ORIGINAL ARTICLE

Psychological repercussions on nursing staff due to the COVID-19 pandemic: A cross-sectional study

D. Martínez-Ponce [a], M.A. Amat-Traconis [a], L.Y. Cala-Rosabal [a,◊], E. Chapan-Xolio [a], L. Valenzuela-Velázquez [a], M.G. Lecourtois-Amézquita [b,*]

[a] *General Hospital of Boca del Río, Veracruz, Mexico*
[b] *General Hospital of Boca del Río, Veracruzana University, Faculty of Medicine, Veracruz, Mexico*

Abstract

Introduction: The coronavirus disease 2019 (COVID-19) pandemic has caused a high demand for health services, especially nursing. This workload can lead to emotional distress affecting their daily lives on a personal and professional basis.

Objective: To examine the prevalence of depression, anxiety, and stress in nurses and to analyze the factors associated with their presence during the COVID-19 pandemic.

Methods: An observational cross-sectional descriptive study was carried out in a second-level hospital in Mexico between September and October 2020. Within a population of 150 nurses invited to the study, 116 participated by answering a questionnaire regarding emotional aspects during their time caring for COVID-19 patients, as well as using the depression, anxiety, and stress scale (DASS-21).

Results: Among de 116 participants, 77.6% were females, and 22.4% were males. The 91.4% reported fear of spreading the disease to their families, and 59.5% reported that the death of their patients infected with COVID-19 affected them deeply. The factors associated with moderate to extremely severe levels of depression were the attitude of indifference from the community to their work during the pandemic (OR:2.66) and the increase consumption of addictive substances (OR:9.80). In the stress subscale, the variables that conferred a significant association was working inside the COVID-19 area (OR:17.05), being severely affected by the death of patients infected (OR:4.23), and fear of entering the red zone (OR:19.47). The need for psychological care was associated with moderate to severe depression and anxiety (OR:7.38, OR:9.50, respectively). For the anxiety subscale, no association with the studied variables was found.

---

* Corresponding author.
  E-mail address: hgbr.lecourtois@gmail.com (M.G. Lecourtois-Amézquita).
◊ Policlínico Universitario ''Dr. Gustavo Aldereguía Lima'', Las Tunas, Universidad de Ciencias Médicas de Las Tunas, Cuba.

Conclusions: The study indicates a high prevalence of emotional distress among nurses, and that there were working, psychological and social factors associated with symptoms of depression and stress. Future research should focus on prevention measures and strategies to reduce psychological impact, as this could affect the quality of care provided to their patients.

Repercusiones psicológicas en el personal de enfermería debido a la pandemia de COVID-19: un estudio transversal

Resumen

Introducción: La pandemia de la enfermedad por coronavirus 2019 (COVID-19) ha provocado una alta demanda de servicios de salud, especialmente de enfermería. Este aumento en la carga de trabajo puede conducir a una angustia emocional que afecta su vida diaria, tanto a nivel personal como profesional.

Objetivo: Examinar la prevalencia de depresión, ansiedad y estrés en enfermeras y analizar los factores asociados a su presencia durante la pandemia por la enfermedad de COVID-19.

Métodos: Se realizó un estudio observacional descriptivo de corte transversal en un hospital de segundo nivel en México, entre septiembre y octubre de 2020. De una población de 150 enfermeros(as), 116 participaron respondiendo un cuestionario sobre aspectos emocionales y la escala de depresión, ansiedad y estrés (DASS-21).

Resultados: De los 116 participantes, el 77,6% eran mujeres y el 22,4% eran hombres. El 91,4% manifestó temor de contagiar la enfermedad a sus familiares y el 59,5% se sintió profundamente afectado por el fallecimiento de sus pacientes con COVID-19. Los factores asociados a niveles moderados a extremadamente severos de depresión fueron la actitud indiferente por parte de la comunidad hacia su trabajo durante la pandemia (OR: 2,66) y el aumento del consumo de sustancias adictivas (OR: 9,80). En la subescala de estrés, las variables que confirieron asociación significativa fue trabajar en el área COVID-19 (OR:17,05), verse gravemente afectado por la muerte de pacientes con COVID-19 (OR: 4,23), miedo a entrar en zona roja (OR: 19,47). La necesidad de atención psicológica se asoció con depresión y ansiedad moderadas a severa (OR: 7,38, OR: 9,50, respectivamente). Para la subescala de ansiedad no se encontró asociación con las variables estudiadas.

Conclusiones: El estudio indica una alta prevalencia de angustia emocional entre el personal de enfermería, y se identificaron factores laborales, psicológicos y sociales asociados a los síntomas de depresión y estrés. Las investigaciones futuras deben centrarse en medidas y estrategias de prevención para reducir el impacto psicológico, ya que esto podría afectar la calidad de la atención brindada a los pacientes.

Introduction

By the end of February 2020, the first coronavirus disease 2019 (COVID-19) case in Mexico was confirmed, from that moment on, there has been an exponential growth in the cases since then. Toward the end of 2021, according to data from de Mexican Health Department, there were more than 4 million confirmed cases and 302,228 deaths in the country.[1] Due to the high demand in health services, the deficit on nurse-to-patient ratio was evident, causing a significant workload on the health system.[2]

Two years have passed since the beginning of the pandemic, and with all the COVID-19 waves that have occurred, there has been a constant emotional burden on the nurses who must learn how to treat patients infected with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and what measures to take to avoid getting infected and infecting their family.[3] Public health measures had been adopted, such as isolation, quarantine, and social distancing to prevent spread, and clearly the uncertainty about how long these restrictions would last was a significant source of distress.[4]

It is not the first time during the current era that we are faced with a pandemic; previously, in Asia during 2002, there was an outbreak of severe acute respiratory syndrome (SARS), China, Hong Kong, Singapore, and Taiwan were the most affected places, and similarly, the nursing and medical staff found themselves in a high-risk situation of spreading the disease and facing uncertainty.[5] Chong et al. evaluated the psychological effect on health care workers during the sanitary emergency due to SARS; once in the

phase of controlled and implemented attention protocols, the health staff presented depression and depersonalization symptoms, unlike anxiety symptoms which are dominant during the first phase of the outbreak. Nurses also worry about getting themselves and their families infected; this feeling of fear and anxiety is a risk factor for their mental health.[6]

During the sanitary crisis of COVID-19, attention was focused on controlling biological hazards and achieving effective treatments. In contrast, mental health tends to be neglected even though it can significantly affect the population and even continue with its repercussions after the crisis.[2,7] Healthcare workers, especially nurses, are considered highly susceptible to psychological disorders and emotional problems, such as stress, anxiety, and depression, which have risen and aggravated. A meta-analysis reported that the prevalence of anxiety (37%), depression (35%), and stress (43%) symptoms in nurses is greater than the estimated during the pandemic of the Middle East respiratory syndrome (MERS) and SARS.[6,8,9]

The responsibilities of nurses to the patients differ from other healthcare workers since they are the ones who spend more time directly caring for the patient. Nurses form an emotional bond, which even in patients with COVID-19 was even more remarkable because family members could not visit them due to the risk of contagion.[6] This study aimed to analyze the psychological repercussions on nursing staff associated with the COVID-19 pandemic. Examine the prevalence of symptoms of depression, anxiety, and stress in nurses and analyze the factors associated with their presence during COVID-19 pandemic.

Materials and methods

A cross-sectional study was conducted, nurses answered a self-report questionnaire in the General Hospital of Boca del Río, a second-level hospital in Veracruz, Mexico, designated to care exclusively for suspected and confirmed COVID-19 cases.[10] The data collection period was between September and October 2020. The entire nursing staff was invited to participate ($N = 150$) through the chief nursing and sub-chief during each shift; there was a 78% response ($n = 116$). A convenience sampling design was used, participants of all shifts working in the hospital were invited.

The survey had three sections, sociodemographic data, perception of their labor during the pandemic, and the measurement tool was the Depression, Anxiety and Stress Scale (DASS-21) for evaluating the level of symptomatology and is applied in clinical and non-clinical contexts.[11] The scale consists of 21 items on a Likert-type scale and the higher the score, the higher the level of negative emotions, the subscales are scored as follows: normal (0–9), mild (10–12), moderate (13–20), severe (21–27), and extremely severe (28–42) for Depression; normal (0–6), mild (7–9), moderate (10–14), severe (15–19), and extremely severe (20–42) for Anxiety; and normal (0–10), mild (11–18), moderate (19–26), severe (27–34), and extremely severe (35–42) for Stress.[12] Each scale consists of seven items, with an internal consistency coefficient (Cronbach's alpha) of $\alpha = 0.89$ for the scale in general, $\alpha = 0.76$ for the depression subscale, $\alpha = 0.74$ for anxiety, and $\alpha = 0.82$ for stress.

After signing the informed consent form during one of their shifts, all participants completed their questionnaires without interruptions. This project has followed the guidelines of the Declaration of Helsinki; the institutional ethics committee approved the study.

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) software version 25. A descriptive analysis was made by calculating means, standard deviations, frequencies, and the Kolmogorov–Smirnov's normality test was also applied, there were no missing values in any variable. The X^2 test was used to compare the differences between the groups of categorical variables, also the Mann–Whitney test for continuous variables. A bivariate analysis was conducted to explore variables associated with the subscales, then a multivariate logistic regression was performed using stepwise variable selection, all variables that independently were significantly associated were entered into the model. It was considered a significant level at $p < 0.05$.

Results

A total of 116 nurses participated in the study, 90% were female, and the mean age was 33 years ($\pm$ 6.91). There was no significant difference between unmarried (46.55%), married or with a couple (53.45%). About 38.79% ($n = 45$) reported living with someone in the high-risk age group for COVID-19, and 16.37% of them had some comorbidity such as hypertension, obesity, and diabetes. The average number of years working in the current organization was 4.11, and 84.43% of the participants were in direct care of patients infected with the virus (Table 1).

Table 2 shows emotions or conducts that they experienced during the last month; the majority felt fear of infecting their family ($n = 106$) and acknowledgment from their family for their work ($n = 113$). However, they perceived an attitude of indifference ($n = 68$), discrimination ($n = 20$), or even violence ($n = 3$) from the community about their labor during the pandemic. Among the participants, 59.48% felt significantly affected because of the death of infected patients. Furthermore, 24.1% of the participants reported experiencing nightmares because of the emotional distress of their job. When entering the red zone, areas where confirmed COVID-19 cases were cared for, they experienced concern (50.86%), fear (26.72%), and indifference (2.59%); 24.14% acknowledged having increased their consumption of some drug, whether legal or illegal; additionally, 61.21% ($n = 71$) expressed needing psychological attention.

Regarding the results of the DASS-21, overall, 56.03% presented depression, 78.45% reported anxiety, and 84.48% were stressed. They were mainly affected by an extremely severe level on all three subscales, depression (32%), anxiety (40%), and stress (52%) (Table 3).

The variables associated with the presence of anxiety, depression, and stress were identified in the bivariate analysis, participants in the age range of 30–39 (reference category 50–59 years) were twice more likely to present moderate to extremely severe depression (OR:2.18, p 0.042), the perceived attitude of indifference coming from part of the community toward their work during the pandemic contributed almost three times more to presenting

Table 1 Sociodemographics characteristics of participants.

Variables	n = 116 (%)	p-Value
Age (years)		
20–29	29 (25.00)	0.000
30–39	69 (59.48)	
40–49	15 (12.93)	
50–59	3 (2.59)	
Sex		
Female	90 (77.59)	0.000
Male	26 (22.41)	
Marital status		
Unmarried	54 (46.55)	0.458
Married	62 (53.45)	
Live with high-risk group relatives for COVID-19		
Yes	45 (38.79)	0.016
No	71 (61.21)	
Tenure $(\overline{x}, DE)$	4.11 (± 2.51)	0.000
Working area		
COVID-19	98 (84.48)	0.000
No COVID-19	18 (15.52)	
Another job		
Yes	24 (20.69)	0.000
No	92 (79.31)	

No missing values.

Table 2 Feelings and behaviors experienced during the last month.

Variables	n = 116 (%)	p-Value
Fear of infecting family		
Yes	106 (91.38)	0.000
No	10 (8.62)	
Receives family acknowledgment for their work in the pandemic		
Yes	113 (97.41)	0.000
No	3 (2.59)	
Attitude of the community toward their work during the pandemic is		
Admiration	25 (21.55)	0.000
Discrimination	20 (17.24)	
Indifferent	68 (58.62)	
Violent	3 (2.59)	
Affected emotionally by the death of patients with COVID-19		
Severely	69 (59.48)	0.000
Moderately	43 (37.07)	
Slightly	4 (3.45)	
Difficulty concentrating at work		
Yes	48 (41.38)	0.000
No	68 (58.62)	
Increase in the consumption of some drug addiction		
Yes	28 (24.14)	0.000
No	88 (75.86)	
Work-related disorders during the COVID-19 pandemic		
Visual hallucinations	8 (6.70)	0.003
Auditory hallucinations	2 (1.72)	
Nightmares	28 (24.1)	
All	4 (3.45)	
None	74 (63.79)	
Feelings when entering the red zone		
Fear	31 (26.72)	0.000
Concern	59 (50.86)	
Indifference	3 (2.59)	
None	23 (19.83)	
Feeling the need for psychological attention		
Yes	71 (61.21)	0.016
No	45 (38.79)	

No missing values.

depression (OR:2.74, *p* 0.009) admiration was taken as a reference category, feeling severely affected by the death of COVID-19 patients under their care increased the possibility of having symptoms of depression and stress (OR:4.03, *p* 0.000; OR:5.42, *p* 0.001, respectively) and being slightly affected was the reference category, difficulties to maintain focus at work was associated with having depression and anxiety (OR:4.11, *p* 0.004; OR:9, *p* 0.014. respectively) compared to not having difficulties; likewise the drug consumption increased the chances of having depression (OR:15, *p* 0.001), also feeling fear of entering the red zone elevated the possibilities of showing signs of depression and stress (OR:2.94, *p* 0.017; OR:9.84, *p* 0.005, respectively), as reference category was not having feelings of fear, concern or indifference; the acceptance of needing psychological attention was significantly associated to depression and stress (OR:8.85, *p* 0.000; OR:8:43, *p* 0.001, respectively). No significant association with any of the evaluated factors was identified with the subscale of anxiety (Table 4).

In the multivariate logistic regression analysis, the factors consistently associated with the stages of depression were the attitude of indifference perceived by the community toward their work (OR: 2.66; IC 95%: 1.13–6.98), the increase in drug use (OR: 9.80; IC 95%: 1.38–14.78), and the perception of needing a psychological intervention (OR: 7.38; IC 95%: 2.75–19.73). Concerning the stress subscale rotating in the COVID-19 area was identified as an associated factor (OR: 17.05; IC 95%: 2.96–19.81), feeling affected by the patients under their care (OR: 4.23; IC 95%: 1.19–15.07), entering the red zone (OR: 19.47; IC 95%: 2.08–41.69), and

the need for psychological attention (OR: 9.50; IC 95%: 1.41–63.81). There were no associated risk factors for the anxiety subscale (Table 5).

Discussion

The COVID-19 pandemic has significantly impacted different aspects of society, from education to finance, social, and environmental. Moreover, around the world, work and classes have been set up remotely to prevent rapid spread of the virus. However, health workers had to remain in their worksites which resulted in experiencing a series of psychological disorders caused by the rising workload, physical

Table 3   Anxiety, stress, and depression scores.

	Dass-21 subscales levels			
	Mild	Prevalence (95% CI)	Severe	Extremely severe
Depression	9 (7.43–10.39)	14 (6.92–20.22)	10 (5.01–12.65)	32 (21.24–42.17)
Anxiety	15 (10.23–20.14)	28 (19.38–36.25)	8 (6.01–15.31)	40 (30.62–48.21)
Stress	8 (6.53–12.32)	22 (16.72–28.01)	16 (11.09–22.41)	52 (48.71–58.04)

Note: The cut-off point for DASS-21 subscales levels are as Lovibond et al. Manual for the Depression Anxiety Stress Scales.

Table 4   Risk factors and DASS-21 subscales.

Variables	Depression		Anxiety		Stress	
	OR (95% CI)	*p*-Value	OR (95% CI)	*p*-Value	OR (95% CI)	*p*-Value
Sex						
Female	1.02 (0.84–1.24)	0.847	0.77 (0.50–1.20)	0.141	1.39 (0.48–4.01)	0.544
Male	0.93 (0.47–1.86)		1.89 (0.86–4.14)		1.28 (0.58–2.81)	
Marital status						
Unmarried	0.78 (0.37–1.63)	0.514	0.69 (0.21–2.25)	0.535	1.19 (0.47–3.00)	0.719
Married			Ref.			
Age						
20–29	0.55 (0.23–1.28)	0.160	1.13 (0.29–4.41)	0.865	0.50 (0.19–1.36)	0.181
30–39	**2.18 (1.03–4.64)**	**0.042**	1.20 (0.41–4.13)	0.660	1.61 (0.63–4.10)	0.314
40–49	0.88 (0.23–2.62)	0.821	0.79 (0.16–3.99)	0.780	0.46 (0.04–5.27)	0.520
50–59			Ref.			
Working area						
COVID-19	1.33 (0.49–3.65)	0.575	2.82 (0.77–10.43)	0.107	**4.80 (1.62–14.25)**	**0.003**
No COVID-19			Ref.			
Attitude of the community toward their work during the pandemic is						
Discrimination	2.52 (0.17–1.22)	0.112	1.16 (0.24–5.71)	0.851	0.92 (0.27–3.09)	0.897
Indifferent	**2.74 (1.28–5.87)**	**0.009**	1.76 (0.55–5.63)	0.333	0.81 (0.74–0.88)	0.396
Violent	0.38 (0.03–4.34)	0.422	0.88 (0.83–0.95)	0.533	0.81 (0.74–0.88)	0.396
Admiration			Ref.			
Affected by the death of patients with COVID-19						
Severely	**4.03 (1.84–8.85)**	**0.000**	1.84 (0.58–5.86)	0.299	**5.42 (1.93–15.21)**	**0.001**
Moderately	0.31 (0.14–1.00)	0.070	1.33 (0.19–2.00)	0.428	1.23 (0.91–1.35)	0.080
Slightly			Ref.			
Difficulty concentrating at work						
Yes	**4.11 (1.52–11.08)**	**0.004**	0.851 (0.78–0.93)	0.027	**9.00 (1.14–69.50)**	**0.014**
No			Ref.			
Increase in the consumption of some drug addiction						
Yes	**15.00 (1.91–11.79)**	**0.001**	0.87 (0.81–0.94)	0.126	1.00 (0.70–0.86)	0.370
No			Ref.			
Feelings when entering the red zone						
Fear	**2.94 (1.18–7.31)**	**0.017**	0.85 (0.77–1.93)	0.210	**9.84 (1.26–76.65)**	**0.005**
Concern	0.86 (0.41–1.79)	0.692	0.87 (0.27–2.78)	0.819	1.64 (0.64–4.21)	0.300
Indifference	1.59 (0.14–18.01)	0.707	0.88 (0.83–0.95)	0.533	0.46 (0.04–5.27)	0.520
None			Ref.			
Feeling the need for psychological attention						
Yes	**8.85 (3.46–22.60)**	**0.000**	0.82 (0.73 –1.91)	0.052	**8.43 (1.86–38.13)**	**0.001**
No			Ref.			

OR: odds ratio; CI: confidence interval; Ref.: reference category.

Table 5 Factors associated with increased DASS-21 scores.

Variables	Depression subscale		Stress subscale	
	OR (95% CI)	p-Value	OR (95% CI)	p-Value
COVID-19 working area	2.00 (0.53–7.59)	0.311	**17.05 (2.96–19.81)**	**0.001**
Indifference from the community toward their work in the pandemic	**2.66 (1.13–6.98)**	**0.040**	3.63 (0.92–14.21)	0.064
Severely affected by the death of patients with COVID-19	2.54 (0.94–6.83)	0.047	**4.23 (1.19–15.07)**	**0.026**
Increase the consumption of some drug addiction	**9.80 (1.38–14.78)**	**0.020**	3.12 (0.03–27.67)	0.998
Fear of entering the red zone	2.34 (0.74–7.37)	0.147	**19.47 (2.08–41.69)**	**0.012**
Feeling the need for psychological attention	**7.38 (2.75–19.73)**	**0.000**	**9.50 (1.41–63.81)**	**0.020**

OR: odds ratio; CI: confidence interval.
OR adjusted for sociodemographics variables.

exhaustion, lack of proper equipment for personal protection, and scarcity, adding the risk of contamination in the workplace and infecting their loved ones, and lastly the continuous exposure to traumatic events such as the death of infected patients.[13,14]

In this study, psychological affliction has been examined using DASS-21, the prevalence of anxiety, depression, and stress (60%, 37.3%, 65.3%, respectively). Similar results have been reported in health workers being affected by anxiety disorders (23–28%), depression (22–31%), and stress (38–45%) during other pandemic events in 2002 due to severe acute respiratory syndrome (SARS) and in 2009 due to influenza A (H1N1) virus.[15–19]

It has been reported that being female is a risk factor in developing depression; however, it must be considered that historically, mainly women have been the ones who study nursing.[20–22] There were 77.59% females in this study, there was no association between the sex and developing depression, anxiety, or stress. Among the participants, those in the COVID-19 area were at a higher risk of developing mental health outcomes such as moderate to highly severe degrees of stress. In Bangladesh, Portugal, Poland, and the United States of America, healthcare staff working in COVID-19 areas have shown a greater propensity for psychological effects; these studies also used the DASS-21 scale.[17,21,23,24] Shechter et al. found that in New York City (2020), three of every four healthcare workers were highly distressed by fears about transmitting COVID-19 to family or friends and even more highly distressed by maintaining social distance from family.[25]

Epidemiological data showed that the high fatality rate in Mexico is currently one of the highest in the world with 5.73%, furthermore in 2020 increased by 12.40%.[26] The death of patients infected with SARS-CoV2 was another factor that was found to be associated with the possibility of presenting moderate to extremely severe levels of stress. The evidence consistently showed that among health workers, nurses are the ones who have experienced a more significant degree of stress and anxiety as they stand in the closest contact with patients who need constant care.[24,27]

In this study, nurses who reported increased use of some drugs were up to 10 times more likely to have moderate to extremely severe levels of depression. A study conducted in Brazil found high consumption rates of tobacco and alcohol (OR: 5.62; IC 95%: 2.10–15.03) among healthcare workers (n = 376) caring for COVID-19 patients. Further, the participants with signs of depression and stress were more likely to accept that they needed to get psychological attention during the pandemic (OR: 7.38; IC 95%: 2.75–19.73; OR: 9.50; IC 95%: 1.41–63.81).[28] In mental health terms, this is critical data for promoting new strategies that help to minimize emotional deterioration when dealing with a disease outbreak.[29]

Almost thirty-five percent of participants showed extremely severe rates of anxiety, although no significant association was found with sociodemographic and emotional factors. Previous studies have demonstrated associated factors with moderate to extreme rates of anxiety, like job dissatisfaction, fear of getting infected at work, preexisting health conditions, and taking care of infected patients.[23–25]

Sustained psychological distress can affect health in the long term; there is an association with cardiometabolic risk, systemic inflammation, and increased blood pressure. A study during the peak of the SARS outbreak showed that after one year following up after the crisis, perceived stress and depression levels increased among high-risk healthcare workers.[30] A systemic review revealed that at least one in five workers had experienced emotional disorders, proving the need to carry out strategies to mitigate the effects that these will have on the mental health professionals who care for public health.[16]

The limitations of this study include a small sample size compared to the population of healthcare workers. Although we found a high prevalence of anxiety among nurses, no significant association was found with the associated risk factors; other factors should have been considered. We cannot exclude the possibilities that nurses who chose not to participate have been too overwhelmed since this study was carried out during the peak of the pandemic.

Conclusion

Nurses presented a high prevalence of anxiety, depression, and stress during the COVID-19 pandemic, increasing the risk of mental health problems. In addition, the factors associated with this emotional distress make evident the need for psychological support for nurses working in COVID-19 designated hospitals. The emotional well-being of health workers is essential since the quality of care they provide to their patients will depend on it. The results highlight the need to implement public health interventions to promote mental well-being among nurses. The pandemic continues to spread, putting pressure on the health system; therefore, it is essential to implement specific measures to promote mental wellness in nurses since they have been the frontline workers.

Funding

Conflict of interest

All authors declare that they have no conflict of interest.

Acknowledgment

References

1. Secretaria de Salud. Datos Abiertos de México – Información referente a casos COVID-19 en México [Internet]. 2020. Available from: https://datos.gob.mx/busca/dataset/informacion-referente-a-casos-covid-19-en-mexico [cited 9.2.22].
2. Organization WH. State of the world's nursing 2020: investing in education, jobs and leadership. World Health Organization; 2020.
3. Zhang SX, Liu J, Afshar Jahanshahi A, Nawaser K, Yousefi A, Li J, et al. At the height of the storm: healthcare staff's health conditions and job satisfaction and their associated predictors during the epidemic peak of COVID-19. Brain Behav Immun. 2020;87:144–6, http://dx.doi.org/10.1016/j.bbi.2020.05.010.
4. World Health Organization. Mental health and psychosocial considerations during the COVID-19 outbreak 2020. https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf [accessed 8.2.22].
5. Peiris JSM, Lai ST, Poon LLM, Guan Y, Yam LYC, Lim W, et al. Coronavirus as a possible cause of severe acute respiratory syndrome. Lancet. 2003;361:1319–25, http://dx.doi.org/10.1016/s0140-6736(03)13077-2.
6. Chong M-Y, Wang W-C, Hsieh W-C, Lee C-Y, Chiu N-M, Yeh W-C, et al. Psychological impact of severe acute respiratory syndrome on health workers in a tertiary hospital. Br J Psychiatry. 2004;185:127–33, http://dx.doi.org/10.1192/bjp.185.2.127.
7. Santos JLGD, Balsanelli AP, Freitas E, de O, Menegon FHA, Carneiro IA, et al. Work environment of hospital nurses during the COVID-19 pandemic in Brazil. Int Nurs Rev. 2021;68:228–37, http://dx.doi.org/10.1111/inr.12662.
8. Al Maqbali M, Al Sinani M, Al-Lenjawi B. Prevalence of stress, depression, anxiety and sleep disturbance among nurses during the COVID-19 pandemic: a systematic review and meta-analysis. J Psychosom Res. 2021;141:110343, http://dx.doi.org/10.1016/j.jpsychores.2020.1103.43.
9. Lee SM, Kang WS, Cho A-R, Kim T, Park JK. Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. Compr Psychiatry. 2018;87:123–7, http://dx.doi.org/10.1016/j.comppsych.2018.10.003.
10. Secretaria de Salud. Lineamiento de reconversión hospitalaria [Internet]. 2020. Available from: https://coronavirus.gob.mx/wp-content/uploads/2020/04/Documentos-Lineamientos-Reconversion-Hospitalaria.pdf [cited 9.3.22].
11. Lovibond SH, Lovibond PF. Depression anxiety stress scales. American Psychological Association (APA). 2011, http://dx.doi.org/10.1037/t01004-000.
12. Lovibond PF, Lovibond SH. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behav Res Ther. 1995;33:335–43, http://dx.doi.org/10.1016/0005-7967(94)00075-u.
13. Chen R, Sun C, Chen J-J, Jen H-J, Kang XL, Kao C-C, et al. A large-scale survey on trauma, burnout, and posttraumatic growth among nurses during the COVID-19 pandemic. Int J Ment Health Nurs. 2021;30:102–16, http://dx.doi.org/10.1111/inm.12796.
14. Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: rapid review and meta-analysis. BMJ. 2020;369:m1642, http://dx.doi.org/10.1136/bmj.m1642.
15. Su T-P, Lien T-C, Yang C-Y, Su YL, Wang J-H, Tsai S-L, et al. Prevalence of psychiatric morbidity and psychological adaptation of the nurses in a structured SARS caring unit during outbreak: a prospective and periodic assessment study in Taiwan. J Psychiatr Res. 2007;41:119–30, http://dx.doi.org/10.1016/j.jpsychires.2005.12.006.
16. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. Brain Behav Immun. 2020;88:901–7, http://dx.doi.org/10.1016/j.bbi.2020.05.026.
17. Da Rosa P, Brown R, Pravecek B, Carotta C, Garcia AS, Carson P, et al. Factors associated with nurses' emotional distress during the COVID-19 pandemic. Appl Nurs Res. 2021;62:151502, http://dx.doi.org/10.1016/j.apnr.2021.151502.
18. Pinho L, Correia T, Sampaio F, Sequeira C, Teixeira L, Lopes M, et al. The use of mental health promotion strategies by nurses to reduce anxiety, stress, and depression during the COVID-19 outbreak: a prospective cohort study. Environ Res. 2021;195:110828, http://dx.doi.org/10.1016/j.envres.2021.110828.
19. Hemmati F, Sarokhani M, Abdan Z, Sarokhani D, Dehkordi AH, Fakhri M. The prevalence of depression, anxiety and stress in nurses working in iranian hospitals: a systematic review and meta-analysis. Przegl Epidemiol. 2021;75:254–62, http://dx.doi.org/10.32394/pe.75.24.

20. World Health Organization. State of the world's nursing 2020: investing in education, jobs, and leadership. WHO, Geneva; 2020.

21. Chowdhury SR, Sunna TC, Das DC, Kabir H, Hossain A, Mahmud S, et al. Mental health symptoms among the nurses of Bangladesh during the COVID-19 pandemic. Middle East Curr Psychiatry. 2021;28:23, http://dx.doi.org/10.1186/s43045-021-00103-x.

22. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA Netw Open. 2020;3:e203976, http://dx.doi.org/10.1001/jamanetworkopen.2020.3976.

23. Sampaio F, Sequeira C, Teixeira L. Impact of COVID-19 outbreak on nurses' mental health: a prospective cohort study. Environ Res. 2021;194:110620, http://dx.doi.org/10.1016/j.envres.2020.110620.

24. Dziedzic B, Kobos E, Sienkiewicz Z, Idzik A. Mental health of nurses during the fourth wave of the COVID-19 pandemic in Poland. Int J Environ Res Public Health. 2022;19, http://dx.doi.org/10.3390/ijerph19031785.

25. Shechter A, Diaz F, Moise N, Anstey DE, Ye S, Agarwal S, et al. Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic. Gen Hosp Psychiatry. 2020;66:1–8, http://dx.doi.org/10.1016/j.genhosppsych.2020.06.007.

26. Our World in Data. COVID-19 Data Explorer [Internet]. Our World in Data. Available from: https://ourworldindata.org/explorers/coronavirus-data-explorer?facet=none&pickerSort=desc&pickerMetric=cfr&Interva=Cumulative&Relative+to+Population=true&Color+by+test+positivity=false&country=~MEX&Metric=Case+fatality+rate [cited 10.3.22].

27. Zerbini G, Ebigbo A, Reicherts P, Kunz M, Messman H. Psychosocial burden of healthcare professionals in times of COVID-19 – a survey conducted at the University Hospital Augsburg. Ger Med Sci. 2020;18, http://dx.doi.org/10.3205/000281.

28. Vinicius Santinelli Pestana D, Raglione D, Junior LD, Liberatti C, de SP, Braga EC, et al. Stress and substance abuse among workers during the COVID-19 pandemic in an intensive care unit: a cross-sectional study. PLOS ONE. 2022;17:e0263892, http://dx.doi.org/10.1371/journal.pone.0263892.

29. Kang L, Ma S, Chen M, Yang J, Wang Y, Li R, et al. Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: a cross-sectional study. Brain Behav Immun. 2020;87:11–7, http://dx.doi.org/10.1016/j.bbi.2020.03.028.

30. Honkonen T, Ahola K, Pertovaara M, Isometsä E, Kalimo R, Nykyri E, et al. The association between burnout and physical illness in the general population-results from the Finnish Health 2000 study. J Psychosom Res. 2006;61:59–66, http://dx.doi.org/10.1016/j.jpsychores.2005.10.002.