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Original Article

Determining low back pain factors and effects on daily activities in operating room personnel in Türkiye

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ABSTRACT

Introduction: Low back pain is a common problem among operating room personnel. The study was performed to determine low back pain (LBP) factors and effects on daily activities in operating room personnel.

Methods: The descriptive study was conducted in January 2018 in Ankara, Türkiye. The study sample consisted of 210 operating room personnel. Data from the study were collected using the Oswestry Low Back Pain Disability Questionnaire and Socio-Demographic Characteristics and Low Back Health Question Form.

Results: The majority of operating room personnel had LBP. The mean disability score of the Operating room personnel was 9.69±6.49. A total of 8.1% of operating room personnel had severe disabilities. The disability score of the operating room personnel was higher in women, nurses, and personnel who worked over 8 hours a day, those who had any level of stress, and those who lifted patients without assistance.

Conclusion: LBP remains an important problem in operating room staff and negatively affects daily activities. Considering the disability caused by LBP, to prevent LBP, developing comprehensive programs with hospital management including exercise, coping with stress, smoking cessation, and regulation of the working environment and conditions is suggested.

Keywords: Disability, Low back pain, Occupational health, Operating room

Introduction

Low back pain (LBP) is an important health problem that is common worldwide and is a major cause of disability.[1] LBP leads to a loss of working days, creating a serious economic burden on countries. [2,3] LBP is more common in some occupational groups that strain the lumbar region and require heavy lifting.[4,5] There are many occupational and individual risk factors for LBP. Chronic traumas such as physically heavy work, frequent bending, long-standing, lifting heavy loads, sudden unplanned movements, and repetitive movements cause LBP.[5-7]

It is emphasized that healthcare professionals have many risk factors that increase the risk of LBP. [8,11] Healthcare professionals often experience more LBP than other occupational groups, with the main factors being heavy lifting, sudden and unplanned movements, patient lifting, bending forward, standing in a fixed position, standing for extended periods, carrying patients, positioning patients, and stress.[4,12-16] Among healthcare

professionals, operating room (OR) personnel are exposed to almost all risks associated with LBP. Therefore, LBP is an important occupational problem in OR personnel. The main factors that increase the risk of LBP in this group are standing for a long-time during surgery, staying in a position that induces strain in the lumbar region, carrying patients, and lifting the surgery equipment.[17-21]

The prevalence of LBP, loss of workdays, healthcare costs, and reduced quality of life make it important to effectively implement measures for LBP.[2,3,8,22] LBP also influences an individual's ability to perform daily activities. Functional disability has been shown to increase as the severity of LBP increases.[23] More than half of the nurses were reported to have limited activities and 53.9% took sick leave due to LBP.[24] Approximately one-fourth of OR nurses were reported to have experienced moderate disability.[22] Although there have been interventional studies and programs to prevent LBP, it remains a serious occupational problem for healthcare professionals.[25-27] Considering this situation, more comprehensive studies in terms of factors affecting LBP will contribute to the multi-dimensional handling of the problem. Several studies have been conducted on LBP among healthcare professionals; however, extensive studies on LBP risk factors and disability in daily activities due to LBP are limited.[17,21]

Methods

This descriptive study was performed to determine LBP risk factors and disability levels in daily activities caused by LBP in OR personnel. The study was conducted between January 2 and 31, 2018, with doctors, nurses, anesthesia technicians surgical technicians, and healthcare aides working in the OR of the training and research hospital. The hospital has 1010 beds and 26 ORs. A convenience sampling method was used to select participants. The study included 250 OR personnel. A total of 210 (84%) OR personnel who volunteered and were not on sick leave were included. Forty OR personnel did not participate in the study due to sick leave, intense work tempo, or different working hours.

Characteristics of the Socio-Demographic and Low back Health Question Form and Oswestry Low Back Pain Disability Questionnaire were used as data collection tools.

Characteristics of the Socio-Demographic and Low back Health Question Form: This form consists of 30 questions developed by the researchers to determine the socio-demographic and low back health characteristics of healthcare professionals.[8,19-21,25,28]

Oswestry Low Back Pain Disability Questionnaire: It was developed by Fairbank et al. to evaluate functional disability in 1980.[29] The form was revised by Fritz et al. in 2001, converting it to a new version used today. This questionnaire is also referred to as the Oswestry Disability Index (ODI).[30] The Turkish validity and reliability of the ODI (2.0) was made by Yakut et al. in 2004. In this study, daily activities were measured in 10 different dimensions: severity of pain, personal care, lifting, walking, sitting, standing, sleeping, degree of pain change, social life, and travel.[31] While the minimum score obtained from the scale was 0, the maximum score was 50. An increased score indicates an increase in disability level. Cronbach's alpha for ODI was 0.89 in Yakut et al.'s study and 0.79 in this study.[31]

The percentage values obtained are interpreted as follows:

0%–20%: Minimal disability
21%–40%: Moderate disability
41%–60%: Severe disability
61%–80%: Completely disability
81%–100%: Bed bound/exaggerating symptoms

The Questionnaire was used without revision, as the questions were reported to be understandable by 10 OR personnel. One-to-one interviews with OR personnel were performed by the researcher, and their consent was obtained by explaining the aim of the study and what to expect from them. The forms were collected by visiting during the agreed hours and days. Forms were filled in an average of 15 minutes.

The Ethics committee approval required for the study was obtained from the Medical and Health Sciences Research Board (KA17 / 27) of Health Science University. The necessary official permits were obtained from the Medical Education Board

of the same university. Written informed consent was obtained from each operating room personnel. The study was conducted following the principles of the Declaration of Helsinki.

Data obtained from the study were transferred to the computer environment and analyzed with the IBM SPSS Statistics Version 17.0 (SPSS Inc., Chicago, Illinois, USA) package program. Descriptive data were expressed in mean ± standard deviation (SD), number and frequency. Shapiro Wilk's test was used due to the number of units upon an investigation of the normal distribution of variables. While analyzing the differences between the groups, the One sample test, and the One Way ANOVA test were used for variables that were normally distributed, and Mann-Whitney U and Kruskal-Wallis H tests were used when the variables were not normally distributed. A p-value of <0.05 was considered statistically significant.

Results

The mean age of the OR personnel was 38±8.02, and 41.9% were 31–40 years old. Furthermore, 75.7% were males, and 81.9% were married. Additionally, 53.8% of the OR personnel were doctors, 17.6% were nurses, 14.3% were anesthesia technicians, 3.3% were surgical technicians, and 11% were healthcare aides.

It was determined that 84.3% of OR personnel experienced LBP at least once in their lifetime, and the prevalence of LBP was 81.4% in a year. A total of 29.9% of patients were diagnosed with LBP (Table 1).

Table 1. Characteristics of the low back pain of the OR personnel

Characteristics	n (%)
Low back pain (n=210)	177(84.3)
Low back pain in the last year (n=177)	171 (81.4)
Diagnosis with low back pain(n=177)	124(70.1)
Sick leave for low back pain(n=177)	15(8.4)

Although not shown in the table, the majority of OR personnel performed risky movements for LBP. 77.2% of the OR personnel positioned patients, 69.9% carried patients between the stretcher and the operating table, 65.1% worked in a position that strained the low back, 54.4% rotated the upper part of the body, 53.9% performed unplanned sudden movement, 50.9% performed bending the low back forward without bending the knees, and 36.9% lifted heavy objects such as surgery sets higher than the low back. The most common activities where LBP was reported by the OR personnel included standing during operations for extended durations (40.6%), heavy lifting (33.8%), and working in the same position during surgery (23.6%).

The mean ODI score of the OR personnel was 9.69±6.49. While 51.9% of the OR personnel had minimal disability, 40% of them had moderate disability, 8.1% of them had severe disability. The mean ODI score was higher in OR personnel who have LBP (t=14.205, <0.001) (Table 2).

Table 2. ODI Score according to having low back pain in OR Personnel (N=210)

ODI Score%	n	%
Minimal	109	51.9
Moderate	84	40.0
Severe	40	8.1

Low back pain	n(%)	ODI Score%	ODI Score Mean (SD)	Test* p
Yes	177 (84.3)	22.16	11.05 (5.93)	14.205
No	33 (15.7)	3.61	1.78 (2.73)	<0.001
Total	210	19.25	9.60 (6.49)	

* Independent Sample T

The mean ODI scores were examined according to demographic characteristics and risk factors of OR personnel. Female scores were higher than male scores (t=3.791, <0.001), and nurses' scores were higher than doctors' scores (χ^2=14.264, p = 0.006) (Table 3).

OR personnel who work over 8 hours a day have a higher ODI score than OR personnel who work 8 hours or less (t=2.647, 0.009). The mean ODI score was higher in OR personnel who experienced stress at all levels in the work environment (χ^2=27.708, <0.001), and in those who did not receive help when lifting patients (t=-2.241, p <0.044) (Table 4).

Table 3. ODI scores according to the descriptive characteristics of OR Personnel (N=210)

Descriptive Characteristics		n(%)	ODI Score (%)	ODI Score Mean(SD)	Test, p-value
Gender	Female	51 (24.2)	25.16	12.50 (6.39)	**3.791**
	Male	159 (75.7)	17.36	8.66 (6.27)	**<0.001**
Age	<35 years	58 (27.6)	17.35	8.63 (5.57)	-1.328*
	≥35 years	152(72.4)	19.97	9.96 (6.79)	0.186
BMI	Normal (18.5-24.9)	88 (41.9)	19.36	9.65 (6.25)	3.251†
	Preobes (25-29.9)	101(48.1)	17.79	8.88 (6.35)	0.41
	Obes (≥30)	21 (10.0)	25.77	12.80 (7.56)	
Occupation	Doctor	113 (53.8)	16.87	8.42 (5.91)	**14.264‡**
	Nurse	37 (13.1)	26.31	13,10 (6.95)	**0.006**
	Anesthesia technician	30 (8.8)	17.67	8.83 (5.14)	
	Surgical technician	7 (9.1)	18.29	9.31 (5.04)	
	Healthcare aide	23 (10.8)	21.97	10.86 (8.47)	
Working years in occupation	≤5 year	26 (12.4)	15.24	7.57 (4.56)	1.911 †
	6-10 year	29 (13.8)	17.72	8.82 (5.95)	0.151
	> 10 year	155 (73.8)	20.21	10.08 (6.81)	
	Total	210		9.60 (6.49)	

*Independent Sample T , † One way Anova, ‡ Kruskal Wallis H

Table 4. ODI scores according to the risk factors of OR personnel (N=210)

Risk Factors		n (%)	ODI Score %	ODI Score Mean (SD)	p
Shift work	Yes	160 (76.2)	20.07	10.0(6.31)	1.652*
	No	50 (23.8)	16.64	8.28 (6.96)	0.100
Working over 8 hours	Yes	126 (60.0)	21.16	10.55 (6.33)	**2,647***
	No	84 (40.0)	16.39	8.16 (6.51)	**0.009**
Pregnancy (Female=46)	Yes	33 (71.7)	28.88	14.39 (5.03)	-1.872†
	No	13 (28.3)	23.41	11.61 (6.88)	0.061
Smoke Cigarette	Yes	85 (40.5)	20.16	10.08 (6.74)	.877*
	No	125 (59.5)	18.63	9.27 (6.33)	0.376

Sport	Yes	38 (18.1)	15.89	7.92 (6.15)	-1.769*
	No	172 (81.9)	19.99	9.97 (6.53)	0.078
Receiving support when lifting patients	Yes	143 (68.1)	17.92	8.92 (5.88)	**-2.241***
	Sometimes/No	67 (31.9.)	21.30	11.04 (7.49)	**0.044**
Stress in working	No stress	7 (3.3)	5.71	2.85(3.62)	**27.708‡**
	Mild stress	40 (19.0)	16.00	8.00 (6.11)	**<0.001**
	Moderate stress	92 (43.8)	17.15	8.55 (6.18)	
	Severe stress	71 (33.8)	25.15	12.52(6.19)	

* Independent Sample T, † Man Whitney U, ‡Kruskal Wallis H

Discussion

According to the results of the study, the majority of OR personnel had LBP. In studies with healthcare professionals in different countries, the prevalence of LBP ranged from approximately 45%–85%.[22, 32,33] The prevalence of LBP in healthcare workers in Türkiye is between 33% and 87.5%.[25,34-36] Nurses are the group most affected by LBP.[8,18,20] In our study, the prevalence of LBP was similar to that reported in the literature. OR personnel, especially nurses, are among the groups most affected by LBP due to the profession's characteristics and working environment and conditions. Excessive load on the lumbar region, lifting, bending, twisting, and intense physical activity are risks for LBP.[5]

Hospital personnel, especially OR personnel, report that factors that cause back pain include standing for extended durations, lifting heavy objects and patients, bending forward, being in a constant position for a long time, and experiencing psychological stress. These factors cause more LBP in healthcare professionals than in those working in other sectors. [8,14,36] In this study, OR personnel have many risk factors that can lead to low back pain. They reported being exposed to factors that strain the lumbar region, such as heavy lifting and standing for long hours, as well as standing for a long time in an inappropriate position. In addition, OR personnel have individual and professional risk factors such as stress, smoking cigarettes, obesity, not participating in sports, not paying attention to body mechanics, and standing for extended durations. The results indicated that most of these risks are preventable, and these factors can be controlled by individual and professional interventions and organizations.

Lack of assistance while removing patients is an important risk factor for LBP.[8] Louis Andersen et al. (2019) determined that patient transfer increased the risk of LBP by a factor of 3.58, which explains why LBP is higher in OR personnel.[16]

LBP causing different levels of disability for healthcare professionals has been previously reported. [22] In this study, while the mean ODI score in OR personnel was founded as 9.69±6.49, 51.9% of the OR personnel had minimal and 40% of them had a moderate disability. Moderate disability (24.9%-89.4%) related to back pain was found in the studies conducted with health care personnel.[37-39] According to this result, OR Personnel experience pain with sitting, lifting, and standing, but the daily activities were not affected. The mean ODI score of women was higher than that of men in this study ($p<0.05$). When the literature was reviewed, the frequency of LBP affecting daily activities was found to be higher in women than in men. [3, 40] LBP may cause more disability in women's daily activities than in men's due to factors such as a comparatively low physical endurance, giving birth, and continued workload at home.

While the mean scores of the nurses were higher than those of the other occupational groups, the mean scores of the nurses were significantly higher than those of the doctors and anesthesia technicians ($p<0.05$). The rate of nurses with LBP is higher than other healthcare professionals.[8,20,34] The higher LBP in nurses can be attributed to the fact that they consist mainly of women, have long working hours, and perform activities that strain lumbar regions, such as patient lifting.

Working for a long hour increases the risk of LBP. Similar to our study, other studies show that working more than 8 hours a day and working in

shifts were factors that increased LBP in nurses.[26, 36] Standing for an extended period increases the load on the lumbar region and may cause damage to the structures in this area over time.[8, 36] The fact that OR personnel have to stand for a long time due to the nature of their job may have led to this result.

The ODI scores of those who experienced stress at all levels in the work environment were higher than those of those who never experienced stress ($p<0.05$). In the literature, it is emphasized that physical and emotional stress factors affect LBP.[7,8, 36] This is an expected result given that ORs are extremely stressful environments for patients and employees.

Limitations of the study: This study was carried out in a single center. Therefore, the results cannot be generalized.

Conclusion

In conclusion, LBP was higher in OR personnel, and nurses had more disabilities in their daily activities than other personnel. Considering the results of the study, repetition of training programs for the correct use of body mechanics and lifting devices to raise awareness on low back health, to arrange the working environment following ergonomic principles, to provide lifting devices, and to facilitate staff access to them is recommended. Improving the number of personnel, arranging appropriate rest times for employees, and developing programs for coping with stress can be effective in preventing back pain. More comprehensive studies can be suggested about the relationship between stress, LBP, and disability.

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