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THE RELATIONSHIP BETWEEN OCCUPATIONAL FATIGUE AND PERCEIVED STRESS LEVEL AMONG NURSES DURING THE COVID-19 PANDEMIC: A CROSS-SECTIONAL STUDY FROM TURKEY

COVID-19 PANDEMİSİ SIRASINDA HEMŞİRELERDE MESLEKİ YORGUNLUK VE ALGILANAN STRES DÜZEYİ ARASINDAKİ İLİŞKİ: TÜRKİYE'DEN KESİTSEL BİR ÇALIŞMA

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ABSTRACT

Objective: The coronavirus disease (COVID 19) is a significant problem that affects occupational fatigue and stress level of nurses working at the forefront of the pandemic. The purpose of this study is to determine the relationship between occupational fatigue and perceived stress level among nurses during the COVID-19 pandemic.

Method: This cross-sectional study was conducted on 1441 nurses between May 23 and June 7, 2020 using online questionnaire in Turkey.

Results: Nurses' occupational fatigue scale scores were moderate to high in chronic and acute fatigue sub-dimensions and moderate to low in the recovery sub-dimension. Furthermore, the average stress level perceived by nurses was reported to be high in this study.

Conclusion: It is extremely important for long working hours to be addressed so that nurses can recover and cope with stress during this ongoing pandemic.

Key Words: COVID-19, Occupational Fatigue, Stress

ÖZ

Amaç: Koronavirüs hastalığı (COVID 19), pandemide ön planda çalışan hemşirelerin mesleki yorgunluk ve stres düzeylerini etkileyen önemli bir sorundur. Bu çalışmanın amacı, COVID-19 pandemisi sürecinde hemşirelerde mesleki yorgunluk ile algılanan stres düzeyi arasındaki ilişkiyi belirlemekti.

Yöntem: Bu kesitsel çalışma, Türkiye'de 23 Mayıs-7 Haziran 2020 tarihleri arasında 1441 hemşire üzerinde çevrimiçi anket kullanılarak yapıldı.

Bulgular: Hemşirelerin mesleki yorgunluk ölçeği puanları kronik ve akut yorgunluk alt boyutlarında orta ile yüksek, iyileşme alt boyutunda orta ile düşük arasındaydı. Ayrıca bu çalışmada hemşirelerin algıladıkları ortalama stres düzeylerinin yüksek olduğu belirlendi.

Sonuç: Süregelen bu pandemi sürecinde hemşirelerin kendilerini toparlayabilmeleri ve stresle baş edebilmeleri için uzun çalışma saatlerinin ele alınması son derece önemlidir.

Anahtar Kelimeler: COVID-19, Mesleki Yorgunluk, Stres

INTRODUCTION

The coronavirus disease (COVID 19) pandemic did not only turn into one of the world's most crucial health crises, but also brought many catastrophic results. A sudden, severe and widespread infection caused by the virus has equally increased the requirement for inpatient healthcare [1,2]. Nurses went via a great paradox during the pandemic. Individuals stayed home and avoided social contact; however, healthcare workers continued to work and were in direct contact with the virus [3]. Nurses were at the forefront of meeting the increasing medical care requirements because of the pandemic.

On the one hand, nurses worked 24/7 at the bedside to meet the severe healthcare requirements of patients infected with COVID-19; on the other hand, they fought against the risk of virus transmission [4]. Changing working conditions during the pandemic caused physical and mental fatigue in nurses all over the world [4-8].

Fatigue is defined as decrease in capacity of an individual to perform activities expected of him/her because of weakened physical and mental strength [9,10]. Generally, fatigue is evaluated as mental and muscular in two categories. Mental fatigue is a phenomenon that decreases an individual's cognitive competence, productivity, and

motivation related to the job as well as increases the possibility of making mistakes [9]. Muscular fatigue, however, is a condition that progressively affects the health of the individual, particularly the musculoskeletal and nervous system, which leads to insufficient physical capacity in tasks requiring strength. In the literature, the primary factors causing mental and muscular fatigue are occupational workload, intensive work, working more than eight hours a day or 40 hours a week, high physical exertion, workplace environmental factors (heat and noise), not getting sufficient rest, insomnia, distress, social environment of the workplace, not being rewarded for the work performed [9,10]. Fatigue can then start with tension, anger, and sadness and cause mood disorders over time, leading to multiple mental disorders such as anxiety and depression [9]. Furthermore, the impaired mood weakens the individual's complex cognitive capacity, decreases his/her concentration, ability to plan and make decisions during crises, as well as reduces his/her ability to perceive risk. This situation causes various losses and occupational accidents depending on the nature of the work [9,11]. In nursing, occupational fatigue is considered as a condition that reduces job performance, reduces the quality of patient care, threatens patient safety, causes malpractice, and increases health care costs [11-13].

Nurses were exposed to excessive muscular fatigue because of factors such as the rapid increase in the number of patients and care burden, prolonged working hours, and physical ailments because of personal protective equipment during the pandemic. They continue to work under the influence of extreme mental fatigue because of factors such as long working hours, fear and anxiety of COVID-19 transmission for both themselves and their loved ones, staying away from home and family, environmental change, news in media, and insufficient organizational support [14-16]. In this context, occupational fatigue during the pandemic increased the stress level of working nurses all over the world [17,18]. The increase in the number of healthcare workers who died because of COVID-19 is another factor that increases the stress level among nurses [19]. As per the results of a meta-analysis compiling the studies conducted with healthcare professionals in April 2020, the anxiety rate was 23.2%, the depression rate was 22.8% and the insomnia rate 38.9% [16]. In a study conducted in China (2020) during the pandemic with 1257 healthcare workers, 50.4% of participants had symptoms of depression, 44.6% had anxiety, 34.0% had insomnia, and 71.5% had distress [14]. A study conducted with 657 healthcare workers in New York (2020) reported that 64% of the nurses had acute stress disorder, 53% had depression and 40% had anxiety [20]. In a study in Turkey, (2020) conducted with 939 health personnel during the pandemic, it was reported that 77.6% of the participants showed symptoms of depression, 60.2% showed symptoms of anxiety, 50.4% showed symptoms of insomnia and 76.4% showed symptoms of distress [21].

In a study conducted during the pandemic in our country, it was found that health workers experienced moderate anxiety and that health workers with physical fatigue caused an increase in their anxiety levels [22]. In another study, it was determined that nurses experienced higher burnout and fatigue compared to other healthcare workers [23]. In cases such as pandemics, due to the inadequacy of emergency action plans, on top of that, the insufficient number of nurses not to be increased with urgent and effective planning causes nurses to be exhausted in the early period and their mental health is rapidly affected negatively. In order to meet the need for nurses, the assignment of nurses from different fields, and having to work in areas that are unfamiliar and require a lot of knowledge and skills, such as intensive care, increase work stress of nurses. In order to increase psychological well-being of nurses, cognitive and psychological comprehensive protective measures should be taken [24]. Managers and decision makers have a great responsibility to ensure that nurses, who are fighting with awareness of how sacred and valuable life is in the COVID-19 disease, do not come out of this war tired, exhausted, worried, hopeless, damaged and lost. No country, hospital or clinic that

does not keep healthcare workers safe will not be able to keep their patients safe [25].

Few studies have examined the relationship between occupational fatigue and stress level of nurses working at the forefront of the COVID-19 pandemic [17,18]. During the Severe Acute Respiratory Syndrome (SARS) epidemic, it was observed that fatigue caused stress, especially in high-risk healthcare workers [15]. Studies conducted in different populations and at different times of the pandemic are required to raise social and institutional awareness for occupational fatigue and stress levels experienced by nurses that directly affect quality and safety of patient care. Studies that reveal the relationship between occupational fatigue and stress in nurses from different populations will contribute to the development of strategies to protect nurses' health, to improve patient care standards, and thus to the country's economy. In order to better manage this process, it is important to protect the mental health of nurses, who constitute an important link in the health system in the delivery of care services. It will be crucial for managers to plan in advance to develop various strategies to protect the mental health of nurses and to keep them away from negative situations, and to carry out this and similar studies to provide them with the necessary support. In this context, it is thought that this study, which was planned to determine the relationship between occupational fatigue and stress experienced by Turkish nurses during the pandemic process, will contribute to the literature on the new and uncertain COVID-19 pandemic. In addition, it is thought that in such cases, institutions/managers to improve the quality of care will anticipate dangerous situations in the early period and raise awareness that they should develop recommendations/policies.

METHOD

Study design and sampling

This study was conducted between May 23 and June 7, 2020, as a cross-sectional study. According to the Ministry of Health 2020 data, 204,969 nurses are working in Turkey. Nurses working for at least 1 year were included in the present study. The sample size of the study was calculated as 1062 with a 3% margin of error at a 95% confidence interval [26]. A reserve sample of 30% was included in the study and the final sample size was determined as 1381. Moreover, 1480 nurses were invited to the study via e-mail and WhatsApp (Meta INC, California, USA) gibi whereas 1414 nurses voluntarily accepted to participate in the study.

Data collection

The data collection form used in the study was created by the researchers based on a literature review. The prepared data collection form was converted into a digital question form using Google Forms. Information about the purpose of the research and how to fill the form was included in the first part of the digital questionnaire. The forms were sent to the nurses via e-mail and WhatsApp. Participants' responses were digitally obtained via Google Forms.

Data collection tools

The data collection form comprised three sections. The first section included questions about the socio-demographic characteristics of the participants. The second section included the "Perceived Stress Scale (PSS-14)" to measure the perceived stress level of the participants during the COVID-19 pandemic. The third section included the "Occupational Fatigue-Exhaustion Recovery Scale (OFERS)" to measure the occupational fatigue of the participants during the COVID-19 pandemic.

The Perceived Stress Scale (PSS): The PSS which measures how stressful an individual perceives any event in his/her life, was developed by Cohen et al. (1983) [23]. The Turkish validity and reliability study of the scale was conducted by Eskin et al. (2013) [24]. The PSS comprises 14 items and two sub-dimensions, "perception of inadequacy" and "perception of stress/discomfort". It is a five-point

Likert-type scale. Each item is scored as "0 = Never", "1 = Almost Never ", "2 = Sometimes ", "3 = Fairly Often", "4 = Very Often". Seven items (items 4, 5, 6, 7, 9, 10, 13) containing positive statements are reverse coded in the scale. The score ranges between 0 and 56 points, and higher scores indicate higher perceived stress level [28].

The Occupational Fatigue Exhaustion Recovery Scale: To measure occupational fatigue, the Occupational Fatigue Exhaustion Recovery Scale (OFER) was developed by Winwood et al (2005) [29]. The Turkish validity and reliability study of the scale was conducted by Havlioglu&Ortabag (2019) [30]; it comprises 15 items and three sub-dimensions. It is a seven-point Likert-type scale. Sub-dimension scores are separately evaluated. Sub-dimension scores are calculated with the formula (item total scores/30 x 100). Each sub-dimension score ranges from "0" to "100". High scores in chronic fatigue (CFD) and acute fatigue (AFD) sub-dimensions indicate an increased level of occupational fatigue. A high score in the recovery (RD) sub-dimension indicates that the recovery between shifts is positive. In the scoring, 0–25 points indicate low fatigue, 25-50 points indicate moderate/low fatigue, 50-75 points indicate moderate/high fatigue and 75-100 points indicate high fatigue.

Statistical Analysis

Descriptive data were presented as frequencies (n) and percentages (%) and mean±standard deviation for measured variables. The normality of the data was analyzed using the Kolmogorov-Smirnov Test. The data showed normal distribution characteristics and parametric tests were used. PSS and OFER were evaluated based on mean scores, and the relationship between the two scales was tested with the Pearson correlation analysis. The t-test was used to determine the difference between two groups, and the ANOVA test was used to assess the differences among three or more groups. SPSS for Windows Version 22.0 (SPSS Inc., Chicago, IL, USA) was used for the statistical analysis of the data. $P < 0.05$ was accepted as statistically significant for all analyses.

Ethical Consideration

The ethical approval of this study was obtained from Hasan Kalyoncu University Ethics Committee on 28.05.2020 with the decision number 031. Participants participated in the study on a voluntary basis. The purpose and content of the study was explained to the participants beforehand. The participants were informed that personal information would be kept confidential. Participants volunteering to take part in the study marked the relevant item in the data collection form as "Yes." Informed consent was obtained from all individual participants included in the study.

RESULTS

Characteristics of participants

1414 nurses working in pandemic hospitals in Turkey participated in the study. Table 1 lists the distribution of the participants according to some introductory characteristics. The mean age of the participants was 30.40±7.78 years, 71.6% were female and 46.9% were married. Of the participants, 80.1% reported that they worked in shifts during the COVID-19 pandemic, 74.3% were on night shifts, 38% were on night shifts for 37-72 hours a week, and 56.2% reported that they provided care to patients diagnosed with COVID-19 (Table 1).

Comparison of PSS mean scores and mean subscale scores of OFER with respect to introductory characteristics of participants

Participants had a mean PSS score of 31.41±7.86, a mean CFD score of 65.51±25.83, a mean AFD score of 73.60±21.90, and a mean RD score of 42.51±19.63.

Table 2 lists the comparisons of participant characteristics with PSS and OFER scores. PSS, CFD and AFD scores of female participants were higher compared to males (p<0.05). When PSS and OFER subscale scores were compared as per the age groups of the

participants, participants in the 19-25 age group were reported to have the highest PSS, CFD and AFD scores but the lowest RD scores compared to the other groups (p<0.05). Single participants had significantly higher PSS, CFD and AFD scores compared to married participants (p<0.05). It was determined that participants who did not have children had higher PSS, CFD and AFD scores but lower RD scores compared to participants with children (p<0.05). Furthermore, participants with more than two children had significantly lower PSS, CFD and AFD scores and the highest RD scores (p<0.05).

Table 1. Distribution of the participants according to some introductory characteristics (n=1414)

Variables		n	%
	19-25	457	32.3
Age	26-35	634	44.8
	36-58	323	22.8
Sex	Women	1013	71.6
	Men	401	28.4
Marital status	Married	663	46.9
	Single	751	53.1
	Emergency	205	14.5
Department	Intensive care	365	25.8
	Other	844	59.7
	17-24 hours	177	12.5
Weekly working hours	25-36 hours	233	16.5
	37-72 hours	537	38.0
	73 hours and more	50	3.5
	1-2	227	16.1
Average number of patients per nurse	3-4	397	28.1
	5-6	271	19.2
	7 and more	519	36.7
Work by shifts	Yes	1132	80.1
Night shifts	Yes	1050	74.3
Willingness to resign	Yes	371	26.2
Caring for patients who have diagnosed with COVID-19	Yes	794	56.2

Table 3 lists the relationships between the participants' occupational histories and PSS, CFD, AFD and RD scores.

Participants working in intensive care units were reported to have the highest CFD and AFD scores and the lowest RD scores compared to those working in other units (p<0.05). A statistically significant difference was found between PSS, CFD, AFD and RD scores with respect to the total work experience of participants (p<0.05).

Participants working in shifts were found to have significantly higher PSS, CFD and AFD scores and lower RD scores compared to other participants (p<0.05). Participants who worked in night shifts had significantly higher PSS, CFD and AFD scores and lower RD scores (p<0.05). When the weekly total working hours of participants was examined, participants who worked more than 73 h a week had significantly higher PSS, CFD and AFD scores and lower RD scores compared to others.

The caregivers of patients diagnosed with COVID-19 had higher PSS, CFD and AFD scores and lower RD scores compared to other participants (p<0.05).

Table 2. Comparison PSS mean scores, and sub scales of OFER mean scores to some introductory characteristics of participants

Variables		PSSM±SD	Test statistic	p	CFDM±SD	Test statistic	p	AFDM±SD	Test statistic	p	RDM±SD	Test statistic	p
Sex	Women	32.13±7.64	5.549[a]	.001[*]	66.67±25.20	2.709[a]	.009[*]	74.49±20.79	2.252[a]	.025[*]	42.05±19.22	1.387[a]	.166
	Men	29.58±8.13			62.56±27.17			71.37±24.37			43.66±20.62		
Age	19-25	32.49±7.82			68.35±24.17			75.95±20.02			40.44±19.56		
	26-35	31.82±7.66	20.09[b]	.001[*]	67.03±25.34	16.08[b]	.001[*]	74.74±21.36	14.15[b]	.001[*]	41.78±19.43	11.09[b]	.001[*]
	36-58	29.06±7.88			58.50±27.80			68.04±24.46			46.87±19.51		
Marital status	Married	30.75±8.09	2.960[a]	.003[*]	64.00±26.85	2.057[a]	.04[*]	72.09±23.12	2.427[a]	.015[*]	42.96±19.53	0.811[a]	.417
	Single	31.99±7.62			66.84±24.84			74.94±20.69			42.11±19.72		
Number of children	None	32.12±7.86			67.55±24.88			74.86±20.95			41.58±19.77		
	1	31.65±5.58	16.055[b]	.001[*]	66.73±25.45	13.24[b]	.001[*]	75.46±21.61	9.463[b]	.001[*]	40.70±17.59	7.193[b]	.001[*]
	2-6	29.70±8.24			59.07±27.63			68.98±24.00			46.28±19.95		
Department	Emergency	31.24±7.93			63.44±26.14			70.61±23.74			49.97±20.49		
	Intensive care	31.82±7.91	0.683[b]	.505	68.76±23.84	4.089[b]	.017[*]	77.49±20.42	8.556[b]	.001[*]	39.37±19.14	10.157[b]	.001[*]
	Other	31.27±7.83			64.60±26.48			72.65±21.86			42.78±19.42		
Number of years passed in the profession	1 year and less	30.48±7.28			59.93±25.41			71.64±20.80			46.82±20.57		
	2-4 years	33.13±7.90	18.408[b]	.001[*]	71.87±22.89	26.583[b]	.001[*]	76.42±20.13	14.464[b]	.001[*]	38.97±19.24	19.195[b]	.001[*]
	5-10 years	32.24±7.91			69.69±24.23			77.41±20.94			39.01±18.43		
	11 years and more	29.37±7.64			58.40±28.02			68.32±24.09			46.77±19.14		
Work by shifts	Yes	31.79±7.96	3.181[a]	.007[*]	66.59±25.46	2.194[a]	.028[*]	74.24±21.87	1.567[a]	.129	42.12±19.82	3.684[a]	.001[*]
	No	29.87±7.27			61.14±26.88			71.05±21.87			44.10±18.78		
Night shifts	Yes	31.97±7.93	3.665[a]	.001[*]	67.74±25.11	5.679[a]	.001[*]	75.15±21.45	4.773[a]	.001[*]	41.51±20.06	3.630[a]	.001[*]
	No	29.80±7.71			56.88±26.98			67.33±23.31			46.85±16.82		
Weekly time of night shifts	8-16 hours	31.28±8.32			60.32±26.21			69.55±22.84			42.67±18.72		
	17-24 hours	29.83±7.13			60.67±26.44			69.02±21.29			47.92±18.24		
	25-36 hours	31.96±7.91	4.682[b]	.001[*]	65.35±25.58	11.357[b]	.001[*]	74.62±21.33	9.001[b]	.001[*]	43.61±19.58	10.490[b]	.001[*]
	37-72 hours	32.43±7.96			70.14±23.92			77.04±21.26			39.49±20.18		
	73 hours and more	34.02±7.19			81.133±21.09			84.40±17.31			31.20±17.55		
Caring for patients who have diagnosed with COVID-19	Yes	32.15±8.01	4.070[a]	.001[*]	67.82±25.81	3.829[a]	.001[*]	74.76±22.18	2.249[a]	.025[*]	41.97±19.80	1.175[a]	.001[*]
	No	30.45±7.57			62.54±25.58			72.12±21.47			43.20±19.40		

a: t-test, b: ANOVA, *: p<0.05

The relationship between PSS and OFER subscale scores

The results of the relationship between the study outcomes and IA are shown in Table 3 lists the relationship between PSS and OFER subscale scores. There was a statistically significant positive and moderate correlation between the PSS scores and CFD (r=.602; p=.001) and AFD scores (r=.558; p=.001). A strong positive correlation was reported between the CFD scores and the AFD scores of the participants in the study (r=.717; p=.001). Statistically significant negative correlations were reported between the RD scores and PSS scores (r =-.573; p =.001), CFD scores (r=.652; p=.001) and AFD scores (r=.639; p=.001) (Table 3).

Table 3. Correlations between PSS and subscale of OFER scores

a	PSS		CFD		AFD		RD	
	r	p	r	p	r	p	r	p
CFD	.602ª	.001*	1	-	1	-	1	-
AFD	.558ª	.001*	.717ª	.001*	1	-	1	-
RD	-.573ª	.001*	-.652ª	.001*	-.639ª	.001*	1	-

a: Pearson correlation, *: p<0.05

DISCUSSION

The occupational fatigue and perceived stress levels of the nurses participating in this study were evaluated. Nurses' occupational fatigue scale scores were moderate to high in chronic and acute fatigue sub-dimensions and moderate to low in the recovery sub-dimension. When occupational fatigue studies conducted on nurses in the literature were reviewed, moderate and high rates of acute and chronic fatigue and low and moderate recovery levels were reported [11,30]. Furthermore, the average stress level perceived by nurses was reported to be high in this study. Studies in the literature have reported similar results [5,30]. Because of the present study, we can say that nurses experienced high levels of fatigue and showed a moderate recovery, in accordance with the literature. Nurses have a critical role in the provision of health services, and the workload of nurses increased significantly during the pandemic. Moreover, working in shifts because of the nature of the nursing profession as well as long and busy working hours increase fatigue and stress levels.

In the present study, women received higher scores in the acute fatigue and chronic fatigue sub-dimensions. Younan et al. (2019) have stated that sex has no effect on occupational fatigue [32]. However, while many healthcare professionals provide services during the pandemic conditions, they are under heavy emotional and physical pressure they experience every day. Because of their positions, they are on the front line of fighting COVID-19. Furthermore, women living in Turkey have to deal with the education of their children at home who cannot attend school, cook food and clean the house, and meet growing domestic requirements as well as increasing hygiene requirements [33]. The increased occupational fatigue of women living in Turkey during the pandemic is attributed to these situations they experience at home. Nurses, who are an indispensable part of the team in medical procedures, are under a great psychological stress. Sustained occupational stress will lead to chronic health problems, such as depression, anxiety, insomnia, cardiovascular, and cerebrovascular diseases and even chronic fatigue [34-36]. In Lee and Jang's study (2019), occupational stress was found to be positively related to fatigue among nurses [37]. Zhu et al. (2020) stated that the perceived stress level of female nurses was higher than the perceived stress level of male nurses [38]. Similar to this study, we reported that female nurses' perceived stress level was higher than male nurses. However, there are studies stating that stress level does not differ according to gender [8,39].

In this study, young nurses (19-25 years old) scored higher in the acute fatigue and chronic fatigue sub-dimensions, and lower in the recovery sub-dimension. Employees with 2-4 years of work experience received higher scores in chronic fatigue, those with 5-10 years of work experience received higher scores in the acute fatigue sub-dimension, and those with 2-4 years of work experience received lower scores in the recovery sub-dimension. Studies in the literature have demonstrated that young people experience more fatigue [40]. This may be due to the fact that among nurses, young people work in more exhaustive and intensive services such as emergency and intensive care units and may have confused occupational fatigue with physical fatigue. In a previous study, Chekole et al. (2020) reported that participants between the ages of 25-31 perceive more stress than other age groups [41]. Similarly, in the present study, it was determined that nurses between the ages of 19-25 had higher perceived stress levels during the COVID-19 pandemic compared to other age groups. Merino and Agustin (2020) reported that as the age of nurses increases, the level of stress increases [42]. This difference may be attributed to the different economic conditions and health policies of different countries. Economic conditions may lead to shortages of health workers. It has been determined that the lack of nurses is an important source of psychological distress among nurses and it has been reported that the workload increases [43-44]. The number of nurses in Malaysia in 2017 was 106,289 nurses, making the nurse–population ratio 1:302, and the density of nursing (per 1,000 population) 4.1, which is high compared to the majority of other countries in South East Asia, but lower than that in developed countries. In Merino and Agustin's study, a statistically significant positive relationship was found between the perceived stress level of nurses during the COVID-19 pandemic and the acute and chronic fatigue sub-dimensions [42]. Accordingly, it is seen that stress and fatigue are interrelated.

In the present study, it was found that single nurses got higher scores in the acute fatigue and chronic fatigue sub-dimensions. In the study conducted by Huang et al., it was found that being married was associated with chronic fatigue [34]. In Turkey, single healthcare workers who have responsibilities at home such as elderly or disabled care are experiencing problems in fulfilling these responsibilities due to the risk of virus transmission [33]. In addition, problems in transportation and accommodation facilities, especially on the days when curfew is imposed, and longer working hours of single nurses compared to married nurses further increase the workload of single healthcare professionals. These are additional stressors affecting healthcare professionals and therefore contribute to occupational fatigue.

In the present study, the people working in the intensive care unit got higher scores in the acute fatigue and chronic fatigue sub-dimensions and lower scores in the recovery sub-dimension. Nurses are exposed to the emotional effects of the environment they are in, because they constantly witness the suffering periods of the patients in intensive care that extend throughout the treatment. This situation triggers fatigue development and exhaustion. Moreover, rapid transmission of the virus, lack of immunity in the general population, delayed testing, limited equipment, uncertainty about the end of the pandemic, and general anxiety in the community have increased the pressure on healthcare provision [46].

In the present study, it was observed that nurses working in shifts during the COVID-19 pandemic got higher scores in the acute fatigue and chronic fatigue sub-dimensions. Nurses working in the night shift are more likely to experience occupational fatigue compared to those working during the day shift because of less sleep and poor sleep quality. In the literature, the occupational fatigue scores of nurses working in shifts and having frequent shifts were higher [12,30]. Time between shifts is an important factor for acute fatigue to progress into chronic fatigue [29]. In this study, acute fatigue occurs first in nurses working in shifts, and then progresses into chronic fatigue because of insufficient sleep quality depending on time between shifts.

In the present study, nurses who were on night call during the COVID-19 pandemic and worked for 73 h or more in a week got higher scores in the acute fatigue and chronic fatigue sub-dimensions as well as lower scores in the recovery sub-dimension. In the study conducted by

Huang et al., long weekly working hours and working in night shifts were associated with chronic fatigue [34]. Chaiard et al. (2018) mentioned that in their study nurses experienced more occupational fatigue because of the disruption of sleep rhythm and sleep patterns caused by excessive night calls [47]. Mo et al. (2020) stated that long working hours are among the primary factors that induce stress in nurses during the COVID-19 pandemic [5]. Cui et al. (2020) stated that long shifts and night calls are associated with stress levels among nurses [48]. Similar to these studies, in this study, the perceived stress level of nurses working in shifts and especially in long shifts for 73 h or more was higher.

It was found that nurses caring for patients diagnosed with COVID-19 got higher scores in the acute fatigue and chronic fatigue sub-dimensions. The most common issues of complaint by healthcare professionals during the pandemic are the increased workload, lack of personal protective equipment and the lack of training regarding the pandemic [49]. It is expected that healthcare professionals have high levels of fatigue as a result of their struggle against this situation they are facing for the first time, together with the problems they experience during this period.

Long working hours and constant shifts are expected to have an effect on fatigue and insomnia. In addition to all these factors, the working environment during the pandemic became very stressful, especially in intensive care units. Nurses witnessed patients suffering, unable to breathe, intubated and dying much more often than in normal times. The process of deciding on the use and rotation of limited resources increased stress and fatigue. While caring for infected patients, in addition to the existing situations in the working environment, the nurses dealt with the stress of being infected, and infecting their families or friends without knowing that they were infected [42]. The World Health Organization draws attention to the fact that healthcare professionals who are at the forefront of the fight against COVID-19 may face many risks such as pathogen exposure, long working hours, psychological problems, fatigue, occupational burnout, and physical and psychological violence [50]. However, the studies carried out; Due to the heavy workload of nurses caring for patients with COVID-19 and the need to wear personal protective equipment all the time, feeling overwhelmed and exhausted, fear of being infected and infecting their family [51] fatigue, helplessness, [52,53] lack of personal protective equipment, it shows that they feel very much negative emotions such as anxiety because their relatives cannot meet their care needs [52] and feeling powerless about not being able to benefit patients [51-54].

Study Limitations

The data of this study were collected in the first months of the pandemic. The nurses tried to cope with this process with intrinsic motivation and professionalism. They attempted to give their patients the best care, despite being subjected to stigma by the community in fear of transmission, long working hours, difficulty of working with protective equipment, witnessing the painful death of their patients, and having to say goodbye to their families by phone.

CONCLUSION

In this study, which conducted to determine the relationship between occupational fatigue and stress in Turkish nurses during the first months of the pandemic, chronic and acute fatigue sub-dimension scores were reported to be moderate-high and the recovery sub-dimension scores were reported to be low-moderate. Moreover, the average stress level perceived by nurses in our study was determined to be high. Along with these results, it is extremely important for long working hours to be addressed so that nurses can recover and cope with stress during this ongoing pandemic. Patient losses witnessed by nurses during the pandemic are likely to lead to post traumatic stress disorder in future. Therefore, interventions that can increase the coping of nurses and ways of combating stress should be taught. It is extremely important that interventions to cope with stress are quickly planned and implemented.

Implications for nursing practice

The COVID-19 pandemic has been affecting the social life, economy, education, briefly all vital areas in the countries and caused changes in individual life. Based on our results, several points should be considered regarding the clinical implications of the COVID-19 pandemic on nurses in Turkey. During this COVID-19 outbreak nurses are working in difficult conditions away from their families and had to struggle with different problems in the work place. Because of that, nurses are strongly feeling more stressed and occupational fatigue than usual, which could have a negative impact on their mental health. Nurses are key professionals and their psychological health is important to improve quality of health care. Therefore, the findings of our current study can contribute to design psychosocial support activities aiming to decrease occupational fatigue and perceived stress level of nurses in health care services during COVID-19 pandemic and similar future disease periods.

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