Socioeconómicas y Ambientales
MS: Multiple sclerosis
NA: Not applicable
NDI: Neighbourhood Deprivation Index
NEUT-RI: Neutrophil reactivity intensity
NLR: Neutrophil-lymphocyte ratio

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NM: Neuromuscular
NPPV: Noninvasive positive-pressure ventilation
NR: Not reported
NRB: Non-rebreather
NS: Not significant
O2: Oxygen
PAD: Peripheral arterial disease
PaO2: Partial pressure of oxygen
PaCO2: Partial pressure of carbon dioxide
PCR: Polymerase chain reaction
PF: Ratio of the partial pressure of arterial oxygen to the fraction of inspired oxygen
P/F: Ratio of the partial pressure of arterial oxygen to the fraction of inspired oxygen
PIN: Personal identification number
PLT: Platelets
PMR: Polymyalgia rheumatica
PsA: Psoriatic arthritis
PT: Prothrombin time
QSOFA: Quick Sepsis Related Organ Failure Assessment
RNA: Ribonucleic acid
RR: Respiratory rate
RTB: Population Statistics of Sweden
RT-PCR: Reverse transcription polymerase chain reaction
SAPS3: Simplified Acute Physiology Score 3
SIRI: Influenza and Virus Infection Registry
SpO2: Oxygen saturation
SRF: Severe respiratory failure
WHO: World Health Organization

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Bhasin 2020	Wrong study design. Cross-sectional.
Cummings 2020	Inappropriate statistical analysis. No multivariate analysis.
Hernández-Garduño 2020	Wrong population. Not COVID-infected patients
Lighter 2020	Inappropriate statistical analysis. No multivariate analysis.
Steinberg 2020	Inappropriate statistical analysis. No multivariate analysis.
Williamson 2020	Wrong population. Not COVID-infected patients.
Yates 2020	Wrong outcomes. Assessing risk of COVID-19 infection.
Zhang 2020	Inappropriate statistical analysis. No multivariate analysis.

ADDITIONAL TABLES

Table 1. Overall characteristics of included studies

DESIGN	Number of studies
Prospective cohort	32

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Table 1. Overall characteristics of included studies *(Continued)*

Retrospective cohort	101
Registry data	35
Case-control	3
Total	171

SETTING	Number of studies
Inpatient	120
Outpatient	4
Outpatient and inpatient	47
Unspecified	5
Total	176

OBESITY MEASUREMENT TIME	Number of studies
Before or right at presentation	84
After presentation	15
Unspecified	74
Total	173

COUNTRY	Number of studies
US	70
China	18
UK	14
Italy	11
Spain	10
France	9
Mexico	8
Brazil	3
Iran	3

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Table 1. Overall characteristics of included studies *(Continued)*

International	3
Germany	2
Netherlands	2
Ireland	2
Turkey	2
South Korea	2
Thailand	2
Kuwait	1
Belgium	1
Oman	1
Bolivia	1
Congo	1
India	1
Israel	1
Morocco	1
Qatar	1
Sweden	1
Total	171

Table 2. Overall risk of bias per outcome

Outcome	Overall risk of bias (%)			
	Low		High	
	Number of studies	%	Number of studies	%
ICU admission	27	57.45	20	42.55
Hospitalisation	19	57.58	14	42.42
Length of ICU admission	1	50	1	50
Length of hospitalisation	2	40	3	60
Length of mechanical ventilation	1	100	0	0

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Table 2. Overall risk of bias per outcome *(Continued)*

Mechanical ventilation	26	52	24	48
Mortality	64	56.64	49	43.36
Pneumonia	3	50	3	50
Severe COVID	13	41.94	18	58.06
Total	156	54.17	132	45.83

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Table 3. Domain-specific risk of bias per outcome

	QUIPS domains																	
	Selection bias			Attrition bias			PF measurement bias			Outcome measurement bias			Confounding bias			Statistical analysis bias		
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
ICU admission	30	14	3	20	20	7	26	12	9	41	6	0	28	11	8	36	6	5
Hospitalisation	22	8	3	15	13	5	15	7	11	30	3	0	22	8	3	23	7	3
Length of ICU admission	0	2	0	2	0	0	2	0	0	1	1	0	1	1	0	1	1	0
Length of hospitalisation	3	1	1	3	2	0	3	2	0	5	0	0	2	1	2	3	2	0
Length of mechanical ventilation	1	0	0	1	0	0	0	1	0	1	0	0	0	1	0	1	0	0
Mechanical ventilation	37	10	3	24	20	6	26	13	11	41	9	0	28	12	10	39	7	4
Mortality	76	26	11	66	35	12	67	22	24	108	3	2	69	26	18	75	23	15
Pneumonia	4	2	0	3	2	1	2	3	1	4	1	1	3	1	2	3	2	1
Severe COVID	19	12	0	16	11	4	20	3	8	22	6	3	17	8	6	21	5	5
Total	192	75	21	150	103	35	161	63	64	253	29	6	170	69	49	202	53	33

ICU: Intensive care unit
PF: Prognostic factor
QUIPS: Quality in Prognostic Studies tool

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APPENDICES

Appendix 1. Search strategies

English Databases:

MEDLINE (PubMed)

#1 **"COVID-19"[Mesh] OR "SARS-CoV-2"[Mesh] OR "COVID-19 Testing"[Mesh] OR "COVID-19 Vaccines"[Mesh]**

#2

Search: **("2019 nCoV"[tiab] OR 2019nCoV[tiab] OR "2019 novel coronavirus"[tiab] OR ((coronavirus[tiab] OR "coro-na virus"[tiab]) AND (Huanan[tiab] OR Hubei[tiab] OR Wuhan[tiab])) OR "coronavirus-19"[tiab] OR "coronavirus dis-ease-19"[tiab] OR "coronavirus disease-2019"[tiab] OR "COVID 19"[tiab] OR COVID19[tiab] OR "nCov 2019"[tiab] OR "new coronavirus"[tiab] OR "new coronaviruses"[tiab] OR "novel coronavirus"[tiab] OR "novel coronaviruses"[tiab] OR "novel corona virus"[tiab] OR "SARS-CoV2"[tiab] OR "SARS CoV-2"[tiab] OR SARSCoV2[tiab] OR "SARSCoV-2"[tiab] OR "SARS-coro-navirus-2"[tiab] OR "SARS-like coronavirus"[tiab] OR "Severe Acute Respiratory Syndrome Coronavirus-2"[tiab] OR "COV-ID-19"[nm] OR "COVID-19 drug treatment"[nm] OR "COVID-19 serotherapy"[nm] OR "LAMP assay"[nm] OR "severe acute res-piratory syndrome coronavirus 2"[nm] OR "spike protein, SARS-CoV-2"[nm]) NOT ("animals"[mh] NOT "humans"[mh]) NOT (editorial[pt] OR newspaper article[pt])**

#3 #1 OR #2

#4 obese OR obesity OR overweight

#5 **bmi or "body mass index" or "body mass" or "body weight" or "metabolic disorder" or "waist circumference"**

#6 **obesity [MeSH Terms] or "body mass index" [MeSH Terms]**

#7 #4 OR #5 OR #6

#8 #3 AND #7 Filters: **from 2019/12/1 - 2021/4/23**

Embase (Ovid)

#1 coronavirus.mp. or Coronavirinae/ or exp Coronavirinae/

#2 (coronavirus* or coronovirus* or coronavirinae* or Coronavirus* or Coronovirus* or "2019-nCoV" or 2019nCoV or nCoV2019 or nCoV-2019 or COVID-19 or COVID19 or covid 19 or HCoV-19 or HCoV19 or 2019 novel* or Ncov or n-cov or SARS-CoV-2 or SARSCoV-2 or SARSCoV2 or SARS-CoV2 or SARSCov19 or SARS-Cov19 or SARSCov-19 or SARS-Cov-19 or Ncorona*).mp.

#3 SARS coronavirus/ or severe acute respiratory syndrome/ or severe acute respiratory syndrome*.mp.

#4 ((corona* or corono*) adj2 (virus* or viral* or virinae*)).mp.

#5 #1 or #2 or #3 or #4

#6 obesity/

#7 (obese or obesity or overweight or bmi or body mass index).mp.

#8 #6 or #7

#9 #5 and #8

#10 limit 9 to dd=20191201 -20210421

Cochrane COVID-19 Study Register (https://covid-19.cochrane.org/)

Filtered by

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obese or obesity or overweight or BMI or “body mass index” or “body mass” or “body weight” or “metabolic disorder” or “waist circumference”

Date searched: 23 April 2021

WHO COVID-19 database (https://search.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/)

(tw:(obese or obesity or overweight or BMI or body mass index or body mass or body weight or metabolic disorder or waist circumference))

Date searched: 23 April 2021

Chinese Databases:

China Network Knowledge Infrastructure (CNKI)

((SU = 肥胖+体重+超重+身体质量指数+体重指数+BMI+代谢失调+代谢异常+代谢障碍+代谢紊乱+腰围) or

(TKA = 肥胖+体重+超重+身体质量指数+体重指数+BMI+代谢失调+代谢异常+代谢障碍+代谢紊乱+腰围)) and

((SU = 2019冠状病毒+新型冠状病毒+新型冠状病毒肺炎+新冠肺炎+新冠肺炎疫情+冠状病毒+冠状病毒感染+新型冠状病毒感染+新型冠状病毒感染的肺炎+

"COVID-19"+"COVID19"+"2019-nCoV"+"2019nCoV"+"SARS-CoV"+"SARSCoV"+"nCoV2019"+"nCoV-2019"+"HCoV-19"+"HCoV19"+

严重急性呼吸综合症+严重急性呼吸综合征+严重急性呼吸道症候群+急性呼吸综合征) or

(TKA = 2019冠状病毒+新型冠状病毒+新型冠状病毒肺炎+新冠肺炎+新冠肺炎疫情+冠状病毒+冠状病毒感染+新型冠状病毒感染+新型冠状病毒感染的肺炎+

"COVID-19"+"COVID19"+"2019-nCoV"+"2019nCoV"+"SARS-CoV"+"SARSCoV"+"nCoV2019"+"nCoV-2019"+"HCoV-19"+"HCoV19"+

严重急性呼吸综合症+严重急性呼吸综合征+严重急性呼吸道症候群+急性呼吸综合征))

Chinese Scientific Journals Database (VIP)

(U = 肥胖+体重+超重+身体质量指数+体重指数+BMI+代谢失调+代谢异常+代谢障碍+代谢紊乱+腰围) and

(U = 2019冠状病毒+新型冠状病毒+新型冠状病毒肺炎+新冠肺炎+新冠肺炎疫情+冠状病毒+冠状病毒感染+新型冠状病毒感染+新型冠状病毒感染的肺炎+

"COVID-19"+"COVID19"+"2019-nCoV"+"2019nCoV"+"SARS-CoV"+"SARSCoV"+"nCoV2019"+"nCoV-2019"+"HCoV-19"+"HCoV19"+

严重急性呼吸综合症+严重急性呼吸综合征+严重急性呼吸道症候群+急性呼吸综合征)

Wanfang data

((主题: "肥胖" or "体重" or "超重" or "身体质量指数" or "体重指数" or "BMI" or "代谢失调" or "代谢异常" or "代谢障碍" or "代谢紊乱" or "腰围") or

(题名或关键词: "肥胖" or "体重" or "超重" or "身体质量指数" or "体重指数" or "BMI" or "代谢失调" or "代谢异常" or "代谢障碍" or "代谢紊乱" or "腰围")) and

((主题: "2019冠状病毒" or "新型冠状病毒" or "新型冠状病毒肺炎" or "新冠肺炎" or "新冠肺炎疫情" or "冠状病毒" or "冠状病毒感染" or "新型冠状病毒感染" or "新型冠状病毒感染的肺炎" or

"COVID-19" or "COVID19" or "2019-nCoV" or "2019nCoV" or "SARS-CoV" or "SARSCoV" or "nCoV2019" or "nCoV-2019" or "HCoV-19" or "HCoV19" or

"严重急性呼吸综合症" or "严重急性呼吸综合征" or "严重急性呼吸道症候群" or "急性呼吸综合征") or

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(题名或关键词: "2019冠状病毒" or "新型冠状病毒" or "新型冠状病毒肺炎" or "新冠肺炎" or "新冠肺炎疫情" or "冠状病毒" or "冠状病毒感染" or "新型冠状病毒感染" or "新型冠状病毒感染的肺炎" or

"COVID-19" or "COVID19" or "2019-nCoV" or "2019nCoV" or "SARS-CoV" or "SARSCoV" or "nCoV2019" or "nCoV-2019" or "HCoV-19" or "HCoV19" or

"严重急性呼吸综合症" or "严重急性呼吸综合征" or "严重急性呼吸道症候群" or "急性呼吸综合征"))

SinoMed

1) "肥胖"[常用字段:智能] OR "体重"[常用字段:智能] OR "超重"[常用字段:智能] OR "身体质量指数"[常用字段:智能] OR "体重指数"[常用字段:智能] OR "BMI"[常用字段:智能] OR "代谢失调"[常用字段:智能] OR "代谢异常"[常用字段:智能] OR "代谢障碍"[常用字段:智能] OR "代谢紊乱"[常用字段:智能] OR "腰围"[常用字段:智能]

2) "2019冠状病毒"[常用字段:智能] OR "新型冠状病毒"[常用字段:智能] OR "新型冠状病毒肺炎"[常用字段:智能] OR "新冠肺炎"[常用字段:智能] OR "新冠肺炎疫情"[常用字段:智能] OR "冠状病毒"[常用字段:智能] OR "冠状病毒感染"[常用字段:智能] OR "新型冠状病毒感染"[常用字段:智能] OR "新型冠状病毒感染的肺炎"[常用字段:智能] OR " 'COVID-19'"[常用字段:智能] OR "'COVID19'"[常用字段:智能] OR "'2019-nCoV'"[常用字段:智能] OR "'2019nCoV'"[常用字段:智能] OR "'SARS-CoV'"[常用字段:智能] OR "'SARSCoV'"[常用字段:智能] OR "'nCoV2019'"[常用字段:智能] OR "'nCoV-2019'"[常用字段:智能] OR "'HCoV-19'"[常用字段:智能] OR "'HCoV19'"[常用字段:智能] OR "严重急性呼吸综合症"[常用字段:智能] OR "严重急性呼吸综合征"[常用字段:智能] OR "严重急性呼吸道症候群"[常用字段:智能] OR "急性呼吸综合征"[常用字段:智能]

3) (#1) AND (#2)

Appendix 2. Blank Extraction Sheet

https://docs.google.com/spreadsheets/d/1y1xf8DpSPImBrPt36ROqHHwnIEMUS0TSDnyJd6cWOqY/edit?usp=sharing

Appendix 3. Funnel Plots

We presented only the funnel plots for the comparisons that included at least 10 effect estimates. Below you can find the links to each funnel plot and their interpretations:

Mortality and obesity class I analysis funnel plot: Figure S68

Publication bias: not serious. Symmetrical around pooled estimate in the funnel plot.

Mortality and obesity class II analysis funnel plot: Figure S69

Publication bias: not serious. Symmetrical around pooled estimate in the funnel plot.

Mortality and obesity class III analysis funnel plot: Figure S70

Publication bias: serious. Asymmetrical around pooled estimate in the funnel plot.

Mortality and unclassified obesity analysis funnel plot: Figure S71

Publication bias: not serious. Symmetrical around pooled estimate in the funnel plot.

Mortality and every 5 units increase in BMI analysis funnel plot: Figure S72

Publication bias: not serious. Symmetrical around pooled estimate in the funnel plot.

Mechanical ventilation and obesity class I analysis funnel plot: Figure S73

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Publication bias: not serious. Symmetrical around pooled estimate in the funnel plot.

Mechanical ventilation and obesity class III analysis funnel plot: Figure S74

Publication bias: not serious. Symmetrical around pooled estimate in the funnel plot.

Mechanical ventilation and unclassified obesity analysis funnel plot: Figure S75

Publication bias: serious. Asymmetrical around pooled estimate in the funnel plot.

ICU admission and unclassified obesity analysis funnel plot: Figure S76

Publication bias: not serious. Symmetrical around pooled estimate in the funnel plot.

Hospitalisation and unclassified obesity analysis funnel plot: Figure S77

Publication bias: serious. Asymmetrical around pooled estimate in the funnel plot.

Hospitalisation and unclassified obesity analysis funnel plot (within minimum adjustment set subgroup): Figure S78

Publication bias: not serious. Symmetrical around pooled estimate in the funnel plot.

Severe disease and unclassified obesity analysis funnel plot: Figure S79

Publication bias: not serious. Symmetrical around pooled estimate in the funnel plot.

WHAT'S NEW

Date	Event	Description
7 June 2023	Amended	Amendment to fix PDF display

HISTORY

Review first published: Issue 5, 2023

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CONTRIBUTIONS OF AUTHORS

Author		Conception of the idea	Design of study	Database search	Screening	Data extraction	Risk of bias assessment	Data Analysis	Interpretation of data	Manuscript drafting	Critical review of the manuscript
Borna	Tadayon Najafabadi	#	#		#	#	#	#	#	#	#
Daniel	Rayner				#	#	#	#		#	
Kamyar	Shokraee				#	#	#	#			
Kamran	Shokraie				#	#	#			#	
Parsa	Panahi				#	#	#				
Parvaneh	Rastgoo				#	#	#				
Farnoosh	Seirafianpour				#	#	#				
Feryal	Momenilandi				#	#	#				
Pariya	Alinia				#	#	#				
Neda	Parnianfard				#	#	#				
Nima	Hemmati				#	#	#				#
Behrouz	Banivaheb				#	#	#				
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Farid	Foroutan	#	#			#	#	#	#	#	#	#	#	#	

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DECLARATIONS OF INTEREST

AS: partially supported by the Research, Evidence and Development Initiative (READ-It). READ-It (project number 300342-104) is funded by UK aid from the UK government; however, the views expressed do not necessarily reflect the UK government's official policies.

CEN: partially supported by the Research, Evidence and Development Initiative (READ-It). READ-It (project number 300342-104) is funded by
UK aid from the UK government; however, the views expressed do not necessarily reflect the UK government's official policies; partial support paid to my institution by WHO for a scoping review on total fat intake and health outcomes other than measures of unhealthy weight gain, a systematic review on low sodium salt substitutes and cardiovascular health, rapid scoping reviews on coconut and palm oil intake and cardiovascular health, and a scoping review on the health effects of tropical oil consumption; co-director of Cochrane Nutrition but did not have any involvement in the editorial process for this review.

LNA is supported by a research grant from the Canadian Institutes of Health Research.

FF is an editor with the Cochrane Prognosis Methods Group, but did not participate in the editorial process for this review.

All other authors have no interests to declare.

SOURCES OF SUPPORT

Internal sources

- None, Other

  We did not receive any financial support for the conduct of this review

External sources

- Foreign, Commonwealth and Development Office, UK

  Project number 300342-104 (partial support for CEN and AS)

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

To make the review feasible and use more robust methods, we decided to change some of the methods mentioned in the review protocol. These decisions were all made before finishing the data extraction and investigating the study data. All the decisions were made through extensive authors' meetings including methodologists and clinicians. Here we summarise the most important changes from the protocol and our rationale for them.

Initially, to be inclusive of all the study designs that provide similar quality of evidence to answer prognosis questions, we broadened the eligible study designs to also include case-series and registry data. In addition, the astonishing speed of publications around COVID-19 convinced us to include only studies that reported on the outcomes under question by this review. This decision, although uncommon methodologically, was to make the review feasible. Other than these changes, our objective of investigating the independent association between obesity and adverse effects was realised by only including studies that incorporated multivariable analyses.

In the review, we used the QUIPS tool instead of the Newcastle-Ottawa tool. The QUIPS tool is specifically designed to assess the risk of bias in prognostic factor studies. We believe this tool can assess the risk of bias in our included studies better. Furthermore, Riley 2019 and the Cochrane Prognosis group recommend using the QUIPS tool in systematic reviews of prognostic factors.

Additionally, we did not conduct a systematic search of LitCovid in our review. After our search of other electronic databases and sources, we believe that our search was sufficient in capturing all the relevant literature and that an additional search of LitCovid was not necessary.

Another difference between the review and protocol is that we conducted separate meta-analyses for obesity classes and unclassified obesity compared to using the classes as subgroup variables. The predicted number of studies reporting on each class and the clinical relevance of using obesity classes informed this decision. We believe that providing separate effect estimates is more clinically relevant since obesity is not considered only as a binary characteristic in the clinical setting. Furthermore, the lack of sufficient prior knowledge and details in reports compelled us not to undertake subgroup analyses based on other variables.

Because obesity is known to be associated with a number of comorbidities that may affect the outcomes of this review, our review author team, after many discussions, decided to define an adjustment subgroup and investigate the effect of this subgroup on all outcomes.

Finally, we used the statistical methods mentioned before to convert RRs and HRs to ORs. This decision was also made before the data extraction and allowed us to pool data from a wider range of studies in each meta-analysis. This method, in part, led to the possibility of considering separate meta-analyses for obesity classes.

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INDEX TERMS

Medical Subject Headings (MeSH)

*COVID-19; Obesity; *Pandemics; Prospective Studies; Retrospective Studies; Risk Factors

MeSH check words

Adult; Humans

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