The Investigation of Musculoskeletal Disorders, Fatigue and Job Satisfaction of Nurses: A Cross-Sectional Study in Turkey

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ABSTRACT

Objective: This study aimed to evaluate the relationship between musculoskeletal disorders, fatigue and job satisfaction among nurses. **Materials and Methods:** This cross-sectional study was conducted at a university hospital in Turkey with a population of 282 nurses. The data were collected between 12.01.2021 and 08.01.2022. A question form, Cornell Musculoskeletal Disorders Index, Nurse Job Satisfaction Scale and Checklist Individual Strength Fatigue Scale were used to collect the data. **Results:** There was a negative-weak relationship between the fatigue scale and job satisfaction scores, a positive-weak relationship between fatigue and musculoskeletal discomfort scores and a negative-weak relationship between nurse job satisfaction and musculoskeletal discomfort scores. **Conclusion:** These results show that nurses experience musculoskeletal disorders due to their profession, but their fatigue levels are high and their job satisfaction is moderate.
Keywords: Fatigue, Job satisfaction, Nurse.

Hemşirelerde Kas İskelet Sistemi Rahatsızlıkları, Yorgunluk ve İş Doyumunun İncelenmesi: Türkiye'de Kesitsel Bir Çalışma

ÖZ

Amaç: Bu çalışmada hemşirelerde kas iskelet sistemi rahatsızlıkları, yorgunluk ve iş doyumu arasındaki ilişkinin değerlendirilmesi amaçlanmıştır. **Gereç ve Yöntem:** Bu kesitsel çalışma, Türkiye'de bir üniversite hastanesinde 282 hemşirenin katılımıyla gerçekleştirilmiştir. Veriler 01.12.2021-01.08.2022 tarihleri arasında toplanmıştır. Verilerin toplanmasında soru formu, Cornell Kas İskelet Sistemi Bozuklukları İndeksi, Hemşire İş Memnuniyeti Ölçeği ve Bireysel Güç Yorgunluk Ölçeği Kontrol Listesi kullanılmıştır. **Bulgular:** Yorgunluk ölçeği ile iş doyumu puanları arasında negatif-zayıf ilişki, yorgunluk ile kas-iskelet rahatsızlığı puanları arasında pozitif-zayıf ilişki ve hemşire iş doyumu ile kas-iskelet rahatsızlığı puanları arasında negatif-zayıf ilişki bulunmuştur. **Sonuç:** Bu sonuçlar, hemşirelerin meslekleri nedeniyle kas-iskelet sistemi rahatsızlıkları yaşadıklarını, yorgunluk düzeylerinin yüksek ve iş doyumlarının ise orta düzeyde olduğunu göstermektedir.
Anahtar Kelimeler: Yorgunluk, İş doyumu, hemşire.

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INTRODUCTION

Nurses are a professional group who work outside of normal working hours, engage in life-threatening practices, use different technologies at the same time, and work under intense stress (Tambağ et al., 2015; Çoban et al., 2011). Considering the direct patient contact, working postures and working conditions of nurses, it can be said that they are at high risk for work-related musculoskeletal diseases (Sançar et al., 2021). Although the majority of healthcare workers are at risk for musculoskeletal problems, the nursing profession is included in the group of occupations considered dangerous (Usta, 2019; Gül et al., 2014). For these reasons, nursing is a stressful profession with an intense workload due to many negative factors in the working environment (Tambağ et al., 2015; Çoban et al., 2011).

Studies on shift and on-call working systems of nurses indicate that working in this way negatively affects employees' social lives, physiological and psychological health, and even patient safety (Tambağ et al., 2015; Çoban et al., 2011). In particular, lack of sleep due to the length of shifts and the number of consecutive days of work, postponing to meet natural needs due to intense workload, excessive standing and walking distance, frequent bending forward, pushing and pulling, heavy lifting and repetitive movements during patient care activities are among the causes of pain and physical fatigue due to overloading the musculoskeletal system (Şapulu & Akansel, 2021; Usta & Başkurt, 2019).

Fatigue affects the quality of life of individuals and is an important symptom affecting stress and anger control, leading to decreased productivity and performance. Fatigue is the body response to stress that it cannot cope with. Nurses are likely to experience fatigue owing to their high workloads. It is inevitable that fatigue will increase with insomnia, lack of exercise and responsibilities in family life (Yorulmaz et all., 2018). The Canadian Nurses Association stated that work-related fatigue is a condition that affects nurses physically and mentally, negatively affecting their physical and cognitive abilities and leading to the development of burnout (Şapulu & Akansel, 2021).

It is thought that with the occurrence of fatigue, nurses' professional practices and thus their job satisfaction may also be affected. Job satisfaction, which can be defined as an emotional reaction developed as a result of the evaluation of one's work and work environment, is expressed as the level of meeting the physical, mental and social needs of employees in line with expectations (Tambağ et al., 2015). It is stated that job satisfaction levels of nurses are affected by individual (age, education, marital status, socio-cultural environment and personality traits) and institutional (wage, work environment and working conditions, communication in the work environment, relationships with managers, career opportunities) factors (Çam &Yıldırım, 2010). Ensuring job satisfaction in nurses and thus providing patient-centered, quality nursing care to patients at the standards they deserve has a critical importance in the health care system (Yılmaz & Yıldırım, 2016).

In the literature, there is lacking information about the effects of musculoskeletal disorders, fatigue level and job satisfaction of nurses on each other. For this reason, it is thought that this study will enlighten the new studies by examining the concepts of musculoskeletal disorders, fatigue levels and job satisfaction of nurses together.

This study aimed to evaluate the relationship between musculoskeletal disorders, fatigue and job satisfaction among nurses.

MATERIALS AND METHODS

Study type

The study was conducted in the internal-surgical clinics and intensive care units of University Hospital between 01.12.2021 and 01.08.2022.

Study group

The study population consisted of nurses (N= 367) working in the internal and surgical clinics and intensive care units of Aydın Adnan Menderes University Research Hospital. The sample size of the study was calculated as 187 using the sampling method with estimated population. The study was completed with 282 nurses.

Procedures

In the collection of the data, the question form regarding socio-demographic data, Cornell Musculoskeletal Disorders Index, Nurse Job Satisfaction Scale and Checklist Individual Strength Fatigue Scale be used.

Question form

In the form developed by the researchers to define the socio-demographic characteristics of the nurses, age, gender, the unit in which they work, how many years they have been working as a nurse, marital status, the region where they have lived for the longest time, economic status, and family type be questioned.

The Cornell Index of Musculoskeletal Disorders

The questionnaire was developed in 1999 by Hedge and assesses the frequency, severity, and impact on work performance of pain, soreness, or discomfort in 11 different body parts during the last week of work. The frequency of ache, pain or discomfort is rated from never to many times every day; the severity is rated from mildly severe to very severe; and the effect on work performance is rated from not interfering at all to very interfering. The questionnaire consisted of right and left subcategories for all extremity parts except neck, back, waist and hip. For each body part, the weighted score of that body part is calculated by multiplying the ratings marked in the areas of frequency, severity and effect on work performance. The weighted score for each body area takes a value between 0 and 90. An increase in the score indicates an increase in the frequency and severity of pain and its effect on work performance. The Turkish translation was done by by Erdinç et al. (2008), cronbach alpha

value was 0.875 for work performance. It was found 0.876 in our study.

Checklist Individual Strength (CIS - Checklist Individual Strength Fatigue Questionairre)

The CIS questionnaire was used to determine the fatigue level of nurses. This questionairre was developed by Vercoulen, and most widely used to assess chronic fatigue. Here, fatigue is assessed in four aspects: subjective perception of fatigue, decreased concentration, decreased motivation and decreased physical activity. The questionnaire consists of 20 statements measuring fatigue in the last 2 weeks and a 7-point scale is used for the answers. The maximum score that can be obtained from the scale is 140. In our study, Cronbach's value was found to be 0.79.

Nurse Job Satisfaction Scale

This scale was developed by Muya et al. (2014) to determine the job satisfaction of nurses. The reliability and validity study was conducted by Yılmaz & Yıldırım (2016), consists of 27 items and 4 sub-dimensions "Positive Feelings About Work" (1-8, 8 items), "Appropriate Support from Superiors" (9-14, 6 items), "Perceived Importance in the Workplace" (15-22, 8 items), and "Pleasant Working Environment" (23-27, 5 items). The total Cronbach's alpha value of the scale was 0.90. In our study, the Cronbach value was found to be 0.85.

Collection of data

After institutional permission was obtained, information about the study was given by the researchers during the break time of the nurses during working hours. Nurses who agreed to participate in the study were taken to a separate room and asked to fill out the questionnaires based on their self-reports.

Statistical analysis

SPSS 20.00 package program was used for data analysis. The dependent variables of the study were nurses' musculoskeletal disorders, fatigue index and nurse job satisfaction mean scores. Independent variables were socio-demographic variables.

Number, percentage distributions, mean, standard deviation values were given in the analysis of the data. According to the number, percentage, mean and standard deviation of the descriptive variables of the nurses, the Mann-Whitney U test was used for the comparison of paired groups that did not fit the normal distribution according to the results of the Skewnes Kurtosis test, the Kruskal Wallis test was used for the comparison of groups of three or more, the Student t test was used for the comparison of paired groups with normal distribution, and the ANOVA test was used for the comparison of groups of three or more. To determine the correlation of the questionnaires, Pearson correlation analysis was used when the data were normally distributed and Spearman correlation analysis was used when the data were not normally distributed. A level of $p<0.05$ was considered statistically significant.

Ethical approval

Before the study was started, written permissions were obtained from the administrations of the university hospital. Written approval was obtained from the author's Aydın Adnan Menderes University Non-Interventional Ethics Committee (Date: 11.24.2021, Approval no: E-15189967-050.04.04-106260). Verbal permission was also obtained from the nurses participating in the study.

RESULTS

Among the nurses who participated in the study, 76.6% were female, 62.8% were in the 22-30 age group, 56.4% were married, 88.3% had a nuclear family structure, 55.3% had a Bachelor's degree, 69.9% worked as a clinic nurse, 66% had been working as a nurse for 1-9 years, 40.1% cared for 2-7, 8-13 patients, and the average working pattern per week was approximately 3 days during the day and approximately 1 day at night. 72.3% of the nurses stated that they liked their profession, and 72.0% stated that they chose this profession voluntarily (Table 1).

Table 1. Sociodemographic and occupational characteristics of nurses (n=282).

Characteristics		n	%
Gender	Female	216	76.6
	Male	66	23.4
Age group	22-30 years	177	62.8
	31-39 years	73	25.9
	40-49 years	32	11.3
Marital Status	Married	159	56.4
	Single	123	43.6
Family type	Nuclear family	249	88.3
	Extended family	33	11.7
Education Level	VSH	53	18.8
	Associate degree	39	13.8
	License	156	55.3
	Postgraduate	34	12.1

Table 1. (Continue). Sociodemographic and occupational characteristics of nurses (n=282).

Characteristics		n	%
Working unit	Clinic	197	69.9
	Intensive care	85	30.1
Enjoyment of the profession	Liked	204	72.3
	Disliked	78	27.7
Voluntary choice of profession	Voluntary choice	203	72.0
	Involuntarily choice	79	28.0
Duration of work	1-9 years	187	66.3
	10-19 years	67	23.8
	20-29 years	28	9.9
Number of patients cared daily	2-7 patients	113	40.1
	8-13 patients	113	40.1
	14-17 patients	56	19.8
Average weekly work pattern	Day shift (8 hours)		3.27±1.69
	Night shift (16 hours)		1.36±1.25

n: Count, **%:** Column percentage.

The mean score of the CIS Fatigue Scale of the nurses was found to be 75.18±0.82, the mean subscale scores were subjective fatigue perception 30.38±0.41, decrease in concentration 17.89±0.25, decrease in motivation 15.30±0.21, decrease in physical activity 11.62±0.21. The mean score of the Nurse Job Satisfaction Scale was found to be 3.36±0.04, and the mean subscale scores were; positive feelings about work 3.47±0.04, appropriate support from superiors 3.35±0.06, perceived importance at work 3.75±0.04, pleasant working environment 2.56±0.05, Cornell Musculoskeletal Disorders Index mean score 193.97±14.77, back discomfort mean score 21.10±1.48 and 19.20±0.65 for the lumbar region (Table 2).

It was found that there was a negative and weak relationship between the mean scores of the CIS fatigue scale and job satisfactions, a positive and weak relationship with the Cornell discomfort index, and a negative and weak relationship between nurse job satisfaction and the mean scores of the Cornell discomfort index (Table 3).

Table 4 shows the distribution of the nurses according to the body regions specified in the Cornell Musculoskeletal Disorders Index in relation to feeling pain and whether the pain affects their work. It was found that the majority of the nurses felt pain in the lower back (83.3%), back (80.9%) and neck (74.5%). Nurses stated that pain in the left wrist (91.1%), right/left forearm (84.4%, 84.8%) and left upper leg (80.5%) affected their work.

Table 5 shows the comparison of the relationship between the mean scale scores of the nurses participating in the study and some variables. There was no significant relationship between the mean score of the fatigue scale and gender, age, marital status, and duration of employment as a nurse, whereas a significant relationship was found between the work unit, the status of enjoying the profession, the status of choosing the profession voluntarily, and the average number of patients cared for. There was no significant relationship between the mean score of the nurse job satisfaction scale and age, marital status,

work unit, duration of employment as a nurse, average number of patients cared for, while a significant relationship was found between gender, enjoyment and voluntary choice of profession, duration of employment as a nurse, and average number of patients cared for.

Table 2. Mean scale scores of nurses (n=282).

	X±SD*
CIS Fatigue Scale	**75.18±0.82**
Subjective perception of fatigue	30.38±0.41
Decreased concentration	17.89±0.25
Decreased motivation	15.30±0.21
Decreased physical activity	11.62±0.21
Nurse Job Satisfaction Scale	**3.36±0.04**
Positive work related emotions	3.47±0.04
Appropriate support from superiors	3.35±0.06
Perceived importance at work	3.75±0.04
Pleasant working environment	2.56±0.05
Cornell Musculoskeletal Disorders Index	**193.97±14.77**
Neck	13.44±1.18
Right shoulder	10.95±1.07
Left shoulder	9.60±1.05
Upper back	21.10±1.48
Right arm	4.98±0.67
Left arm	4.19±0.65
Back	19.20±0.65
Right forearm	4.12±0.71
Left forearm	4.01±0.77
Right wrist	7.30±0.99
Left wrist	6.44±1.02
Hip	10.65±1.26
Right upper leg	8.84±1.18
Left upper leg	7.26±1.06
Right knee	8.11±0.92
Left knee	7.75±0.95
Right lower leg	8.59±0.94
Left lower leg	8.23±0.95
Right foot	14.39±1.28
Left foot	14.84±1.33

X: Mean, **SD**:Standart Deviation

Table 3. Comparison of the mean scale scores of nurses.

	CIS Fatigue Scale	Nurse Job Satisfaction Scale r*/p	Cornell Musculoskeletal Disorders Index r*/p
CIS Fatigue Scale	-	-0.239/0.000	0.134/0.024
Nurse Job Satisfaction Scale	-	-	-0.158/0.008
Cornell Musculoskeletal Disorders Index	-	-	-

* r: Spearman Correlation Coefficient

There was no significant correlation between the mean Cornell Discomfort Index scores of the nurses and age, marital status, unit of employment, love for the profession, duration of employment as a nurse, average number of patients cared for, while a significant correlation was found with the gender factor.

Table 4. Distribution of nurses according to their body parts in terms of feeling pain and whether pain interferes with their work.

Cornell Musculoskeletal Disorders Index	Pain sensation		Preventing him/her from doing work	
	Pain n(%)	No pain n(%)	Yes n(%)	No n(%)
Neck	**210 (74.5)**	72 (25.5)	190 (67.4)	92 (32.6)
Right shoulder	166 (58.9)	116 (41.1)	212 (75.2)	70 (24.8)
Left shoulder	145 (51.4)	137 (48.6)	219 (77.7)	63 (22.3)
Upper back	**228 (80.9)**	54 (19.1)	205 (72.7)	77 (27.3)
Right arm	118 (41.8)	164 (58.2)	213 (75.5)	69 (24.5)
Left arm	102 (36.2)	180 (63.8)	220 (78.0)	62 (22.0)
Back	**235 (83.3)**	47 (16.7)	203 (72.0)	79 (28.0)
Right forearm	86 (30.5)	196 (69.5)	**238 (84.4)**	44 (15.6)
Left forearm	79 (28.0)	203 (72.0)	**239 (84.8)**	43 (15.2)
Right wrist	113 (40.1)	169 (59.9)	246 (87.2)	36 (12.8)
Left wrist	87 (30.9)	195 (69.1)	**254 (91.1)**	28 (9.9)
Hip	149 (52.8)	133 (47.2)	223 (79.1)	59 (20.9)
Right upper leg	136 (48.2)	146 (51.8)	214 (75.9)	68 (24.1)
Left upper leg	121 (42.9)	161 (57.1)	**227 (80.5)**	55 (19.5)
Right knee	147 (52.1)	135 (47.9)	213 (75.5)	69 (24.5)
Left knee	131 (46.5)	151 (53.5)	220 (78.0)	62 (22.0)
Right lower leg	151 (53.5)	131 (46.5)	206 (73.0)	76 (27.0)
Left lower leg	139 (49.3)	143 (50.7)	212 (75.2)	70 (24.8)
Right foot	192 (68.1)	90 (31.9)	207 (73.4)	75 (26.6)
Left foot	176 (62.4)	106 (37.6)	221 (78.4)	61 (21.6)

DISCUSSION

This cross-sectional study was conducted to examine musculoskeletal disorders, fatigue levels and job satisfaction of nurses, it was found that as the fatigue level of nurses increased, their job satisfaction decreased and musculoskeletal pain averages increased. These results suggest that nurses' job satisfaction and musculoskeletal pain may be related to fatigue levels.

When the Cornell Musculoskeletal Disorders Index of the nurses was evaluated according to the body region, the mean scores of the back and lumbar region were higher than the other regions, It was shown that pain was mostly felt in the lower back, back and neck, and that pain in the left wrist, right/left forearm and left upper leg interfered with the work performed. In the literature, Kandemir et al. (2019) stated in their study that operating room nurses mostly felt pain in the back, neck and shoulder region and that their home/work life was affected due to pain. Sançar et al. (2021) and Gül et al. (2014) reported that work-related musculoskeletal disorders are quite common in nurses, and Gök (2021) stated that the prevalence of pain experience of intensive care nurses is quite high. These results suggest that intense and long working hours have an effect on the pain experienced by nurses. There was no significant correlation between the mean Cornell Discomfort Index scores of nurses and age, marital status, work unit, enjoyment of the profession, working duration as a nurse, and average number of patients cared for, while a significant correlation was found between the gender factor.

Table 5. Comparison of nurses' mean scale scores with specific variables.

	CIS Fatigue Scale X±SD	Nurse Job Satisfaction Scale X±SD	Cornell Musculoskeletal Disorders Index X±SD
Gender			
Female	75.36±13.58	3.38±0.55	210.50±18.01
Male	74.61±14.64	3.27±0.75	139.88±21.43
t/p	0.582/0.446	21.11/0.000	6.86/0.009
Age group			
22-30 years	74.69±13.92	3.35±0.63	197.57±261.86
31-39 years	76.08±14.48	3.30±0.53	173.17±225.17
40-49 years	75.84±11.77	3.36±0.60	221.52±221.14
F/p	0.303/0.739	1.602/0.203	0.471/0.625
Marital Status			
Married(n:159)	75.67±13.78	3.33±0.57	206.01±279.85
Single(n:123)	74.54±13.88	3.39±0.63	178.41±199.72
	0.284/0.595	0.751/0.863	3.844/0.335
Working unit			
Clinic (n=197)	76.34±15.07	3.35±0.63	182.47±233.61
İntensive Care (n=85)	72.51±91.88	3.36±0.55	220.64±278.61
t/p	17.74/0.012	6.50/0.885	2.704/0.270
Enjoyment of the profession			
Liked (n=204)	76.19±14.31	3.48±0.59	178.40±238.12
Disliked (n=78)	72.54±12.10	3.03±0.51	234.69±269.77
t/p	9.740/0.033	1.573/0.000	0.266/0.108
Voluntary choice of profession			
Voluntary choice (n:203)	77.52±14.56	3.41±0.55	177.29±225.03
Involuntarily choise (n:79)	69.18±9.33	3.22±0.708	236.84±296.60
t/p	16.09/0.000	5.043/0.017	5.614/0.109
Duration of work			
1-9 years	75.32±14.22	3.33±0.62	199.48±260.99
10-19 years	74.01±13.51	3.34±0.54	164.32±224.27
20-29 years	77.00±11.82	3.57±0.60	228.13±211.41
F/p	0.490/0.613	1.970/0.141	0.789/0.455
Number of patients cared daily			
2-7 patients	74.15±11.64	3.36±0.55	189.36±251.72
8-13 patients	78.10±14.59	3.35±0.63	178.17±217.65
14-17 patients	71.38±15.83	3.37±0.65	235.16±294.34
F/p	5.106/0.007	0.018/0.983	1.021/0.362

X: mean, SD: Standard Deviation, t: t test, F: ANOVA

Krishnan et al. (2021) found that nurses had a high rate of work-related musculoskeletal pain, with the highest incidence of low back and ankle/foot pain, followed by neck and shoulder pain. It was also reported that age, low education level, being female, high BMI and working time were the main risk factors for musculoskeletal problems. In a study conducted by Attar (2014), it was reported that the most common musculoskeletal problems in nurses were low back, ankle, foot, neck and shoulder. Soylar & Özer (2018) stated in his systematic review study that work-related musculoskeletal system problems in nurses ranged between 33% and 88%, the most common condition was low back pain, it was mostly seen in nurses working in the operating room, and it was also stated that it was the most important reason for absenteeism, requesting a change of duty/job and consulting a doctor. According to Soylar, a significant relationship was found between gender and low back pain in studies and it was reported that women had more low back pain than men. Younan et al. (2019) reported that the prevalence of work-related musculoskeletal disorders among nurses working in acute care hospitals across Lebanon was 71%, back pain was the most common musculoskeletal disorder, and nurses with 5-10 years of experience had 1.6 times more work-related musculoskeletal disorders than nurses with less than 5 years of experience. Gündüz & Sayılan (2021) showed that there was a significant correlation between age, unit of work, type of task, time spent in the same position and low back pain. At the same time, it was stated that most of the nurses experienced low back pain and that low back pain negatively affected job satisfaction, and that weight lifting, walking, sitting, sitting, standing, sleeping, housework, and social activities were most affected by low back pain. It is known that the physical workload of nurses may vary depending on the nature of the unit they work in and the variety of tasks expected, the frequency of exposure to

excessive postures and the duration of exposure, and prolonged exposure may cause various musculoskeletal problems (Krishnan et al., 2021). According to these results, it was seen that the nurses were able to continue working even though they felt pain in areas such as the back and neck. However, the pain they experience in areas affecting fine hand functions interrupts and prevents their professional practices. Since there are frequently repeated and challenging movements within the basic practices of nursing care, it is thought that reducing the intensity of these movements by reducing the number of patients or providing support staff, short breaks, relaxing exercises, posture trainings, and maintaining hand and upper extremity functions at an optimal level will prevent occupational deformation and will be protective in terms of musculoskeletal system disorders in the long term.

In this study, it was found that nurses had higher mean scores on the CIS Fatigue Scale and higher mean scores on the subjective fatigue perception subscale than the others. This result shows that nurses perceive themselves individually tired as well as being physically tired in the working environment. A significant relationship was found between the fatigue levels of the nurses and the unit they worked in, their enjoyment of their profession, their voluntary choice of their profession and the average number of patients they cared for. It was stated that clinical nurses felt significantly more fatigue than nurses in intensive care, nurses who liked their profession than those who did not like their profession, nurses who preferred their profession voluntarily than those who preferred their profession involuntarily, and nurses who cared for an average of 8-13 patients per week felt significantly more fatigue than others. In the literature, Tirviene et al. (2020) reported that the general fatigue level was higher in intensive care nurses, the mental fatigue level was higher in young nurses, and physical and mental fatigue reduced the quality of work of nurses. Hosseini et al. (2021). In a study conducted with Iranian nurses, they stated that fatigue, age and working year were among the factors affecting work-related musculoskeletal system and that there was an interactive relationship between fatigue and work-related musculoskeletal system findings. They stated that fatigue causes a decrease in performance with insufficient rest following excessive activity and that nurses move more slowly when they are tired and perform even simple tasks longer than expected. Karahan et al. (2020) evaluated nurses according to the shifts they worked; they reported that the fatigue level of nurses was generally severe. Şapulu & Akansel (2021), examining fatigue and related concepts in intensive care nurses, emphasized that nurses felt tired in most of the studies. It is thought that this result may be due to the long working time of nurses, the fact that the profession involves repetitive movements, the information processing process is long and the

number of patients per nurse is high due to the low number of employees. Chronic fatigue, which develops for these reasons, directly affects nurses, who are expected to have the ability to make urgent decisions and to implement them without error, and who are in constant communication with patients and their relatives, in all units of hospitals. With increasing expectations, it can be said that the level of fatigue felt by nurses working in units such as intensive care will increase in parallel with the level of stress and tension. In line with these results, it is thought that increasing the number of employees and providing the necessary technical support to the applications by taking into account the fatigue in all units, especially in intensive care units, is important in improving the quality of care, patient satisfaction and preventing medical errors. In our study, it was found that the mean scores of the Job Satisfaction Scale of the nurses were at a moderate level, there was no significant relationship between age, marital status, the unit where they worked, the duration of working as a nurse, the average number of patients they cared for, and there was a significant relationship between gender, enjoyment and willingness to choose their profession. In the literature, job satisfaction and work-related musculoskeletal pain were found to be inversely related. In particular, the risk of low back pain, which was 0.65 times higher in nurses with more than 10 years of work experience compared to nurses with 6-10 years of work experience, was evaluated as a reason for a decrease in job satisfaction. Nurses with more work experience are also responsible for clinical education and management in the unit. These responsibilities bring physical and mental fatigue to nurses and thus inadequate job satisfaction (Thiese et al., 2020). Yüksel et al. (2016) stated that nurses have a low level of job satisfaction in their study, while Eraydın et al. (2021) and Baran & Kavuran (2021) stated that nurses' job satisfaction is at a medium level in their study. When the findings of the studies are examined, it is thought that the fact that nurses have medium and low levels of job satisfaction is due to the difficulty of nurses' working conditions and inadequate wage policy.

In our study, it was observed that practicing the profession with enjoyment also had a positive effect on job satisfaction. The increased risk of work-related musculoskeletal pain in nurses who are dissatisfied with their job shows that job satisfaction in nursing can cause a psychosocial stress factor with physical burden and dissatisfaction. Satisfaction while practicing the profession shows that satisfaction has not only psychological effects but also physical effects. While a significant relationship was found between female gender and job satisfaction in our study, it has been argued that female employees are more sensitive in tasks such as patient transportation and changing position, where physical load increases, and job satisfaction will be adversely affected (Sun et

al., 2021). Similarly, Aylaz et al. (2017) obtained higher scores in male employees in general job satisfaction evaluations in their study. Kızılırmak & Bulut (2022) stated that, Carol Gliggan, one of the developmental theoristspointed that the perception of care is mostly specific to women, that they consider the care of others more than men, and that they are more inclined to take ownership of care. According to the findings, it is thought that the higher job satisfaction of female nurses may be due to the perception of the nursing profession as a woman's profession in the society, the belief that women should struggle with the difficulties of this profession, and their ability to assume the responsibility of giving care. It was found that there was a negative low-level significant relationship between the mean scores of the CIS fatigue scale and job satisfactions, a positive low-level significant relationship with the Cornell discomfort index, and a negative low-level significant relationship between nurse job satisfaction and Cornell discomfort index mean scores. The findings obtained are thought to have a negative effect on job satisfaction when evaluated together with physical loads, general fatigue and regional musculoskeletal system pains experienced in working conditions.

Study Limitations and Strengths
The limitations of the study are that it is a cross-sectional study and that it was conducted only on nurses working in the institution where the application was made.

CONCLUSION
In our study, it was concluded that nurses had high levels of musculoskeletal disorders and fatigue levels and moderate levels of job satisfaction. Significant correlations between job satisfaction, fatigue level, musculoskeletal disorders and variables such as gender of the nurses, the clinic they work in and the average number of patients they care for, and preferring their profession willingly are important results of our study.

From these results, it is seen that problems such as musculoskeletal system pain and fatigue level are important factors affecting job satisfaction of nurses and the regulation of factors such as the number of clinical patients worked with are variables that may affect these disorders and related professional satisfaction. It is thought that improving the working environment in terms of factors such as the number of employees in the units where nurses work in health institutions and the average number of patients cared for will be a factor in reducing the problems experienced in the profession. It may be recommended that personal fatigue should be taken into consideration in units where care practices are intensive, resting areas should be located close to the unit where they work, effective break arrangements should be established, and equipment support should be provided to assist care. It is recommended that training emphasizing the importance of correct

posture and protective exercises should be provided to nurses, and regular physical and psychological controls should be performed. With these recommendations, it is thought that not only nurses will increase the quality of health care and patient satisfaction but also contribute positively to the reduction of medical errors.

Conflict of Interest
The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions
Plan, design: OEG,SB; **Material, methods and data collection:** OEG,SB; **Data analysis and comments:** OEG,SB; **Writing and corrections:** OEG,SB.

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