

CLINICAL RESEARCH / KLİNİK ÇALIŞMA

COMPARISON OF OPERATING THEATER AND NON-OPERATING THEATER STAFF IN TERMS OF MUSCULOSKELETAL SYSTEM PROBLEMS

AMELİYATHANE VE AMELİYATHANE DIŞI ÇALIŞANLARININ KAS İSKELET SİSTEMİ PROBLEMLERİ AÇISINDAN KARŞILAŞTIRILMASI

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ABSTRACT

Objective: Many problems associated with musculoskeletal system can be seen in health workers due to physical and psychological overload. In this study, it was aimed to compare and evaluate musculoskeletal problems in operating theater and non-operating theater personnel.

Method: Two-hundred participants, including 100 operating theater and 100 non-operating theater personnel, were included in the study. Participants were asked to complete questionnaires with a total of 25 questions about weekly working times, working histories and demographic information, as well as experiences with back pain, shoulder pain, and neck pain.

Results: The study included 73 doctors, 80 nurses, 33 technicians and 14 personnel. 66.5% of the participants were female. 29.5% were smoking and 13% were exercising regularly. The rates of back pain, shoulder pain, and neck pain were 78%, 54.5% and 56.5%, respectively. The weight, height and weekly working times were less while the referral to doctors and physiotherapists was higher in non-operating theater personnel. In the last 7 days, the rate of back pain was higher in the operating room personnel.

Conclusion: In this study, we found that musculoskeletal system problems were seen at a high rate in health workers, that personnel did not exercise regularly and that they were inadequate to get professional help for musculoskeletal problems. We believe that healthcare professionals should be well informed about the physical, psychological and social factors that cause these problems and that preventive measures should be taken and treatment should be provided.

KEYWORDS: Occupation, Health, Pain

ÖZ

Amaç: Sağlık çalışanlarında fiziksel ve psikolojik aşırı yüklenme nedeni ile kas-iskelet sistemi ile ilişkili pek çok problemler görülebilmektedir. Bu çalışmada ameliyathane ve ameliyathane dışı çalışanlarının kas-iskelet problemleri açısından değerlendirilerek karşılaştırılması amaçlandı.

Yöntem: Ameliyathane ve ameliyathane dışı çalışanı 100'er kişi olmak üzere 200 katılımcı çalışmaya dahil edildi. Katılımcılardan haftalık çalışma süreleri, çalışma geçmişleri ve demografik bilgilerinin yanı sıra, bel ağrısı, omuz ağrısı ve boyun ağrısı deneyimleri ile ilgili toplam 25 soru içeren anket doldurmaları istendi.

Bulgular: Çalışmaya 73 doktor, 80 hemşire, 33 tekniker ve 14 personel dahil edildi. Katılımcıların % 66,5'u kadındı. % 29,5'u sigara kullanmakta ve % 13'ü düzenli egzersiz yapmaktaydı. Bel ağrısı, omuz ağrısı ve boyun ağrısı oranları sırasıyla % 78, % 54,5 ve % 56,5 idi. Ameliyathane dışı çalışanlarda; kilo, boy ve haftalık çalışma süreleri daha az, doktor ve fizyoterapist başvuru daha fazla bulundu. Ameliyathane çalışanlarında son 7 gün içinde bel ağrısı görülme sıklığı daha fazlaydı.

Sonuç: Bu çalışmada sağlık çalışanlarında kas iskelet sistemi problemleri oldukça yüksek oranlarda görüldüğünü, çalışanların düzenli egzersiz yapmadığını, kas-iskelet sistemi problemlerine yönelik profesyonel yardım almakta yetersiz olduklarını tespit ettik. Sağlık çalışanlarında bu problemlere neden olan fiziksel, psikolojik ve sosyal faktörlerin iyi aydınlatılması ve bunlara yönelik önleyici tedbirlerin alınmasının ve tedavi imkanı sağlanmasının gerekliliğine inanmaktayız.

ANAHTAR KELİMELE: Meslek, Sağlık, Ağrı

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INTRODUCTION

Workload and the associated occupational stress have been reported as one the main causes of morbidity among healthcare workers (1). Work related musculoskeletal disorders among these individuals have been an issue for many years.

Due to the fact that the healthcare sector is serving 24 hours a day, healthcare workers who have been providing care are confronted with various risk factors. For this reason, physical disorders such as back pain, lower back pain, stomach pain, shoulder pain, neck pain, headache, sleep disturbance, difficulty in concentration, rapid irritation and moral disturbances are seen physically (2). In the operating rooms, where advanced technology tools are used and a variety of surgical techniques and methods are applied in the light of new and improved information, working conditions are even more important. Additionally, due to the important and risky interventions applied, there are some risks for the employees (3).

The studies undertaken in occupational groups with respect to the simultaneous occurrence of different musculoskeletal complaints and their interrelationships in our country are limited. Tezel et al, reported that back pain in nurses and in various types of health care staff varied between 33-53% (4). Among these individuals, ages, working years, departments, gender, physical conditions, and weekly working hours have varying degrees of effects on development of musculoskeletal disorders.

The purpose of this study was to determine incidence and features of musculoskeletal disorders in a group of health care workers at a tertiary hospital and to compare the findings obtained from participants working at operating rooms or out of operating rooms of the hospital. Secondly, we planned to transfer and direct the information to the healthcare workers or the responsible authorities of the institution based on the obtained data.

MATERIAL AND METHOD

After approval of our study by Ankara Atatürk Training and Research Hospital Ethics Committee and patients' informed consent, we included 200 voluntary health care workers who accepted to answer the questionnaire in our hospital. The ones working for at least one year and over in the health sector were included. The participants were collected as the ones employed in operating room or outside of operating room. The exclusion criteria composed of the ones with drug use stories, a presence of musculoskeletal pain before starting work, and those who were pregnant.

A questionnaire composed of two parts was distributed for self-administration. In the first part of the questionnaire the demographic characteristics, habits, chronic disease, drug use, occupation, duration of work, presence of shift work, job satisfaction were questioned. In the second part, the features of the back pain, such as severity, frequency, need for treatment, restricted physical activities, medical treatments or rest reports and durations were interrogated. For evaluation of musculoskeletal pain, the standardized Nordic Musculoskeletal Questionnaire was applied and simply adapted and translated for the Turkish context (5). The presence of low back, shoulder and neck pain was identified as the pain in the mentioned regions requiring treatment or felt at least three days and all day long. Chronic pain was defined as pain felt over 12 weeks (6).

Statistical Analysis

Evaluation of the data was done in using Windows-based Microsoft® Office Excel® 2010 (Excel 2010® v14.0.7, Microsoft Corporation) and IBM SPSS Statistics 23.0 (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, V23.0. Armonk, NY: IBM Corp.). The conformity of continuous variables (age, weight, height, body mass index (BMI), duration of working, weekly working time) to normal distribution was examined with Shapiro-Wilk test. For descriptive statistics, mean \pm standard deviation (SD) was used for age and all skewed data were stated as median [interquartile range (IQR)]. Categorical data were expressed as number (n) and percentage (%). In the comparison of groups of continuous variables, if the number of groups was 3 or more, Kruskal-Wallis test was applied. To determine the origin of the difference, post hoc paired comparisons were made with Bonferroni corrected Mann-Whitney test. The difference between two groups (surgeon-clinician, male-female doctors-others etc), was determined by Mann-Whitney *U* test. The differences between categorical variables were examined with chi-square test. To be able to define the risk increase in 2 x 2 tables, Odds Ratio and 95% Confidence Interval values were calculated. A value of $p < 0.05$ was considered as statistically significant.

RESULTS

Two-hundred volunteers were included in this study. The median age was 31(13.3) years. The median working time in total was 7.5 (16) years. The weekly median working hours were 41 (20). The median height, weight and BMI of the participants were respectively 165.5 (14) cm, 66 (22) kg, 24.2 (4.5) kg m². 133 (66.5%) of the participants were women and 67 (33.5%) were men. 134 (67%) of them were married and 109 (54.4%) had

Table I. Basic characteristics of the participants

Parameters		Value
Age (years)*		31 (13.3)
Working time (years)*		7.1 (16)
Working time in the latest institution (years)*		4.3 (7.8)
Working hours per week (hours)*		41 (20)
Height (cm)*		166 (14)
Weight (kg)*		66 (22)
BMI(kg/m²)*		24.2 (4.5)
Working Department**	Surgery	100 (50)
	Clinics	100 (50)
Gender**	Male	67 (33.5)
	Female	133 (66.5)
Dominant Hand**	Right	194 (97)
	Left	6 (3)
Marrital Status**	Married	134 (67)
	Single	66 (33)
Smoking **	No	141 (70.5)
	Yes	59 (29.5)
Education **	Others	24 (12)
	University	176 (88)
Job **	Doctor (Surgeon)	45 (22.5)
	Doctor (Clinician)	28 (14)
	Nurse	80 (40)
	Technician	33 (16.5)
	Cleaning staff	14 (7)
Children **	No	91 (45.5)
	Yes	109 (54.5)

*Data are presented as median(IQR)

** Data are presented as number of cases (Interquartile range) - n (IQR)

children. 176 (88%) were graduated from university and 73 (36.5%) of them were medical doctors. Of all the respondents, 45 (22.5%) were either surgeons or anesthesiologists, 28 (14%) were clinicians, 80 (40%) were nurses. The rest composed of anesthesia technicians and cleaning staff [33 (16.5%)-14 (7%)]. 100 of the participants were working in operation room, while 100 of them were working out of operating room. The basic characteristics of the participants are presented in Table I.

The low back was the body part with highest frequency of pain complaint (78%). During the preceding year, the prevalence of low back pain was reported to be highest (98.1%). The neck (92.9%) and the shoulder (76.1%) were other sites frequently affected (Table II). The low back pain lasted at least 1-7 days in 47.7% of the participants (Table II). 112 (73.2%), 68 (64.8%) and 72 (68.6%) of the participants admitted that they had activity restriction due to low back, shoulder and neck pain, respectively. The neck pain was the most prominent factor in having rest at home for more than 30 days (Table II). 14 (9%) participants with pain experience reported that they had previously been hospitalized as a result of low back pain. In a total of 8 (7.3%) cases, it was seen that there was an accident thought to play a role in the shoulder pain. Besides, 4 (3.5%) participants reported experiencing an accident or injury that caused neck pain. The percentage of participants applying to a physician or a physiotherapist with a complaint of pain in the last 12 months was highest in the ones suffering from low back pain (Table II).

Table II. Distribution of pain and activity status according to the pain localizations*

		Lower Back	Shoulder	Neck
Previous presence of pain	Absent	44 (22)	91 (45.5)	87 (43.5)
	Present	156 (78)	109 (54.5)	113 (56.5)
Last 12 months' pain presence	Absent	3 (1.9)	26 (23.9)	8 (7.10)
	Present	153 (98.1)	83 (76.1)	105 (92.9)
Total number of back pain in the last 12 months (days)	0	3 (1.9)	14 (13.2)	8 (7.1)
	1-7	74 (47.7)	48 (45.3)	58 (51.3)
	8-30	26 (16.8)	15 (14.2)	18 (15.9)
	>30	37 (23.9)	18 (17.0)	19 (16.8)
	Everyday	15 (9.7)	11 (10.4)	10 (8.8)
Restriction of daily activity due to pain in the past 12 months	Absent	41 (26.8)	37 (35.2)	33 (31.4)
	Present	112 (73.2)	68 (64.8)	72 (68.6)
During the past 12 months, how long has your back pain prevented you from doing your job ? (days)	0	51 (33.6)	42 (40.0)	37 (35.2)
	1-7	76 (50.0)	41 (39.0)	37 (35.2)
	8-30	13 (8.6)	14 (13.3)	20 (19.0)
	>30	12 (7.9)	8 (7.6)	11 (10.5)
Shift change for pain	Absent	119 (76.3)	97 (89.0)	102 (90.3)
	Present	37 (23.7)	12 (11.0)	11 (9.7)
Applying to a physician or physiotherapist for pain in the last 12 months	Absent	101 (66)	80 (75.5)	81 (77.1)
	Present	52 (34)	26 (24.5)	24 (22.9)
Pain in the last 7 days	Absent	83 (54.2)	58 (54.7)	51 (48.6)
	Present	70 (45.8)	48 (45.3)	54 (51.4)

*Values are presented as number of cases (percentage of column)

Table III. Factors in lumbar pain complaint

			Absent	Present	P	95 CI OR (Lower-Upper)***
Basic Characteristics	Gender*	Male	15 (34.1)	52 (33.3)	0.925	1.034 (0.510-2.097)
		Female	29 (65.9)	104 (66.7)		
	Age (years)**		30 (14)	31 (8.5)	0.338	-
	Height (cm)**		165 (13)	166 (15)	0.247	-
	Weight (kg)**		65 (18)	66 (22)	0.972	-
	BMI (kg/m ²)**		24.3 (4.1)	24.2 (4.6)	0.631	-
	Marrital Status*	Married	25 (56.8)	109 (69.9)	0.104	0.567 (0.285-1.128)
		Single	19 (43.2)	47 (30.1)		
	Children*	Absent	23 (52.3)	68 (43.6)	0.307	1.417 (0.725-2.772)
		Present	21 (47.7)	88 (56.4)		
	Hand Usage*	Right	42 (95.5)	152 (97.4)	0.496	0.553 (0.098-3.122)
		Left	2 (4.5)	4 (2.6)		
Education and job	Education*	Others	10 (22.7)	14 (9.0)	0.013	2.983 (1.221-7.291)
		University or above	34 (77.3)	142 (91.0)		
	Job*	Others	33 (75.0)	94 (60.3)	0.073	1.979 (0.931-4.206)
		Doctor	11 (25.0)	62 (39.7)		
	Department*	Surgery	20 (45.5)	80 (51.3)	0.495	0.792 (0.405-1.549)
		Clinics	24 (54.5)	76 (48.7)		
	Working time (years)**		9.8 (15)	7.1 (16)	0.796	-
	Working time in the latest institution (years)**		4.8 (10)	4 (7.6)	0.604	-
Routines	Working hours per week (hours)**		40 (20)	45 (24)	0.369	-
	Smoking*	Absent	35 (79.5)	106 (67.9)	0.136	1.834 (0.819-4.107)
		Present	9 (20.5)	50 (32.1)		
	Exercise *	Absent	36 (81.8)	138 (88.5)	0.247	0.587 (0.236-1.458)
		Present	8 (18.2)	18 (11.5)		

*Values are presented as number of cases (column percentage). Chi Square test is used for comparison, $p < 0.05$ is significant

**Values are presented as median (interquartile range). Mann-Whitney U test is used for comparison, $p < 0.05$ is significant

***CI: Confidence Interval, OR: Odds Ratio(Lower-Upper Bound.) Calculated for 2x2 tables. Significant results presented in bold

The low back pain was prominently seen in doctors (84%), nurses (80%), technicians (74%), and cleaning staff (42.9%). We found that high educational level was a risk factor for low back and neck pain [$p < 0.05$; 95% CI, OR: 2.983 (1.221-7.291) and $p < 0.05$; 95% CI, OR: 3.678 (1.450-9.326)], while female gender and high BMI were risk factors for shoulder pain [$p < 0.05$; 95% CI, OR: 1.978 (1.091-3.586)] (Table III, Table IV, Table V).

Working in or out of operating room, cigarette smoking and doing physical activities regularly didn't make any difference in the prevalence of pain experience. Medical doctors didn't differ from the other workers in prevalence of complaints.

DISCUSSION

In this cross-sectional study performed at a tertiary hospital in Ankara, we found high prevalences for low back, neck and shoulder pain in the healthcare workers. The low back was the most commonly reported body site, affecting almost all of the participants in the past year (98.1%). A significant proportion of these participants reported restriction in daily activities and off duty time

lasting 1-7 days. Out of these respondents, almost 50% reported that they were suffering from pain at the time of the survey. However, medical care seeking or shift changing weren't notably high in these subjects.

Occupational musculoskeletal pain is reported to be an important health problem especially for healthcare workers (7). Especially, low back pain is the most frequently encountered musculoskeletal disorder in many workplaces and in many occupational groups. In the literature, the incidence of low back pain in hospital workers has been reported as 46-65.8% (8,9). The frequency of low back pain in different studies performed in health personnel and nurses in Turkey varies between 39.9% and 69.0% (4). Our survey of Turkish health care workers revealed a 98.1% incidence of low-back pain. Interestingly, this figure is higher than most other rates reported in the literature. One of the reasons for this may be that the operating room workers are covered in this study, as a difference. Actually, operating room workers are much more exposed to factors such as heavy lifting, forward bending, patient transferring, permanent constant posture and thus, in more strenuous

Table IV. Factors in shoulder pain complaint

			Absent	Present	p	%95 CI OR (Lower-Upper)***
Basic Characteristics	Gender*	Male	38 (41.8%)	29 (26.6%)	0.024	1.978 (1.091-3.586)
		Female	53 (58.2%)	80 (73.4%)		
	Age (years)**		30 (13)	32 (12)	0.162	-
	Height (cm)**		168.5 (15)	165 (12)	0.138	-
	Weight (kg)**		69 (26)	64 (17)	0.031	-
	BMI (kg/m ²)**		25.3 (5.5)	23.8 (4.0)	0.020	-
	Marital Status*	Married	64 (70.3%)	70 (64.2%)	0.360	1.321 (0.727-2.398)
		Single	27 (29.7%)	39(35.8%)		
	Children*	Absent	45 (49.5%)	46 (42.2%)	0.305	1.340 (0.765-2.345)
		Present	46 (50.5%)	63 (57.8%)		
	Hand Usage*	Right	86 (94.5%)	108 (99.1%)	0.059	0.159 (0.018-1.389)
		Left	5 (5.5%)	1 (0.9%)		
Education and job	Education*	Others	13 (14.3%)	11 (10.1%)	0.363	1.485 (0.631-3.496)
		University or above	78 (85.7%)	98 (89.9%)		
	Job*	Others	58 (63.7%)	69 (63.3%)	0.949	1.019 (0.571-1.817)
		Doctor	33 (36.3%)	40 (36.7%)		
	Department*	Surgeon	44 (48.4%)	56 (51.4%)	0.670	0.886 (0.508-1.546)
		Clinician	47 (51.6%)	53 (48.6%)		
	Working time (years)**		6.5 (15.7)	9.4 (16.0)	0.558	-
	Working time in the latest institution (years)**		4.7 (8)	4 (7.4)	0.290	-
Routines	Working hours per week (hours)**		45 (20)	40 (25)	0.871	-
	Smoking*	Absent	68 (74.7%)	73 (67.0%)	0.231	1.458 (0.785-2.707)
		Present	23 (25.3%)	36 (33.0%)		
	Smoking *	Absent	79 (86.8%)	95 (87.2%)	0.943	0.970 (0.424-2.218)
		Present	12 (13.2%)	14 (12.8%)		

*Values are presented as number of cases (column percentage). Chi Square test is used for comparison, $p < 0.05$ is significant

**Values are presented as median (interquartile range). Mann-Whitney U test is used for comparison, $p < 0.05$ is significant

***CI:Confidence Interval, OR: Odds Ratio(Lower-Upper Bound.) Calculated for 2x2 tables .Significant results presented in bold

patient handling activities with psychological stress during work. Also, both anesthesiologists and surgeons are faced with longer weekly working hours, increased number of shifts and inappropriate posture during long working hours.

In a study, Omokhodion et al (8) have found the highest rate of low back pain in nurses (69%). We didn't make such a classification based on profession in this study. Although the prevalence of low back pain was high among the health care workers, it didn't make any significant difference to the medical doctors. However, we discovered that, being a doctor or a worker out of operating room didn't make any difference in low back pain prevalence, at least in this population.

Vijendren et al (2) found papers relating to musculoskeletal pain in a search about the work-related health of doctors amongst a number of different disciplines within medicine in the UK. As a common opinion of three national surveys in UK, musculoskeletal disorders were addressed to be frequently seen amongst surgeons. Prevalence of hand complaints followed back and neck disorders (10-12).

In some studies, low back pain was found to be positively related to age, female sex, high body mass index, smoking, low socioeconomic level, weekly working hours, number of shifts and inappropriate posture (13,14). Our study supported the findings of no gender difference in the incidence of low back pain. Interestingly, educational level made a difference for the presence of low back pain in this study. This could be interpreted in a few ways. Probably, higher educated personnel are able to address their problem more consciously. On the other side, these participants are under more mental pressure, boring or tedious tasks and not enough support at work; so that they don't know how to cope with these problems.

Neck and shoulder-related musculoskeletal disorders were the second and the third most frequently reported symptoms during the last year, affecting 92.9% and 76.1% respectively. As there hasn't been a study matching ours in every aspect, it is hard to interpret these prevalences. However; high percentages like these may be attributed to young age of the population. As the participants, independent of their profession, are not

Table V. Factors in neck pain complaint

			Absent	Present	P	%95 CI OR (Lower-Upper)***
Basic Characteristics	Gender*	Male	33 (37.9%)	34 (30.1%)	0.244	1.420 (0.786-2.564)
		Female	54 (62.1%)	79 (69.9%)		
	Age (years)**		31.8 (14)	32.5 (12.3)	0.217	-
	Height (cm)**		163.5 (13)	165.5 (11)	0.487	-
	Weight (kg)**		60.5 (15)	65.5 (16)	0.693	-
	BMI (kg/m ²)**		22.7 (3.4)	24.2 (4.0)	0.842	-
	Marrital Status*	Married	57 (65.5%)	77 (68.1%)	0.696	0.888 (0.491-1.608)
		Single	30 (34.5%)	36 (31.9%)		
	Children*	Absent	43 (49.4%)	48 (42.5%)	0.328	1.323 (0.754-2.321)
		Present	44 (50.6%)	65 (57.5%)		
	Hand Usage*	Right	84 (96.6%)	110 (97.3%)	0.744	0.764 (0.150-3.879)
		Left	3 (3.4%)	3 (2.7%)		
Education and job	Education*	Others	17 (19.5%)	7 (6.2%)	0.004	3.678 (1.450-9.326)
		University or above	70 (80.5%)	106 (93.8%)		
	Job*	Others	61 (70.1%)	66 (58.4%)	0.088	1.671 (0.924-3.021)
		Doctor	26 (29.9%)	47 (41.6%)		
	Department*	Surgeon	43 (49.4%)	57 (50.4%)	0.887	0.960 (0.549-1.679)
		Clinician	44 (50.6%)	56 (49.6%)		
	Working time (years)**		9.8 (15)	7.1 (16)	0.796	
	Working time in the latest institution (years)**			4.8 (10)	4(7.6)	0.604
	Working hours per week (hours)**			40 (20)	45(24)	0.369
Routines	Smoking*	Absent	65 (74.7%)	76 (67.3%)	0.252	1.438 (0.771-2.682)
		Present	22 (25.3%)	37 (32.7%)		
	Exercise *	Absent	75 (86.2%)	99 (87.6%)	0.77	0.884 (0.386-2.022)
		Present	12 (13.8%)	14 (12.4%)		

*Values are presented as number of cases (column percentage). Chi Square test is used for comparison, p<0.05 is significant

**Values are presented as median (interquartile range). Mann-Whitney U test is used for comparison, p<0.05 is significant

***CI:Confidence Interval, OR: Odds Ratio (Lower-Upper Bound.) Calculated for 2x2 tables .Significant results presented in bold

experienced enough, they are easily exposed to improper situations that increase the risk of incurring work-related musculoskeletal disorders. In a study, Magora (15) stated that sudden, great physical efforts characterized by unexpectedness were related to a high incidence of musculoskeletal disorders. So both age and experience in the profession were considered as risk factors in this study. However, working years of the participants were all above five years. Thus, these respondents can't be considered as inexperienced, but as ignorant. So, in-service training at regular intervals should be disregarded.

Similarly with the literature, the number of participants suffering from shoulder pain were significantly high in females (16). The increased BMI was also found as a risk factor for shoulder pain in our study.

In other studies, it was determined that workers with a short or minimal resting time, pain during the work, poor social contact among employees, high-risk workers who were expected to have high performance from their employees would have upper extremity problems and functional limitations within 3 months (17). Even studies

have indicated that the progress of pain and symptoms is more influenced by psychosocial risk factors than mechanical effects and psychosocial factors lead to an increase in muscle tone (18). The important point is that; this may impact on the working relationship between doctors and other health care workers with possible adverse effects on patient care (19,20).

In a study in Italy, it was found that back pain was inversely associated with cigarette smoking, while it was more frequent in the nurses who had children. There was no significant relationship between sports performance and pain frequency (21). In this study we couldn't show any significant relationship between pain and having a child or having regular sports. In addition, as with the so-called study, cigarette smoking wasn't a significant risk factor for pain in our participants. The health care workers examined in this study, showed low rates of admittance to doctor with the complaint of pain. Also the most common number of days off duty were 1-7 days. In a study conducted in Dutch and Greek nurses, 45% of the nurses in both groups was reported to receive medical care for low back pain (22). In other words, one

of the two health personnel suffering from back pain refers to a doctor for this reason. So, we can conclude that health care seeking and days off duty in our participant population were not too much. The reasons of this result can be discussed. The doctors made only 36.5% of this population. As mentioned above, differences between education level, socioeconomic status and type of employment may be involved in this difference. They may not know early signs and symptoms of these disorders. For this reason, health care workers should be informed about the causes, early signs and symptoms and ways of prevention of musculoskeletal disorders, to avoid possible complications, work power and day loss. In this aspect, it is important to increase awareness and taking precautions in the early period. Also, these personnel may not find solutions such as changing shifts, or taking rest, because of the growing demand in this sector.

CONCLUSION

Despite the limited numbers of published literature in Turkey, we believe the prevalence of work-related musculoskeletal disorders among health care workers, without discrimination of the profession, is high in Turkey. This field encompasses stress-related risk factors such as extreme working hours, time pressure, difficult or complicated tasks, insufficient rest periods, monotony and physically bad conditions. We need to emphasize the role of ergonomics, counseling, proper working conditions and patient management techniques with further studies.

REFERENCES

1. Lorusso A, Bruno S, L'Abbate N. A review of low back pain and musculoskeletal disorders among Italian nursing personnel. *Ind Health* 2007; 45: 637-644.
2. Vijendren A, Yung M, Sanchez J. Occupational health issues amongst UK doctors: a literature review. *Occup Med (Lond)* 2015; 65: 519-528.
3. Tyssen R. Health problems and the use of health services among physicians: a review article with particular emphasis on Norwegian studies. *Ind Health* 2007; 45: 599-610.
4. Tezel A. Musculoskeletal complaints among a group of Turkish nurses. *Int J Neurosci* 2005; 115: 871-880.
5. Kuorinka I, Jonsson B, Kilbom A, et al. Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. *Appl Ergon* 1987; 18: 233-237.
6. Turhanoglu AD. Kronik bel ağrısı. *Türkiye Klinikleri Journal of Physical Medicine Rehabilitation Special Topics* 2011; 4: 117-122.
7. Salik Y, Ozcan A. Work-related musculoskeletal disorders: a survey of physical therapists in Izmir-Turkey. *BMC Musculoskelet Disord* 2004; 5: 27.
8. Omokhodion FO, Umar US, Ogunnowo BE. Prevalence of low back pain among staff in a rural hospital in Nigeria. *Occup Med (Lond)* 2000; 50: 107-110.
9. Karahan A, Kav S, Abbasoglu A, Dogan N. Low back pain: prevalence and associated risk factors among hospital staff. *J Adv Nurs* 2009; 65: 516-524.
10. Soueid A, Oudit D, Thiagarajah S, Laitung G. The pain of surgery: pain experienced by surgeons while operating. *Int J Surg* 2010; 8: 118-120.
11. Babar-Craig H, Banfield G, Knight J. Prevalence of back and neck pain amongst ENT consultants: national survey. *J Laryngol Otol* 2003; 117: 979-982.
12. Chatterjee A, Ryan WG, Rosen ES. Back pain in ophthalmologists. *Eye (Lond)* 1994; 8 (Pt 4): 473-474.
13. Bejjia I, Younes M, Jamila HB et al. Prevalence and factors associated to low back pain among hospital staff. *Joint Bone Spine* 2005; 72: 254-259.
14. Ouédraogo DD, Ouédraogo V, Ouédraogo LT et al. Prevalence and factors associated with low back pain among hospital staff in Ouagadougou (Burkina Faso). [Article in French] *Med Trop (Mars)* 2010; 70: 277-280 [Abstract].
15. Magora A: Investigation of the relation between low back pain and occupation: 4. Physical requirements: Bending, rotation, reaching and sudden maximal effort. *Scand J Rehabil* 1973; 5: 186-190.
16. Torngvist EW, Hagberg M, Hagman M, Risberg EH, Toomingas A. The influence of working conditions and individual factors on the incidence of neck and upper limb symptoms among professional computer users. *Int Arch Occup Environ Health* 2009; 82: 689-702.
17. Bongers PM, Ijmker S, van de Heuvel S, Blatter BM. Epidemiology of work related neck and upper limb problems: Psychosocial and personal risk factors (Part I) and effective interventions from a biobehavioural perspective (Part II). *J Occup Rehabil* 2006; 16: 279-302.
18. Sharma A, Sharp DM, Walker LG, Monson JR. Stress and burnout among colorectal surgeons and colorectal nurse specialists working in the National Health Service. *Colorectal Dis* 2008; 10: 397-406.
19. Caplan RP. Stress, anxiety, and depression in hospital consultants, general practitioners, and senior health service managers. *BMJ* 1994; 309: 1261-1263.
20. Allen I. Stress in hospital medicine: a problem for key hospital staff. *Hosp Med* 2001; 62: 501-503.
21. Violante FS, Fiori M, Fiorentini C, Risi A, Garaqnani G, Bonfiglioli R, Mattioli S. Associations of psychosocial and individual factors with three different categories of back disorder among nursing staff. *J. Occup. Health* 2004; 46: 100-108.
22. Alexopoulos EC, Burdorf A, Kalokerinou A. A comparative analysis on musculoskeletal disorders between Greek and Dutch nursing personnel. *Int Arch. Occup Environ Health* 2006; 79: 82-88.