Burnout, resilience and work engagement among Dutch intensivists in the aftermath of the COVID-19 crisis: A nationwide survey

Iwan A. Meynaar, MD, PhD, MSc [a,*], Thomas Ottens, MD, PhD [a], Marieke Zegers, PhD [b], Margo M.C. van Mol, PhD [c], Iwan C.C. van der Horst, MD, PhD [d]

[a] Intensive Care Unit, HagaZiekenhuis, Els Borst-Eilersplein 275, 2545AA, The Hague, the Netherlands
[b] Intensive Care Unit, Radboud University Medical Centre, Nijmegen, the Netherlands
[c] Intensive Care Unit Adults, Erasmus Medical Centre, Rotterdam, the Netherlands
[d] Intensive Care Unit, Maastricht University Medical Center+, Maastricht, the Netherlands

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ABSTRACT

Purpose: The COVID-19 crisis put a strain on intensive care resources everywhere in the world increasing the risk of burnout. Previously, the prevalence of burnout among Dutch intensivists was found to be low. Engagement and resilience among intensivists have not previously been studied quantitatively, however, both are related to burnout and provide a possible way to mitigate burnout. Our objective was to study burnout and its association with work engagement and resilience among Dutch intensivists in the aftermath of the COVID-19 crisis.
Methods: An online questionnaire was sent to all Dutch intensivists. The questionnaire consisted of questions on personal and work-related characteristics and validated questionnaires: the Maslach Burnout Inventory, the Utrecht Work Engagement Scale, and the Resilience Evaluation Scale.
Results: The response rate was 27.2% with 162 evaluable responses. Thirteen respondents (8.0%) were classified as having burnout, 63 (38.9%) respondents were reporting high work engagement. Burnout was found to be negatively associated with both work engagement and resilience.
Conclusion: In the aftermath of the 2020 COVID-19 crisis, we found a raised prevalence of burnout among intensivists, however this is still low in international comparisons. Intensivists with burnout scored low on resilience and low on work engagement.

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1. Introduction

The COVID-19 pandemic that hit the world at the beginning of 2020 led to a sudden and sharp increase in the demand for intensive care unit (ICU) capacity worldwide [1]. In the Netherlands, with 17 million inhabitants the number of ICU beds rose from just over 1000 on March 8th to 1700 on April 8th to take care of 1313 COVID-19 patients [2-4]. Increasing the number of beds and critically ill patients with a contagious disease required severe quarantine measures such as the use of isolation, personal protective equipment, and sending away the patients' family and loved ones. Working in unfamiliar surroundings and in unfamiliar teams undoubtedly put a severe strain on all ICU professionals. On the

one hand, this strain may lead to compassion fatigue, moral distress, posttraumatic stress, or burnout [5,6]. On the other hand, the increased workload also led to more or new meaning and appreciation of the medical profession and could increase joy, job satisfaction, and work engagement of intensivists, thus, protecting them from burnout [7,8]. The prevalence of burnout among Dutch intensivists was found to be 4.4% in a nationwide online study in 2013 [9]. In this study, burnout was associated with work related conflict and with complaints from patients or relatives, but not with personal characteristics or other work related characteristics. From a second survey among managing directors of all Dutch intensive care units who were asked how many intensivists in their unit were suffering from burnout in the preceding year, a burnout incidence of 7.4% was found [9]. These figures were rather low compared to the prevalence or incidence commonly found in ICU professionals which vary between 40 and 50% with extremes between 0 and 80% [10-13]. The low burnout rate in Dutch intensivists as compared to the literature could only be partly explained by a difference in workload or by methodological reasons, as studies on burnout vary extensively in the way burnout is defined. So, if burnout is indeed less prevalent in Dutch intensivists, how might this be explained? The

concept of work engagement might be helpful in answering this question. As proposed in the Job Demands-resources model, burnout is seen as one of the possible consequences of the combination of personal characteristics and organizational factors in the work environment [14]. At the other end of the continuum, work engagement is the opposite of burnout. Several factors, among which resilience, might have influence on this energetic equilibrium [15-17]. Resilience is defined as the ability to achieve an adequate and positive adjustment to adversity. Resilience is a personal characteristic that is highly necessary to adapt to changing and demanding circumstances as in a healthcare crisis [18,19]. Resilience can be learned and trained, and as such, resilience training has been used to prevent or mitigate burnout [20]. The study aims were (1) to measure and compare the prevalence of burnout among Dutch intensivists in the wake of the COVID-19 crisis (2) to study the association between burnout, engagement, and resilience.

2. Methods

Burnout, work engagement, and resilience were measured by means of an online questionnaire sent to all members of the Dutch Society for Intensive Care using the Survey Monkey tool. A short introduction and request to participate was incorporated into the society's digital newsletter, including a link to the online questionnaire. Members of the society are either intensivists or fellows (intensivists in training). The first request to participate in the questionnaire was sent on May 24th, 2020 (6 weeks after the day with the highest ICU bed occupancy), and reminders were sent on June 11th and July 20th. The request to participate was also shared on social media. The need for ethical approval was waived by the local ethical committee of the HagaZiekenhuis.

The questionnaire was designed with guidance of the CHERRIES checklist [21] and consisted of 54 questions in total, with 9 introductory questions on personal characteristics and work environment. The first two questions were to confirm that the participant had worked as an intensivist or fellow in a Dutch ICU during the COVID-19 crisis. Starting the questionnaire by answering the questions was regarded as Informed Consent with the study. The complete questionnaire is shown in Appendix 1.

Burnout was assessed using the Dutch version of the Maslach Burnout Inventory, (MBI) (Utrecht Burnout Scale, UBOS) [22,23], a validated questionnaire containing 20 questions, subdivided into 8 items on the subscale emotional exhaustion (EE), 5 questions on the subscale depersonalization (DP) and 7 questions on the subscale personal accomplishment (PA). In the UBOS, questions are statements regarding the participants' experience to which the respondent has to answer in a 7-point Likert scale ranging from 'never' to 'daily'. The results were regarded evaluable when in the UBOS questions a maximum of one answer was missing per subscale, if more than one answer was missing, the results for the relevant part were regarded as unevaluable and not used in the analysis. To assess the burnout score of a single participant, points were awarded for each answer ranging from 0 points for the answer 'never' to 6 points for answering 'daily'. Next, as prescribed by the UBOS manual, average scores were calculated separately for the 3 domains (EE, DP, and PA) and for the purpose of the study burnout was diagnosed when a participant had a high EE score (>2.38) with either a high DP score (>1.80 for men or > 1.60 for women) or a low PA score (< 3.70) or both. Contrary to the UBOS, the MBI does not have a standardized way or cut-off to diagnose burnout [10,23]. Different authors have used different ways to diagnose burnout from the results of the MBI, which makes it difficult to compare results. For comparability we also used a more common method to diagnose burnout, which is different from the UBOS and generally results in much higher burnout rates [6,10,12,24]. These authors calculate the sum of EE and DP minus the sum of PA to end up with a single value, burnout is diagnosed if this greater than minus 8. As the MBI has 22 questions (9 on EE, 5 on DP and 8 on PA) but the UBOS only has 20 questions (8 on EE, 5 on DP and 7 on PA, these 20 questions appear both in the UBOS and the MBI,

the remaining two were found to be redundant by the UBOS developers) we first recalculated the sum of the scores on EE and PA by multiplying the means of EE and PA with 9 and 8 respectively. Next, the sum of the score for PA was subtracted from the sum of the scores for EE and DP (burnout score = EE + DP-PA) and burnout was diagnosed when this burnout score was greater than minus 8 (e.g. -7.5, 3.4). This burnout score was also used in multiple linear regression analysis and in correlation analysis as a continuous measure of burnout.

Work engagement was measured using the Utrecht Engagement Scale (UBES), the Dutch version of the (Utrecht Work Engagement Scale) UWES [25,26]. The UBES consists of 15 statements in total, which are to be answered similarly to the UBOS on a 7-point Likert scale in which the answer 'never' was scored as 0 and the answer 'daily' was scored as 6 points, resulting in an average score between 0 and 6. The minimum number of answers required in the UBES questions was 12, if more than 3 answers were missing, the results on this part were regarded as unevaluable and not used in the analysis. In accordance with the UBES manual, engagement was considered low with a score below 3.06; a score of 3.07–4.66 is considered intermediate, and engagement is high with 4.67 or a higher score. Work engagement was dichotomized into either high engagement or intermediate and low engagement.

Resilience was measured using the validated Dutch version of the Resilience Evaluation Scale (RES) [18]. The RES consists of 9 questions, statements on experience, and self-evaluation that are to be answered on a 5-point Likert scale ranging from 'I disagree completely' (0 points) to 'I agree completely' (4 points) resulting in an average score between 0 and 4. The higher the average score, the more resilient the participant is, according to the RES. Contrary to the UBOS and the UBES, the RES does not classify respondents. The minimum number of answers required in order to regard the results as evaluable was 7, so if more than 2 answers were missing from the RES score we regarded the RES as unevaluable and it was not used in the analysis.

When the survey ended on August 11th, 2020, all responses were extracted and analyzed using Microsoft Excel and IBM SPSS version 26. Burnout and engagement were categorized, and burnout, engagement and resilience scores were calculated as mentioned above. Continuous variables were checked for normality using histograms and Q-Q plots and compared using Student's *t*-test. Categorical variables are expressed as frequency (percentages) and were compared between groups using Fisher's exact-test. Correlation was tested using Pearson's R test. Significant risk factors for burnout in univariate analysis were tested in a multiple linear regression model. A *p* value ≤0.05 was considered significant.

3. Results

The Dutch Society for Intensive Care has 649 members who are intensivists and 147 members who are fellows (intensivists in training). The questionnaire was filled out by 177 intensivists and 3 fellows. Since only 2% of the fellows responded, they were excluded from further analysis. With 649 intensivists in the Dutch Society for Intensive Care this results in a response rate of 177/649 (27.2%). The responses of 15 participants were incomplete, resulting in 162 evaluable responses.

Ninety-eight out of 162 respondents (60.5%) were male, 93 (57.4%) were 46 years or older, 102 (63.0%) had 10 years of experience or more and 122 (75.3%) worked in a large teaching hospital or an academic hospital (Tables 1 and 2). According to the UBOS classification rules, 21 intensivists (13.0%) had high scores on EE, 20 (12.3%) had high scores on DP and 16 (9.9%) had low scores on PA. As suggested in the UBOS manual, burnout was diagnosed in 13 intensivists, in total (8.0%) with 4 (2.5%) having high EE, high DP and low PA, 8 (4.9%) having high EE and high DP and 1 (0.62%) having high EE and low PA. Alternatively, if we were to define a burnout score as (EE + DP-PA) greater than minus 8, the burnout prevalence would have been 27/162 (16.7%). Results concerning burnout are presented in Table 1. Out of 162

Table 1
shows the relationship between the presence or absence of burnout and personal and work-related characteristics as well as the relationship between burnout, engagement and resilience.

	All N = 162 (100%)	Burnout N = 13 (8.0%)	No burnout N = 149 (92.0%)	p
Gender				
Men	98	5 (5.1%)	93 (94.9%)	ns*
Women	64	8 (12.5%)	56 (87.5%)	
Age				
≤45 years	69	3 (4.3%)	66 (95.7%)	ns*
≥ 46 years	93	10 (10.8%)	83 (89.2%)	
Experience as an intensivist				
10 years or less	60	3 (5.0%)	57 (95.0%)	ns*
More than 10 years	102	10 (9.8%)	92 (90.2%)	
Type of hospital				
Academic or large teaching	122	8 (6.6%)	114 (93.4%)	ns*
Other	40	5 (12.5%)	35 (87.5%)	
Number of ICU beds before the COVID-19 crisis				
20 or less	98	10 (10.2%)	88 (89.8%)	ns*
21 or more	64	3 (4.7%)	61 (95.3%)	
Maximum number of ICU beds during the COVID-19 crisis				
20 or less	28	4 (14.3%)	24 (85.7%)	ns*
21 or more	134	9 (6.7%)	125 (93.3%)	
Scores				
Mean burnout score (SD)	−22.1 14.2)	5.63 (10.9)	−24.5 (11.7)	<0.001**
Mean engagement score (SD)	4.30 (0.96)	3.12 (1.04)	4.40 (0.89)	<0.001**
Mean resilience score (SD)	3.23 (0.44)	2.79 (0.48)	3.26 (0.42)	0.001**
Work engagement				
High	63	1 (1.6%)	62 (98.4%)	
Intermediate	82	6 (7.3%)	76 (92.7%)	
Low	17	6 (35.3%)	11 (64.7%)	

*Fisher Exact text, **Student's t-test, ns = not significant.

Table 2
shows the relationship between work engagement and personal and work-related characteristics. This table also shows the relationship between burnout, engagement and resilience.

	All N = 162 (100%)	Low or intermediate engagement N = 99 (61.1%)	High engagement N = 63 (38.9%)	p
Gender				
Men	98	55 (56.1%)	43 (43.9%)	ns*
Women	64	44 (69.0%)	20 (31.0%)	
Age				
≤45 years	69	42 (61.3%)	27 (38.7%)	ns*
≥46 years	93	57 (60.9%)	36 (39.1%)	
Experience as an intensivist				
10 years or less	60	38 (63.3%)	22 (36.7%)	ns*
More than 10 years	102	61 (59.8%)	41 (40.2%)	
Type of hospital				
Academic or large teaching	122	70 (57,4%)	52 (42.6%)	ns*
Other	40	29 (72.5%)	11 (27.5%)	
Number of ICU beds before the COVID-19 crisis				
20 or less	98	64 (65.3%)	34 (34.7%)	ns*
21 or more	64	35 (54.7%)	29 (45.3%)	
Maximum number of ICU beds during the COVID-19 crisis				
20 or less	28	21 (75.0%)	7 (25.0%)	ns*
21 or more	134	78 (58.2%)	56 (41.8%)	
Scores				
Mean burnout score (SD)	−22.1 (14.2)	−16.5 (14.2)	−30.8 (8.8)	<0.001**
Mean engagement score (SD)	4.30 (0.96)	3.70 (0.71)	5.23 (0.37)	<0.001**
Mean resilience score (SD)	3.23 (0.44)	3.09 (0.41)	3.44 (0.40)	<0.001**
Burnout				
Yes	13	12 (92.3%)	1 (7.7%)	0.017*
No	149	87 (58.4%)	62 (41.6%)	

*Fisher Exact text, **Student's t-test, ns = not significant.

respondents, 63 (38.9%), 82 (50.6%) and 17 (10.5%) were classified as having a high, intermediate and low work engagement, results are presented in Table 2. No significant risk factors for burnout or work engagement were found in the personal or work-related characteristics. We found significantly lower scores for engagement and resilience in intensivists with burnout than intensivists without burnout. Burnout and engagement were negatively correlated (Pearson's $R = -0.706$, $R^2 = 49.8\%$, $p < 0.001$). Burnout and resilience were also negatively correlated (Pearson's $R = -0.569$, $R^2 = 32.3\%$, $p < 0.001$). Resilience and engagement were positively correlated (Pearson's $R = 0.533$, $R^2 = 28.4\%$, $p < 0.001$). Multiple regression was carried out to investigate whether work engagement and resilience could significantly predict burnout. The results of the regression analysis indicate that the model explained 55.9% of the variance and that the model was a significant predictor of burnout ($F = 94.52$, $p < 0.001$). Both work engagement and resilience contributed significantly to the model (Table 3).

4. Discussion

In this nationwide online survey among Dutch intensivists in the aftermath of the 2020 COVID-19 crisis, we found 8% prevalence of burnout among intensivists. In a similar study among Dutch intensivists in 2013 using the same methodology, a burnout prevalence of 4.4% was found, however, there is no direct proof to attribute this difference solely to the COVID-19 crisis. Secondly, we found that work engagement in intensivists was high, with 38.9% of respondents

scoring high engagement and only 10.5% scoring low on engagement. Thirdly, we found that intensivists with burnout had lower scores for engagement as well as for resilience, confirming the reciprocal relationship between burnout on the one hand and resilience and engagement on the other.

The found burnout prevalence of 8.0% is much lower than usually reported in literature, but the prevalence and incidence of burnout in healthcare professionals varied enormously between studies and different countries [10,11,13]. For a large part these differences can be explained by different methodologies in diagnosing and defining burnout in different studies, precluding worthwhile comparison of burnout rates between studies [10,27,28]. This is illustrated by the present study in which we found a burnout rate of 8.0% using the official UBOS method and 16.7% using another frequently used method. This is also illustrated by other authors. Garrouste-Orgeas et al. found a burnout prevalence of either 3% or 40% depending on which cut-off score was used in the MBI [24]. Still, even the burnout prevalence of 16.7% that we obtained using a less strict definition for burnout, is considerably lower than what is usually reported. Dutch intensivists most probably have working conditions that are less stressful than for instance French intensivists [9]. In the Netherlands there are more nurses per patient, more residents per patient and more intensivists per patient compared to France as reported by Embriaco et al. [12] So, the low prevalence of burnout found in Dutch intensivists is probably partly explained by organizational reasons and partly by methodical reasons.

Table 3

shows the results of the multiple linear regression analysis with burnout as dependent and work engagement and resilience as covariates. The results of the regression analysis indicate that the model explained 55.9% of the variance and that the model was a significant predictor of burnout (F = 94.52, p < 0.001). Both work engagement and resilience contributed significantly to the model.

	B unstandardized	Beta standardized	p	t (95% CI)
Work engagement score	−8.36	−0.547	<0.001	−8.93 (−10.21- -6.51)
Resilience score	−8.33	−0.263	<0.001	−4.09 (−12.36 - -4.30)
Constant	40.08	7.097	<0.001	7.08 (28.92–51.24)

To our knowledge, this is the first study to measure burnout and resilience and work engagement among intensivists in the wake of the COVID-19 crisis. As proposed in the Job Demands Resources model, burnout and work engagement are at the opposite ends of one continuum, and indeed we can confirm that burnout increases when work engagement decreases [15]. Resilience has not been studied as extensively as burnout and engagement. Resilience is regarded as a protective trait against burnout and indeed, we found that burnout increased with decreasing scores for resilience. Resilience is regarded as a personality trait but it can also be trained and our findings support the training of resilience to mitigate burnout [19,20,29-31]. Note however that resilience accounts for only a small part of burnout (R^2 = 32.3%) and while the correlation between work engagement and burnout is stronger (R^2 = 49.8%) it is clear that there is more to burnout, work engagement and resilience. Also from our data we cannot distinguish between mere associations or causality.

This study has several limitations that need to be acknowledged. The most important is an online survey as measuring instrument with an incomplete response and thus with inherent risks of biases like selection bias [6]. The study was carried out just after the peak of the COVID-19 crisis in the Netherlands had passed. In this period most healthcare professionals had to recover physically and emotionally, which could have influenced the response rate negatively. Furthermore, results might have differed if it had been conducted before the crisis or during the peak. Therefore, we cannot say whether the measured traits will remain or if they will change during a possible new outbreak. We also have to acknowledge the fact that during the COVID-19 crisis in the Netherlands, it was never necessary to refuse patients ICU admission based on the unavailability of ICU beds. It was a close call, but even at the height of the crisis, there was always a bed available either inside the country or in Germany. A particular strength of the study is the fact that it uniquely combines data on burnout, engagement and resilience from a single population.

5. Conclusion

In conclusion, a raised risk for burnout was found among Dutch intensivists in the wake of the COVID-19 crisis, however, this was still low compared to other countries. Work engagement was found to be high. Burnout was inversely related to, but not fully explained by, resilience and work engagement.

Authors' contributions

The questionnaire was designed by Iwan Meynaar and Thomas Ottens. Acquisition, analysis and interpretation of the data were performed by Iwan Meynaar, Thomas Ottens, Marieke Zegers, Margo van Mol and Iwan van der Horst. The first draft of the manuscript was written by Iwan Meynaar and all authors commented on subsequent versions of the manuscript. All authors read and approved the final manuscript.

Ethics approval

The need for ethical approval was waived by the local ethical committee ('Medisch-ethische Toetsingscommissie Leiden Den Haag Delft').

Consent to participate

Participating in the questionnaire was regarded as consent with the study.

Declaration of Competing Interest

None.

Appendix 1. The questionnaire

The questionnaire was in Dutch

1. What is your profession? (intensivist/fellow/other)
2. Did you work in a Dutch ICU during the COVID-19 crisis? (yes/no)
3. What is your age? (≤35/36–45/46–55/≥ 56 years)
4. What is your gender? (male/female/other)
5. How long have you been working as an intensivist? (I am a fellow/ <5 years/5–10 years/>10 years)
6. In what kind of hospital do you work? (academic/large teaching/ other hospital)
7. How many ICU beds does your hospital normally have? (<12/ 12–20/21–30/>30 beds)
8. What is the maximum number of IC beds in your hospital during the crisis? (<12/12–20/21–30/>30 beds)
9. In which province do you work?

Items 10–29 are from the UBOS (the validated Dutch version of the MBI). The validated English version is shown here. All items are to be answered in a 7-point Likert scale ranging from 'never' (0 points) to 'daily' (6 points). The MBI has two items (I feel very energetic/working with people directly puts too much stress on me) that were found to be redundant by the UBOS developers.

10. I feel emotionally drained from my work.
11. I feel used up at the end of the workday.
12. I feel fatigued when I get up in the morning and have to face another day on the job.
13. Working with people all day is really a strain for me.
14. I feel burned out from my work.
15. I feel frustrated by my job.
16. I feel I'm working too hard on my job.
17. I feel like I'm at the end of my rope.
18. I feel I treat some recipients as if they were impersonal objects.
19. I've become more callous toward people since I took this job.
20. I worry that this job is hardening me emotionally.
21. I don't really care what happens to some recipients.
22. I feel recipients blame me for some of their problems
23. I can easily understand how my recipients feel about things.

24. I deal very effectively with the problems of my recipients.
25. I feel I'm positively influencing other people's lives through my work.
26. I can easily create a relaxed atmosphere with my recipients.
27. I feel exhilarated after working closely with my recipients.
28. I have accomplished many worthwhile things in this job.
29. In my work, I deal with emotional problems very calmly

Items 30–44 are from the UBES (the validated Dutch version of the UWES). The validated English version is shown here. All items are to be answered in a 7-point Likert scale ranging from 'never' (0 points) to 'daily' (6 points).

30. At my work, I feel bursting with energy
31. I find the work that I do full of meaning and purpose
32. Time flies when I'm working
33. At my job, I feel strong and vigorous
34. I am enthusiastic about my job.
35. When I am working, I forget everything else around me
36. My job inspires me
37. When I get up in the morning, I feel like going to work
38. I feel happy when I am working intense
39. I am proud on the work that I do
40. I am immersed in my work
41. I can continue working for very long periods at a time
42. To me, my job is challenging
43. I get carried away when I'm working
44. At my job, I am very resilient, mentally

Items 45–54 are from the RES are to be answered on a 5-point Likert scale ranging from 'I disagree completely' (0 points) to 'I agree completely' (4 points). The validated English version is shown here.

45. I have confidence in myself.
46. I can easily adjust in a difficult situation.
47. I am able to persevere.
48. After setbacks, I can easily pick up where I left off.
49. I am resilient.
50. I can cope well with unexpected problems.
51. I appreciate myself.
52. I can handle a lot at the same time.
53. I believe in myself.

Item 54 was an open ended question: do you have any suggestions or remarks?

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