
DIFFERENCES IN PERCEPTED STRESS AMONG HEALTHCARE WORKERS DURING THE COVID-19 PANDEMIC (IN RELATION TO THE WORKPLACE)

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Abstract: Purpose: With the advent of the COVID-19 pandemic, there has been an increased business engagement of all health workers. Due to the work of health workers with people infected with coronavirus, there is a possibility of daily infection. However, in addition to the consequences of the physical health of the COVID-19 pandemic, it leaves the consequences for the mental health of health workers as well. **Methodology:** 107 respondents divided into four sub-samples participated in the study: doctors of medicine, nurses, masters of pharmacy and other medical workers: laboratory technician, pharmaceutical technician, therapist, radiologist, anesthesiologist and others. Respondents are employed in medical institutions in the canton of Sarajevo, Bosnia and Herzegovina. For research purposes, a standardized Perceived stress scale made up of 10 questions was used. **Results:** The results of the research indicate that in all subjects (physicians, nurses, masters of pharmacy, medical workers) during the COVID-19 pandemic, there was increased stress in the workplace. Significant differences have been identified in the responses of nurses and pharmacists and other medical workers, where nurses have highlighted the ability to cope with situations that must be made to monitor a possible infection. Differences were found in responses between nurses and medical workers, where nurses pointed out that they could almost never fully control the situation related to the COVID-19 pandemic. **Conclusion:** In all health workers regardless of the position they were engaged during the COVID-19 pandemic, moderate stress was perceived. **Recommendations:** It is of great importance to monitor stress among healthcare professionals during the pandemic because stress causes long-term consequences for the mental health of health professionals, and prevents the provision of proper health care and care of health professionals about their patients.

Keywords: stress, health workers, COVID-19 pandemic

1. INTRODUCTION

The declaration of the COVID-19 pandemic and the introduction of measures such as quarantine and curfew, for the purpose of preventing the spread of coronavirus (SARS-CoV-2) has led to the development of negative consequences for human mental health, and most often of which were: depression, anxiety, stress, and sleep problems. The frequency rate of the mentioned negative consequences on human mental health was higher during the COVID-19 pandemic compared to the period before the COVID-19 pandemic (Lakhan et al, 2020). Given that the emergence of the COVID-19 pandemic has affected all segments of human life (professional, social, financial, physical and mental health) is of great importance to identify the most critical changes that need to be offered

adequate solutions (Robillard et al, 2020). The situation caused by the COVID-19 pandemic has affected all health workers around the world, which is why the World Health Organization has also pointed to the heavy burden and engagement of health workers (World Health Organization, 2020). The COVID-19 pandemic has caused an increased volume of work among all healthcare professionals resulting in the development of potential causes of stress: an increasing number of confirmed or suspicious cases of infection, the use of equipment in work for personal protection, the impact of all media, the inability to procure the necessary medicines and equipment, the feeling of inadequate support for superiors, etc. (Lai et al, 2020). The full functioning of one state's health system basically depends on the engagement and role of health workers. However, the occurrence of stress in health workers caused by the COVID-19 pandemic prevents the ability of the health system to respond properly to the necessary requirements (Muller et al, 2020).

Given that health professionals are located in different positions within the health system, the goal of this research is to determine the existence of differences in perceived stress in health workers depending on the position where they were engaged during the COVID-19 pandemic.

2. MATERIAL AND METHODS

Responders

This study was attended by 107 respondents divided into four sub samples: doctors of medicine (N=27), nurses (N=28), masters of pharmacy (N=26) and other medical workers: laboratory technician, pharmaceutical technician, therapist, radiologist, anesthesiologist and others (N=26). All respondents are employed in medical institutions in the canton of Sarajevo, Bosnia and Herzegovina.

Methods

For the purposes of the research, Perceived stress scale consisting of 10 questions whose creator is Cohen et al (1983), and for this research, a custom version of the pandemic conditions (Campo-Arias, 2020) was used. Perceived stress scale is a tool for assessing stress exposure in the last month. For each claim, respondents were able to complete one of the five responses offered (never, almost never, occasionally, almost always and always). Any claim was evaluated on a scale of 0-4, only that the reverse scaling scale was used for claims 4, 5, 7 and 8 (0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0).

The total test result can range from 0-40 points. When the result of 0-13 indicates a low stress level, of 14-26 moderate stress levels, while between 27-40 is marked as high stress levels (Cohen et al, 1983). The survey was conducted online, using the Google Form platform in November, 2021. The research was anonymous and voluntary.

Statistical analysis

Basic descriptive indicators were calculated for each subsample: arithmetic mean, median, standard deviation, minimum and maximum value, while data distribution was calculated by measure of asymmetry (skjunis) and measure of kurtosis. Differences between subsamples were determined by the Kruskal Wallis test, while the Bonferroni post hoc test determined which subsamples there were significant differences. The level for accepting a statistically significant difference is $p \leq 0.05$. The data were processed in the SPSS statistical package ver. 23.0. The research results are presented in text and tables.

3. RESULTS

Insight into the basic descriptive indicators of the response to the perceived stress questionnaire at the doctor of medicine shows that the medial values of the response to particles in the questionnaire relate to the occasional experience of stress. The overall score of the perceived stress assessment shows that doctors are exposed to moderate stress due to the pandemic-related situation (MED= 19.50). Minimum and maximum values show that respondents gave answers ranging from never to always. The values of minimum and maximum values of total score show that we have people who are in the low stress category (MIN=4), but also those who experience high stress levels (MAX=33). The resulting indicators of asymmetry measures show that the responses in the acceptable range (+/- 2) and that most particles have a negative sign, which shows that most results are among higher values than median and arithmetic mean (Šimić, 2017). The kurtosis measure shows that the results in the particles and the overall jump form a platykurtic curve. The positive values of the kurtosis measures show that there are more results accumulated around the distribution center, while negative values indicate a flatter distribution (Pallant, 2010). (Table 1).

Table 1: Results of descriptive indicators of perceived stress in doctors

Particles	MEAN	MED	SD	MIN	MAX	SKJ	KURT
Feeling anxious	1,83	2,00	1,02	0,00	4,00	-0,48	0,14
Feeling unable to control	1,80	2,00	1,10	0,00	4,00	-0,08	-0,12
Feelings of nervousness and stress	2,10	2,00	0,96	0,00	4,00	0,04	0,92
A sense of confidence	1,80	2,00	1,03	0,00	4,00	-0,18	-0,32
A sense of optimism that things are going well	2,13	2,00	1,07	0,00	4,00	-0,10	-0,40
Feeling unable to cope with the situation	1,47	2,00	1,04	0,00	4,00	0,09	-0,24
A sense of control over potential difficulties	1,87	2,00	1,01	0,00	4,00	-0,15	-0,35
A sense of overall control over the epidemic	2,13	2,00	1,14	0,00	4,00	-0,43	-0,11
Feeling angry about things that are out of control	2,13	2,00	1,22	0,00	4,00	-0,15	-0,48
The feeling of not being able to overcome the difficulties that are accumulating	2,17	2,00	1,29	0,00	4,00	-0,12	-0,79
Total score	19,43	19,50	5,93	4,00	33,00	-0,42	2,12

MEAN - arithmetic mean, MED - median, SD - standard deviation, MIN - minimum value, MAX - maximum value, SKJ - ~~skjuniis~~ kurtosis, KURT – kurtosis

By analyzing the basic descriptive indicators of perceived stress in nurses, we notice that the medial values of responses to particles in the questionnaire relate to an occasional experience of stress. The exception is in responses related to inability to cope with a situation where nurses felt they felt capable of coping with situations that had to be done to monitor for a possible infection (MED=0.00), as well as in the response related to the sense of control over the epidemic where nurses responded that they could almost never fully control the situation related to the pandemic. The total score assessment of perceived stress shows that nurses are exposed to moderate stress due to a pandemic-related situation (MED= 20.00). Minimum and maximum values show that respondents gave answers ranging from never to always. The results of the maximum and minimum values of the total jump in the questionnaire show that respondents entering the low stress category (MIN=8) are held among nurses, but also those in the high stress category (MAX= 27). The resulting indicators of asymmetry measures show that the responses in the acceptable range (+/- 2) and that in most particles are a negative sign, which shows that most results are among higher values than median and arithmetic mean (Šimić, 2017). The measure of flatness shows that the results in the particles and the total score form a platykurtic curve. The positive values of the kurtosis measures show that there are more results accumulated around the distribution center, while negative values indicate a flatter distribution (Pallant, 2010). (Table 2).

Table 2: Results of descriptive indicators of perceived stress in nurses / technician

Particles	MEAN	MED	SD	MIN	MAX	SKJ	KURT
Feeling anxious	1,79	2,00	1,26	0,00	4,00	0,08	-0,41
Feeling unable to control	1,97	2,00	1,15	0,00	4,00	-0,08	-0,30
Feelings of nervousness and stress	2,28	2,00	1,36	0,00	4,00	-0,17	-0,93
A sense of confidence	1,66	2,00	1,04	0,00	4,00	0,36	0,32
A sense of optimism that things are going well	2,17	2,00	1,20	0,00	4,00	-0,09	-0,50
Feeling unable to cope with situations	0,79	0,00	1,01	0,00	4,00	1,33	1,87
A sense of control over potential difficulties	2,21	2,00	1,21	0,00	4,00	-0,03	-0,41
A sense of overall control over the epidemic	2,76	3,00	1,30	0,00	4,00	-0,88	-0,07
Feeling angry about things that are out of control	1,66	2,00	1,32	0,00	4,00	0,39	-0,68
The feeling of not being able to overcome the difficulties that are accumulating	1,79	2,00	1,29	0,00	4,00	0,41	-0,57
Total score	19,07	20,00	4,47	8,00	27,00	-0,66	0,16

MEAN - arithmetic mean, MED - median, SD - standard deviation, MIN - minimum value, MAX - maximum value, SKJ - *skjurnis*, KURT – kurtosis

Insight into the basic descriptive indicators of the response to the perceived stress questionnaire in the Master of Pharmacy shows that the medial values of the response to particles in the questionnaire relate to the occasional experience of stress. The overall score of the perceived stress assessment shows that pharmacists are exposed to moderate stress due to the pandemic-related situation (MED = 20). Unlike other subsamples, pharmacists did not answer the first, fourth, and sixth questions in the full range of answers offered. The values of minimum and maximum values in the overall score show that we have people who are in the category of low stress (MIN = 7), but also those who experience high levels of stress (MAX = 29). The obtained indicators of asymmetry measures show that the answers are in the acceptable range (+/- 2) and that most particles have a negative sign, which shows that most of the results are among the higher values than the median and arithmetic mean (Šimić, 2017). The measure of flattening shows that the results in the particles and the total score form a platykurtic curve. Positive values of flattening measures show that there are more results accumulated around the center of distribution, while negative values indicate a flatter distribution (Pallant, 2010). (Table 3).

Table 3: Results of descriptive indicators of perceived stress in pharmacists

Particles	MEAN	MED	SD	MIN	MAX	SKJ	KURT
Feeling anxious	1,85	2,00	0,78	0,00	3,00	-0,79	0,95
Feeling unable to control	2,31	2,00	0,79	1,00	4,00	0,43	0,15
Feelings of nervousness and stress	2,27	2,00	0,78	0,00	4,00	-0,53	2,23
A sense of confidence	1,69	2,00	1,01	0,00	3,00	-0,32	-0,87
A sense of optimism that things are going well	1,92	2,00	0,84	0,00	4,00	0,15	0,80
Feeling unable to cope with situations	1,54	2,00	1,07	0,00	3,00	-0,22	-1,15
A sense of control over potential difficulties	2,15	2,00	1,05	0,00	4,00	0,12	-0,43
A sense of overall control over the epidemic	2,35	2,00	0,98	0,00	4,00	-0,23	0,18
Feeling angry about things that are out of control	1,88	2,00	1,24	0,00	4,00	-0,17	-0,92
The feeling of not being able to overcome the difficulties that are accumulating	1,81	2,00	1,06	0,00	4,00	-0,24	-0,26
Total score	19,77	20,00	4,52	7,00	29,00	-0,47	1,84

MEAN - arithmetic mean, MED - median, SD - standard deviation, MIN - minimum value, MAX - maximum value, SKJ - *skjuniis*, KURT – kurtosis

By insight into basic descriptive indicators of responses to the perceived stress questionnaire in other medical workers (laboratory technician, pharmaceutical technician, therapist, radiologist, anesthesiologist and others) we notice that the medial values of responses to particles in the questionnaire refer to an occasional experience of stress. The total score assessment of perceived stress shows that other medical workers are exposed to moderate stress due to a pandemic-related situation (MED=20). Minimum and maximum values show that respondents gave answers ranging from never to always. The values of minimum and maximum values of total score show that we have people who are in the low stress category (MIN=11), but also those who experience high stress levels (MAX=38). The resulting indicators of asymmetry measures show that the responses are in the acceptable range (+/- 2) and that in most of them particles are of a negative sign, which shows that most results are among higher values than median and arithmetic mean (Šimić, 2017). The kurtosis measure shows that the results in the particles and the overall score form a platykurtic curve. The positive values of the flattening measures show that there are more results accumulated around the distribution center, while negative values indicate a flatter distribution (Pallant, 2010). (Table 4).

Table 4: Results of descriptive indicators of perceived stress in other health professionals

Particles	MEAN	MED	SD	MIN	MAX	SKJ	KURT
Feeling anxious	2,04	2,00	1,04	0,00	4,00	0,15	0,37
Feeling unable to control	2,31	2,00	1,05	0,00	4,00	-0,01	-0,28
Feelings of nervousness and stress	2,62	2,00	0,98	1,00	4,00	0,34	-1,15
A sense of confidence	1,81	2,00	0,98	0,00	4,00	-0,14	0,20
A sense of optimism that things are going well	1,92	2,00	0,93	0,00	4,00	0,16	-0,32
Feeling unable to cope with situations	1,81	2,00	1,10	0,00	4,00	0,21	-0,25
A sense of control over potential difficulties	1,65	2,00	1,09	0,00	4,00	0,37	0,11
A sense of overall control over the epidemic	2,00	2,00	0,98	0,00	4,00	0,00	0,58
Feeling angry about things that are out of control	1,96	2,00	1,25	0,00	4,00	0,08	-0,57
The feeling of not being able to overcome the difficulties that are accumulating	2,08	2,00	0,84	1,00	4,00	0,71	0,43
Total score	20,19	20,00	5,56	11,00	38,00	1,13	3,06

MEAN - arithmetic mean, MED - median, SD - standard deviation, MIN - minimum value, MAX - maximum value, SKJ - *skjūnis*, KURT – kurtosis

The results of the Kruskal Wallis test by which we assessed the differences between medical staff performing different jobs show the existence of statistically significant differences in two particles in the stress experienced at the time of the pandemic. The differences were identified at the level of significance ($p \leq 0.05$) in the particles "I felt incapable of dealing with the things I had to do to monitor a possible infection" ($\chi^2 = 13.74, df=3.00, p=0.00$) and "I felt I had everything under control regarding the epidemic" ($\chi^2 = 8.75, df=3.00, p=0.03$). Given that the differences between several groups were analyzed, applying Bonferoni's post hoc test found that statistically significant differences in the particle "I felt incapable of dealing with the things I had to do to monitor a possible infection" between nurses and pharmacists and nurses and other medical workers, while in the "I felt that I had everything under control regarding the epidemic" were established among other medical workers and nurses. (Table 5).

Table 5: Results of differences in perceived stress in medical staff

Particles	1*	2*	3*	4*	Kruskal Wallis		
	Mean Rank	Mean Rank	Mean Rank	Mean Rank	χ^2	df	Sig.
Feeling anxious	56,07	53,53	55,27	59,40	,58	3,00	,90
Feeling unable to control	48,32	52,95	62,33	61,94	4,39	3,00	,22
Feelings of nervousness and stress	49,73	55,59	56,04	63,65	3,06	3,00	,38
A sense of confidence	58,18	52,31	55,42	58,17	,72	3,00	,87
A sense of optimism that things are going well	58,98	59,74	52,21	52,17	1,52	3,00	,68
Feeling unable to cope with situations	58,68	38,50	61,19	67,23	13,74	3,00	,00
A sense of control over potential difficulties	53,80	62,19	60,90	46,73	4,37	3,00	,22
A sense of overall control over the epidemic	51,67	69,24	56,27	45,96	8,75	3,00	,03
Feeling angry about things that are out of control	61,65	49,12	56,17	56,98	2,44	3,00	,49
Feeling unable to overcome the difficulties that are accumulating	61,48	50,31	53,10	58,92	2,43	3,00	,49
Total score	55,05	54,52	57,42	57,33	0,18	3,00	0,98

1- doctors of medicine; 2- nurses; 3- masters of pharmacy; 4- other medical workers;
Mean Rank - average rank value, χ^2 - hi square, df- degrees of freedom, Sig - statistical significance.

4. DISCUSSION

The emergence of the COVID-19 pandemic has caused a significant occurrence of stress among the general population, but also among health professionals. Javadeker et al (2021) investigated the impact of the COVID-19 pandemic on the mental health of the general population and doctors where the occurrence of stress was observed in 38.46% of physicians, and further statistical analysis showed that a higher degree of stress was reported in physician compared to the general population (Javadekar et al, 2021). Healthcare professionals, primary physicians who work directly with patients suffering from COVID-19 are more exposed to more frequent development of mental health consequences during treatment and care for patients with COVID-19 (Rajkumar, 2020). Similar results were obtained in a study conducted in India among physicians working in hospitals with patients suffering from COVID-19, where a connection to perceived stress (Uvais et al, 2020) was observed. Based on the study performed by Das et al (2020) strong and moderate stress were reported at 37.4% respondents. The occurrence of strong and moderate stress was enhanced by work of six and more hours in the workplace (Das et al, 2020). The results of the mentioned research are correlated with the results of our research. The conducted study noted the perception of moderate stress in physicians due to the situation caused by the COVID-19 pandemic. Stress values from low to extremely high levels of stress have been reported by physicians. As a result of the work of physicians at the departments and contacts with patients suffering from COVID-19, and the lack of protective equipment, the emergence of post-traumatic stress disorder occurred. In the study of Emre et al (2021) they recorded the occurrence of posttraumatic stress disorder in 40 physicians out of a total of 225 physicians who participated in the study (Emre et al, 2021). Based on the mentioned studies, it is noted that the COVID-19 pandemic has had a significant impact on the mental health of the employed physicians, and that in this way, each health facility management should focus on procedures for providing support to physicians with a view to preserving mental health (Galbraith et al, 2021). Previous virus phenomena have left consequences for health workers, both physical health and mental health. The most common consequences that were reported during the occurrence, but also a few years after the onset of the virus are: symptoms of posttraumatic stress, combustion, depression and anxiety (Muller et al, 2020). Studies conducted during the COVID-19 pandemic that have studied the impact on the mental health of all health workers, testify to the same consequences. One such study conducted in Asia in 2021 dealt with the study of the impact of the COVID-19 pandemic on the mental health of health workers and staff. The emergence of mental stress, insomnia, depression, fear, anxiety, and exhaustion are just some of the many possible negative predictors that can influence the safety of the patient himself, but also the health worker (Thatrimontrichai et al, 2021). Similar data were obtained in a large survey conducted in Italy, conducted by Lasalvia et al (2020) involving a total of 2,195 health

workers. Of the total number of respondents, 62.3% reported traumatic experiences that were associated with the development of the COVID-19 pandemic. The study found there was a greater tendency to develop psychopathological consequences primary in nurses, but also all other health professionals who are directly involved in working with patients with COVID-19 (Lasalvia et al, 2020). In the research we conducted, a perception of moderate stress in medical workers was observed (laboratory technician, pharmaceutical technician, therapist, radiologist, anesthesiologist, etc.) as well as with nurses. However, the nurses pointed out that they feel able to cope with the situations that must be done to monitor a possible infection, but that they can almost never completely control the situation related to the COVID-19 pandemic. The COVID-19 pandemic requires the engagement of one nurse to treat several patients at once. In such a way, nurses deviate from the daily usual mode of work. In his research, Gordon et al (2021) point out that mental health consequences occur in nurses as a result of increased care for patients diagnosed with COVID-19 (Gordon et al, 2021). The same results were obtained in a 2020 study in China, where respondents expressed a high degree of mental burden, which occurred in particular in nurses, but also other medical workers who have been treated with patients with COVID-19 (Lai et al, 2020). Among health professionals, there is a significant role for pharmacists. The role of pharmacists is most important due to the provision of proper information on measures to prevent the spread of coronavirus infection, on the proper use of drugs, to whom to turn for professional assistance, etc. (Novak et al, 2021). The COVID-19 pandemic has also caused stress among pharmacists due to the high risk of coronavirus infection and increased business engagement (Elbeddini et al, 2020). In addition to pharmacists employed in pharmacies, stress is also reported among pharmacists employed in hospitals. A study conducted by Wu et al (2021), pointed out that stress at work is confirmed by as many as 60% hospital pharmacists. Pharmacists with a higher professional title, and aged between 31-35, marked the occurrence of stress at work higher than other pharmacists (Wu et al, 2021). A higher level of stress was also reported in a study conducted in Serbia by Jovicic-Bata et al (2021) among pharmacists employed in pharmacies (Jovicic-Bata et al, 2021). In the mentioned study, 93.1% respondents believe that work in pharmacies has become more complex with the appearance of the COVID-19 pandemic. As a result, 68.9% of respondents became more worried and burdened about how to preserve their health and the health of their families. Such a situation has led to pharmacists marking a higher level of stress (Jovicic-Bata et al, 2021). The obtained results of our research among pharmacists indicate that moderate-intensity stress has also been present as a result of the development of the COVID-19 pandemic, where pharmacists perceive high-level stress as well as low-level stress. Jovicic-Bata et al (2021) in their research highlight the importance of preparing a stronger health system in order to lead to a reduction in stress at work through a new reorganization of pharmaceutical activities and roles (Jovicic-Bata et al, 2021). By conducting regular checkups of health professionals involved in working with patients with COVID-19, and health workers whose scope of work extended due to the COVID-19 pandemic, as well as constant assessments of stress in the workplace enable the prevention of the impact of stress on mental health (Das et al, 2020). This research has particular importance to draw attention to all policy makers and health care leaders to provide protection to all healthcare professionals to enable the proper provision of health care for their patients.

5. CONCLUSION

The emergence of the COVID-19 pandemic has caused stress development in all health workers. In all categories of health workers, moderate stress was perceived, and all respondents experienced occasional experience of stress in the workplace, regardless of the position in which health workers were engaged during the COVID-19 pandemic. The existence of differences in responses between nurses and pharmacists and other medical workers, nurses highlighted the ability to cope with situations that must be made to monitor a possible infection. Differences were identified between nurses and medical workers, where nurses pointed out that they could almost never fully control the situation related to the COVID-19 pandemic. Stress among healthcare workers needs to be monitored during the pandemic, but also after the pandemic, as stress causes long-term consequences for mental health. Given that the COVID-19 pandemic continues to draw increased engagements of all health workers, the long-term impact of stress on health workers will be known in the future.

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CONFLICT OF INTEREST

There are no conflicts of interest to declare by any of the authors of this study.

REFERENCES

- Campo-Arias, A., Pedrozo-Cortés, M. J., & Pedrozo-Pupo, J. C. (2020). Pandemic-Related Perceived Stress Scale of COVID-19: An exploration of online psychometric performance. Escala de estrés percibido relacionado con la pandemia de COVID-19: una exploración del desempeño psicométrico en línea. *Revista Colombiana de psiquiatría (English ed.)*, 49(4), 229–230. <https://doi.org/10.1016%2Fj.rcp.2020.05.005>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of health and social behavior*, 24(4), 385–396.
- Das, A., Sil, A., Jaiswal, S., Rajeev, R., Thole, A., Jafferany, M., & Ali, S. N. (2020). A Study to Evaluate Depression and Perceived Stress Among Frontline Indian Doctors Combating the COVID-19 Pandemic. *The primary care companion for CNS disorders*, 22(5), 20m02716. <https://doi.org/10.4088/PCC.20m02716>
- Elbeddini, A., Wen, C. X., Tayefehchamani, Y., & To, A. (2020). Mental health issues impacting pharmacists during COVID-19. *Journal of Pharmaceutical Policy and Practice*, 13, 46. <https://doi.org/10.1186/s40545-020-00252-0>
- Emre, N., Edirne, T., Ozsahin, A., & Kulceler, M. F. (2021). Assessment on risk and stress of resident doctors during the COVID-19 pandemic. *Journal of infection in developing countries*, 15(8), 1080-1085. <https://doi.org/10.3855/jidc.14877>
- Galbraith, N., Boyda, D., McFeeters, D., & Hassan, T. (2021). The mental health of doctors during the COVID-19 pandemic. *BJP psych bulletin*, 45(2), 93-97. <https://doi.org/10.1192/bjb.2020.44>
- Gordon, J. M., Magbee, T., & Yoder, L.H. (2021). The experiences of critical care nurses caring for patients with COVID-19 during the 2020 pandemic: A qualitative study. *Applied nursing research: ANR*, 59, 151418. <https://doi.org/10.1016/j.apnr.2021.151418>
- Jovičić-Bata, J., Pavlović, N., Milošević, N., Gavarić, N., Goločorbin-Kon, S., Todorović, N., & Lalić-Popović, M. (2021). Coping with the burden of the COVID-19 pandemic: a cross-sectional study of community pharmacists from Serbia. *BMC Health Services Research*, 21(1), 304. <https://doi.org/10.1186/s12913-021-06327-1>
- Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., & Hu, S. (2020). Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Netw Open*, 3(3):e203976. <https://doi.org/10.1001/jamanetworkopen.2020.3976>
- Lakhan, R., Agrawal, A., & Sharma, M. (2020). Prevalence of Depression, Anxiety, and Stress during COVID-19 Pandemic. *Journal of neurosciences in rural practice*, 11(4), 519-525. <https://doi.org/10.1055/s-0040-1716442>
- Lasalvia, A., Bonetto, C., Porru, S., Carta, A., Tardivo, S., Bovo, C., Ruggeri, M., & Amaddeo, F. (2020). Psychological impact of COVID-19 pandemic on healthcare workers in a highly burdened area of north-east Italy. *Epidemiology and psychiatric sciences*, 30, e1. <https://doi.org/10.1017/S2045796020001158>
- Muller, A. E., Hafstad, E. V., Himmels, J. P. W., Smedslund, G., Flottorp, S., Stensland, S. Ø., Stroobants, S., Van de Velde, S., & Vist G. E. (2020). The mental health impact of the covid-19 pandemic on healthcare workers, and interventions to help them: A rapid systematic review. *Psychiatry Res*, 293:113441. <https://doi.org/10.1016/j.psychres.2020.113441>
- Novak, H., Tadić, I., Falamić, S., & Ortner Hadžiabdić, M. (2021). Pharmacists' role, work practices, and safety measures against COVID-19: A comparative study. *Journal of the American Pharmacists Association*, 61(4), 398-407. <https://doi.org/10.1016/j.japh.2021.03.006>
- Pallant, J. (2010). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS*. Maidenhead: Open University Press/McGraw-Hill.
- Javadekar, A., Javadekar, S., Chaudhury, S., & Saldanha, D. (2021). Depression, anxiety, stress, and sleep disturbances in doctors and general population during COVID-19 pandemic. *Industrial psychiatry journal*, 30(Suppl1), S20-S24. <https://doi.org/10.4103/0972-6748.328783>
- Rajkumar, R. P. (2020). COVID-19 and mental health: a review of the existing literature. *Asian journal of psychiatry*, 52, 102066. <https://doi.org/10.1016/j.ajp.2020.102066>
- Robillard, R., Saad, M., Edwards, J., Solomonova, E., Pennestri, M. H., Daros, A., Veissière, S.P.L., Quilty, L., Dion, K., Nixon, A., Phillips, J., Bhatla, R., Spilg, E., Godbout, R., Yazji, B., Rushton, C., Gifford, W. A., Gautam, M., Boaf, A., Swartz, R., & Kendzerska, T. (2020). Social, financial and psychological stress during an emerging pandemic: observations from a population survey in the acute phase of COVID-19. *BMJ Open*, 10(12), e043805. <https://doi.org/10.1136/bmjopen-2020-043805>
- Šimić, M. (2017). *Measures of data asymmetry [Graduate thesis]*. Zagreb: University of Zagreb, Faculty of Science. Available from: <https://urn.nsk.hr/urn:nbn:hr:217:309355>. Accessed: 29.03.2022

- Thatrimontrichai, A., Weber, D.J., & Apisarnthanarak, A. (2021). Mental health among healthcare personnel during COVID-19 in Asia: A systematic review. *Journal of the Formosan Medical Association = Taiwan yi zhi*, 120(6), 1296-1304. <https://doi.org/10.1016/j.jfma.2021.01.023>
- Uvais, N. A., Shihabudheen, P., & Hafi, N. (2020). Perceived Stress and Stigma Among Doctors Working in COVID-19-Designated Hospitals in India. *The primary care companion for CNS disorders*, 22(4), 20br02724. <https://doi.org/10.4088/pcc.20br02724>
- WHO. R&D Blueprint: World Health Organization; 2020. COVID 19 Public Health Emergency of International Concern (PHEIC) Global Research and Innovation Forum: Towards a Research Roadmap; pp. 1–7. Available from: [https://www.who.int/publications/m/item/covid-19-public-health-emergency-of-international-concern-\(pheic\)-global-research-and-innovation-forum](https://www.who.int/publications/m/item/covid-19-public-health-emergency-of-international-concern-(pheic)-global-research-and-innovation-forum). Accessed: 10.02.2022.
- Wu, J., Cai, J., Fang, M., Wang, Y., & Xu, F. (2021). Young hospital pharmacists' job stress and career prospects amidst the COVID-19 pandemic in China. *Journal of Pharmaceutical Policy and Practice*, 14(1), 66. <https://doi.org/10.1186/s40545-021-00355-2>