Revista Brasileira de Enfermagem
REBEn

SUPPLEMENTARY EDITION 1
CORONAVIRUS/COVID-19

ORIGINAL ARTICLE

Prevalence and factors associated with poor sleep quality among nursing professionals during the COVID-19 pandemic

Prevalência e fatores associados à má qualidade do sono entre profissionais de enfermagem durante a pandemia de COVID-19

Prevalencia y factores asociados a la mala calidad del sueño entre profesionales de enfermería durante la pandemia de COVID-19

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How to cite this article:
Kantorski LP, Oliveira MM, Alves PF, Treichel CAS, Coimbra VCC, Gonçalves BA, et al. Prevalence and factors associated with poor sleep quality among nursing professionals during the COVID-19 pandemic. Rev Bras Enferm. 2022;75(Suppl 1):e20210517. https://doi.org/10.1590/0034-7167-2021-0517

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Submission: 09-15-2021 **Approval:** 01-18-2022

ABSTRACT

Objective: to identify the prevalence and factors associated with poor sleep quality among nursing professionals during the COVID-19 pandemic. **Method:** a cross-sectional study, conducted in June and July 2020, with 890 nursing professionals. To screen the outcome, question 3 of the Self-Reporting Questionnaire was used, assessing poor sleep quality 30 days preceding the application of the questionnaire. Associations between variables of interest were tested using Poisson regression models. **Results:** the prevalence of poor sleep quality was 68%. Associated factors were moderate or heavy workload, poor assessment of working conditions, suspected infection with COVID-19, more than two thirds of the workload for pandemic and the use of psychotropic drugs. **Conclusion:** the study pointed out a high prevalence of poor sleep quality among nursing workers with an important relationship with working conditions.
Descriptors: COVID-19; Nursing, Team; Nursing; Sleep Wake Disorders; Prevalence.

RESUMO

Objetivo: identificar a prevalência e os fatores associados à má qualidade do sono entre profissionais de enfermagem durante a pandemia de COVID-19. **Método:** estudo transversal, realizado nos meses de junho e julho de 2020, com 890 profissionais de enfermagem. Para triagem do desfecho, foi utilizada a questão 3 do Self-Reporting Questionnaire, avaliando a má qualidade do sono 30 dias anteriores à aplicação do questionário. As associações entre as variáveis de interesse foram testadas por meio de modelos de regressão de Poisson. **Resultados:** a prevalência de má qualidade do sono foi de 68%. Os fatores associados foram carga horária moderada ou pesada, má avaliação das condições de trabalho, suspeita de infecção por COVID-19, mais de dois terços da carga horária por pandemia e uso de psicofármacos. **Conclusão:** o estudo apontou alta prevalência de má qualidade do sono entre trabalhadores de enfermagem com importante relação com as condições de trabalho.
Descritores: COVID-19; Equipe de Enfermagem; Enfermagem; Distúrbios do Sono Vigília; Prevalência.

RESUMEN

Objetivo: identificar la prevalencia y los factores asociados a la mala calidad del sueño entre los profesionales de enfermería durante la pandemia de COVID-19. **Método:** estudio transversal, realizado en junio y julio de 2020, con 890 profesionales de enfermería. Para cribar el desenlace se utilizó la pregunta 3 del Cuestionario de Autoinforme, que evalúa la mala calidad del sueño en los 30 días anteriores a la aplicación del cuestionario. Las asociaciones entre variables de interés se probaron utilizando modelos de regresión de Poisson. **Resultados:** la prevalencia de mala calidad del sueño fue del 68%. Los factores asociados fueron carga de trabajo moderada o alta, mala evaluación de las condiciones de trabajo, sospecha de infección por COVID-19, más de dos tercios de la carga de trabajo por pandemia y uso de psicofármacos. **Conclusión:** el estudio señaló una alta prevalencia de mala calidad del sueño entre los trabajadores de enfermería con una importante relación con las condiciones de trabajo.
Descriptores: COVID-19; Grupo de Enfermería; Enfermería; Trastornos del Sueño-Virgilia; Prevalencia.

ONLINE VERSION ISSN: 1984-0446

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) emerged in January 2020 and was declared a pandemic by the World Health Organization (WHO) in March 2020. In the ensuing months, a series of research efforts have been undertaken to understand the causes, consequences, and magnitude of psychosocial repercussions caused by the disease and by mitigation measures like social and physical distancing[1].

Among the psychosocial repercussions studied, poor sleep quality stands out, and the person may have difficulty initiating and/or maintaining sleep, or even presenting non-restorative sleep with impairment of daily activities[2-3]. People with poor sleep quality can have adverse consequences in life. This situation can affect their daily functioning. It may cause changes in cognitive capacity, the immune system, contribute to the emergence and worsening of health problems, especially those related to obesity, hypertension and diabetes, in addition to the propensity for disorders such as depression[4-6].

In the context of health care, poor sleep quality, linked with high workloads imposed by the pandemic, also draws attention to the possibility of an increase in clinical errors and occupational accidents that can put patients' and professionals' lives at risk[7-8]. In this context, one of the groups that has stood out in studies on the topic is nursing professionals[9-10].

Nursing professionals make up more than half of the health workforce[11]. In the current pandemic, they are responsible for carrying out the majority of tasks related to the prevention and containment of new infections[12], in addition to providing direct care to patients suspected or confirmed to be infected with SARS-CoV-2. Duties performed by nursing professionals range from administering medications and performing complex procedures to basic human hygiene and feeding[13].

It is noteworthy that a number of studies have pointed to the perspective that these professionals report poor sleep quality in greater proportion when compared to other professional categories, even within the health sector[14-15]. This reality points to the need to identify possible predictors of this outcome, in order to establish strategies capable of minimizing the risks and effects related to it. Epidemiological studies to identify associated factors are a contribution to this.

Although studies of this type have been carried out in several countries[9-10,16-17], results based on the Brazilian context are still scarce in the scientific literature, especially through studies carried out with well-defined sampling frames.

OBJECTIVE

To identify the prevalence and factors associated with poor sleep quality among nursing professionals during the COVID-19 pandemic.

METHODS

Ethical aspects

The study was approved by an accredited Ethics Committee, following the Brazilian regulatory standards and guidelines for research involving human beings (CNS (*Conselho Nacional de Saúde* – Brazilian National Health Council) Resolution 466/2012), in addition to the Declaration of Helsinki.

Consistent with ethical principles, participants were guaranteed the right of non-participation in the research from first contact, and the Informed Consent Form was signed. Participants agreed in giving their informed consent that their anonymized data could be used for scientific purposes.

Study design, site, and period

We conducted a cross-sectional study from June to July 2020 with nursing professionals from Pelotas, a municipality with 343.132 inhabitants located in southern Brazil. The services aimed at tackling the pandemic, and, therefore, included in this study were: 50 Primary Care units; two walk in clinics; two hospital services; one emergency room service; one mobile emergency care service; one teleconsultation service; the municipal epidemiological surveillance service; and the vacancy regulation center.

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE Statement) guidelines were complied with in this study.

Sample; inclusion and exclusion criteria

Our intention was to carry out a census of all nursing professionals in these services. In that regard, according to a previous survey, the total number of nursing professionals linked to these services was 1,297.

Nursing professionals over 18 years old, duly registered with the Regional Nursing Council (COREN) and who worked in the services to face the COVID-19 pandemic in the municipality of Pelotas were included. Nursing professionals on vacation or away from work activities during the period of data collection were excluded. A total of 21 professionals were also excluded because it was not possible to obtain a valid means of contact, such as e-mail, WhatsApp, mobile or landline number.

After applying the inclusion and exclusion criteria, the existence of 1,186 professionals eligible for our study was verified. Among these, we were unable to locate 242 subjects through known means of contact, and another 54 refused to participate in the study. Thus, we were able to include 75% of eligible professionals in the study.

Study protocol

Data collection took place through an online self-administered questionnaire. After being contacted and accepting to participate in the study, all professionals received a link to access the questionnaire, which could be accessed only after reading and agreeing to the consent form, which explained the purpose of the study, the right to not participate in the research if they did not wish to do so, to cease participating in the research at any time, and to remain anonymous.

Sociodemographic- and other COVID-19-related background data were collected using a self-developed questionnaire. For the assessment of the presence of poor sleep quality, question 3 of the SRQ-20 scale was used. This instrument was proposed by the World Health Organization, to detect Minor Psychiatric Disorders

and was developed by Harding[18] and validated for Brazil by Mari and Williams[19], having been found sensitivity and specificity of 83% and 80%, respectively. The question asked if, in the past 30 days, the individual "slept badly". Poor sleep quality was considered in participants who responded positively to the question.

Sociodemographic and other data collected were sex, ethnicity, age, education, per capita income, type of service employed, nursing category, belonging to the risk group, assessment of working conditions, COVID-19-specific training, lack of Personal Protective Equipment (PPE), perceived burden degree, level of involvement with COVID-19 cases, workload proportion with patients suspected with COVID-19 infection, COVID-19 diagnosis among family or close friends, degree of social distancing, problems with alcohol or tobacco, and current use of psychotropic drugs.

Analysis of results, and statistics

Statistical analyses were conducted using Stata 16 (Stata Corporation, College Station, Texas USA). Prevalence of sleep disorders was calculated for the cohort overall and for each covariate.

Associations between the outcome of interest and study covariates were tested using unadjusted and adjusted Poisson regression models with robust variance estimators. Each of the adjusted analyses was carried out using forward stepwise selection, to determine the inclusion of covariates. The criterion for inclusion was a p-value ≤0.20[20].

The covariates selected as potential confounders were sex, age, education, assessment of working conditions, burden, suspected infection, and current use of psychotropic drugs. Covariates were adjusted among themselves, and with each of the other covariates. Missing data were excluded from the analysis.

RESULTS

A total of 890 nursing professionals answered the online questionnaire. Among them, 319 (35.8%) were registered nurses, 501 (56.3%) were nurse technicians, and 70 (7.86%) were nursing assistants. Most participants were female (84.8%, n= 755), with average age of 40.4 years (SD = 8.58). Most participants worked at a hospital service (64.8% n= 577) or Primary Care (10.3% n= 92). Among professionals surveyed, the prevalence of self-reported sleep disorders in the 30 days prior to completing the questionnaire was 68% (n= 605). The prevalence of the main outcome and unadjusted and adjusted associations by covariate are shown in Table 1. It should be emphasised that regression analysis was preceded by a collinearity test and the results were satisfactory to perform the analyses (VIF < 1.46)

We found evidence for an inverse association of self-reported poor sleep quality with males (RR: 0.86; 95% CI: 0.75-0.99) and aged 51 years or older (RR: 0.76; 95% CI: 0.62-0.92). In contrast, a positive association was observed between sleeping disorders and education, with undergraduate (RR: 1.12; 95% CI: 1.00-1.26) and graduate (RR: 1.16; 95% CI: 1.05-1.29) professionals at apparently greater risk than those with high school education.

We also found strong evidence for an association between self-reported poor sleep quality and the feeling of moderate (RR: 1.32; 95% CI: 1.16-1.50) or heavy (RR: 1.44; 95% CI: 1.28-1.62) burden, and with the assessment of working conditions as poor (RR: 1.23; 95% CI: 1.10-1.38).

Table 1 - Prevalence, unadjusted and adjusted[a] associations between studied variables and poor sleep quality using Poisson regression. Relative Risks (RR) and 95% confidence intervals (CIs) are presented (N=890)

	n	%	Unadjusted RR (95% CI)	*P* value	Adjusted[a] RR (95% CI)	*P* value
Sex						
Female	755	69.5	1		1	
Male	135	59.2	0.85 (0.73-0.98)	0.034	0.86 (0.75-0.99)	0.044
Ethnicity						
White	665	68.4	1		1	
Mixed race	122	72.1	1.05 (0.93-1.19)	0.396	1.03 (0.93-1.15)	0.485
Black	103	60.1	0.87 (0.74-1.03)	0.129	0.90 (0.77-1.06)	0.236
Age						
Up to 30	117	69.2	1		1	
31 to 40	365	73.4	1.06 (0.92-1.21)	0.396	0.94 (0.82-1.07)	0.379
41 to 50	292	66.4	0.95 (0.82-1.11)	0.580	0.89 (0.77-1.03)	0.125
+51	116	53.4	0.77 (0.62-0.95)	0.015	0.76 (0.62-0.92)	0.007
Education						
High school	330	62.1	1		1	
Undergraduate education	212	69.8	1.12 (0.99-1.26)	0.061	1.12 (1.00-1.26)	0.042
Graduate education	348	72.4	1.16 (1.04-1.29)	0.005	1.16 (1.05-1.29)	0.003
Per capita income						
Up to 1 minimum wage	205	67.8	1		1	
Up to 2 minimum wages	305	67.2	0.99 (0.87-1.12)	0.889	0.95 (0.84-1.07)	0.429
Up to 3 minimum wages	132	65.1	0.96 (0.82- 1.12)	0.617	0.90 (0.77-1.05)	0.185
More than 3 minimum wages	168	72.0	1.06 (0.92-1.21)	0.375	0.96 (0.83-1.10)	0.580
Type of service						
Primary Care	118	71.1	1		1	
Outpatient	92	68.4	0.96 (0.80-1.15)	0.673	0.99 (0.83-1.18)	0.959
Emergency	84	70.2	0.98 (0.82-1.18)	0.884	0.97 (0.82-1.16)	0.817
Hospital	577	67.0	0.94 (0.82-1.07)	0.363	0.92 (0.81-1.05)	0.233
Administrative	19	63.1	0.88 (0.61-1.27)	0.517	0.92 (0.64-1.31)	0.663

To be continued

Table 1 (concluded)

	n	%	Unadjusted RR (95% CI)	*P* value	Adjusted[a] RR (95% CI)	*P* value
Nursing category						
Registered nurse	319	73.0	1		1	
Nursing technician	501	66.4	0.90 (0.83-0.99)	0.043	1.04 (0.91-1.19)	0.482
Nursing assistant	70	55.7	0.76 (0.61-0.94)	0.016	0.96 (0.76-1.21)	0.769
Risk group						
No	606	65.8	1		1	
Yes	284	72.5	1.10 (1.00-1.20)	0.039	1.07 (0.98-1.17)	0.106
Assessment of working conditions						
Great	325	59.3	1		1	
Regular	409	68.2	1.14 (1.02-1.28)	0.015	1.07 (0.96-1.19)	0.193
Poor	156	85.2	1.43 (1.28-1.60)	**<0.001**	1.23 (1.10-1.38)	**<0.001**
COVID-19-specific training						
No	319	67.7	1		1	
Yes	571	68.1	1.00 (0.91-1.10)	0.899	1.00 (0.91-1.09)	0.958
Lack of Personal Protective Equipment						
No	508	63.9	1			
Yes	382	73.3	1.14 (1.04-1.25)	0.003	1.06 (0.98-1.16)	0.131
Burden						
Light	343	51.6	1		1	
Moderate	262	71.7	1.39 (1.22-1.57)	**<0.001**	1.32 (1.16-1.50)	**<0.001**
Heavy	285	84.2	1.63 (1.45-1.82)	**<0.001**	1.44 (1.28-1.62)	**<0.001**
Involvement with COVID-19 cases						
None	288	59.3	1		1	
Indirect work (e.g., administrative)	65	67.6	1.14 (0.93-1.38)	0.184	1.09 (0.91-1.30)	0.319
Contact with suspected cases	310	70.9	1.19 (1.06-1.34)	0.003	1.08 (0.96-1.22)	0.152
Contact with confirmed cases	277	74.8	1.26 (1.11-1.42)	**<0.001**	1.12 (0.99-1.26)	0.061
COVID-19 workload proportion						
None	288	59.3	1		1	
Up to one third	169	66.8	1.12 (0.97-1.29)	0.103	1.03 (0.90-1.18)	0.621
Up to two thirds	166	71.0	1.19 (1.04-1.37)	0.010	1.11 (0.97-1.27)	0.103
More than two thirds	267	76.0	1.28 (1.13-1.43)	**<0.001**	1.13 (1.01-1.27)	0.033
Suspected infection						
No	574	62.0	1		1	
Yes	316	78.8	1.27 (1.16-1.38)	**<0.001**	1.17 (1.07- 1.27)	**<0.001**
COVID-19 diagnosis among family or close friends						
No	616	65.5	1		1	
Yes	274	73.3	1.11 (1.02-1.22)	0.016	1.00 (0.92-1.10)	0.839
Degree of social restriction						
Light	227	61.2	1		1	
Moderate	568	70.4	1.15 (1.02-1.29)	0.019	1.11 (0.99-1.24)	0.059
Intense	95	69.4	1.13 (0.95-1.34)	0.143	1.12 (0.95-1.31)	0.152
Alcohol abuse						
No	824	66.7	1		1	
Yes	66	83.3	1.24 (1.10-1.40)	**<0.001**	1.10 (0.98-1.24)	0.085
Tobacco problems						
No	748	66.7	1		1	
Yes	142	74.6	1.11 (1.00-1.24)	0.042	1.09 (0.98-1.21)	0.099
Current use of psychotropic drugs						
No	703	65.4	1		1	
Yes	187	77.5	1.18 (1.07-1.30)	**<0.001**	1.13 (1.03-1.24)	0.009
TOTAL	890	68.0%				

[a]*Adjusted for sex, age, education, assessment of working conditions, burden, suspected infection, and current use of psychotropic drugs. RR = Relative Risks; CI = confidence intervals.*

Nursing professionals surveyed were more likely to report suffering from sleep disorders if they also reported suspected infection with SARS-CoV-2 (RR: 1.17; 95% CI: 1.07-1.27), dedicated more than two thirds of their workload to handling tasks related to the COVID-19 pandemic (RR: 1.13; 95% CI: 1.01-1.27), or used psychotropic drugs (RR: 1.13; 95% CI: 1.03-1.24).

DISCUSSION

Our results reinforce the need to consider the repercussions of the COVID-19 pandemic on mental health and its related aspects, including implications for sleep quality among nursing professionals. We found evidence that poor sleep quality is associated with work overload and time at work dedicated to pandemic-related tasks. Notably, there was a high proportion of nursing professionals who reported poor sleep quality in the month before the questionnaire was applied.

Similar findings have been documented in other cohorts[21-23]; however, our study reported prevalence of 68% is higher than that observed in two systematic reviews on the topic[14,24].

In a systematic review conducted[24], the prevalence of sleep disturbances reflected in their poor sleep quality among nurses

during the pandemic period had an average of 34.8%. This ranged from 19.5% in a study[10] to 60% in a other study[25], both of which were carried out in China. In the meta-analysis[14], the average prevalence of sleep disorders was 38.8%.

However, it is worth emphasizing important methodological differences between our study and those mentioned above. While the studies used scales to screen the outcome[14,24], the presence of sleep disorders in our study was assessed by self-report from a simple question, which although validated as part of the Self-Reporting Questionnaire (SRQ-20) indicates bad sleep quality that is vastly different from those obtained by specific scales for this purpose, such as the Pittsburgh Sleep Quality Index (PSQI), used in different studies[10,26-27]. However, a study carried out in Italy[28] found prevalence of poor sleep quality reported by nurses of 75.72%, showing that being a woman and working on the front line of coping with COVID-19 was associated with poor sleep quality.

It is noteworthy that the occurrence of sleep-related problems among nurses is a recurrent phenomenon in the literature, having been well explored even before the pandemic period. In this sense, it is worth noting the existence of studies that point to high prevalence of this outcome in nursing professionals in different parts of the world, for instance, in a study conducted in Turkey[29] and in a study conducted in Taiwan[30]. In these studies, the prevalence of sleep disorders among the nurses studied was 79.1% and 59%, respectively.

In the studies cited above, in addition to aspects such as work shift turnover, anxiety and depression being related to poor sleep quality, aspects such as professional overload and precarious working conditions stood out[29-30], aspects also highlighted by our results. Another study in the pandemic period reinforces occupational stressors as predictors of poor sleep quality among Chinese nurses[31]. Thus, the need to recognize and establish strategies, during and beyond the pandemic period, to deal with situations that afflict the nursing team on a daily basis, is evident.

In our study, suspicion of contagion was a factor positively associated with the presence of reports of poor sleep quality in the last 30 days, as well as the dedication of more than two thirds of the workload to specific actions to fight the pandemic. These data support the findings of authors[9,21,26,32] who evidenced the proximity of patients with COVID-19 as a predictor of the presence of impairment in sleep quality among health professionals.

Burden and precarious working conditions have also been cited by studies carried out in the pandemic period as factors related to the occurrence of sleep disorders. In a study, for instance, 60% of nursing professionals who worked on the front lines in the fight against the pandemic in China had manifested poor sleep quality[25]. This was related to the extension of working hours and the burden experienced by these professionals. The latter finding was also reported in a different study[33].

Precarious working conditions were associated with an increase in the frequency of use of psychoactive substances among nursing professionals[34]. This highlights an additional way in which nursing professionals' working conditions may affect their mental health. Studies also found that 19% of nursing professionals in Wuhan, China, used hypnotics during the period in which they worked with COVID-19 patients[25].

Study limitations

In this regard, it is noteworthy that, in our study, we found an association between the presence of poor sleep quality and the use of psychotropic drugs, which is a finding that clearly represents one of the limitations of this study in relation to reverse causality caused by its cross-sectional type. It is not possible to trace a sense of causality; after all, it is not possible to predict whether poor sleep quality would have led to the consumption of these medications, or their use, in some subjects, could have led to the outcome.

Other limitation is the lack of previous data about the population studied for the outcome in question.

Contributions to nursing, health, and public health

Related to the contributions to nursing and to the health system, this study, based on a well-defined sampling frame, provides valuable information about this important impact on the lives of nursing professionals who are daily available to fight the pandemic and support the health system.

The lack of previous studies conducted with the same population of this study makes it impossible to compare the pre-pandemic scenario with the period studied. However, our results, added to the theoretical accumulation in the field, seem to suggest that the pandemic may have exacerbated pre-existing conditions such as the aforementioned work overload and precarious conditions, in addition to including other anxiogenic factors, such as fear of contagion of COVID-19.

In this regard, the knowledge built in this study contributes so that new policies and work process strategies aimed at this professional category require better working conditions and, consequently, an improvement in public health care quality.

CONCLUSION

The synthesis of data from our study points to a high prevalence of poor sleep quality among the professionals studied, which is related, in addition to sociodemographic issues, to aspects such as work overload, precarious working conditions, and suspected contagion, the workload proportion aimed at fighting the pandemic and the use of psychotropic drugs.

Risk of sleep disorder associated with various aspects of nursing professionals' work, as documented in various countries pre-pandemic, appears to have been exacerbated by COVID-19 pandemic working conditions. Health services and institutions representing the nursing working class must act urgently to ensure healthier work routines and working environments within a broader expansion of a comprehensive care network for nursing professionals.

FUNDING

The authors would like to thank the Research Support Foundation of the State of Rio Grande do Sul (*Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul* - FAPERGS) for funding the execution of this research through the FAPERGS Emergency Notice 06/2020 - Science and technology in the fight against COVID-19.

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