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Burnout among intensive care nurses, physicians and leaders during the COVID-19 pandemic: A national longitudinal study

Ingvild Strand Hovland[1,2,3] | Laila Skogstad[3,4] | Lien My Diep[5] | Øivind Ekeberg[6] | Johan Ræder[7,8] | Siv Karlsson Stafseth[3,9] | Erlend Hem[2,10] | Karin Isaksson Rø[10] | Irene Lie[3,11]

[1]Division of Medicine, Department of Acute Medicine, Oslo University Hospital, Oslo, Norway

[2]Department of Behavioural Medicine, Faculty of Medicine, Institute of Basic Medical Sciences, University of Oslo, Oslo, Norway

[3]Centre for Patient Centered Heart and Lung Research, Department of Cardiothoracic Surgery, Oslo University Hospital, Oslo, Norway

[4]Department of Health and Care Sciences, Faculty of Health Sciences, Arctic University of Norway, UiT, Tromsø, Norway

[5]Oslo Centre for Biostatistics and Epidemiology, Oslo University Hospital, Oslo, Norway

[6]Psychosomatic and CL Psychiatry, Division of Mental Health and Addiction, Oslo University Hospital, Oslo, Norway

[7]Department of Anesthesiology, Faculty of Medicine, Institute of Clinical Medicine, University of Oslo, Oslo, Norway

[8]Department of Anaesthesiology, Oslo University Hospital, Oslo, Norway

[9]Department of MEVU, Lovisenberg Diaconal University College, Oslo, Norway

[10]Institute for Studies of the Medical Profession, Oslo, Norway

[11]Department of Health Sciences in Gjøvik, Norwegian University of Science and Technology, Gjøvik, Norway

Correspondence
Ingvild Strand Hovland, Department of Acute Medicine, Oslo University Hospital, P.O. Box 4950 Nydalen, NO-0424 Oslo, Norway.
Email: istran@ous-hf.no

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Abstract

Background: Burnout is frequent among intensive care unit (ICU) healthcare professionals and may result in medical errors and absenteeism. The COVID-19 pandemic caused additional strain during working hours and also affected off-duty life. The aims of this study were to survey burnout levels among ICU healthcare professionals during the first year of COVID-19, describe those who reported burnout, and analyse demographic and work-related factors associated with burnout.

Methods: This was a national prospective longitudinal cohort study of 484 nurses, physicians and leaders working in intensive care units with COVID-19 patients in Norway. Burnout was measured at 6- and 12-month follow-up, after a registration of baseline data during the first months of the COVID epidemic. The Copenhagen Burnout Inventory (CBI), was used (range 0–100), burnout caseness defined as CBI ≥50. Bi- and multivariable logistic regression analyses were performed to examine baseline demographic variables and work-related factors associated with burnout caseness at 12 months.

Results: At 6 months, the median CBI score was 17, increasing to 21 at 12 months ($p = .037$), with nurses accounting for most of the increase. Thirty-two per cent had an increase in score of more than 5, whereas 25% had a decrease of more than 5. Ten per cent reported caseness of burnout at 6 months and 14% at 12 months (n.s.). The participants with burnout caseness were of significantly lower age, had

fewer years of experience, reported more previous anxiety and/or depression, more moral distress, less perceived hospital recognition, and more fear of infection in the bivariate analyses. Burnout was the single standing most reported type of psychological distress, and 24 out of 41 (59%) with burnout caseness also reported caseness of anxiety, depression and/or post-traumatic stress disorder (PTSD) symptoms. Multivariate analysis showed statistically significant associations of burnout caseness with fewer years of professional experience ($p = .041$) and borderline significance of perceived support by leader ($p = .049$).

Conclusion: In Norway, a minority of ICU nurses, physicians and leaders reported burnout 1 year into the pandemic. A majority of those with burnout reported anxiety, depression and/or PTSD symptoms combined. Burnout was associated with less years of professional experience.

KEYWORDS
burnout, Copenhagen Burnout Scale, COVID-19, ICU, leader, longitudinal, nurse, physician

Editorial Comment

This prospective survey 1 year into the COVID-19 pandemic in Norway showed that, while burnout among healthcare professionals was less common than in other countries, it was reported more by persons with less work experience and was associated with other signs of psychological strain.

1 | INTRODUCTION

Burnout is associated with high workload, lack of control of the work environment, emotionally demanding tasks, moral dilemmas and shift work.[1,2] These factors are all prevalent in intensive care units (ICUs). Minimal work experience, being female and single, as well as personality traits of perfectionism, idealism and neuroticism are risk factors at an individual level.[1] The prevalence of burnout for ICU healthcare professionals is estimated to be 6%–47% internationally.[3] Burnout has been linked to dissatisfaction at work, resignation from the profession and even mental illnesses like substance abuse disorders, anxiety and depression, and at an institutional level increased prevalence of medical errors, decreased quality of care and patient satisfaction.[1,2] International critical care societies have stated their concern about the rising prevalence and potential consequences of burnout.[1]

The COVID-19 pandemic amplified many of the factors associated with burnout, increased workload and moral dilemmas, and more specifically physical exhaustion due to personal protective equipment and fear of contracting the new virus. The societal preventive measures, like social distancing and home schooling did affect private life. In total, an altered work–life balance could lead to exacerbation of burnout.[2]

In April 2020, shortly after the start of the COVID pandemic, a worldwide survey of all types of healthcare professionals ($N = 2707$) reported a burnout prevalence of 51%. The survey found that burnout was associated with increased work impact on off-duty activities, and more challenging working conditions: performing tasks exceeding one's qualifications, morally demanding triage tasks and working directly with the COVID-19 patients.[4] The same prevalence of burnout was found by the European Society of Intensive Care Medicine in a survey among its members in May 2020 (response rate 20%, $N = 1001$).[5] Hence, due to these first reports of high prevalence of burnout and the uncertainty of the scope and duration of the pandemic, continuous surveillance of burnout levels was recommended.[4,6] However, burnout may not be the only expression of strain during such a potentially life-threatening event as COVID-19 represented. Other manifestations, such as anxiety, depression or post-traumatic stress disorder (PTSD) symptoms, were found to be as frequent as burnout.[7,8] We have previously reported low levels of anxiety, depression and PTSD symptoms in our cohort of ICU healthcare professionals during the first year of COVID-19.[9]

In this report, the primary aim was to present the levels of burnout at 6- and 12-month follow-up. Secondary aims are (i) to characterise the participants who report burnout, including the association with anxiety, depression and PTSD symptoms at 12-month follow-up, and (ii) to analyse demographic and work-related factors at baseline that were associated with burnout at 12 months.

2 | METHODS

2.1 | Study design and population

The present research was part of an extensive prospective longitudinal cohort study. The study population included participants from 27 of the 28 hospitals with a COVID ICU in Norway. The study was conducted according to the Declaration of Helsinki and was approved

by the Regional Committee for Medical and Health Research Ethics South-East Norway group A (2020/136144) and the data protective officer at Oslo University Hospital (20/09438). At each of the 27 hospitals, the study was approved by the local data protection officer, the head of research and local leaders. The inclusion criteria included a Norwegian social security number, working in an ICU with COVID-19 patients and being either a nurse, a physician or a leader. The inclusion process is described in the two publications on baseline data.[10,11] At the time of inclusion, the research group had no access to individual contact information or national or local numbers of ICU healthcare professionals in Norway. Thus, an unknown number of invitations to participate in the study, including direct link to the consent and questionnaire, were distributed by local leaders through the hospitals' administration systems. The electronic consent application and questionnaire, and storage of data were provided by Services for Sensitive Data (TSD) at the University of Oslo. In this paper, we present data from the questionnaires at baseline, 6-month follow-up and 12-month follow-up. The baseline data were collected from 6 May to 15 July 2020. Data collection at 6-month follow-up took place from 24 August to 30 September 2020, whereas at 12-month follow-up data collection was conducted from 5 May to 6 June 2021.

2.2 | Measures

The questionnaire was a composite of items pertaining to background variables, COVID ICU work-related variables, COVID and private life-related variables, and validated checklists. The research group added the personal burnout scale of Copenhagen Burnout Inventory (CBI) to the follow-up questionnaire at both 6- and 12-month follow-up. The present paper is based on 56 variables described in detail below. The full wording of the variables is available in the Supplementary File 1.

The background variables were demographic data (age, gender and marital status) and work experience (profession, years of work experience and previous ICU experience), as well as self-reported previous symptoms of anxiety and/or depression and risk of serious COVID-19 infection. All items were recorded at baseline.

The CBI is internationally recommended, validated and recognised for healthcare professionals.[12–16] CBI consists of three scales: personal burnout, work-related burnout and client-related burnout. The overall scale for burnout is personal burnout defined as 'the degree of physical and psychological fatigue and exhaustion experienced by the person'. We chose the personal burnout scale because the pandemic affected all parts of life. In this paper, we hereafter refer to the personal burnout scale of the Copenhagen Burnout Inventory as CBI. The personal burnout dimension is measured with the following items:

1. How often do you feel tired?
2. How often are you physically exhausted?
3. How often are you emotionally exhausted?
4. How often do you think: 'I can't take it any more'?
5. How often do you feel worn out?
6. How often do you feel weak and susceptible to illness?

Response options: Always (100), Often (75), Sometimes (50), Seldom (25) and Never/almost never (0). The total score is the average of the six items' scores. Kristensen et al. found an increase of at least 5 points as a 'significant' increase in burnout and we have applied this definition to our data.[14] We defined cases of burnout (caseness) as levels at or above (≥) 50 on the CBI. The chosen cut-off is based on previous research.[17–23]

The Hopkins Symptoms Checklist (HSCL-10) is a validated checklist for anxiety and depression symptoms. The HSCL-10 records symptoms experienced during the previous week and consists of 10 items, measuring symptoms of depression (6 items) and anxiety (4 items).[24–26] Each item is rated from 1 (low) to 4 (high), and the total score is the mean of all scores. The predefined cut-off for caseness is 1.85 for anxiety and depression in our population.

The PTSD checklist for Diagnostic and Statistical Manual of Mental Disorders 5 (PCL-5) is a 20-item screening tool for symptoms of traumatisation; the timeframe of symptoms is the previous month.[27,28] Each item is rated from 0 (low) to 4 (high), and the total score is the sum of all scores combined. The predefined cut-off for caseness is 31 for PTSD in our population.

The work-related factors at baseline were chosen by reviewing current literature and conducting three roundtable discussions in our interdisciplinary research group to achieve consensus. The factors were checked for collinearity and the 10 most clinically relevant factors were chosen for analysis. The 10 factors are stated in detail in the Supplementary File 2.

2.3 | Statistical analyses

The characteristics of the sample were described using means with standard deviation (SD), range (min–max), median with interquartile range (IQR) or frequencies with percentages depending on the type of variable and the variable distribution. Differences in the distribution of CBI scores among the three professions were examined using the Kruskal–Wallis test. Differences in CBI scores from 6- to 12-month follow-up were tested with the paired samples Wilcoxon signed-rank test. Differences in demographic variables between the complete cases and the non-responders at 6- and/or 12-month follow-up were calculated by the Independent sample *t* test for continuous variables and Pearson's Chi-square test for categorical variables. The same applies for the calculation of the differences between the groups with burnout caseness versus the group without burnout.

Non-parametric correlation analysis was performed to check for the strength of association between the work-related factor and the demographic variables prior to regression analysis. A Spearman's correlation coefficient >0.4 was considered to indicate collinearity. The five work-related factors that had graded answers were dichotomised before regression analysis: 'no, never' or 'not at all' to 'no' and the other options as 'yes'.

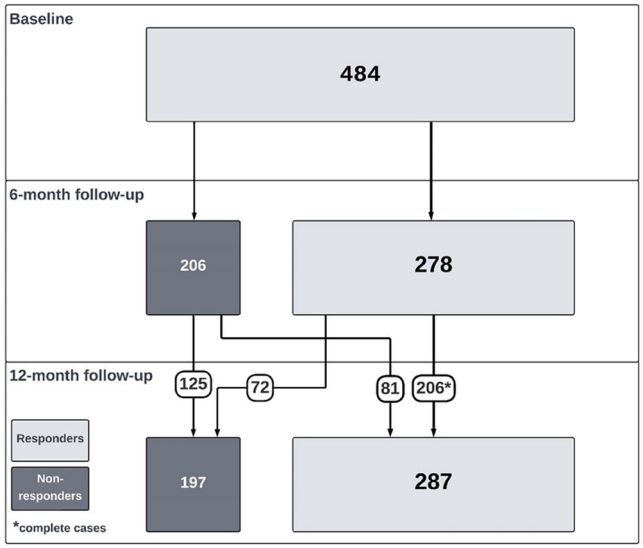

FIGURE 1 Flowchart of respondents at baseline and 6- and 12-month follow-up.

Bivariable and multivariable logistic regression analyses were performed to examine the association between demographic variables and work-related factors at baseline with burnout caseness at 12-month follow-up. The strength of association was quantified as the odds ratio (OR) with a 95% confidence interval (CI). The significance level was set to .05. The analyses were performed with Stata/SE version 17.0 and IBM SPSS version 28.0 for Windows.

3 | RESULTS

3.1 | Demographic characteristics

At baseline, 484 nurses, physicians and leaders consented to participate and completed the questionnaire; 278 (57.4%) of them completed the 6-month follow-up questionnaire, and at 12-month follow-up, 287 (59.3%) responded, as illustrated in Figure 1. There were 206 participants who completed all three questionnaires, defined as complete cases, and 278 were non-responders at either 6- and/or 12-month follow-up. The complete case group had statistically significant more participants with previous ICU experience than the non-responders (Table 1).

3.2 | Burnout cases and score levels 6 and 12 months in the complete case group

In the complete case group ($n = 206$), at 6-month follow-up, 10.2% ($n = 21/206$) of the participants reported caseness for burnout and 17 of those were nurses. At 12-month follow-up, 13.6% ($n = 28/206$) reported caseness for burnout; 25 of those were nurses. There was no significant change in the number of cases of burnout from 6 to 12 months.

There was, however, a statistically significant increase in median CBI scores from 6 to 12 months and the nurses accounted for most of this increase (Table 2).

A majority of the population did report a more than 5 points change of the CBI from 6 to 12 months (Table 3). Thirty-two per cent (66/206) reported an increase, and the median increase was 20.8 points. An almost as high percentage reported a decrease (51/206, 24.8%) and the median decrease reported was −16.7 points (Table 3).

3.3 | Characteristics of participants reporting burnout at 12-month follow-up in the total population

In the total population of respondents at 12-month follow-up ($n = 287$), the group of 41 with caseness for burnout differed statistical significantly with: lower age, less years of experience, more previous anxiety and/or depression, more moral distress, less perceived hospital recognition and more fear of infection (Table 4).

Figure 2 illustrates the relationship between caseness burnout and caseness anxiety, depression and/or PTSD at 12-month follow-up, $n = 55/287$ (19.2%) of the total population. Burnout ($n = 41/287$) was as prevalent as anxiety, depression and PTSD symptoms combined ($n = 38/287$). The majority ($n = 24/41$, 58.5%) of those with caseness of burnout reported either anxiety, depression and/or PTSD symptoms in addition, but burnout was the single standing most reported type of psychological distress ($n = 17$).

3.4 | Demographic factors and work-related factors associated with caseness of burnout at 12-month follow-up

Less years of experience, more previous anxiety and/or depression, more moral distress, less perceived hospital recognition, more fear of infection and more loneliness were statistically significant associated with burnout caseness at 12-month follow-up by bivariable analysis. In the multivariable analysis, only less years of professional experience and perceived support by leader were statistically significantly associated with burnout caseness (Table 5).

4 | DISCUSSION

In the present national longitudinal cohort study, 14% of the study population of the nurses, physicians and leaders working in COVID ICUs reported caseness of burnout 12 months after baseline at the start of the pandemic. There was no significant increase in cases from 6- to 12-month follow-up. However, there was a significant increase in the median CBI score, and nurses accounted for most of the increase. Multivariable analysis showed borderline significant

TABLE 1 Demographic characteristics of the study population at baseline ($N = 484$), complete cases ($n = 206$) and non-responders at 6- and/or 12-month ($n = 278$).

	Baseline ($N = 484$)	Complete cases ($n = 206$)	Non-responders 6- and/or 12-months ($n = 278$)	Difference of the complete cases ($n = 206$) and non-responders ($n = 278$), p value[a]
Age, mean (SD, min–max)	44.9 (9.7, 24–65)[b]	45.4 (8.9, 25–62)	44.4 (10.2, 24–65)[b]	.250
Gender, female, *n* (%)	377 (77.9)	158 (76.6)	219 (78.8)	.586
Married/partner, *n* (%)	362 (74.8)	162 (78.6)	200 (71.9)	.093
Profession				
Nurse, *n* (%)	392 (81.0)	164 (79.6)	228 (82.0)	
Physician, *n* (%)	43 (8.9)	21 (10.2)	22 (7.9)	.677
Leader, *n* (%)	49 (10.1)	21 (10.2)	28 (10.1)	
Years of professional experience, mean (SD, min–max)	19.3 (9.5, 2–42)[c]	19.5 (8.9, 2–39)	19.1 (9.9, 2–42)[c]	.613
Previous ICU work experience, *n* (%)	444 (91.7)	195 (94.7)	249 (89.6)	**.044***
Self-reported previous symptoms of anxiety and/or depression, *n* (%)	124 (25.6)	55 (26.7)	69 (24.8)	.640
Risk factors for serious COVID-infection, *n* (%)	65 (13.4)	29 (14.1)	36 (12.9)	.719

Abbreviation: ICU, intensive care unit.
*$p < .05$.[a]Independent sample *t* test or Pearson's chi-square test.
[b]Data missing on two participants.
[c]Data missing on three participants.

TABLE 2 Burnout levels (CBI) at 6- and 12-month follow-up, complete cases ($n = 206$).

	CBI 6-month follow-up	CBI 12-month follow-up	p Value, difference 6- to 12-month[a]
Total population, median (Q1–Q3)	16.7 (8.3–29.2)	20.8 (8.3–33.3)	**.037***
Nurses $n = 164$, median (Q1–Q3)	16.7 (8.3–25.0)	20.8 (8.3–37.5)	**.013***
Physicians $n = 21$, median (Q1–Q3)	16.7 (4.2–29.2)	20.8 (8.3–25.0)	.627
Leaders $n = 21$, median (Q1–Q3)	12.5 (4.2–29.2)	12.5 (0.0–29.2)	.422
p Value, difference between professions[b]	0.929	0.295	

Abbreviation: CBI, Copenhagen Burnout Inventory.
*$p < .05$.[a]Samples Wilcoxon signed-rank test.
[b]Kruskal–Wallis test.

association between the caseness of burnout at 12-month follow-up and less professional experience and perceived support by leader.

4.1 | Burnout levels and trajectories

The burnout prevalence in our study population was lower than reported in two systematic reviews of studies on COVID. ICU healthcare professionals reported on burnout prevalences between 45%–85% and 49%–58%, and with a higher prevalence among nurses.[29,30] Most of the studies included in these reviews utilised a single question on burnout or the Maslach Burnout Inventory. Directly comparable CBI scores during spring 2021 were reported in a study of Greek nurses (mean CBI = 50) and in a Taiwanese study of all types of healthcare professionals (mean CBI = 36).[31,32] In a comparable healthcare system, Sweden that was more severely affected by the COVID-19 pandemic, 4.7% of physicians reported burnout (Burnout Assessment Tool) in 2021, anaesthesiologists and intensive care physicians had the lowest scores, while emergency medicine physicians had the highest.[33,34] To our knowledge, this study is the only one reporting burnout percentages lower than ours. However, as the number of physicians in our population is small and we used a different inventory, a direct comparison is not appropriate. There is, to our knowledge, only one previous study of Norwegian ICU healthcare professionals and burnout. It is a single-centre study from 2013, and the levels of burnout measured via the Maslach Burnout Inventory were deemed low.[35]

TABLE 3 Changes in burnout levels (CBI) in points from 6- to 12-month follow-ups in the complete case group ($n = 206$).

	Nurses ($n = 164$)	Physicians ($n = 21$)	Leaders ($n = 21$)	Total population ($n = 206$)
Stable values, within 5 points, *n* (%)	71 (43.3)	11 (52.4)	7 (33.3)	89 (43.2)
At least 5 points increase, *n* (%)	57 (34.8)	4 (19.1)	5 (23.8)	66 (32.0)
At least 5 points increase, mean (SD, min–max)	24.0 (16.3, 8.3–75.0)	25.0 (27.8, 8.3–66.6)	25.8 (18.5, 8.3–54.2)	24.2 (16.9, 8.3–75.0)
At least 5 points increase, median (Q1–Q3)	20.8 (12.5–33.3)	12.5 (10.4–39.6)	20.8 (12.5–33.3)	20.8 (12.5–33.3)
At least 5 points decrease, *n* (%)	36 (22.0)	6 (28.6)	9 (42.9)	51 (24.8)
At least 5 points decrease, mean (SD, min–max)	−18.8 (10.7, −45.8 to −8.3)	−12.5 (10.2, −33.3 to −8.33)	−18.1 (5.9, −29.2 to −12.5)	−17.9 (10.0, −45.8 to −8.3)
At least 5 points decrease, median (Q1–Q3)	−16.7 (−25.0 to −12.5)	−8.3 (−8.3 to −8.3)	−16.7 (−20.8 to −12.5)	−16.7 (−25.0 to −8.3)

Abbreviation: CBI, Copenhagen Burnout Inventory.

TABLE 4 Comparison of demographic and work-related factors in the healthcare professionals with CBI <50 and CBI ≥50 at 12-month follow-up ($n = 287$).

	CBI <50 ($n = 246$)	CBI ≥50 ($n = 41$)	*p* Value[a]
Age, mean (SD)	46.13 (8.96)	42.80 (9.65)	**.031***
Gender, female, *n* (%)	185 (75.2)	36 (87.8)	.076
Married/partner, yes, *n* (%)	184 (74.8)	31 (75.6)	.911
Profession, *n* (%)			
Nurse	191 (77.6)	38 (92.7)	.089
Physician	27 (11.0)	2 (4.9)	
Leader	28 (11.4)	1 (2.4)	
Years of professional experience, mean (SD)	20.27 (8.96)	16.95 (9.38)	**.030***
Previous ICU work experience, yes, *n* (%)	228 (92.7)	41 (100)	.086
Self-reported previous symptoms of anxiety and/or depression	77 (26.8)	17 (41.5)	**.022***
Risk factors for serious COVID-infection	34 (13.8)	6 (14.6)	.889
Personal values misalignment, yes	97 (39.4)	24 (58.5)	**.022***
Hospital recognition	236 (95.9)	36 (87.8)	**.030***
Professional preparedness	240 (97.6)	40 (97.6)	1.0
Professional information	128 (52.0)	23 (56.1)	.629
Simulation training	103 (41.9)	15 (36.6)	.524
Fear of infection	105 (42.7)	29 (70.7)	**<.001***
Feeling of loneliness	160 (65.0)	33 (80.5)	.051
No extra support	89 (36.2)	14 (34.2)	.802
Talk to leader	73 (29.7)	14 (34.2)	.564
Daily debrief	24 (9.8)	1 (2.4)	.225

Abbreviations: CBI, Copenhagen Burnout Inventory; ICU, intensive care unit.
*$p < .05$.[a]Chi-square test or independent sample *t* test.

Longitudinal studies of burnout among ICU professionals during the pandemic are scarce. One German study did not find any increase in burnout during a 6-month follow-up in 2020.[36] Two studies comparing pre-pandemic levels with pandemic levels found a rise in burnout: a US single-centre study of ICU professionals found, using the Maslach Burnout Inventory, a significant increase from (59% to

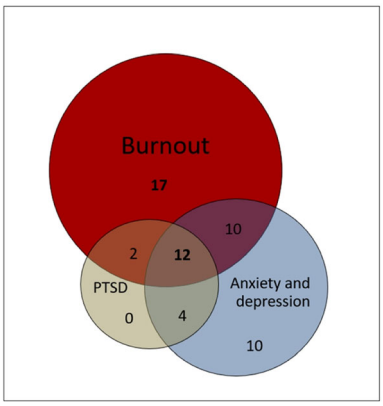

FIGURE 2 Relationship between caseness burnout, anxiety, depression, and PTSD (post traumatic stress disorder), $n = 55$ participants combined, at 12-month follow-up in the total population ($n = 287$).

69%), and nurses were excessively affected.[37] This increase in burnout levels is similar to those observed in a Dutch study, although the levels of burnout were lower, with pre-pandemic levels at 23% versus pandemic levels of 36%.[38] Further, nurses reported higher levels than physicians, but interestingly, the pandemic incidence rate of burnout was higher among physicians than nurses.[38]

Both the low incidence and the stability of the burnout levels in our population may be partly explained by workload and work situation. Compared to other countries, the numbers of COVID-19 patients who needed hospital care and ICU care were lower and during the lockdown emergency medicine admissions declined and elective surgery was stopped.[39] At the same time, knowledge of the COVID-19 disease panorama and treatment increased, vaccine availability and quality of personal protective equipment improved, and most hospitals were able to make better work schedules with longer breaks. These are all factors that could possibly improve the work situation and mitigate burnout.

However, we found a small but significant rise in the median CBI score, but only among the nurses. It may reflect that nurses perceived their work situation as more demanding throughout the 12-month follow-up, as shown in two international reviews,[29,30] as well as in international longitudinal studies.[37,38]

Whereas there was a fair stability in burnout scores from 6 to 12 months at a group level, the individual scores showed that almost one out of three had a more than 5-point increase in score and one out of four a similar decrease. This suggests that only looking at group levels may overlook the fact that a significant proportion of the respondents actually perceive more burnout throughout the observation period.

4.2 | Professional experience and perceived leader support

In our study, less year of professional experience and perceived support by leader were associated with burnout. This is partly aligned with two reviews, which found factors known from pre-pandemic studies, such as female gender and younger age, shortages of resources, high workload and poor management and support, but also COVID-related factors such as lack of personal protective equipment, stigma and fear of infection to be associated with burnout.[30,40]

Lack of professional experience is a well-known risk factor: A pre-pandemic review concludes that fewer years of experience impose a risk factor for burnout.[3] In 2020, a survey of Norwegian physicians found that those working in specialities with a high degree of COVID-19 exposure, reported more scarcity of personal protective equipment and, thus, a higher risk of contagion; however, they did not have higher odds for fear of being infected themselves, and they had lower odds for concern about infecting family than other physicians.[41] The lower odds were thought to be due to more experience with infectious diseases than other groups of doctors.[41] The mean professional experience of this study's population was almost 20 years.

The finding of an association of burnout and perceived talking to leader as supportive is surprising and contradictory to the findings in the two reviews.[30,40] As there is no association bivariate, and only a borderline statistical significance in the multivariate analysis, this finding needs to be further explored in future studies.

4.3 | Strengths and limitations

This study's adopts a national and longitudinal approach. The loss to follow-up is moderate. We chose the CBI which is the recommended screening tool for burnout.[12,13] However, burnout is still a debated phenomenon. Due to the use of several different validated checklists in the literature, comparing this study's results to other studies with different measures must be approached with caution. This study was carried out during the first year of the pandemic. This may be a strength, as it captures the effects of the initial and most critical phase. However, it might be a limitation that it did not follow the participants throughout the entire length of the pandemic to observe potential adaptations. Another limitation may be that we did not collect burnout status at the baseline inclusion. Thus, we do not know for sure whether our number of burnout cases was caused by the pandemic as such, or whether they just reflect the baseline incidence in an ICU-workers population. An important limitation of this study is that the full representativeness of our responding population is unknown. There are no national statistics on the total number of healthcare employees working in Norwegian healthcare ICU units, who might have been potential candidates for our survey. Further, we do not know how many individual employees received the invitation and the link from the hospital administration. However, we have reason to consider the study population as representative, as we were able to include employees from 27 out of 28 relevant ICUs across Norway. Due to unknown response rate, no sample calculations were possible. The number of physicians and leaders is small; thus, the generalisability of the findings for these two groups is limited.

TABLE 5 Bi- and multivariable logistic regression analyses of demographic and work-related factors at baseline and the association with burnout (CBI ≥50) at 12-month follow-up ($n = 286$[a]).

	Bivariable analysis			Multivariable analysis		
	OR	95% CI	*p* Value	OR	95% CI	*p* Value
Gender						
Female	Ref.			Ref.		
Male	0.42	0.16–1.12	.084	0.41	0.14–1.24	.116
Married/partner, no	0.96	0.44–2.07	.911	0.61	0.25–1.45	.260
Profession						
Nurse	Ref.			Ref.		
Physician	0.37	0.09–1.63	.190	0.41	0.08–2.13	.288
Leader	0.18	0.02–1.36	.096	0.24	0.03–2.12	.198
Years of professional experience[a]	0.96	0.92–0.99	**.032***	0.96	0.92–0.99	**.041***
Self-reported previous symptoms of anxiety and/or depression, yes	2.20	1.11–4.36	**.025***	1.97	0.90–4.30	.090
Risk factors for serious COVID infection, yes	1.07	0.42–2.73	.889	0.69	0.24–1.98	.489
Personal values misalignment, yes	2.17	1.11–4.25	**.024***	1.70	0.80–3.64	.170
Hospital recognition	0.31	0.10–0.94	**.039***	0.41	0.11–1.44	.163
Professional preparedness	1.00	0.12–8.53	1.000	1.90	0.17–20.93	.599
Professional information	1.18	0.61–2.29	.630	1.46	0.66–3.25	.350
Simulation training	0.80	0.40–1.59	.525	0.80	0.37–1.73	.572
Fear of infection	3.25	1.58–6.66	**.001***	2.11	0.95–4.71	.067
Feeling of loneliness	2.22	0.98–5.01	**.056***	1.50	0.59–3.83	.397
No extra support	0.92	0.46–1.83	.802	1.01	0.46–2.22	.975
Talk to leader	1.23	0.61–2.48	.565	2.43	1.00–5.87	**.049***
Daily debrief	0.23	0.03–1.76	.157	0.23	0.03–1.96	.178

Abbreviations: CBI, Copenhagen Burnout Inventory; CI, confidence interval; OR, odds ratio.
*$p < .05$.
[a]Years of professional experience missing on one participant.

5 | CONCLUSION

In Norway, only a minority of ICU nurses, physicians and leaders reported burnout 1 year into the pandemic. Less than half of the respondents showed stable registrations from 6 to 12 months. A majority of those with burnout also reported anxiety, depression and/or PTSD symptoms combined.

AUTHOR CONTRIBUTIONS

IL is the originator and head of the study. IL, JR, SS and ØE contributed to the study consept. IL, JR, SS, ØE, LS and ISH contributed to construction of the questionnaire. IL, SS and ISH accuired the data. LMD provided statistical advice and calculations. IL, JR, KIR, LMD, ØE, LS, SS, EH and ISH contributed to the interpretation of the data and the drafting of the manuscript.

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DATA AVAILABILITY STATEMENT

Due to the respondents' written informed consent data are not available on request. A non-author can be contacted to secure accuracy regarding data.

ORCID

Ingvild Strand Hovland https://orcid.org/0000-0001-8048-0232
Johan Ræder https://orcid.org/0000-0003-2487-0839

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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