

PEER REVIEW HISTORY

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ARTICLE DETAILS

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| TITLE (PROVISIONAL) | Risk assessment of metabolic syndrome prevalence involving sedentary occupations and socioeconomic status |
| AUTHORS | Chen, Ming-Shu; Chiu, Chi-Hao; Chen, Shih-Hsin |

VERSION 1 – REVIEW

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| REVIEWER | Lavie, Carl The University of Queensland School of Medicine |
| REVIEW RETURNED | 25-Aug-2020 |

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| GENERAL COMMENTS | This is a nice study and well written manuscript on an important topic that is publishable in its present form. However, the authors could consider including a very major State of the Art on sedentary behavior, physical activity (PA) and exercise (Lavie CJ et al. Circ Res 2019; 124: 799-815), one promoting PA , exercise and fitness (Fletcher GF et al. JACC 2018; 72: 1622-1639), a research paper on resistance exercise reducing the metabolic syndrome (Bakker EA et al. Mayo Clinic Proc 2017; 92: 1214-1222), and one very recent on Muscular Strength (Carbone S et al. J Cardiopulm Rehabil Prev 2020; on-line August.) |
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| REVIEWER | Leischik, Roman University Witten/ Herdecke, Cardiology / Sports Medicine |
| REVIEW RETURNED | 29-Sep-2020 |

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| GENERAL COMMENTS | <p>I think this paper can be accepted, we need regression analysis /with odds ratio/Hazard ratio) for the risk od sedentary. See publication "Aerobic capacity, physical activity, and metabolic risk factors in firefighters compared with police officers and sedentary clerks, R Leischik, P Foshag, M Strauß, H Littwitz, P Garg... - PloS one, 2015" cite and discuss too "Prospective Evaluation of Cardiovascular, Cardiorespiratory, and Metabolic Risk of German Office Workers in Comparison to International DataM Strauss, P Foshag, R Leischik - International Journal of Environmental Research and ..., 2020.</p> <p>The number of participants is high, so after regression analysis and improvement of discussion of the studies this paper can be published. As introduction discuss and cite Paper "Plasticity of Health, R Leischik, B Dworrak, M Strauss, B Przybylek, T Dworrak, D Schöne, ... German Journal of Medicine 1 (DOI:10.19209/GJOM000001), 1-17 http://www.gjom.de/en/articles/plasticity-of-health/,</p> <p>all publications are open access Thank you for a nice publication</p> |
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| REVIEWER | Nakata, Yoshio University of Tsukuba, Faculty of Health and Sport Sciences |
| REVIEW RETURNED | 18-Jan-2021 |

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| GENERAL COMMENTS | <p>The present study examined the association between type of occupation and prevalence of metabolic syndrome. This issue is impressive; however, several problems should be addressed as follows.</p> <ol style="list-style-type: none"> 1. Although the authors focused on taxi driving, they compared three categories of occupation. Taxi driving is one of the occupations in Category I. The current title of this manuscript is misleading. 2. Although the authors focused on sedentary behavior and social-economic status (SES), they compared three categories of occupation. Category I is a sedentary occupation, Category II is a non-sedentary occupation, and Category III is a sedentary and high-SES occupation. These comparisons cannot reveal each effect of sedentary behavior and SES. Also, the validation of this grouping is unclear. 3. The introduction of this manuscript is redundant and not straight-forward. Also, the rationale and hypothesis of this study are unclear. 4. The representativeness of this dataset is unclear. The authors should describe how to recruit participants. 5. The authors described Category III as significantly associated with the prevalence of metabolic syndrome; however, the odds ratio was not significant (95% confidence interval: 0.96-1.09). 6. Most analyses were not multivariate analyses. Crude analyses cannot reveal the proper associations. |
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VERSION 1 – AUTHOR RESPONSE

Response to Reviewer 1.

This is a nice study and well written manuscript on an important topic that is publishable in its present form. However, the authors could consider including a very major State of the Art on sedentary behavior, physical activity (PA) and exercise (Lavie CJ et al. *Circ Res* 2019; 124: 799-815),

one promoting PA , exercise and fitness (Fletcher GF et al. *JACC* 2018; 72: 1622-1639), a research

paper on resistance exercise reducing the metabolic syndrome (Bakker EA et al. *Mayo Clinic Proc*

2017; 92: 1214-1222), and one very recent on Muscular Strength (Carbone S et al. *J Cardiopulm*

Rehabil Prev 2020; on-line August.)

Ans: Thank you for the helpful comments. We cited these four related references into numerous appropriate

places. These related references to express our intended meaning more clearly, please read the online version

of the manuscript comparison. The partial reference list is also shown as follows, which presented the

recommended papers.

a) [28] Lavie, C. J., Ozemek, C., Carbone, S., Katzmarzyk, P. T., & Blair, S. N. (2019). Sedentary

behavior, exercise, and cardiovascular health. *Circulation research*, 124(5), 799-815.

b) [47] Fletcher, G. F., Landolfo, C., Niebauer, J., Ozemek, C., Arena, R., & Lavie, C. J. (2018). Promoting physical activity and exercise: JACC health promotion series. *Journal of the American College of Cardiology*, 72(14), 1622-1639.

c) [46] Bakker, E. A., Lee, D. C., Sui, X., Artero, E. G., Ruiz, J. R., Eijsvogels, T. M., ... & Blair, S. N. (2017, August). Association of resistance exercise, independent of and combined with aerobic exercise, with the incidence of metabolic syndrome. In *Mayo Clinic Proceedings* (Vol. 92, No. 8, pp. 1214-1222). Elsevier.

d) [18] Carbone, S., Kirkman, D. L., Garten, R. S., Rodriguez-Miguel, P., Artero, E. G., Lee, D. C., & Lavie, C. J. (2020). Muscular strength and cardiovascular disease: an updated state-of-the-art narrative review. *Journal of Cardiopulmonary Rehabilitation and Prevention*, 40(5), 302-309.

Finally, we present the differences by using the following link to go through the revisions. Thank you

once again for your efforts to enhance the quality of this paper.

<https://draftable.com/compare/IVePLpJaOqWR>

BMJ Open (ISSN:2044-6055)

March. 4, 2021

Response to Reviewer 2.

1. I think this paper can be accepted, we need regression analysis /with odds ratio/Hazard ratio) for

the risk of sedentary. See publication "Aerobic capacity, physical activity, and metabolic risk factors in firefighters compared with police officers and sedentary clerks, R Leischik, P Foshag, M

Strauß, H Littwitz, P Garg... - PloS one, 2015" cite and discuss too " Prospective Evaluation of Cardiovascular, Cardiorespiratory, and Metabolic Risk of German Office Workers in Comparison

to International DataM Strauss, P Foshag, R Leischik - International Journal of Environmental Research and ..., 2020..

Ans: Thank you for your suggestions. We include them into our manuscript. Please refer to each paper with

the corresponding number in the red parentheses.

a) [31] Leischik, R., Foshag, P., Strauß, M., Littwitz, H., Garg, P., Dworrak, B., & Horlitz, M. (2015).

Aerobic capacity, physical activity and metabolic risk factors in firefighters compared with police

officers and sedentary clerks. *PloS one*, 10(7), e0133113.

b) [33] Strauss, M., Foshag, P., & Leischik, R. (2020). Prospective evaluation of cardiovascular, cardiorespiratory, and metabolic risk of German office workers in comparison to international data.

International journal of environmental research and public health, 17(5), 1590.

2. The number of participants is high, so after regression analysis and improvement of discussion of

the studies this paper can be published. As introduction discuss and cite Paper "Plasticity of Health, R Leischik, B Dworrak, M Strauss, B Przybylek, T Dworrak, D Schöne, ... *German Journal of Medicine* 1 (DOI:10.19209/GJOM000001), 1-17

<http://www.gjom.de/en/articles/plasticity-of-health/>..

Ans: Thank you to provide the following article. We refer to the article in the introduction and discussion

now.

Please read the following sentences related to this cited paper.

Introduction: Page 2

SES is a combination of salary, social status, and education and can be evaluated by occupation or work status [36].

Discussions: Page 6.

In addition, the people belonged to high-SES may have better capability to cope with non-communication diseases compared with general sedentary occupations [36]. This reason might causes the odds ratio of sedentary and high-SES group is not significant compared with general sedentary group.

Reference:

a) [36] Leischik, R., Dworak, B., Strauss, M., Przybylek, B., Schöne, D., Horlitz, M., ... & Dworak,

T. (2016). Plasticity of health. German Journal of Medicine, 1, 1-17.

Finally, due to there are places revised, we present the differences by using the following link.

Thank

you.

<https://draftable.com/compare/IVePLpJaOqWR>

BMJ Open (ISSN:2044-6055)

March. 4, 2021

Response to Reviewer 3.

1. Although the authors focused on taxi driving, they compared three categories of occupation. Taxi

driving is one of the occupations in Category I. The current title of this manuscript is misleading.

Ans: Thank you for your kindly reminder. Yes, you are right. Even though the taxi driver is one of the

important occupations in our database, our original title may cause misunderstanding. We revised the article

title into "Risk assessment of metabolic syndrome prevalence involving sedentary occupations and socioeconomic status"

2. Although the authors focused on sedentary behavior and social-economic status (SES), they

compared three categories of occupation. Category I is a sedentary occupation, Category II is a nonsedentary occupation, and Category III is a sedentary and high-SES occupation. These comparisons

cannot reveal each effect of sedentary behavior and SES. Also, the validation of this grouping is

unclear.

Ans: Thank you for your constructive comment. In Table 7, we compared the three groups and Group-I

(sedentary occupation) is as the baseline in the multiple logistic regression model. We could see there is a

significant difference between the Group-I and Group-II which indicated the sedentary behavior indeed

influences the MetS prevalence. Later on, Group-I and Group-III are both belonged to sedentary group while

Group-III has the attribute of high-SES. When we compared the Group-I and Group-III, it might be easier for

us to distinguish the effect of high-SES. Our results shown there is no difference between the Group-I and

Group-III although the odds ratio of Group-III is a little bit higher than the one of Group-I.

In terms of the grouping, we refer to a reference [38] which presented the grouping information. and revised

the descriptions in “Definition of a sedentary occupation and SES” on page 3.

[38] Jans MP, Proper KI, Hildebrandt VH. Sedentary behavior in Dutch workers: differences between

occupations and business sectors. Am J Prev Med. 2007 Dec;33(6):450-4. doi:

10.1016/j.amepre.2007.07.033. PMID: 18022060

3. The introduction of this manuscript is redundant and not straight-forward. Also, the rationale and

hypothesis of this study are unclear.

Ans: We revised our introduction section which avoids redundant paragraph. In addition, we remove the

paragraphs of taxi drivers to keep the focus on three categories of occupations. The rationale and hypothesis

of this study were added in the end of introduction. Please refer to Page 2 or the following paragraph.

Finally, although there are numerous studies that include some occupations or SES condition [22, 32, 34,

35], this research might be the first one to study those in sedentary or more high-SES-associated

occupations, especially occupations that increase MetS risk which haven't explored yet by prior researches.

There are eight major occupations and then to be allocated in three groups, including general sedentary

occupation, non-sedentary occupation, and sedentary occupations with high-SES. Our hypothesis includes

whether there is a difference between the sedentary occupation, and high-SES would cause higher MetS

prevalence. The next section explains the methods used in this paper.

4. The representativeness of this dataset is unclear. The authors should describe how to recruit

participants.

Ans: Thank you for your comment. Due to the dataset description is not clear, we revised it on page 3.

We obtained two datasets from the New Taipei City Government Annual Taxi Health Examination Survey

and MJ Health Check-Up--Based Population Database (MJPD). The duration of the first dataset covered

the 2012–2016 period and was conducted by Far Eastern Memorial Hospital (FEMH) 1

. The second dataset

MJPD was collected from four MJ clinics, which provide periodical health examinations to their members,

which is accessible to researchers upon request².

All of the data sets used in this study were authorized and given to this study's researchers by the MJPD

Health Research Foundation with FEMH IRB approval. The laboratory data of the two databases were

obtained from the same biochemical examination apparatus (Hitachi-7600). The two datasets conform to

the ISO-15189 guidelines. Regarding ethical data use, the protocol of this study was approved by the Research Ethics Review Committee at FEMH (FEMH-IRB-107126-E) and the MJ Health Research Foundation.

5. The authors described Category III as significantly associated with the prevalence of metabolic

syndrome; however, the odds ratio was not significant (95% confidence interval: 0.96-1.09)

Ans: Yes, you are right. There is no significant difference between the Group-I and Group-III even though the

odds ratio of Group-III is a little bit higher. We modified our descriptions in Results, Discussions, and

Conclusions on Page 3 to Page 6.

6. Most analyses were not multivariate analyses. Crude analyses cannot reveal the proper associations.

Ans: The definition of multivariate analysis is to use more than two predictors in one analysis which is useful

to clarify the associations between the factors. The Multiple Logistic Regression model used in table 7 is

belonged to the multivariate analysis. Except the results in Table 7, we agreed that they are not belonged to

the multivariate analysis. Finally, we add the limitations, please read the online version

(<https://draftable.com/compare/IVePLpJaOqWR>) in the end of Discussion section (page 6), and we hope that this

article will lead other scholars to consider more related variables in multivariate analysis.

1 EMH is one of the exclusive hospitals that mainly undertakes the annual health check-up of taxi drivers in

New Taipei City, and it is also the hospital with the largest number of services and the largest hospital in

New Taipei City.

2 <http://www.mjhrf.org/main/page/release1/en/#release01>

VERSION 2 – REVIEW

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| REVIEWER | Leischik, Roman University Witten/ Herdecke, Cardiology / Sports Medicine |
| REVIEW RETURNED | 15-Mar-2021 |

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| GENERAL COMMENTS | Thank you for the improvements .. your paper can be published now |
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| REVIEWER | Nakata, Yoshio University of Tsukuba, Faculty of Health and Sport Sciences |
| REVIEW RETURNED | 24-Mar-2021 |

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| GENERAL COMMENTS | The authors have partly done what I asked. A major remained problem is that the authors do not consider the effect of gender. For example, the authors have yet consisted that taxi drivers had the highest MetS prevalence; however, the authors exclude female taxi drivers from this dataset. Stratification analysis by gender or multivariate analysis, including gender as a covariate, was a more desirable method. The other remained problems are as follows. |
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| | <p>1. Although the authors said that they remove the paragraphs of taxi drivers to focus on three categories of occupations, some descriptions of taxi drivers remained in abstract, introduction, result, discussion, and conclusion.</p> <p>2. As I pointed out in the first round, the authors described Category III as significantly associated with the prevalence of metabolic syndrome; however, the odds ratio was not significant (95% confidence interval: 0.96-1.09). The authors should remove or revise the description of the abstract. There is no evidence to conclude that high-SES increase MetS risk.</p> <p>3. In tables 4-7, stratification by gender is desirable.</p> <p>4. The conclusion of this manuscript is redundant. The authors should remove a reference and summarize more concisely.</p> |
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VERSION 2 – AUTHOR RESPONSE

Response to Reviewers

We thank the comments from Reviewer No. 2 who accepted this paper, and the Reviewer No. 3 provided some further comments based on our prior revisions. According to the comments given by Reviewer No. 3, we replied them one-by-one. Please kindly refer to the following responses.

1. Although the authors said that they remove the paragraphs of taxi drivers to focus on three categories of occupations, some descriptions of taxi drivers remained in abstract, introduction, result, discussion, and conclusion.

Ans: In order not to highlight the taxi drivers, we removed the following statements in abstract, introduction, result, discussion, and conclusion.

Abstract: "Taxi drivers were most likely to have MetS." is deleted.

Introduction: This sentence, "We selected taxi driving as the representative sedentary occupation, in addition to analyzing some high-SES-associated occupations," is removed.

Result: We draw away the description of the dataset description for taxi driver. Then, we keep some descriptions of taxi driver, such as "Among the occupations, taxi driving had the highest MetS prevalence rate (e.g., 33.41% and 60.71% for male and female, respectively)..." because some tables shown the specific results of the occupations, including managers, service staff, and taxi drivers.

Conclusion: We revised the following two sentences and also remove one citation related to the taxi driver.

Sentence 1: The study found that taxi drivers were indeed a high-risk group. However, high-SES-associated but sedentary occupations, such as a lawyer, teacher, accountant, doctor, nurse, engineer, and manager, were also high-risk groups for MetS.

Revised: The study found that lawyer, teacher, accountant, doctor, nurse, engineer, manager, and taxi driver, were high-risk groups for MetS.

Sentence 2: However, after the eight categories were grouped into three groups, general sedentary occupations (group-I), of which taxi driving falls under, had a lower MetS prevalence than did sedentary and high-SES (group-III) occupations. This means that in general, high-SES and sedentary workers has a little-bit more risk than the general sedentary counterparts.

Revised: After the eight categories were grouped into three groups when the age is above 60, there is a significant difference. The sedentary and high-SES occupations (group-III) are likely to have MetS than the general sedentary occupations (group-I) and non-sedentary occupations (group-II).

Sentence 3: We recommend for government authorities to focus on taxi drivers, sedentary blue-collar workers, and sedentary high-SES workers in their policies, particularly in tailoring health promotion programs to these groups, such as aerobic exercise...

Revised: We recommend for government authorities to focus on sedentary high-SES workers in their policies, particularly in tailoring health promotion programs to these groups, such as aerobic exercise...

2. As I pointed out in the first round, the authors described Category III as significantly associated with the prevalence of metabolic syndrome; however, the odds ratio was not significant (95% confidence interval: 0.96-1.09). The authors should remove or revise the description of the abstract. There is no evidence to conclude that high-SES increase MetS risk.

Ans: Thank you very much for this comment. There is a major difference that we limited the the age is above 60 in the original table. There is a significant difference. The odd ratio of sedentary high-SES workers (Group-III) is 1.39 which is higher than the one of general Sedentary (Group-I) and non-sedentary (Group-II) occupations.

3. In tables 4-7, stratification by gender is desirable.

Ans: Thank you very much for this constructed comment. Due to the effect of gender should be considered, we modified the Table 4 to Table 7. The corresponding results are shown Table 4 to Table 10 now. Please kindly refer to the revised manuscript.

4. The conclusion of this manuscript is redundant. The authors should remove a reference and summarize more concisely.

Ans: We shorten the conclusion, so that the content is much more precise now. Besides, a reference is also removed. Please refer to the following paragraph of the revised conclusion.

Although prolonged sitting is an ostensibly novel risk factor for health outcomes across all ages, its association must be replicated in occupational conditions [32]. In this study, we noted that age and occupation categories were risk factors for MetS. The study found that lawyer, teacher, accountant, doctor, nurse, engineer, manager, and taxi driver, were high-risk groups for MetS. After the eight categories were grouped into three groups when the age is above 60, there is a significant difference. The sedentary and high-SES occupations (group-III) are likely to have MetS than the general sedentary occupations (group-I) and non-sedentary occupations (group-II). We recommend for government authorities to focus on sedentary high-SES workers in their policies, particularly in tailoring health promotion programs to these groups, such as aerobic exercise [46] or physical activities [28, 47].

VERSION 3 – REVIEW

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| REVIEWER | Nakata, Yoshio University of Tsukuba, Faculty of Health and Sport Sciences |
| REVIEW RETURNED | 26-May-2021 |

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| GENERAL COMMENTS | <p>The authors have focused on the participants in the age above 60; however, this population (n=2387) is only 3% of this cohort. The authors' decision stands for discarding 97% of the dataset. The reviewer thinks it not appropriate. As the authors said in the abstract, a multiple logistic regression algorithm was used to test factors for three age segments. Those in the other age groups (≤ 40 and 40-60 years) should be shown as the primary results.</p> <p>Minor points</p> <ol style="list-style-type: none"> 1. In the abstract, the last sentence was incomplete. 2. In the result, Chi-square exact test and multiple logistic regression analysis subsection, in the second paragraph, the authors included 60-year participants in this age group; however, in tables 6-9, they showed as "Age>60." In table 10, they showed as "age ≥ 60." |
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VERSION 3 – AUTHOR RESPONSE

Response to Reviewer No. 3.

Thank you very much to point out a major question and two minor problems. The authors are grateful for improving the quality of this paper when we read your responses. Please kindly refer to our response shown below. Thank you.

Q1. The authors have focused on the participants in the age above 60; however, this population (n=2387) is only 3% of this cohort. The authors' decision stands for discarding 97% of the dataset. The reviewer thinks it not appropriate. As the authors said in the abstract, a multiple logistic regression algorithm was used to test factors for three age segments. Those in the other age groups (≤ 40 and 40-60 years) should be shown as the primary results.

Answer: Thank you very much to point out this major problem. We agreed that it is not sufficient that we only provided the result of age > 60. In this revised paper, we examined the results of multiple logistic regression algorithm for the other age groups (say age ≤40, and 40 to 60 years-old) were shown in Table 10 and Table 11, respectively. In Table 10, the MetS prevalence rate of Group-II (Non sedentary-related occupations) is significantly lower than that of Group-I (General sedentary-related occupations) and Group-III (Sedentary-related occupations with high-SES) when age ≤ 40. Then, there is no difference among the three groups when age is greater than 40 or less than or equal to 60 in Table 11. According to these new findings, we modified the abstract, results, discussions, and conclusions. To show the differences, please go through them via the following link.

<https://draftable.com/compare/uVKMBsDodSq>

Minor points

Q2. In the abstract, the last sentence was incomplete.

Answer: Many thanks. We modified the last sentences of the abstract. Please refer them below.

The occupational sedentary behavior might influence the MetS in different age groups. Non-sedentary occupations have less risk of having MetS for the younger generation. High-SES and sedentary occupations above 60 increased the MetS risk significantly. We suggest that the authorities focus on the high-SES and sedentary occupations.

Q3. In the result, Chi-square exact test and multiple logistic regression analysis subsection, in the second paragraph, the authors included 60-year participants in this age group; however, in tables 6-9, they showed as “Age>60.” In table 10, they showed as “age ≥ 60.”

Answer: Yes, you are right. We should denote the Age>60 instead of age ≥ 60 on the original Table 10 (It is in Table 12 now). Hence, we fixed this problem already.

VERSION 4 – REVIEW

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| REVIEWER | Nakata, Yoshio University of Tsukuba, Faculty of Health and Sport Sciences |
| REVIEW RETURNED | 02-Sep-2021 |

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| GENERAL COMMENTS | The authors have done what I asked. However, there are a lot of grammatical errors in the present manuscript. Therefore, proofreading is necessary before publication. |
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