Sleep quality deterioration in healthcare workers during the COVID-19 pandemic: the role of work-related factors and mental health

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Letter to the Editor

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Dear Editor,

Alboghdadly et al[1] recently published results of a cross-sectional study conducted in the early phase of the COVID-19 pandemic in 100 healthcare workers (HCW) from Saudi hospitals. They showed tendencies towards higher anxiety levels (Self-Rating Anxiety Scale[2]) in female and younger HCW, and poorer sleep quality (Pittsburgh Sleep Quality Index[3]) in male HCW and HCW with higher incomes. We hypothesize that work-related factors and mental health also influence sleep quality in HCW in this pandemic period. In May 2020, 482 HCW (95% being doctors) in France answered an online survey which documented sleep quality before and during the country's first COVID-19 lockdown (visual analogue scale (VAS), ranging from 0 = very poor to 4 = excellent), and current levels of anxiety (General Anxiety Disorders scale, GAD-7[4] and depression (Patient Health Questionnaire, PHQ-9[5]). To access the survey, online consent was needed. We defined sleep quality deterioration as reporting a decrease in the VAS score since the lockdown resulting in a current score ≤1. Among study participants (median age [interquartile range]: 36 [32-42] years, 84.9% of women), 20.3% reported sleep quality deterioration, 17.9% moderate to severe anxiety (GAD-7 score ≥10), and 20.9% moderate to severe depression (PHQ-9 score ≥10). Multivariable logistic regression models – with and without adjustment for moderate to severe anxiety and depression – showed higher odds of sleep quality deterioration in HCW not working in the country's largest cities (Paris, Marseille, Lyon), and in HCW working onsite during the lockdown who changed team or hospital unit (Table I). Moderate to severe anxiety and depression were independent predictors of sleep quality deterioration. These results confirm the high rate of HCW who have experienced a deterioration in sleep quality during the pandemic[1,6,7] and the negative impact of anxiety on their sleep quality[6]. Our findings also suggest that stressful emergency situations such as changes in work organization during the pandemic, which led HCW to temporarily integrate into new teams or hospital units and adapt to new protocols and duties, had a detrimental effect on their sleep quality. Interestingly, not working in the largest cities also appeared to be detrimental to sleep quality. This may have been due to a greater risk of work overload or a lack of support from peers, because of fewer healthcare staff.

To conclude, sleep quality deterioration was highly prevalent in French HCW during the early stages of the COVID-19 pandemic, with multiple risk factors. Given the continued presence of this worldwide pandemic, changes in HCW sleep quality must be monitored to implement interventions at both the structural and individual levels, with a view to improving HCW well-being and health, and consequently the quality of patient care.

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Declaration of interest
The authors declare that they have no conflict of interest.

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Table I. Work-related and mental health-related factors associated with sleep quality deterioration in healthcare workers during the early stages of the COVID-19 pandemic: an online survey in France (logistic regression models, n=489).

Variable (% of missing values)		Univariable analyses		Multivariable analyses			
				Model A: not adjusted for moderate to severe anxiety and depression		Model B: adjusted for moderate to severe anxiety and depression	
	% of HCW	OR [95% CI]	*p*	aOR [95% CI]	*p*	aOR [95% CI]	*p*
Female sex (0)	84.9	2.70 [1.2 - 6.09]	0.017	2.54 [1.13 - 5.72]	0.025		
Age - *in years* (0.4)							
- 18 to 29 (ref.)	12.1	1					
- 30 to 49	74.0	1.46 [0.68 - 3.11]	0.328				
- 50 and older	14.0	1.44 [0.57 - 3.62]	0.441				
Work-related factors							
Type of profession (0.2)							
- doctor (ref.)	95.0	1		1			
- paramedical[a]	5.0	3.00 [1.29 - 6.97]	0.011	3.05 [1.30 - 7.13]	0.010		
Work setting (0)							
- self-employed (ref.)	50.4	1					
- employed in a private institution	12.0	0.89 [0.44 – 1.80]	0.749				
- employed in a public institution	37.6	0.71 [0.43 – 1.15]	0.165				
Type of position (0.2)							
- exclusively day work (ref.)	90.6	1					
- day/night alternation or exclusively night work	9.4	0.46 [0.18 – 1.20]	0.113				
Working in a large city[b] (0)	13.1	0.45 [0.20 - 1.02]	0.057	0.42 [0.19 - 0.95]	0.037	0.41 [0.18 – 0.91]	0.028
COVID-19-related factors							
Working conditions during the lockdown[c] (0)							
- onsite, no change of team or hospital unit (ref.)	42.5	1		1		1	
- onsite, change of team or hospital unit	6.2	3.72 [1.68 - 8.28]	0.001	5.73 [2.24 - 14.66]	<0.001	7.50 [2.84 – 19.83]	<0.001
- telework (at least partially)	44.4	0.95 [0.58 - 1.55]	0.834	0.99 [0.58 - 1.67]	0.963	1.24 [0.71 – 2.19]	0.453
- work interruption	6.8	0.95 [0.37 - 2.45]	0.909	1.10 [0.39 - 3.13]	0.854	1.37 [0.44 – 4.31]	0.585
Exposure to COVID-19 infection (0)							
- exposed but not infected (ref.)	78.6	1		1		1	
- exposed and infected	9.8	0.33 [0.11 – 0.94]	0.037	0.20 [0.06 - 0.71]	0.012	0.18 [0.05 – 0.68]	0.012
- not exposed	11.6	0.76 [0.37 – 1.58]	0.466	0.86 [0.41 - 1.82]	0.700	1.22 [0.53 – 2.81]	0.648
Worried by the risk of COVID-19 complications[d] (0)	53.3	1.67 [1.06 – 2.64]	0.028				
Mental health-related factors							
History of psychiatric disorders (0)							
- no (ref.)	65.4	1	0.046				
- yes, not currently on treatment	26.1	1.32 [0.79 – 2.20]	0.284				
- yes, currently on treatment	8.5	2.40 [1.18 – 4.87]	0.015				
Currently receiving hypnotics (0)	2.7	2.53 [0.81 - 7.91]	0.111	3.62 [1.18 - 11.06]	0.024		
Moderate to severe anxiety[e] (1.2)	17.9	4.87 [2.92 – 8.11]	<0.001	-		3.39 [1.77 – 6.49]	<0.001
Moderate to severe depression[f] (1.9)	20.9	5.16 [3.15 – 8.45]	<0.001	-		3.22 [1.75 – 5.90]	<0.001

Abbreviations: aOR = adjusted odds ratio; CI = confidence interval; HCW = healthcare workers; OR = odds ratio; ref. = reference category.
Variables with a *p*-value <0.20 were tested in the multivariable analyses. A backward selection procedure was used to build the final models, which included only significant variables ($p<0.05$). Analyses were performed using Stata version 17.0 for Windows (StataCorp., College Station, TX, USA) software.
[a]Paramedical professions include nurses, nursing assistants, physiotherapists, osteopaths, midwives, psychologists, pharmacists, and pharmacy dispensers.
[b]Large cities include cities of more than 500 000 inhabitants (Paris, Marseille, and Lyon).
[c]Four category-variable built using a hierarchical cluster analysis based on HCW answers to eight binary items concerning their working conditions during France's first COVID-19-related lockdown (17 March-11 May, 2020).
[d]The corresponding item in the questionnaire was as follows: *"Do you or a loved one have a health condition that causes you to be concerned about the risk of complications from COVID-19, such as a history of at-risk diseases (diabetes, asthma, etc.) or current pregnancy?"*
[e]Defined as a GAD-7[4] score ≥10 (the GAD-7 score ranges from 0 to 21, with higher values denoting higher levels of anxiety).
[f]Defined as a PHQ-9[5] score ≥10 (the PHQ-9 score ranges from 0 to 27, with higher values denoting higher levels of depression).

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