Original Article

Identification of Nurses' Stress Levels Experienced Due to the COVID-19 Pandemic: A Sample of a City Hospital in Turkey

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Abstract

Background: The COVID-19 pandemic has caused an unprecedented crisis at a global level. All people now know that nothing in the world will be the same again.
Aim: The purpose of this study is to identify nurses' stress levels experienced due to the COVID-19 pandemic.
Methods: This descriptive study was conducted with 662 volunteer nurses working in a city hospital. Data were collected through the Socio-demographic Form and the Perceived Stress Scale (PSS-14). Data were analyzed using numbers, percentages, means, Kruskal Wallis, Mann Whitney U, and Spearman Correlation analyses.
Results: Of all the participating nurses, 61.8% found the pandemic management of the hospital adequate, and 63.4% did not experience problems with protective equipment. The nurses' perceived stress level mean score was found 31.07±7.78. Significant differences were found between nurses' perceived stress mean scores according to the variables such as gender, age, working unit, duration of working, finding the pandemic management of the hospital adequate, and experiencing problems with protective equipment.
Conclusions: The nurses' perceived stress level was found to be above-average. Their stress levels were found to have been affected by some variables due to the pandemic. Nurses could be recommended to use coping strategies in this period. Nurses should be recommended to apply coping methods to maintain the optimum health conditions and to reduce or prevent stress in the unit they are working and to recognize the negative effects of job-related stress on health.

Key words: Nurse, COVID-19, stress level

Introduction

The COVID-19 pandemic, which has become the biggest global problem in recent years, has been causing more and more severe consequences every day. In this process, nurses compromise the biggest global health workforce (Ziff & Ziff, 2020, World Health Organization, 2020). Health workers who contact with and/or take care of COVID-19 patients are at the risk of infections, which inevitably puts health workers under high risks. Health workers play a critical role not only in the clinical management of patients but also in the application of adequate infection and prevention control measures in health institutions. The identification of the potential risk factors for SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus) infection among health workers is necessary for evaluating the potential risk factors, characterizing the transmission pattern of the virus, preventing future infections among health workers, and preventing the healthcare-associated infection with SARS-CoV-2 (WHO Protocol 2020). The SARS-CoV-2 infection is known to transmit to health workers through respiratory drops, bodily fluids, and contaminated surfaces. During the SARS-CoV-2 epidemic, health workers constituted 21% of the cases (WHO Case-Control Protocol-2020), which causes stress among health workers, especially nurses.

The COVID-19 pandemic has caused an unprecedented crisis at a global level. All people now know that nothing in the world will be the same again. This process, which causes all individuals, societies, and countries to have a deep shock and experience multidimensional effects, is also a lesson for humanity. It has also brought many problems to humanity (Palandoken 2020). During the care and treatment provided to patients with COVID-19, nurses have the potential to be

directly or indirectly exposed to patients or contaminated materials (contaminated medical materials, devices, and equipment). They also have important responsibilities in decreasing/preventing the spread and contamination to patients within the hospital. The most important step to be taken by nurses in the clinical management of the disease and prevention of infection is breaking the chain of infection via sufficient knowledge level and accurate practices. To do this, nurses should be knowledgeable about how COVID-19 is transmitted, who is at risk, what the clinical symptoms and findings are, how the diagnosis is made, and how the treatment is administered, and they should plan and apply the clinical management well (Demirag and Hindistan 2020). A questionnaire administered to clinic workers showed that 55% of clinicians potentially had a four-fifth or five-fifth stress level. Of all the clinicians, 33% reported that their stress level during the questionnaire was worse than the first month of the COVID-19 pandemic, 43% reported to have the same difficulties in the clinics, but they also reported to adapt to or improve this situation. In addition to the stress indicated for the practices, the participants stated that stress increased among patients, and 80% of the participants stated that the patients carried a heavier than usual mental health burden (Primary Care Collaborative. Primarycare & COVID-19: Week 17 survey2020).

Health workers' allocating extra time for protecting both patients and themselves due to the pandemic could cause stress. Before the pandemic, various studies conducted with health workers and nurses working in different countries utilized various stress scales and reported high or moderate levels of stress (Erşan et al. 2013; Asefzadeh et al. 2017, Jaracz et al. 2017, Chatzigianni et al., 2018;Rakhshani et al. 2018;Ebstein et al., 2019, Davey et al., 2019). Nurses experiencing stress in the normal process could experience more intense stress due to the pandemic.

The purpose of this study is to identify nurses' stress levels experienced due to the COVID-19 pandemic.

Materials and methods - Study design

The target population of this descriptive study was nurses working in X Hospital. No sampling was utilized, the study included 662 nurses who agreed to participate in the study between June and July 2020. Data were collected through the Socio-demographic Form and the Perceived Stress Scale (PSS-14).

The Socio-demographic Form: This form included questions that aimed to collect data about nurses' pandemic-related status as well as characteristics such as age, gender, education level, etc.

The Perceived Stress Scale (PSS-14): The 14-item scale was developed by Cohen et al. (1983) and it aims to measure how individuals evaluate stressful life experiences within the past month as unpredictable, uncontrollable, and difficult to cope with. The items in the scale are rated on a 5-point Likert scale scored between "0=never", "4=almost always". The scale was found to have a two-factor structure, but they were not named; the scores ranged between 0 and 56. Higher scores indicate higher perceived stress. The internal consistency coefficient of the scale developed by Cohen et al., (1983) was found between .75 and .86. Eskin et al. (2013) adapted the scale to Turkish. The analyses showed that the scale consisted of a two-factor structure as "inadequate self-efficacy and perception of stress/discomfort. The reliability values of the two factors were found as .69 and .80. The total internal consistency coefficient of the scale was calculated as .84 (Eskin et al., 2013). This study found the internal consistency coefficient as .86.

Data Collection: This study collected data between June and July 2020 through the Socio-demographic Form and the Perceived Stress Scale (PSS-14) sent via Google Forms using a self-report questionnaire. Responses were received from 662 nurses who agreed to participate in the study.

Data Analysis: Data were analyzed in SPSS 21 package programming on the computer. Descriptive statistics included numbers, percentages, and means. Normality distribution of the data was analyzed using the normality (Shapiro-Wilk) test, which indicated that the variables did not demonstrate normal distribution. Data were analyzed using the Mann Whitney U, Kruskal Wallis, and Spearman correlation analysis tests. Statistical significance was taken $p < 0.05$

Ethical Considerations: Ethics committee approval was obtained from X Human Research Ethics Committee (30/04/2020- Protocol No:04/08), and written approval was obtained from the institution where the study was conducted. The nurses were informed about the purposes and benefits of the study through the Google forms, and their consent was received.

Results

The demographic characteristics of the participating nurses are demonstrated in Table 1. The average age of the nurses was 32.00±8.23, and it was found that 78.5% of the participants were females, 54.4% were married, 65.3% had an undergraduate degree, 42.0% worked for 0 to 5 years, and 26.2 % worked in the pandemic clinic. Of all the participating nurses, 61.8% found the pandemic management of the hospital adequate, and 63.4% did not have problems with protective equipment (Table 1). The participating nurses' Perceived Stress Scale mean score was found 31.07±7.78.

Significant differences were found between nurses' perceived stress mean scores and variables such as gender, working unit, duration of working, finding the pandemic management of the hospital adequate, and experiencing problems with protective equipment. A negative, significant relationship was found between nurses' age and stress levels (Table 2).

The difference between the participating nurses' perceived stress mean scores according to their marital status and educational level was not significant (Table 2).

Table 1. Distribution of the demographic characteristics of the nurses (n=662)

Demographic Characteristics		n	%
Gender	Female	520	78.5
	Male	142	21.5
Marital Status	Married	360	54.4
	Single	302	45.6
Education Level	High School	113	17.0
	Associate degree	104	15.7
	Undergraduate	432	65.3
	Postgraduate	13	2.0
Working unit	Internal diseases	149	22.5
	Surgery	91	13.7
	Emergency-intensive care-operating room	249	37.6
	Pandemic clinic	173	26.2
Finding the pandemic management of the hospital adequate	Yes	409	61.8
	No	253	38.2
Having problems with protective equipment	Yes	242	36.6
	No	420	63.4
Perceived Stress Scale mean score	31.07±7.78		
Age (Ort:32.00±8.23) Min:18 Max:57			
Duration of working (year)	0-5 years	278	42.0
	6-10 years	119	18.0
	11-15 years	84	12.6
	16-20 years	70	10.6
	21 years and over	111	16.8

Table 2. Comparison of the nurses' perceived stress scale mean scores according to their demographic characteristics (n=662)

Descriptive Characteristics		**n**	**Ort.**	**SS.**	**Test and significance**
Gender	Female	520	31.74	7.64	U=28951.000 **p=0.000**
	Male	142	28.61	7.84	
Marital status	Married	360	30.98	7.58	U=53129.000 p=0.615
	Single	302	31.18	8.03	
Education Level	High school	113	31.15	8.14	KW=1.060 p=0.787
	Associate degree	104	31.81	8.13	
	undergraduate	432	30.92	7.61	
	Postgraduate	13	29.38	7.95	
Working unit	Internal diseases	149	28.99	7.34	KW=62.291 **p=0.000**
	Surgery	91	30.23	7.67	
	Emergency-intensive care-operating room	249	29.88	7.10	
	Pandemic clinic	173	35.02	7.80	
Working Duration (Year)	0-5 years	278	31.12	8.00	KW=13.540 **p=0.009**
	6-10 years	119	33.05	7.40	
	11-15 years	84	31.10	7.95	
	16-20 years	70	30.00	7.26	
	21 years and above	111	29.49	7.47	
Finding the hospital's pandemic management adequate	Yes	409	30.00	8.11	U=39976.500 **p=0.000**
	No	253	32.79	6.91	
Having problems with protective equipment	Yes	242	32.76	7.18	U=40626.000 **P=0.000**
	No	420	30.10	7.96	
Age (Ort:32.00±8.23) r=-0.111 **p=0.004**					

Discussion

Nurses are undermore intense stress due to the COVID-19 pandemic. This study found nurses' stress levels as above-average. A study conducted with health workers in Turkey reported that the work stress of health workers was high (Ersan et al. 2013). A study conducted with nurses in Greece reported that the nurses had a moderate level of total stress mean score (Chatzigianni et al. 2018). Another study conducted by Rakhshani et al. (2018) showed that nurses experienced a moderate-level stress. A study conducted with nurses in China reported that stress was the most important risk factor (Yao et al. 2018). A study conducted with nurses in Iran showed that 75% of the nurses experienced moderate and high levels of stress (Asefzadeh et al. 2017). A cross-sectional study that aimed to identify job-related stress among nurses working in a public hospital in the Jimma region of Southwest Ethiopia reported the overall job-related stress level as 58.46 ± 12.62. The study also reported that the job-related general stress level was high in one-third of nurses (Dagget et al.2016). In the study entitled risk perceptions and stress assessment in nurses, Middle East Respiratory Syndrome Coronavirus (MERS-CoV) epidemic was reported to cause a relatively important problem among nurses. A significant difference was reported in the worry and fear scale of contracting the MERS-CoV infection between the participants who worked in the areas with high admission probability compared to the participants who had MERS-CoV suspected or positive cases (Bukhari et al. 2016).

The study conducted in Dammam, located in the eastern part of Saudi Arabia, with a view to identifying the indicators of job-related stress among nurses working in primary and secondary healthcare services reported the general prevalence of job-related stress among all nurses as 45,5% (Al-Makhaita et al. 2014). Another study also reported low (12%) and moderate/severe (77%) job-related stress levels (Davey et al. 2019). More than half of the frontline health workers were found to have severe psychological effects due to the COVID-19 pandemic. Nurses were found to have significantly higher stress levels than doctors (Khanam et al. 2020). The results of this study are in line with these study results in the literature. The pandemic has put both nurses and other health workers in a difficult process, which increases nurses' stress levels. This result might have been caused by the fact that the first cases were seen in our country after the World Health Organization declared the COVID-19 process as a pandemic, and the health workers had taken some precautions for this process beforehand.

While female nurses' perceived stress mean scores were found to be higher, it was found that their marital status did not have effects on stress perceptions. A study conducted with health workers in Turkey reported the job stress mean scores higher in women. It was found that marital status did not cause job stress (Erşan et al. 2013).A study conducted with nurses in Greece reported that gender did not affect nurses' stress and a series of positive relationships existed between marital status and various stress factors (Chatzigianni et al. 2018). Another study reported a significant difference between nurses' marital status and stress but found that the difference between gender and stress was not significant (Tran et al. 2019). The difference in the stress level was not significant according to gender and marital status in the study conducted by Davey et al. (2019). These study results demonstrate similarities and differences between the findings of this study. The higher number of female participants and closer numbers of married and single participants could have effects on these results. Besides, since married individuals and women have higher contacts with dependent individuals, their stress levels could have been reported higher.

The education level of the participating nurses was found to have no effects on their perceived stress. A study conducted with health workers in Turkey reported that the job-related stress score of health workers with a postgraduate degree was significantly lower compared to the other three groups (Ersan et al. 2013). Similar to the results of the present study, various studies conducted with nurses reported that the difference between the education level and stress level was not significant (Tran et al. 2019; Rakhshani et al. 2018; Koand Kiser-Larson 2016).

The pandemic is perceived as a source of stress for all individuals. The working unit and duration of working were found to affect nurses' perceived stress. The perceived stress level of the nurses working in the pandemic clinic was found to be higher. A series of positive relationships were reported between the nurses' area of specialization and various stress factors (Chatzigianniet al., 2018). In another study, the difference between years of working, working position. (headnurse, department nurse, supervisor, etc.) and job stress was not significant (Rakhshani et al., 2018). A significant difference was also reported between the years of working in the hospital and stress, and the difference between the working unit and stress was not significant (Tran et al., 2019). General job-related stress could change depending on the working unit. The negative predictors of job-related stress were found as working in a chronic disease follow-up clinic, mutual understanding between the nurse and the doctor in the work environment, and job satisfaction. While the job-related stress was the lowest among nurses working in the polyclinic, it was found to be higher among nurses working in chronic disease follow-up clinics (Dagget et al., 2016). The study conducted in Dammam, located in Eastern Saudi Arabia, investigated job-related stress among nurses working in primary and secondary healthcare levels and found that working in a surgery unit was among the important predictors of job-related stress (Al-Makhaita et al., 2014). The working unit was reported to affect the stress level in the study conducted by Davey et al., (2019) as well. A study conducted during the pandemic reported that the psychological effect among health workers was mainly related to the place of working (Khanam et al., 2020). A study conducted in Turkey reported that the duration of working did not have effects on job-related stress (Erşan et al., 2013). The unit and duration of working demonstrate both similarities and differences with the findings of studies in the literature. Working in a pandemic clinic increases the level of stress significantly.

The participating nurses' perceived stress was found to be affected by the variables such as finding the pandemic management sufficient and having problems with protective equipment. In this process, which makes us once more realize the high importance of health personnel, power of medical equipment, production of health materials, test analyses, bed capacity, and intensive care facilities, the knowledge obtained and experiences gained will inevitably become a guide for similar situations in the future. Frontline health workers fighting with the pandemic have demonstrated outstanding performance at the cost of catching the disease. This devoted work performance has been highly appreciated in all segments of society. Minister of Health, after his speech in the Turkish Grand National Assembly, invited the members of the parliament and all citizens to applaud the health workers (Koca 2020).The citizens across the country applauded health workers from their windows and balconies at 9 pm every day to pay respect. This behavior, which could make history, played a very important role in increasing the morale and motivation of health workers (Ince and Evcil 2020). These kinds of struggles done for health workers could have effects in decreasing their stress levels.

The perceived stress level of the nurses was found to decrease with the increase in their age. A study reported statistically significant relationships between age and both total stress and all separate stress factors. (Chatzigianni et al. 2018). A study conducted with nurses working in the oncology polyclinic reported a significant, positive relationship between the age variable and job-related stress scores (KoandKiser-Larson 2016). Several studies also reported that age did not affect the level of stress (Ersan et al., 2013; Dagget et al., 2016; Davey et al., 2019; Tran et al., 2019). This study found that age had effects on stress. As work experience increases with age, coping methods are used more effectively.

Conclusion and Recommendations: This study, which was conducted during the pandemic, found nurses' perceived stress levels as above-average. The perceived stress levels were found to have been affected by the variables of gender, age, working unit, duration of working, finding the pandemic management of the hospital adequate, and having problems with protective equipment. In line with these results, nurses should be recommended to apply coping methods to maintain the optimum health conditions and to reduce or prevent stress in the unit they are working and to recognize the negative effects of job-related stress on health.

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References

Al-Makhaita. H.M., Sabra. A.A., Hafez A.S.,(2014). Predictors of work-related stress among nurses working in primary and secondary health carelevels in Dammam Eastern Saudi Arabia. J FamCommunityMed, 21:79-84.

Asefzadeh. S., Kalhor. R., Tir M., (2017). Patient safety culture and job stress among nurses in Mazandaran. (Iran). Electronic Physician (ISSN: 2008-5842). 9: 12. Pages: 6010-6016. doi: http://dx.doi.org/10.19082/6010.

Bukhari. E.E., Temsah. M.H., Aleyadhy A.A., Alrabiaa A.A., Alhboob. A.A., Jamal. A.A, Binsaeed. A.A., (2016). Middle East respiratory syndrome coronavirus (MERS-CoV) outbreak perceptions of risk and stress evaluation in nurses. J Infect Dev Ctries. 10(8):845-850. doi:10.3855/jidc.6925.

Chatzigianni.D., Tsounis. A., Markopoulos. N., Sarafis. P., (2018). Occupational stress experienced by nurses working in a Greek Regional Hospital:Across sectional study. Iranian J Nursing Midwifery Res. 23:450-7.

Dagget. T., Molla. A., Belachew. T., (2016). Job related stress among nurses working in Jimma Zone public hospitals. South West Ethiopia: a cross sectional study. BMC Nursing. 15:39.

Davey. A., Sharma. P., Davey. S., Shukla. A., (2019). Is work-associated stress convertedinto psychological distress among the staff nurses: A hospital-basedstudy. J FamilyMed Prim Care. 8:511-6.

Demirag. H., Hindistan. S., (2020). Clinical Management and Nursing of COVID-19. Gumushane University Journal of Health Sciences. 9(2): 222 – 231.

Ersan. E.E., Yildirim. G., Dogan. O., Dogan. S., (2013). Job satisfaction and perceived job stress of the health professionals and the relationship between them. Anatolian Journal of Psychiatry. 14:115-21. (in Turkish).

Eskin. M., Harlak. H., Demirkiran. F., Dereboy. C., (2013). The Adaptation of the Perceived Stress Scale Into Turkish:A Reliability and Validity Analysis New/Yeni Symposium Journal www.yenisymposium.net. 51;3:132-140.

Ince. F., Evcil. F.Y., (2020). (2020). The First Three Weeks of Covid-19 in Turkey. Journal of Suleyman Demirel University Institute of Health Sciences 11(2): 236-241.

Jaracz. M., Rosiak. I., Bertrand-Bucińska. A., Jaskulski. M., Nieżurawska. J., Borkowska. A.,

(2017). Affective temperament, jobstressand professional burnout in nurses and civil servants. Plos one 12:6. e0176698. doi: https://doi.org/10.1371/journal. pone.0176698.

Khanam. A., Dar S.A., Wani. Z.A., Shah. N.N., Haq. I., Kousar. S., (2020) . Health care providers on the front line: A quantitative investigation of the stress and recentonset psychological impact of delivering health care services during COVID-19 in Kashmir. (Indian). J Psychol Med. 42:1–9.

Koca. F., (2020). Let's applaud! how much we can applaud! In my speech at the Parliament at 14:00 today, I invited the representatives of my nation to applaud our devoted health workers. Now, at exactly 21.00, I invite our nation to raise this voice of applause from balconies across Turkey. [Internet]. March 19. [Accessed on April 5, 2020]; Access address: https://twitter.com/drfahrettinkoca/ status/1240699520691757056.

Mazzella. Ebstein. A.M., Sanzero. Eller. L., Tan. K.S., Cherniss. C., Ruggiero. J.S., Cimiotti. J.P., (2019). The relationships between coping, occupational stress, and emotional intelligence in newly hired oncology nurses. Psycho-Oncology. 28:278–283 doi: .https://doi.org/10.1002/pon.4937.

Palandoken. E.A., (2020). The COVID-19 Pandemic and Ethical Issues for Nurses. (COVID-19 Pandemia and Ethical Problems for Nurses). Journal of Izmir Katip Celebi University Faculty of Health Sciences. 5(2): 139-142.

Primary Care Collaborative., (2020). Primary care & COVID-19: Week 17 survey. https://www.healio.com/news/primary-care/20200807/stress-remains-high-among-primary-care-practices-amid-covid19-pandemic?utm_source=selligent&utm_medium=email&utm_campaign=news&m_bt=314445515065

Rakhshani. T., Motlagh. Z., Beigi. V., Rahimkhanli. M., Rashki. M., (2018).The relationship between emotional intelligence and job stress among nurses in Shiraz, (Iran). Malays J MedSci. 25(6):100–109.

Tran. T.T.T., Nguyen. N.B., Luong. M.A, Bui. T.H.A., Phan .T.D, Tran. V.O, N.g.o. TH., Minas. H., Nguyen. T.Q., (2019). Stress, anxietyanddepression in clinicalnurses in Vietnam: a cross-sectional survey and cluster analysis. Tran*et* al. Int J MentHealthSyst. 13:3.doi: https://doi.org/10.1186/s13033-018-0257-4.

Yao. Y., Zhao. S., Gao. X., An. Z., Wang. S., Li. H., Li. Y., Gao. L., Lu. L., Dong. Z., (2018). General self-efficacy modifies the effect of stress on burn out in nurses with different personality types. BMC Health Services Research.18:667. doi: https://doi.org/10.1186/s12913-018-3478-y.

Ziff. AL., Ziff. R.M., (2020). Fractal kinetics of COVID-19 pandemic (with update 3/1/20). MedRxiv, doi: https://doi.org/10.1101/2020.02.16.20023820.

World Health Organization., (2020). State of the World's Nursing 2020: Investing in Education, Jobsand Leadership (Geneva: WHO, 2020). Retrieved May 19, 2020, from https://www.who.int/publicationsdetail/nursing-report-2020.