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The Frequency of Musculoskeletal Pain in Nurses Working in Internal Medicine Intensive Care Units and Related Factors

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ABSTRACT

Background The primary purpose of this study was to determine the frequency of musculoskeletal pain in nurses working in the internal medicine intensive care unit and to determine whether there were differences between nurses working in the internal medicine clinic. In addition, it was aimed to determine the individual and professional risk factors that will cause musculoskeletal pain in nurses working in the internal medicine intensive care unit.

Material and Methods After evaluating eligibility, 82 volunteer nurses, 36 working in the internal medicine intensive care unit and 46 working in the internal medicine clinic, were included in this single-centre, cross-sectional and descriptive study. The demographic characteristics of the participants, their regular exercise status and the factors related to their working conditions were determined by the questionnaire form created by the researchers.

Results Musculoskeletal pain was detected in 61.11% of internal medicine intensive care nurses. There was no statistical difference between the internal medicine intensive care and clinical nurses regarding musculoskeletal pain ($p > 0.05$). A statistically significant relationship was found between the situation of changing the patient's clothes and positioning the patient and the occurrence of musculoskeletal pain ($p < 0.001$). No significant relationship was found between internal medicine intensive care nurses' musculoskeletal pain and their demographic characteristics, regular exercise status and other working conditions ($p > 0.05$).

Conclusions Our study showed that nurses working in the internal medicine intensive care unit experienced a high rate of musculoskeletal pain. The study results will shed light on what kind of precautions nurses should take against work-related musculoskeletal pain.

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INTRODUCTION

The World Health Organization (WHO) has defined work-related musculoskeletal disorders as health problems of locomotor apparatus, i.e. muscles, tendons, the skeleton, cartilage, ligaments and nerves.[1] The incidence of work-related musculoskeletal disorders is high worldwide, and many risk factors depend on the nature of the work.[2]

Work-related musculoskeletal pain is a condition that requires global attention not only because of its individual health effects on workers but also because of its negative effects on countries' economies. In addition, the social problems created by this situation are also significant in terms of social dynamics. Over the past three decades, musculoskeletal disorders have emerged as the third leading cause of disability-adjusted life years among young adults globally.[3]

Work-related musculoskeletal disorders are common, especially among healthcare professionals in direct contact with patients, such as surgeons, nurses, and therapists.[4,5] The incidence of musculoskeletal pain is particularly high in nurses.[6] In a study conducted on 2,400 nurses related to musculoskeletal pain in Turkey, the 12-month prevalence was 79.5%.[7] It is thought that the quality of the work and working conditions of the nurses are related to the frequency of musculoskeletal pain.

Due to these individual and social problems caused by musculoskeletal pain in employees, it is critical to take early measures and to make necessary improvements in the work areas. This situation is more important in professions where work-related musculoskeletal pain is common, especially in nurses. The primary aim of this study was to determine the frequency of musculoskeletal pain in nurses working in the internal medicine intensive care unit and to determine whether there was a difference between nurses working in the internal medicine clinic. In addition, it was aimed to determine the individual and occupational risk factors that will cause musculoskeletal pain in nurses working in the internal medicine intensive care unit.

MATERIAL AND METHODS

The study protocol was approved by the University of Health Sciences Bursa Yüksek İhtisas Training and Research Hospital Clinical Research Ethics Committee (Decision number: 2011-KAEK-25 2023/08-02). The principles of the Declaration of Helsinki conducted the study. Consent was obtained from the participants who wanted to participate in the study voluntarily.

After evaluating eligibility, 82 volunteer nurses, 36 working in the internal medicine intensive care unit and 46 working in the internal medicine clinic, were included in this single-centre, cross-sectional and descriptive study. The participants were divided into two groups: nurses in the intensive care unit in group 1 (n: 36) and nurses in the clinic in group 2 (n: 46).

Participants who did not consent to participate in the study had a diagnosed inflammatory spine disease, had a congenital deformity that increased the risk of musculoskeletal pain, and had psychological, neurological and rheumatological disorders causing musculoskeletal pain were not included in the study. In addition, attention was paid to the fact that the participants included in the study had worked in the same department for at least one year and worked in their profession for at least one year. Finally, participants with chronic non-specific musculoskeletal pain before the study were excluded.

The data were obtained with a questionnaire developed by the researchers evaluating the nurses' socio-demographic characteristics, working conditions and musculoskeletal pain. Age, gender, body mass index (BMI, kg/m^2) and marital status of the nurses were recorded as socio-demographic data. In addition, questions about the working conditions of the nurses, the total working time in the same department, the type of shift they worked, their working positions during most of the daily working hours, whether they took part in changing patient clothes and took part in positioning the patient were recorded in the questionnaire data form. Apart from these, it was also questioned whether the participants did regular exercise (performing at least 150 minutes of moderate-intensity aerobic physical activity [e.g. walking] or 75 minutes of vigorous-intensity aerobic physical activity [e.g. running or jogging] throughout the week was defined as physically active)[8] and recorded in the questionnaire data form. Apart from these data, it was questioned whether the nurses had musculoskeletal pain at least once exceeding 24 hours in the last year, and if so, in which area.

Statistical analysis

The Shapiro-Wilk test assessed whether the variables follow a normal distribution. Continuous

Table 1. Comparison of demographic characteristics between study groups (n: 82).

	Nurses working in the internal medicine		*P*-value
	Intensive care unit (n: 36)	Clinic (n: 46)	
Age (years)	33.50 (24:52)	35 (25:55)	0.500[a]
Gender			> 0.99[b]
Female	32 (88.89%)	41 (89.13%)	
Male	4 (11.11%)	5 (10.87%)	
Marital status			0.589[c]
Married	24 (66.67%)	28 (60.87%)	
Single	12 (33.33%)	18 (39.13%)	
Body mass index (kg/m^2)	25.64 ± 3.22	25.32 ± 2.59	0.311[d]

Data were expressed as n (%) and median (minimum: maximum).
[a] Mann-Whitney U test, [b] Fisher's exact test, [c] Pearson chi-square test, [d] independent sample t-test

variables were presented as median (minimum: maximum) and mean ± standard deviation values. Categorical variables were reported as n (%). According to the normality test results, the Independent samples t-test or Mann-Whitney U test was used to compare the two groups. Pearson chi-square test, Fisher's exact test or Fisher-Freeman-Halton test was used for comparing categorical variables. SPSS (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0, Armonk, NY: IBM Corp.) was used for statistical analysis and p value < 0.05 was considered statistically significant.

RESULTS

A total of 82 nurses, 36 working in the internal medicine intensive care unit and 46 working in the internal medicine clinic, were included in the study. The median age of nurses working in the intensive

Table 2. Comparison of working conditions, regular exercise status and musculoskeletal pain status among study groups (n: 82).

	Nurses working in the internal medicine		*P* - value
	Intensive care unit (n: 36)	Clinic (n: 46)	
Total working time in the current department (years)	7.50 (1:20)	7 (1:22)	0.171[a]
Shift type			0.269[b]
Duty	18 (50%)	16 (34.78%)	
Daytime	5 (13.89%)	12 (26.09%)	
Variable	13 (36.11%)	18 (39.13%)	
Working position			0.063[b]
Mostly standing	33 (91.67%)	35 (76.09%)	
Mostly sitting	3 (8.33%)	11 (23.91%)	
Regular exercise status			0.780[b]
Yes	13 (36.11%)	18 (39.13%)	
No	23 (63.89%)	28 (60.87%)	
Taking part in changing patients' clothes			< 0.001[b]
Yes	29 (80.56%)	7 (15.22%)	
No	7 (19.44%)	39 (84.78%)	
Taking part in positioning the patient			< 0.001[b]
Yes	29 (80.56%)	7 (15.22%)	
No	7 (19.44%)	39 (84.78%)	
Musculoskeletal pain status			0.113[b]
Yes	22 (61.11%)	20 (43.48%)	
No	14 (38.89%)	26 (56.52%)	

Data were expressed as n (%) and median (minimum: maximum).
[a] Mann-Whitney U test, [b] Pearson chi-square test.

Table 3. Distribution of musculoskeletal pain in internal medicine intensive care nurses.

	Frequency
Musculoskeletal pain status	
Yes	22 (61.11%)
No	14 (38.89%)
Musculoskeletal pain area	
Spine pain	17 (77.27%)
Non-spine pain	5 (22.73%)
Total	22 (100%)
Spine pain area	
Low back pain	8 (47.06%)
Neck pain	4 (23.53%)
Back pain	5 (29.41%)
Total	17 (100%)
Non-spine pain area	
Hips and legs	2 (40%)
Shoulders	1 (20%)
Knees	1 (20%)
Wrists and hands	1 (20%)
Elbows	0
Ankles and feet	0
Total	5 (100%)

Data were expressed as n (%).

care unit was 33.50 (minimum: 24 – maximum: 52), while the median age of nurses working in the clinic was 35 (minimum: 25 – maximum: 55). A comparison of the demographic characteristics of the participants in Group 1 and Group 2 was given in Table 1. Variables such as age, gender, BMI and marital status were not different between the groups ($p > 0.05$).

The comparison of the working conditions, regular exercise and musculoskeletal pain status of the participants in Group 1 and Group 2 were shown in Table 2. There was no statistically significant difference between the regular exercise status of the participants in both groups ($p > 0.05$). Musculoskeletal pain occurring at least once in the last year and exceeding 24 hours was detected in 61.11% of the nurses in the internal medicine intensive care unit and 43.48% in the internal medicine clinic. Even though musculoskeletal pain was observed more frequently in nurses working in the internal medicine intensive care unit, no statistically significant difference was found between the two groups regarding musculoskeletal pain ($p > 0.05$). When both groups were compared regarding working conditions, it was determined that nurses working in the internal medicine intensive care unit were more involved in changing the patient's clothes and positioning the patient ($p < 0.001$).

The distribution of musculoskeletal pain of internal medicine intensive care nurses was given in Table 3. Our current study detected musculoskeletal pain in 61.11% of internal medicine intensive care nurses. Musculoskeletal pain mainly manifested itself as spine pain (77.27%). Low back pain (47.06%) was the most common pain area among spinal pain.

The relationship between musculoskeletal pain and demographic characteristics in internal medicine intensive care nurses was depicted in Table 4. According to the results of this study, there was no statistically significant relationship between musculoskeletal pain in internal medicine intensive care nurses and the demographic characteristics of the participants ($p > 0.05$).

The relationship between musculoskeletal pain, working conditions and exercise status in internal medicine intensive care nurses was given in Table 5. According to the results of the current study, a statistically significant relationship was found between the musculoskeletal pain in the internal medicine intensive care nurses and the situation of the nurses changing the patient's clothes and positioning

Table 4. The relationship between musculoskeletal pain and demographic characteristics in internal medicine intensive care nurses (n: 36).

	Musculoskeletal pain (n: 22)	No musculoskeletal pain (n: 14)	*P*-value
Age (years)	26 (29:48)	31 (24:52)	0.133[a]
Gender			> 0.99[b]
Female	19 (86.36%)	13 (92.86%)	
Male	3 (13.64%)	1 (7.14%)	
Marital status			0.471[b]
Married	16 (72.73%)	8 (57.14%)	
Single	6 (27.27%)	6 (42.86%)	
Body mass index (kg/m^2)	24.95 (19.50:30.20)	25.90 (23.30:34.90)	0.327[a]

Data were expressed as n (%) and median (minimum: maximum).
[a] Mann-Whitney U test, [b] Fisher's exact test.

Table 5. The relationship between musculoskeletal pain, working conditions, and exercise status in internal medicine intensive care nurses (n: 36).

	Musculoskeletal pain (n: 22)	No musculoskeletal pain (n: 14)	*P* - value
Total working time in the current department (years)	8.73 ± 3.56	8.21 ± 5.62	0.739[a]
Shift type			0.517[b]
Duty	11 (50%)	7 (50%)	
Daytime	2 (9.09%)	3 (21.43%)	
Variable	9 (40.91%)	4 (28.57%)	
Working position			0.051[c]
Mostly standing	22 (100%)	11 (78.57%)	
Mostly sitting	0	3 (21.43%)	
Regular exercise status			0.452[d]
Yes	9 (40.91%)	4 (28.57%)	
No	13 (59.09%)	10 (71.43%)	
Taking part in changing patients' clothes			< 0.001[c]
Yes	22 (100%)	7 (50%)	
No	0	7 (50%)	
Taking part in positioning the patient			< 0.001[c]
Yes	22 (100%)	7 (50%)	
No	0	7 (50%)	

Data were expressed as n (%) and mean ± standard deviation.
[a] independent sample t-test, [b] Fisher-Freeman-Halton test, [c] Fisher's exact test, [d] Pearson chi-square test.

the patient ($p < 0.001$). There was no significant relationship between musculoskeletal pain, other working conditions, and regular exercise status ($p > 0.05$).

DISCUSSION

In this study, 61.11% of nurses in the internal medicine intensive care unit had musculoskeletal pain. Although musculoskeletal pain was observed more frequently in internal medicine intensive care nurses than in the internal medicine clinic nurses, we did not find a statistically significant difference between the two groups. In addition, according to the results of the current study, a statistically significant relationship was found between musculoskeletal pain in internal medicine intensive care nurses and the situation of nurses changing the patient's clothes and positioning the patient. Again, we found no significant relationship between the other parameters examined in the current study and the occurrence of musculoskeletal pain in internal medicine intensive care nurses.

In a study on the prevalence of work-related musculoskeletal diseases, 300 nurses were included in the sample, and it was found that almost all nurses (97.3%) had complaints of work-related pain in the last 12 months.[9] In a study conducted in Nigeria, 90.7% were clinical nurses, and 118 nurses were included; 84.4% of the nurses who participated in the survey reported that they experienced work-related musculoskeletal pain at some point in their work life.[10] In the same study, the most common musculoskeletal pains of the participants were observed in the spine region and especially in the lower back.[10] In a study evaluating the prevalence and risk factors of work-related musculoskeletal disorders in intensive care unit nurses in China, musculoskeletal pain was observed in 97% of intensive care nurses within the last year.[11] In the same study, the most common pain was spine pain, especially low back pain.[11] The intensive care unit is a department that cares for relatively more severe patients. Compared to clinical patients, patients in intensive care units are generally less able to care for themselves and need more help from their caregivers. Nurses in the intensive care unit perform multiple procedures such as infusion, oral care and airway management daily. For many reasons, they take a more active role in patient care than nurses working in the clinic.[12-14] The overall 12-month prevalence of musculoskeletal pain among nurses worldwide is 40% to 85%. Considering the heavy working conditions of intensive care nurses, this rate may increase in nurses working in intensive care units.[15-20] In our study, 61.11% of the nurses working in the internal medicine intensive care unit and 43.48% of the nurses working in the internal medicine clinic had musculoskeletal pain lasting more than 24 hours in the last year. According to these results, although it is said that the prevalence determined in our study is less than

the literature, it is evident that it is compatible. In addition, in our study, musculoskeletal pain was more common in nurses working in the intensive care unit, similar to the literature. However, it was determined that working in the clinic or intensive care unit did not statistically increase the incidence of musculoskeletal pain in nurses. This difference is mainly due to the small sample size of our sample. In addition, since the participants evaluated the presence of musculoskeletal pain with the recall method, this method may be effective without a statistically significant difference between the two groups regarding musculoskeletal pain.

In general, the most common pain area in nurses with musculoskeletal pain is the spine. In addition, especially low back and back pain is observed more frequently in nurses with spine pain.[21-23] In a questionnaire study evaluating the frequency of musculoskeletal pain in nurses, 569 participants were included. 84.7% of the participants reported a high incidence of low back pain in the previous 12-month period. Low back pain was the most frequently reported body region for pain, followed by the neck, shoulders, and upper back.[24] In the current study, spinal pain was the most common musculoskeletal pain, with 77.27%, consistent with the literature. Low back pain (47.06%), back pain (29.41%) and neck pain (23.53%) are the most common spinal cord pains, respectively. In addition, non-spinal pain was observed less frequently in the current study, similar to the literature. Especially considering the working conditions of the nurses working in the intensive care unit, axial loading may be impaired because they stand more and take more responsibility in patient care. This can cause spinal pain. Our study also draws attention to these points with its results.

Our study found that the demographic characteristics and regular exercise status of the nurses working in the internal medicine intensive care unit were not associated with musculoskeletal pain. It was determined that among the working conditions of internal medicine intensive care nurses, taking part only in changing the patient's clothes and positioning the patient increased musculoskeletal pain. A study conducted among nurses in Italy determined that night shift work, insufficient education, frequent involvement in patient care, lack of equipment, work department, obesity, increased age, work-related stress and lack of physical activity increased the occurrence of low back pain.[25] In general, it is known that taking a primary role in patient care, such as bending, twisting, lifting heavy weights and performing strong movements, increases musculoskeletal pain in nurses. In addition, advanced age and being overweight are known as risk factors for musculoskeletal pain among nurses. Regular exercise is generally considered to be protective in terms of musculoskeletal pain.[26-31] Our results are not fully compatible with the literature because it is a single-centre and small sample size study. In addition, working conditions could be questioned in a limited way with the existing questionnaire. If more parameters were added, the working conditions could be examined more.

There were some limitations of the current study. First, the fact that it was a single-centre study limits the generalizability of the study. Secondly, the small sample size was also a significant limitation. In addition, other limitations were that it was a study based on the subjective evaluation of the participants and the collection of study data using questionnaires without observation. Finally, pain was determined only by questioning, and scales were not used; it was difficult to generalise the results.

CONCLUSIONS

As a result, it was shown in our study that musculoskeletal pain was at a high rate in nurses working in the internal medicine intensive care unit and that the pain most commonly originated from the spine region. In addition, it has been shown that the involvement of nurses in changing the patient's clothes and positioning the patient increases musculoskeletal pain. Our study results will shed light on what measures should be taken for occupational diseases related to the musculoskeletal system in nurses. These results will be a guide for institutions and managers in the prevention of work-related diseases. In addition, our results will help nurses, among the occupational groups experiencing the most common musculoskeletal pain, in the early detection and treatment of pain.

Conflict of Interest

The author(s) declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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Ethical Approval

The study protocol was approved by the University of Health Sciences Bursa Yüksek İhtisas Training and Research Hospital Clinical Research Ethics Committee (Decision number: 2011-KAEK-25 2023/08-02).

Authors' Contribution

Study conception: ACE, UE; Study design: ACE, UE; Supervision: ACE, UE; Materials: ACE; Data collection and/or processing: ACE; Analysis and/or data interpretation: ACE, UE; Literature review: ACE, UE; Critical review: ACE, UE; Manuscript preparing: ACE, UE.

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