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Sleep quality, perceived stress, and quality of life of healthcare professionals working in direct contact with COVID-19 (+) patients: A comparative study

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Abstract

Background/Aim: Healthcare workers can be psychologically and physically affected by the COVID-19 pandemic. This study was conducted to evaluate the sleep quality, perceived stress, and quality of life of healthcare professionals during the COVID-19 pandemic.
Methods: This cross-sectional and comparative study was conducted with employees of a city hospital in Turkey between 01-20 January 2021. Personal Information Form, Jenkins Sleep Scale, Perceived Stress Scale, and Quality of Life Test Short Form-36 (SF-36) were used to collect data during face-to-face interviews conducted with the hospital staff by the researchers. The sample of the study consisted of a healthcare team providing service for COVID-19 patients in the city hospital (Group 1) and a healthcare team working without direct contact with COVID-19 patients (Group 2). The results obtained from the study were compared between these two groups. There were 213 volunteers in Group 1, and 163 volunteer healthcare workers (doctors, nurses, midwives, medical secretaries, patient transfer staff, and patient support staff) in Group 2.
Results: Sleep problems and stress levels were significantly higher among healthcare professionals who had direct contact with COVID-19 (+) patients compared to those who did not ($P<0.05$). Healthcare professionals in Group 1 had lower levels of emotional wellbeing, vitality (energy), mental health, and social function, which are subscales of the SF-36 scale, while the pain and general perception of health subscale scores were higher compared to Group 2 ($P<0.05$). Logistic regression analysis showed that stress (OR: 1.045) and pain (OR: 1.018) were increased in those working in direct contact with COVID-19 (+) patients.
Conclusion: This study showed that healthcare workers who had contact with COVID-19 (+) patients had more sleep problems, their perceived stress levels were higher, and their quality of life was lower.

Keywords: COVID-19, Sleep quality, Perceived stress, Quality of life

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Introduction

The COVID-19 pandemic, reported in December 2019 from Wuhan, China, has affected the world [1, 2]. In this pandemic, which is associated with the respiratory tract, hospitals and other health institutions carry the highest risk of infection [3, 4].

Special services related to the pandemic are carried out along with routine healthcare services. The personnel working in the healthcare sector have essential and decisive roles in the fight against the pandemic. In the execution of these services, healthcare workers who provide radiation, track contact, make a diagnosis, and decide on treatment and post-treatment process are in the front line, while support personnel and public employees are at the back, also fighting for the same cause. Publications from China during the early outbreak reported that 29% of those who got sick were healthcare workers [5]. In an article published in the USA, it was reported that 68.6% of the healthcare workers who got sick were working during the contagious phases of their disease and 47.9% had contact with a patient or a colleague with COVID-19 [6]. Another article reported that 52% of 2457 healthcare workers contracting COVID-19 were nurses and 33% were doctors [7]. According to data released in September, health workers constitute 10.9% of cases in Turkey [8]. In different countries, healthcare workers suffering from COVID-19 constitute 3.46-33.6% of all cases [5-10].

COVID-19 pandemic affects individuals psychologically, and according to the level of exposure and conditions, the graveness of psychological response can increase [9, 10]. The emotional, cognitive, behavioral, physical, or social responses to the pandemic depend on the situation and perceived stress of the person [9-12]. Along with an increasing and unpredictable pace of work among the healthcare workers during this period, there are also factors such as a high risk of infection and contamination, overworking, providing care to terminal or seriously ill patients, experiencing relationship and task sharing problems in the workplace, disturbance of sleep, night shifts and dealing with relatives and economic problems, all of which can lead to stress, tension and a feeling of burnout [13, 14]. The feeling of burnout in business and professional life causes psychological problems, such as increased depressive complaints, impaired quality of life [15-18], fatigue, sleep disturbances, irritability, job dissatisfaction, and inhibition of professionalism. These psychological problems not only affect health workers' attention, understanding, and decision-making ability but also hinder the fight against COVID-19. Additionally, they may result in a lasting effect on the healthcare workers' health [19].

For effective pandemic management and the continuation of healthcare services after the epidemic, there is a need to protect and empower those working in the field of health, as well as risk identification. It is especially important to protect the mental health of healthcare professionals who care for COVID-19 positive patients so that mental disorders can be prevented before they occur [20]. During the pandemic, many studies have been conducted on the physical and mental health of healthcare workers, but no study investigated how the working status affects the sleep quality, perceived stress, and quality of life of healthcare personnel in direct contact with COVID-19 positive patients. In line with this information, we aimed to determine the effect of working in direct contact with patients during the COVID-19 pandemic on sleep quality, perceived stress, and quality of life of healthcare professionals. This study was designed to answer the following research questions:

1. During the COVID-19 outbreak, is there a difference in sleep quality, perceived stress, or quality of life between groups working and not working in direct contact with patients?

2. How effective is working in direct contact with patients during the COVID-19 pandemic on sleep quality, perceived stress, and quality of life?

Materials and methods

Study design and sample

This cross-sectional study was conducted between January 1 and January 20, 2021, with employees of a city hospital in the east of Turkey. The sample of the study consisted of a healthcare team providing service for COVID-19 patients in the city hospital and a healthcare team working in units without direct contact with COVID-19 patients. The effect of providing service for COVID-19 patients with a definitive diagnosis was compared between the two groups of healthcare teams. Group 1 consisted of the healthcare team that provided care to hospitalized COVID-19 patients diagnosed by infectious diseases and chest disease specialists with serological and imaging methods. Group 2 consisted of a medical team working in units such as operating rooms, and polyclinics without direct contact with COVID-19 patients.

At the time of the study, 16 COVID services and 6 COVID intensive care services were active in the hospital. No sampling method was used, and all healthcare staff working in COVID-19 units and all employees who agreed to participate in the study were included. The comparison group was selected among the employees in other units with similar sociodemographic characteristics. Participants included doctors, nurses, midwives, medical secretaries, patient transfer, and patient support staff. OpenEpi version 3 statistics software, which is open for general use, was used to calculate the sample size (http://www.openepi.com). In the power analysis, the sample size was calculated as 374 with a 5% margin of error, 95% confidence interval, 0.80 power of representation, and two-way significance level. After the groups were formed, a total of 376 volunteers (213 primary and 163 secondary group employees) were included in the study following the obtaining of informed consent forms.

The research data were collected by the researcher using face-to-face interviews with hospital staff (doctor, midwife, nurse, and other healthcare personnel) in the hospital. The researchers told the participants that the data obtained would be used for scientific purposes, without using their names, and that they could leave the study at any time. The research was evaluated and approved by the Scientific Research and Editorial Ethics Board of Health Sciences of Inönü University (Decision no: 2020/1428). In addition, a COVID-19 Scientific research permit was obtained from the Ministry of Health of the Republic of Turkey (Form code: 2020-12-18T03_35_12).

Data collection tools

Personal Information Form, Jenkins Sleep Scale (JSEQ), Perceived Stress Scale (PSS), and Quality of Life Test Short Form-36 (SF-36) were used to collect data.

Personal Information Form

This form was prepared by researchers through a literature review to determine various characteristics of healthcare professionals. It includes the socio-demographic (age, gender, marital status, presence of children, education level, etc.) and professional characteristics (profession, working years, etc.) of the healthcare professionals.

Jenkins Sleep Scale (JSEQ)

The Turkish validity and reliability of the scale, developed by Jenkins to evaluate sleep problems, was conducted by Duruöz [21, 22]. This six-point Likert-type scale consists of four items assessing sleep problems within the last four weeks. Higher scores indicate increased sleep disturbance. The reliability of the scale (Cronbach's alpha) is 0.86 [22]. This value was 0.85 in our study.

Perceived Stress Scale (PSS)

Developed by Cohen et al. in 1983, this scale measures the stress perceptions regarding various events that occur in the life of the individual. The Turkish validity and reliability of the scale were conducted by Eskin et al. [23, 24]. It is a five-point Likert type consisting of 14 questions. It is rated from "never (0)" to "very often (4)". Reverse scoring is used for seven items with positively worded questions (4, 5, 6, 7, 9, 10, 13). The higher the scores obtained from the scale, the higher the perception of stress. Cronbach's alpha reliability coefficient of the scale is 0.84 [24]. In our study, the Cronbach's alpha reliability coefficient of the scale was 0.67.

Quality of Life Test Short Form-36 (SF-36)

The scale was developed by Rand (1983) to measure the quality of life of the individual. The Turkish validity and reliability of the scale were conducted by Koçyiğit et al. (1999) [25, 26]. The scale consists of 36 items and 8 subscales: Physical function (10 items), social function (2 items), physical role (4 items), emotional roles (3 items), mental health (5 items), vitality (energy) (4 items), pain (2 items) and general health (5 items). Each subscale is scored between 0 and 100, and the higher the score, the higher the quality of life. Zero points indicate poor quality of life while 100 points indicate good quality of life. In the Turkish validity and reliability study, Cronbach's alpha values of its subscales vary between 0.73-0.76 [25, 26]. In this study, the Cronbach's alpha reliability coefficient of the scale ranged between 0.67-0.84.

Statistical analysis

The data were analyzed with the Statistical Package for the Social Sciences version 25.0 for Windows software (SPSS, Chicago, IL, USA). When reporting the results, healthcare professionals were divided into two groups: Group 1 consisted of workers in direct contact with COVID-19-positive patients while Group 2 had no direct contact. The Chi-square test was used to compare the difference between the groups, and the t-test was used to compare the mean scores of the variables meeting the parametric test conditions. Binary Logistic Regression analysis was used to identify the optimal set of predictors in terms of sleep problems, stress, and quality of life of healthcare professionals who had direct contact with COVID-19 (+) patients. Significant variables in univariate analysis (P<0.05) were added to the regression model. For this purpose, both the existence of direct contact with COVID-19 patients, which was the dependent variable, and the scale scores (JSEQ, PSS, subscales of SF-36: Emotional roles, Mental health, Vitality, Pain and General health), constituting the independent variables, were added to the model. A P-value <0.05 was considered statistically significant.

Results

A comparison of sociodemographic characteristics between the groups is presented in Table 1. Females, singles, those with children, doctors, and those with a history of COVID-19 positivity had higher rates of contact with COVID-19 positive patients (P<0.05). Also, those working in contact with COVID-19 positive patients were younger and had worked for fewer years (P<0.05) (Table 1).

Table 1: Comparison of sociodemographic characteristics between the groups (n = 376)

Variables	Direct contact with COVID-19 (+) patients (n=213)		No direct contact with COVID-19 (+) patients (n=163)		Total (n=376)		Test and P-value
Age (y), Mean (SD)	35.02(7.54)		38.73(8.77)		36.63(8.29)		t=4.306 P<0.001
Years in profession Mean (SD)	12.01(7.83)		14.82(8.98)		13.24(8.46)		t=-3.194 P=0.002
	n	%	n	%	n	%	
Gender							
Female	157	60.9	101	39.1	258	68.6	χ^2=5.916
Male	56	47.5	62	52.5	118	31.4	P=0.015
Educational level							
High school	25	53.2	22	46.8	47	12.5	χ^2=0.261
University and upper	188	57.1	141	42.9	329	87.5	P=0.609
Marital status							
Married	129	49.8	130	50.2	259	68.9	χ^2=15.866
Single	84	71.8	33	28.2	117	31.1	P<0.001
Presence of children							
Yes	80	65.6	42	34.4	254	67.6	χ^2=5.858
No	133	52.4	121	47.6	122	32.4	P=0.016
Profession							
Doctor	30	76.9	9	23.1	39	10.7	χ^2=30.858
Midwife	32	55.2	26	44.8	58	15.9	P<0.001
Nurse	113	67.3	55	32.7	168	46.2	
Other healthcare professionals	36	36.4	63	63.6	99	27.2	
History of COVID-19 (+)	82	70.1	35	29.9	117	31.1	χ^2=12.487
Yes	131	50.6	128	49.4	259	68.9	P<0.001
No							

Comparison of the inter-group JSEQ, PSS, and SF-36 scale averages are presented in Table 2. The mean JSEQ and PSS scores were significantly higher among workers in direct contact with COVID-19 positive patients (P<0.05). This finding suggests that Group 1 has more sleep problems compared to Group 2, and their stress levels are higher. Among those who work in direct contact with COVID-19 positive patients, while the emotional wellbeing, vitality (energy), mental health levels were lower, the mean scores of the sub-dimensions of pain and general health perception were higher (P<0.05). SF-36 physical function, physical role, and social function sub-dimensions mean scores were insignificantly higher in Group 1 (P>0.05) (Table 2). Logistic regression analysis showed increased stress (OR: 1.045) and pain (OR: 1.018) among employees who had direct contact with COVID-19 positive patients (Table 3).

Table 2: Comparison of JSEQ, PSS and SF-36 scales mean scores between the groups (n=376)

Variables	Direct contact with COVID-19 (+) patients (n=213)	No direct contact with COVID-19 (+) patients (n=163)	Test[a]	*P*-value
JSEQ	13.76(5.04)	12.36(5.49)	2.563	0.001
PSS	31.11(5.88)	29.78(6.04)	2.141	0.033
SF-36				
Physical Function	65.09(24.45)	68.58(22.54)	-1.420	1.156
Physical Role	27.58(33.01)	32.82(34.75)	-1.491	0.137
Emotional Role	30.82(29.21)	37.64(32.09)	-2.120	0.035
Vitality (energy)	54.95(11.02)	57.63(3.42)	-2.378	0.018
Mental Health	45.24(13.83)	49.30(12.97)	-2.891	0.004
Social Function	46.95(24.40)	50.83(23.55)	-1.549	0.122
Pain	56.20(26.30)	50.39(28.12)	2.060	0.040
General Health	40.57(14.66)	44.67(14.22)	-2.726	0.007

JSEQ: Jenkins Sleep Scale, PSS: Perceived Stress Scale, [a] Independent samples t-test

Table 3: Binary Logistic Regression analysis for predictors of sleep problems, stress, and quality of life among healthcare professionals in direct contact with COVID-19 (+) patients

Predictors	B	*P*-value	OR	95% CI	
				Lower	Upper
JSEQ	0.043	0.068	1.044	0.997	1.094
PSS	0.044	0.023	1.045	1.006	1.085
Emotional Role	-0.004	0.264	0.996	0.989	1.003
Vitality(energy)	-0.020	0.066	0.981	0.960	1.001
Mental Health	-0.021	0.050	0.979	0.961	0.998
Pain	0.017	<0.001	1.018	1.008	1.027
General Health	-0.014	0.110	0.986	0.970	1.003

JSEQ: Jenkins Sleep Scale, PSS: Perceived Stress Scale, B: Regression Coefficient; OR: Odds Ratio; CI: Confidence Interval. Dependent variable in the model: whether direct contact with COVID-19 patients. Independent variables in the model: JSEQ, PSS, subscales of SF-36: Emotional roles, Mental health, Vitality, Pain and General health

Discussion

The COVID-19 disease, declared as a pandemic as of March 2020, has vitally affected people physically and psychologically. Medical personnel are at the top of the occupational groups affected by the pandemic. Our study aims to determine the quality of sleep, perceived stress levels, and quality of life of health professionals who have direct contact with patients diagnosed with COVID-19.

COVID-19 has infected millions of people around the world and continues to be transmitted. This disease causes not only physical damage to humans but also negatively affects the quality of sleep, hindering their psychological health [8-27]. In this study, it was found that health workers in direct contact with COVID-19 positive patients had more sleep problems. In a meta-analysis, the quality of sleep of medical personnel in contact with COVID-19 patients was 2.57 times worse than medical personnel without contact. In another study, 67.2% of those who provided care for COVID-19 positive patients and 47.7% of those who did not had poor sleep quality [27]. Wang et al. found that 38.0% of health workers had poor sleep quality and 7.0% were anxious [28]. The results of the previously conducted studies resemble our results.

In pandemics, the workload of health care systems and the stress of healthcare professionals increase markedly [29]. In our study, the stress levels of healthcare workers in direct contact with COVID-19 positive were higher, and the perceived stress was 1.045 times more compared to those working without direct contact with COVID-19 positive patients. In a study conducted with healthcare professionals, 18.9% of the personnel had elevated stress symptoms. In another study examining the workload of 180 nurses working in the clinic during the pandemic, participants reported high levels of stress [30]. Another study reported that anxiety and depression scores were significantly higher among health workers providing care for patients with COVID-19 with 3 hours of contact and over [31]. In line with these results, it can be said that COVID clinics have more stressful working conditions than other units.

We found that healthcare workers who have direct contact with COVID-19 positive patients have poorer emotional wellbeing, energy-vitality, and mental health statuses, and higher levels of pain and general health perception. In a study by Stojanov et al. conducted on 201 healthcare professionals, the effects of working with COVID-19 positive patients on the quality of life, symptoms of depression, and anxiety levels were examined. Working with COVID-19 positive patients caused elevated levels of anxiety and depression among healthcare workers, and their quality of sleep and life were negatively affected. In the same study, it was stated that healthcare workers working with COVID-19 positive patients were afraid of infecting their family members; therefore, their general health and social function levels were lower, and they had lower emotional and mental scores. This above-mentioned study with 201 healthcare workers supports our findings [32]. In our study, there was no significant difference between physical function, physical role, and social functionality sub-dimension scores between groups. This may be due to different characteristics such as COVID-19 transmission status and contact time.

In our study, females, bachelors, those with children, doctors, and those with a positive history of COVID-19 had higher rates of working in contact with COVID-19 positive patients, and those in contact with COVID-19 positive patients were younger and had worked for fewer years. In their study on 2457 health workers in Wuhan, China, Zheng et al. determined that 72% of the employees were females, and 33.6% were doctors. In the same study, 64.8% of the married workers had children. These results are similar to our findings [33].

Limitations

This study had some limitations. First, this is a cross-sectional study, which makes it difficult to determine the exposure and outcome relationships between the variables examined and the results. Also, prior knowledge of the situation may affect the determination of exposure or outcome, leading to recall bias. Non-response is a specific problem affecting cross-sectional studies and may cause bias in outcome measures. This is a particular problem when the characteristics of the non-responders differ from those of the respondents. Because the pandemic is ongoing, a control group could not be formed, and the sleep quality, perceived stress level, and quality of life of the healthcare personnel were not evaluated outside the pandemic conditions. Lastly, the results cannot be generalized since the study was completed in a single center. In later studies, a broader sample group may be covered for more accurate results.

Conclusion

Our study revealed an important aspect of the psychology of healthcare professionals during the COVID-19 pandemic. These psychological problems not only affect health workers' attention, understanding, and decision-making ability but also hinder the fight against COVID-19. It was determined that hospital employees who had contact with COVID-19 had more sleep problems, their perceived stress was higher, and their quality of life was lower. Since this threatens the current and future lives of healthcare workers, better personalized care and support should be provided to healthcare workers during and after the pandemic.

In summary, the pandemic has led to psychological problems among healthcare workers. For this reason, support programs for healthcare workers, including psychotherapy options, need to be implemented quickly.

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References

1. World Health Organization. World Health Organization coronavirus disease (COVID-19) dashboard. 2020.
2. Bhaumik S, Moola S, Tyagi J, Nambiar D, Kakoti M. Community health workers for pandemic response: a rapid evidence synthesis. BMJ Glob Health. 2020;5(6):e002769. doi: 10.1136/bmjgh-2020-002769.
3. Styra R, Hawryluck L, Robinson S, Kasapinovic S, Fones C, Gold WL. Impact on health care workers employed in high-risk areas during the Toronto SARS outbreak. J Psychosom Res. 2008;64(2):177-83. doi: 10.1016/j.jpsychores.2007.07.015.
4. Fessell D, Cherniss C. Coronavirus Disease 2019 (COVID-19) and Beyond: Micropractices for Burnout Prevention and Emotional Wellness. J Am Coll Radiol. 2020;17(6):746-8. doi: 10.1016/j.jacr.2020.03.013. Epub 2020 Mar 24. PMID: 32208139; PMCID: PMC7146659.
5. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. JAMA. 2020;323(11):1061-9. doi: 10.1001/jama.2020.1585.
6. Hartmann S, Rubin Z, Sato H, OYong K, Terashita D, Balter S. Coronavirus 2019 (COVID-19) Infections Among Healthcare Workers, Los Angeles County, February - May 2020. Clin Infect Dis. 2020;17:ciaa1200. doi: 10.1093/cid/ciaa1200.
7. Zheng L, Wang X, Zhou C, Liu Q, Li S, Sun Q, et al. Analysis of the Infection Status of Healthcare Workers in Wuhan During the COVID-19 Outbreak: A Cross-sectional Study. Clin Infect Dis. 2020;71(16):2109-13. doi: 10.1093/cid/ciaa588.
8. Pala SÇ, Metintas S. COVID-19 pandemisinde sağlık çalışanları. ESTÜDAM Halk Sağlığı Dergisi. 2020;5:175-87. doi: 10.35232/estudamhsd.789806
9. Tönbül Ö. Koronavirüs (Covid-19) salgını sonrası 20-60 yaş arası bireylerin psikolojik dayanıklılıklarının bazı değişkenler açısından incelenmesi. Humanistic Perspective. 2020;2:159-74.
10. Birinci M, Bulut T. Covıd-19'un sosyo-ekonomik yönden dezavantajlı gruplar üzerindeki etkileri: sosyal hizmet bakış açısından bir değerlendirme. Sosyal Çalışma Dergisi. 2020;4:62-8.
11. Göksu Ö, Kumcağız H. Covid-19 salgınında bireylerde algılanan stres düzeyi ve kaygı düzeyleri. Electronic Turkish Studies. 2020;15.
12. Kırlı U, Binbay T, Elbi H, Alptekin K. COVID-19 pandemisi ve psikotik belirtiler. Klinik Psikiyatri Dergisi. 2020;23. doi: 10.5505/kpd.2020.27122
13. Kaçmaz N. Tükenmişlik sendromu. İst Tıp Fak Derg. 2005;68:29-32.
14. French SE, Lenton R, Walters V, Eyles J. An empirical evaluation of an expanded Nursing Stress Scale. J Nurs Meas. 2000;8(2):161-78.
15. Maslach C, Schaufeli WB, Leiter MP. Job burnout. Annu Rev Psychol. 2001;52:397-422. doi: 10.1146/annurev.psych.52.1.397.
16. Collins S, Long A. Working with the psychological effects of trauma: consequences for mental health-care workers--a literature review. J Psychiatr Ment Health Nurs. 2003;10(4):417-24. doi: 10.1046/j.1365-2850.2003.00620.x.
17. Sabin-Farrell R, Turpin G. Vicarious traumatization: implications for the mental health of health workers? Clin Psychol Rev. 2003;23(3):449-80. doi:10.1016/s0272-7358(03)00030-8.
18. Cullen A. Burnout. Why do we blame the nurse? Am J Nurs. 1995;95(11):23-8.
19. Kang L, Li Y, Hu S, Chen M, Yang C, Yang BX, et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. Lancet Psychiatry. 2020;7(3):e14. doi: 10.1016/S2215-0366(20)30047-X.
20. Asmundson GJG, Taylor S. Coronaphobia: Fear and the 2019-nCoV outbreak. J Anxiety Disord. 2020;70:102196. doi: 10.1016/j.janxdis.2020.102196.
21. Jenkins CD, Stanton BA, Niemcryk SJ, Rose RM. A scale for the estimation of sleep problems in clinical research. J Clin Epidemiol. 1988;41(4):313-21. doi: 10.1016/0895-4356(88)90138-2.
22. Duruöz MT, Erdem D, Gencer K, Ulutatar F, Baklacıoğlu HŞ. Validity and reliability of the Turkish version of the Jenkins Sleep Scale in psoriatic arthritis. Rheumatol Int. 2018;38(2):261-5. doi: 10.1007/s00296-017-3911-2.
23. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav. 1983;24(4):385-96.
24. Eskin M, Harlak H, Demirkıran F, et al. Algılanan stres ölçeğinin Türkçeye uyarlanması: güvenirlik ve geçerlik analizi. In New/Yeni Symposium Journal. 2013;51:132-40.
25. Stewart AL, Hays RD, Ware JE Jr. The MOS short-form general health survey. Reliability and validity in a patient population. Med Care. 1988;26(7):724-35. doi: 10.1097/00005650-198807000-00007.
26. Koçyiğit H, Aydemir Ö, Ölmez N, et al. SF-36'nın Türkçe için güvenilirliği ve geçerliliği. İlaç ve Tedavi Dergisi. 1999;12:102-6.
27. Qi J, Xu J, Li BZ, Huang JS, Yang Y, Zhang ZT, et al. The evaluation of sleep disturbances for Chinese frontline medical workers under the outbreak of COVID-19. Sleep Med. 2020;72:1-4. doi: 10.1016/j.sleep.2020.05.023.
28. Wang S, Xie L, Xu Y, Yu S, Yao B, Xiang D. Sleep disturbances among medical workers during the outbreak of COVID-2019. Occup Med (Lond). 2020;70(5):364-9. doi: 10.1093/occmed/kqaa074.
29. Enli Tuncay F, Koyuncu E, Özel Ş. Pandemilerde sağlık çalışanlarının psikososyal sağlığını etkileyen koruyucu ve risk faktörlerine ilişkin bir derleme. Ankara Medical Journal. 2020;20:488-504. doi: 10.5505/amj.2020.02418.
30. Mo Y, Deng L, Zhang L, Lang Q, Pang H, Liao C, et al. Anxiety of Nurses to support Wuhan in fighting against COVID-19 Epidemic and its Correlation With Work Stress and Self-efficacy. J Clin Nurs. 2021;30(3-4):397-405. doi: 10.1111/jocn.15549.
31. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. Psychiatry Res. 2020;288:112954. doi: 10.1016/j.psychres.2020.112954.
32. Stojanov J, Malobabic M, Stanojevic G, Stevic M, Milosevic V, Stojanov A. Quality of sleep and health-related quality of life among health care professionals treating patients with coronavirus disease-19. Int J Soc Psychiatry. 2020;16:20764020942800. doi: 10.1177/0020764020942800.
33. Zhang R, Hou T, Kong X, Wang G, Wang H, Xu S, et al. Effects of region, epidemic stage, and demographic characteristics on sleep quality and mental disturbances among health care workers during COVID-19 outbreak. Europe PMC. 2020. doi: 10.21203/rs.3.rs-23260/v1.

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