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Work-Related Ergonomic Risks and Musculoskeletal Problems in Operating Room Nurses

Selcan Ataseven Tuğran [a*], Ayşegül Savcı [b]

[a] Evliya Çelebi Training and Research Hospital Neurology Intensive Care Unit, Kutahya, Türkiye.

[b] Kutahya Health Science University, Health Science Faculty, Department of Nursing, Surgical Nursing Department, Kutahya, Türkiye.

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[a]https://orcid.org/0000-0003-1576-1067

[b]https://orcid.org/0000-0002-9176-7420

*Correspondence: Ayşegül Savcı

Kutahya Health Science University, Health Science Faculty, Department of Nursing, Surgical Nursing Department, Kutahya, Türkiye

e-mail: aysegul.savci@ksbu.edu.tr

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ABSTRACT

Purpose: The purpose of this study was to investigate on the work-related ergonomic risks and musculoskeletal problems operating room nurses.

Metots: This study was a descriptive study.The study was conducted on operating room nurses from three state, a pivate and a university hospital in Türkiye (N= 92). Data were collected to Descriptive Form , The Oswestry Disability Index (ODI), Neck Disability Indeks (NDI) and Rapid Entire Body Assesment (REBA). The study conducted from March to October 2019.

Results: The mean age of nurses was 34.99±8.31 years. It was found that nurses had lumbar (76.1%), back (64.1%) and neck (59.8%) pain and 75.2% of the nurses have a very high risk in terms of ergonomic. It was found that there is a statistically significant negative relationship between age and work posture of nurses. It was determined that there was a statistically significant difference between disability caused by low back and neck pain and exercise status. There was a statistically significant difference between weekly and daily standing hours and disability due to neck pain .A strong positive correlation was found between the mean ODI scores and NDI scores. A weak negative correlation was found between the mean NDI scores and REBA scores.

Conclusion: It was determined that the majority of operating room nurses experience musculoskeletal disorders. It was found that the work-related ergonomic risks of the operating room nurses and the issue requires urgent measures.

Keywords:

Operating room nurse,Work Posture, Musculoskeletal problems

INTRODUCTION

Health workers can adversely affect their health and comfort (1,2). Musculoskeletal problems are especially common in nurses because working conditions put stress on physiological and anatomical structures (3,4). Nurses experience problems in areas such as the low back, neck, shoulders and knees, which can be caused by repeated and prolonged performance of the same task. The operating room nurses who must stay in the same position for a long time are especially at high risk (1,2,5).

Posture is the harmonious operation of muscles, joints and supporting structures with physical activity and a healthy posture contains no asymmetry or deformity (4). However, when a movement not consistent with the normal posture of functional tissues is performed, pain and injuries associated with the musculoskeletal system ocur (6). It is difficult for operating room nurses to maintain normal posture in many activities. It has been reported that nurses experience pain related to the musculoskeletal system because of unsuitable physical postures during surgery and twisting/rotational movements in their spine during their tasks (4,7). On the other hand,

it has been reported that social, emotional, cognitive, environmental and behavioral factors may also be effective in these problems, as well as working posture (8).

Healthcare workers are four times more at risk in terms of musculoskeletal problems compared to employees in the industry sector (9,10). Among health care workers, musculoskeletal system problems are most commonly observed in dentists, physiotherapists and nurses (11). Factors such as non-ergonomic design of the operating room environment and lack of attention to body mechanics during the procedure further strain the posture of nurses (12) In the literature, it is stated that placing patients on the operating table/stretcher, positioning the patients, lifting and holding the patient's extremity, applying long-term retraction, lifting and carrying instruments, standing in inappropriate body positions and standing for a long time create risks (13,14). Continuous lifting and carrying lead to gradual and cumulative wear of the musculoskeletal system (1). Musculoskeletal system problems that persist over time lead to chronic pain, disability and deterioration in quality of life (15,16). According to the literature, the most common musculoskeletal system problems in nurses occur in the neck, waist and back (1,3,13,15,17).

The presence of ergonomic problems in the working environment causes problems such as injury, stress, and fatigue in the employees. This situation reduces employee productivity, prevents a quality care service, and may adversely affect patient safety. Evaluation of the posture of operating room nurses can help us realize the risks associated with the musculoskeletal system and take necessary precautions. Studies evaluating the working postures of operating room personnel are limited in our country. In line with the results of this study, awareness can be raised in order to reduce the risk of injury, protect health and increase work efficiency in the operating room. The purpose of this study was to investigate the work-related ergonomic risks and musculoskeletal problems of operating room nurses.

In this study, answers to the following question were sought; "What are the work-related ergonomic risks and musculoskeletal problems of operating room nurses?"

2. MATERIALS AND METHODS

2.1. Design

The study is cross-sectional descriptive research. The study was carried out in three state hospitals, one private hospital, and one university hospital in one of the central provinces of Türkiye. We conducted the study from March to October 2019.

2.2. Sample of the Research

The sample comprised a total of 102 operating room nurses. Inclusion criteria are to have completed the operating room certification program and have worked in the operating room for at least one year. Nurses who had an inflammatory rheumatic disease and were on leave were excluded from the study. The study was completed with N = 92 nurses (Figure 1). After study, post hoc power analysis was carried out with the research's own data using the G*Power

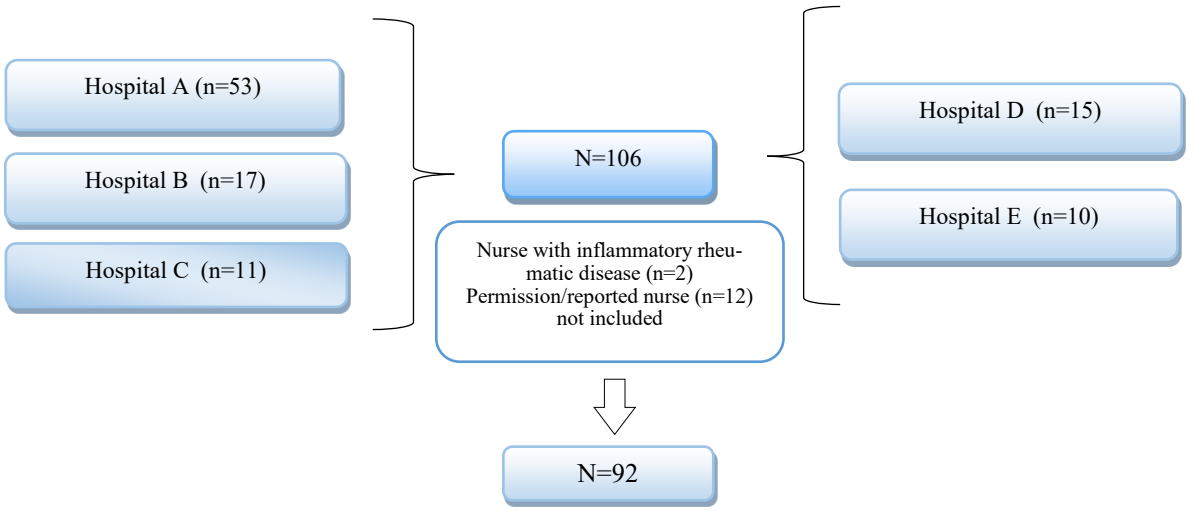


Figure 1: Sample flow diagram.

program. In post hoc power analysis independent groups, t-test analysis data were determined as 95% confidence interval, p= 0.05 significance level, effect factor 0.37, and power of 0.90 with a sample size of 92.

2.3. Data Collection Forms

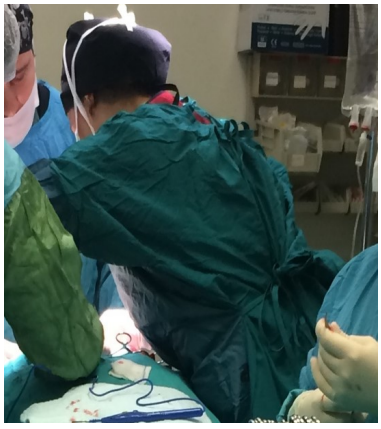
Descriptive form prepared by the researchers with reference to the relevant literature was used to collect data (1,17). This form comprises questions about the demographic characteristics and working conditions of the participants (age, gender, education status, weight, height, body mass index (BMI), regular sport/exercise status and frequency, duration of work in the profession and operating room, which surgeries they attend, weekly working hours, daily standing work hours, positions straining the musculoskeletal system during surgery, whether they feel pain during these positions).

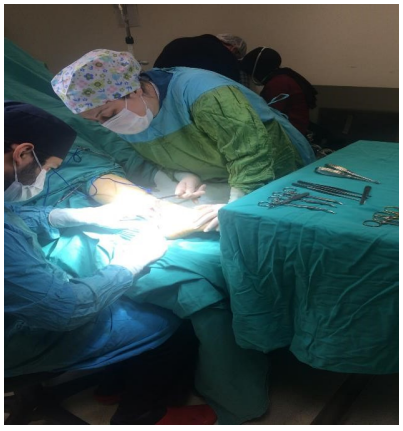
The Oswestry Disability Index (ODI): The index is used to determine the level of disability caused by back pain (18). Turkish validity and reliability of the scale were conducted by Yakut et al., (2004). ODI measures “pain intensity”, “personal care”, “lifting loads”, “walking”, “sitting”, “standing”, “sleeping”, “social life”, “travel” and “pain” with 10 separate questions. Each question is scored between 1 and 5 and the scores are summed up. The results are determined as percentages using the formula total score × 100. The minimum score is 0% and the maximum score is 100%. Evaluation is made as follows: 0%–20% “minimal disability”, 20%–40% “moderate disability”, 40%–60% “severe disability”, 60%–80% “complete disability”, and 80%–100% “confined to bed” (19). In the present study, the Cronbach alpha coefficient of the scale was 0.86. Neck Disability Index (NDI): It was developed by Vernon in 1980. The scale is used to determine the degree of disability of the neck in groups with existing or with a high probability of neck pain (20). A Turkish validity reliability study was conducted by Aslan Telci et al., in 2009 (21). The scale comprises 10 questions each question is scored between 0 and 5 points. According to the test result, a score of 0–14 indicates 'No disability', 15–24 indicates 'Moderate disability', 25–34 indicates 'Severe disability', and a score of 35 and above indicates 'Complete disability' (20,21). In this study, the Cronbach alpha coefficient of the scale was 0.78.

Rapid Entire Body Assessment (REBA): This method is a postural analysis system for individuals working in healthcare and other sectors sensitive to musculoskeletal risks in various tasks (22). REBA was developed in 2000 by Sue Hignett & Lynn McAtamney (23). REBA allows complete postural analysis of the upper extremities (arm, forearm, wrist), body, neck, and lower extremities. When evaluating the posture, “direct observation”, “video recording” or “photos” can be used (23).

2.4. Data Collection

Data were collected by the researcher face-to-face from 1 March to 31 October. Before starting the study, a pilot study was performed with ten (10) operating room nurses. With permission from the nurses, images were obtained during the difficult positions in the operating room, and these positions were evaluated with REBA. REBA was evaluated during the challenging positions identified in the pilot study. Some of these positions are given in Picture 1-2.





Picture 1 and 2 : Examples of nurse's posture in the intraoperative process.

Postures in these images were interpreted by the researcher (Master Student, RN), supervisor (Ph.D., RN), and an independent researcher (Ph.D., Physiotherapist) their risk levels were determined. Thus, possible evaluation biases were avoided when evaluating posture. In this pilot study and related literature, the positions nurses had the most difficulty in the operating room were during the "intraoperative period" and "patient transfer" (13,15,16). The position that nurses had the least difficulty was during the "mayo table set up". For this reason, three rounds of REBA evaluations were planned, including positions during "mayo table set up", "intraoperative period" and "patient transfer". However, because of operating room conditions, prolonged surgeries, not every nurse taking part in these three activities, and time limitation, each nurse was observed in at least one of the positions, and the REBA form was filled by the researcher. A single position was evaluated for each participant and no improvement was recommended to reduce ergonomic risk. In this study, the REBA method was divided first into body parts, Group A (body, neck, legs) and Group B (upper and lower arms, wrists). Postures of the neck, torso and legs were individually determined, and a total score was determined with the help of Table A. A score was obtained by adding the "force" score to the score obtained from Table A. The posture of the upper and lower arms and wrists was evaluated, and a total score was determined with the help of Table B. B score was created by adding the "grip" score to the score obtained from Table B. Using Table C, the C score was obtained, which consisted of scores A and B. Finally, REBA score was obtained by adding activity to the C Score. Each REBA score was evaluated as five levels of activity interacting with each other. Measures to be taken were determined as per activity level ranking (23). (Figure 2) (Table 1).

2.5. Statistical Analysis

Package for Social Science (SPSS) version 27.0 (IBM Corp., Armonk, NY, USA) was used for the analysis of all data. The Kolmogorov-Smirnov test was used to check the normality of the data. Number, percentage, and chi-square tests were used to analyze

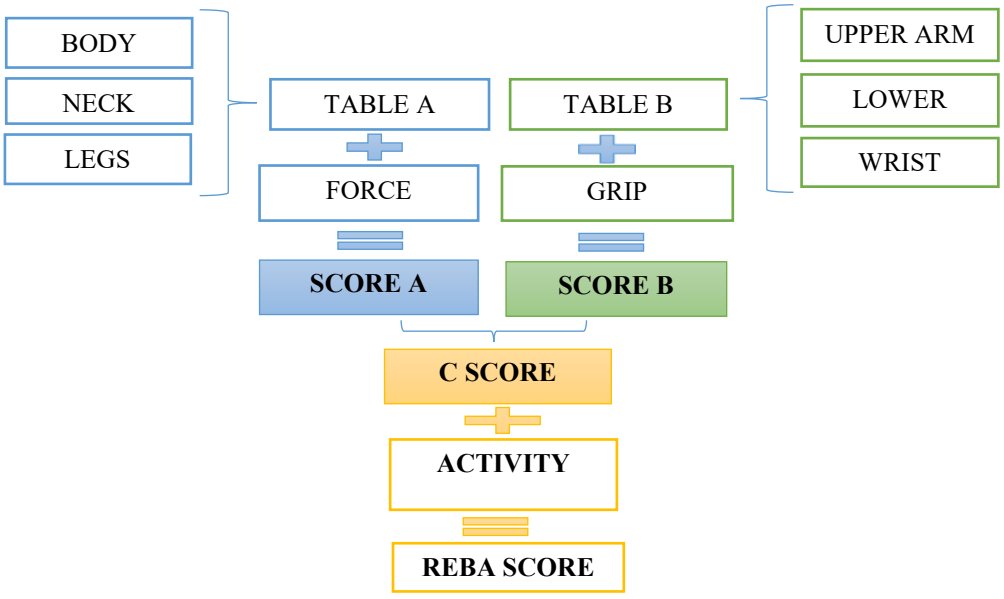


Figure 2: REBA Rating scheme

Table 1: Rapid Entire Body Assesment Risk Rating Table

REBA[ł] RISK RATING			
Degree	**REBA Score**	**Risk Level**	**Precaution**
0	1	Negligible	Not required
1	2-3	Low	May be required
2	4-7	Moderate	Required
3	8-10	High	Required in a short time
4	11-15	Very high	Immediately required

[ł]: Rapid Entire Body Assessment

sociodemographic information. While parametric tests were used for data suitable for normal distribution, nonparametric tests were used for data unsuitable for normal distribution. Independent Samples T-test and Mann Whitney U test analysis were used to compare scale scores according to two -category variables. Chi-square and Kruskal Wallis tests were used to compare scale scores according to variables with more than two categories. To examine the relationship between scale scores and numerical variables, Spearman's correlation coefficient was calculated. The Cronbach's alpha coefficient of the scales used in the study was calculated. P < 0.05 was accepted for the level of significance in all tests.

2.6. Ethics

This study was conducted in accordance with the Helsinki Declaration principles. Ethics committee approval (19.03.2019/04) and institutional permits were obtained from the hospitals where the study was conducted before the data was collected. Written and oral consent was obtained from all nurses.

3. RESULT

The mean age of nurses was 34.99±8.31 years and 95.6% (n=88) of the nurses were women. Moreover, 54.3% were 35 years old and above. The mean BMI of nurses was 24.76 ± 4.13 and 42.4% (n = 39) were overweight and obese. 89.1% of the participants (n = 82) did not regularly exercise, while those who regularly exercised (n = 10) performed activities such as cycling, fitness, walking, and swimming, 3–4 times a week for 30–60 min. Note that 63% of nurses (n = 58) had work experience of 10 years and above and 50% (n = 46) had work experience in the operating room for 10 years and above. Furthermore, 46.7% (n = 43) of the nurses worked 41 h or more in a week, and 50% (n = 46) worked standing for six hour a day. Note that 38% of nurses (n = 35) received a diagnosis for the musculoskeletal system after starting to work in the operating room, 42.4% (n = 39) had musculoskeletal system symptoms after starting to work in the operating room, and % 89.1% (n = 82) had musculoskeletal difficulty in certain positions during surgery. Positions that strained the musculoskeletal system in the operating room were standing for long hours (88.0%, n = 81), holding patient's body parts (arm, leg, etc.) for preparation (54.3%, n=50), and moving tools and materials (42.4%, n = 39). Moreover, 90.2% (n = 83) of nurses felt pain during positions that

Table 2: Distribution of ODI†, NDI‡ and REBA§ Scores of Operating Room Nurses (N=92)

Scales	**X±SD¶**	**Min-Max**
Oswestry Disability Index	9.44±6.90	0.00-32.00
	n	**%**
Minimal disability	60	65.2
Moderate disability	24	26.1
Severe disability	6	6.5
Complete disability	2	2.2
Confined to bed	0	0
	X±SD¶	**Min-Max**
Neck Disability Indeks	9.69±6.04	0.00-28.00
	n	**%**
No disability	19	20.7
Slight disability	52	56.5
Moderate disability	19	20.6
Severe disability	2	2.2
Complete disability	0	0
	X±SD¶	**Min-Max**
Rapid Entire Body Assesment	12.72±1.05	6.00-14.00
A (Neck-Body-Leg)	9.08±1.21	7.00-13.00
B (Arm-Wrist)	8.73±1.41	4.00-12.00
REBA§ Risk Levels	**n**	**%**
Acceptable risk	0	0
Low risk (precautions may be required)	0	0
Medium risk (investigate, rapid measure)	2	2.2
High risk (review, take precautions)	20	22.6
Very high risk (take precautions)	70	75.2

†: Oswestry Disability Index
‡: Neck Disability Indeks
§: Rapid Entire Body Assesment
¶: Mean ± standard deviation

Table 3: Relationship between Age and Body Mass Index and ODI[ǂ], NDI[ǂ], REBA[§] scores of operating room nurses (N=92)

	ODI[ǂ]	NDI[ǂ]	REBA[§]
Age	r_s: 0.059 p=0.573	r_s: 0.000 p=0.998	**r_s: -0.234** **p=0.025***
Body Mass Index	r_s: 0.066 p=0.529	r_s: -0.096 p=0.362	r_s: -0.171 p=0.103

ǂ: Oswestry Disability Index
ǂ: Neck Disability Indeks
§: Rapid Entire Body Assesment
*p<0,05, r_s: Spearman Correlation Analysis, r: Pearson Correlation Analysis.

strained the musculoskeletal system during surgery. It was determined that 76.1% (n= 70) of the nurses experienced low back pain, 64.1% (n= 59) experienced back pain, and 59.8% (n= 55) experienced neck pain. Note that 34.8% of nurses (n = 32) had moderate or more restriction in the lumbar region, 79.3 % (n= 73) had mild or more disability in the neck region. The mean ODI score was 9.44±6.90 and mean NDI score was 9.69±6.04. The posture of 24.8% (n = 22) of nurses was evaluated at moderate and high risk, and 75.2% (n = 70) were evaluated at very high risk (Table 2).

There was a negative, weak, significant correlation between nurses' age and REBA scores (r= -0.234 p = 0.025) (Table 3).

There was a statistically significant difference between ODI (z = -1.980, p = 0.048), NDI (z = -2.709, p = 0.007) scores according to exercise status. There was a statistically significant difference between mean NDI scores according to weekly work hours and daily standing work hours (z = -2.031, p = 0.042; z = -2.175, p = 0.030) (Table 4).

A strong positive correlation was found between the mean ODI scores and NDI scores (r: 0.728, p=0.000). A weak negative correlation was found between the mean NDI scores and REBA scores (r: 0.210, p=0.044) (Table 5).

4. DISCUSSION

In the study, it was determined that the majority of nurses working in the operating room had tasks/ situations during surgery in which the

Table 4: Comparison of socio-demographic and descriptive characteristics of operating room nurses and ODI[ǂ], NDI[ǂ] and REBA[§] scores (N=92)

Variables	n	ODI[ǂ]	NDI[ǂ]	REBA[§]
		X±SD[¶]	**X±SD[¶]**	**X±SD[¶]**
Regular sport/exercise				
Yes	10	6.50±8.74	5.20±5.61	13.00±0.94
No	82	9.80±6.61	10.24±5.89	12.69±1.07
z/p		-1.980/ **0.048***	-2.709/ **0.007***	-0.738/ 0.461
Duration of work in the profession				
4 years and under				
5-9 years	12	9.91±8.05	9.08±6.72	12.91±0.79
10 years and above	22	8.09±5.68	8.68±5.19	12.81±1.09
	58	9.86±7.12	10.20±6.23	12.65±1.10
x^2/p		0.818/ 0.664	0.669/ 0.716	0.623/ 0.732
Duration of work in the operating room				
4 years and under	24	9.25±7.78	8.83±6.51	13.08±0.92
5-9 years	22	8.90±5.33	10.00±5.44	12.63±1.09
10 years and above	46	9.80±7.19	10.00±6.14	12.58±1.08
x^2/p		0.355/ 0.838	0.805/ 0.669	3.558/ 0.169
Weekly working time				
40 hours and under	49	7.95±5.35	8.32±5.01	12.81±1.09
41 hours and above	43	11.13±8.05	11.25±6.76	12.62±1.02
z-t/p		**z:**-1.847/0.065	**z:**-2.031/**0.042***	**z:**-0.949/0.342
Daily standing working time				
0-6 hours				
Over 6 hours	46	8.67±5.70	8.47±5.79	12.60±1.06
	46	10.21±7.90	10.91±6.10	12.84±1.05
z-t/p		**z:**-0.759/0.448	**z:**-2.175/**0.030***	**z:**-1.222/0.222

ǂ: Oswestry Disability Index
ǂ: Neck Disability Indeks
§: Rapid Entire Body Assesment
¶: Mean **±** standard deviation
*p<0.05. z: Mann Whitney U test. x^2: Kruskal Wallis test, t: Independent sample t test.

Table 5: Relationship between ODI†, NDI‡ and REBA§ scores of operating room nurses (N=92)

	ODI†	**NDI‡**	**REBA§**
ODI†	-	r_s:0.728 **p=0.000****	r:-0.181 p=0.084
NDI‡	-	-	r:-0.210 **p=0.044***
REBA§	-	-	-

†: Oswestry Disability Index
‡: Neck Disability Indeks
§: Rapid Entire Body Assesment
*p<0,05, **p<0,01, r_s: Spearman Correlation Analysis, r: Pearson Correlation Analysis.

musculoskeletal system was strained. These were standing for a long time, positioning the patient, holding body areas such as the arm and legs of the patient, retraction, pushing or pulling equipment, patient transfer, and mayo table set up. In a study conducted in Türkiye, it was found that tasks of operating room nurses with highest ergonomic risk were setting up the operating table and instrument/ equipment transfer (4). El Ata et al. (2016) investigated occupational risk factors and risk rates in operating room nurses, and found that these were working while neck in flexion (95%), improper posture (90%), hand and wrist deviation (84.8%), repeated movement of the hand and wrist (84.8%), moving/lifting heavy objects (64.7%), pushing/pulling heavy objects (64.1%), and working while stretching (26.1%) (24). These results are similar to the findings in the present study. Consistent with the literature, these results were thought to be due to prolonged standing and long working hours (4, 25-27). It was determined that 38% of the nurses experienced musculoskeletal problems and 42.4% of them experienced related symptoms after they started working in the operating room. Nurses' age, exercise status, and weekly or daily standing working hours were determined to be effective (26). Reported that nurses working for six years or more, more than one night shift, and more than 40 work hours per week were associated with musculoskeletal disorders (24). In a study conducted in Türkiye, it was found that as the age and work experience of operating room nurses increased, the posture risks also increased (4). In many studies, an increase in age, duration of work, night shifts, weekly working hours, and standing for long hours were determined to be risk factors for musculoskeletal disorders, especially in the waist and neck (4, 8, 25-27).

In other studies, it is noted that physical ergonomic risk factors lead to disorders of the musculoskeletal system (1,12,13,28,29). Janki et al., (2017) investigated ergonomics in laparoscopic surgery and found that 47.5% of 479 surgeons had problems with the musculoskeletal system due to incorrect ergonomics (30). Also, Alexandre et al., (2017) found that lead gowns worn during radiography in operating rooms also caused low back pain and fatigue (31). Voss et al., (2017) stated that 27.6% of surgeons reported occupational injuries due to ergonomic risks; most commonly cervical spine pain and musculoskeletal fatigue (31). In our study, it was found that the most common areas of pain were the lumbar (76.1%), back (64.1%), and neck (59.8%), respectively. El Ata et al., (2016) also found that the most affected areas the nurses working in the operating room related to the musculoskeletal system were the lumbar (76.1%), knees (67.9%), and shoulder/arm (60.9%), respectively (24). Similar results were obtained in many studies conducted on healthcare workers and nurses (2,10,13,32). In the study, when the level of disability that nurses experienced due to neck pain was evaluated, it was found that 79.4% of nurses experienced mild to severe disability. In addition, more than half of nurses had a minimal disability in the lumbar region, while 32.5% had moderate to severe disability. In addition, a significant relationship was found in the present study between low back pain and neck pain, and these disabilities were considered to affect each other. Kandemir et al., (2019) investigated musculoskeletal system pain in operating room nurses and found that more than half

of nurses had back and neck pain that affected home/work life and used medication (2). It was also found that about a third of nurses experiencing these problems received sick reports. In studies examining low back pain in nurses, it was found that half of the nurses have low back pain and the most important reason is ergonomic conditions (15,16,33). To reveal the relationship between back and neck pain with the posture of the operating room nurses, positions that ergonomically challenged them during surgery was evaluated. In this evaluation, it was found that the posture of body parts in group A (torso, neck, legs) was worse than in group B.

This explains the pain in the lower back and neck caused by significant posture errors related to the neck, back, waist, and legs. Moreover, when the total REBA scores of nurses were evaluated, ~98% were found to have high and very high posture risk. High risk indicates that the posture of operating room nurses is inappropriate and needs urgent measures (22,23). In another study in which the REBA scores of operating room nurses were evaluated in the intraoperative process, it was determined that 62.6% of them were at high and very high risk (1). In other studies, it has been stated that there are problems related to incorrect posture among operating room nurses (4, 34).

In this study, only a small proportion of nurses (11.1%) stated that they regularly exercised. These nurses had low levels of neck and low back disability. In another study, it was reported that 74.8% of operating room nurses do not exercise regularly (4). Ribeiro et al., (2017) stated that regular exercise helps reduce symptoms related to musculoskeletal problems (27). Other studies noted that daily exercise in operating room nurses strengthens the back muscles against sudden loads or impacts. Strengthening the muscles reduces the frequency and intensity of pain caused by abnormal loads or impacts. For this reason, it was reported that the prevalence of low back pain is lower in those who regularly exercise (6, 8). Moreover, another study conducted on operating room nurses found that nurses performing daily exercise have a more ergonomic posture compared to others (1). In particular, aerobic exercises, muscle strengthening exercises, stretching, and postural and balance exercises performed in accordance with the age and functional capacity of the individual are mainly recommended for musculoskeletal health (8). Arvidsson et al., (2016) stated that no relationship was found between low back and neck pain and exercise. On the other hand, it has been reported that a multidimensional evaluation is necessary for low back and neck pain. Because, in addition to biomedical approaches for the determination of organic pathology, there is a need to reveal potential social, emotional, cognitive, environmental, and behavioral factors (8). In our study, all dimensions were not examined, and it is thought that exercise may have had a significant effect.

In this study, it was seen that the age of the nurses and BMI did not have a significant effect on low back and neck pain. Surprisingly, it has been observed that as the age of the nurses increases, their working postures are more correct. In the literature, the importance of age, obesity, occupational factors, and postural problems in the low back and neck pain has been emphasized (8). However, the trauma experiences of the nurses in our study group, the surgeries they underwent, and some diseases (osteoporosis, osteoarthritis, disc disorders) may be effective. Of course, psychosocial factors may also have affected the result. It can be thought that the use of smartphones by younger nurses also affects their posture negatively. In recent years, it has been reported that the use of tablets and phones is especially associated with neck and back pain and adversely affects posture (35, 36). This factor may need to be questioned. In the study of Kavitha and Vinodhini (2017), it was determined that the frequency and frequency of musculoskeletal pain decreased with the improvement of body posture after 8 weeks of ergonomics training in nurses (29).No training was given to nurses in this study. However, it was thought that it would be beneficial to provide ergonomics training to operating room nurses. Because it was determined that it was very difficult to maintain the proper posture during the surgery. In the study, a

negative relationship was found between disability due to neck pain and the posture of the nurses. While the nurses were trying to maintain the correct posture, they may have increased their pain in the already limited neck area. In addition, neck pain may have causes other than ergonomic situations. A relationship was found between chronic low back and neck pain, depressive disorders and anxiety (37).

2.7. Limitations of the Study

There are certain limitations of this study. Nurses were initially planned to be evaluated three times, including positions during "mayo table setup", "intraoperative period" and "patient transfer". It was thought that the same nurse being observed for a longer period in these three scenarios would be more objective in terms of posture evaluation. However, because of the conditions of the operating room, prolonged surgeries, each nurse not taking part in all three tasks, and the limitation of time, each nurse was observed in at least one position. For this reason, posture related to a single task was evaluated. Another limitation of the study is the evaluation of posture by the researcher through observation. Posture assessments, therefore, depend on the evaluator, and only measure the intensity of exertion, the duration of exposure during the workday, and the frequency of posture are not considered.

Psychosocial dimensions and neuropathic components that may affect low back and neck pain were not evaluated in the study. In addition, no physical examination was performed. All these may cause deficiencies in the interpretation of the results.

5. CONCLUSION

In this study, the situations that can lead to musculoskeletal problems in operating room nurses were evaluated in the perioperative process. It was determined that the overwhelming majority of nurses had improper posture while working and urgent measures had to be taken.

These measures include allowing high-risk personnel, periodic examinations, establishing rest periods by lying on the back, ergonomics-based training to develop correct body posture, and encouraging regular exercise. It was found that nurses experienced limitations mostly because of neck pain, followed by low back pain. It was determined that the work postures of the young nurses were worse. It can be suggested that future studies be planned to examine the multidimensional causes of low back and neck pain. In particular, the evaluation of physical examination, quality of life, neuropathic component, pain level, depression, and anxiety levels will be meaningful.

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