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Research Article

Work-Related Musculoskeletal Pain in Hospital Employees

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Abstract

Aim: Work-related musculoskeletal disorders are common health problems in the community. They lead to various levels of pain, loss of function, and deterioration in quality of life. Our aim is to evaluate work-related musculoskeletal pain in hospital employees and factors that could prevent this problem.
Material and Method: Female and male hospital employees working in different departments of our hospital participated in the study. Demographic data, work and working environment, ergonomic training, and musculoskeletal pain were queried. The severity of pain in those experiencing it was assessed using the visual analog scale and the Nordic Musculoskeletal Questionnaire.
Results: A total of 275 individuals participated in the study. 72.4% of the participants were female and 27.6% were male. 79.3% of the participants reported musculoskeletal pain. Pain was most commonly (71.3%) observed in the 35-54 age group and was of moderate severity. According to the frequency of pain, it was most common in the back (61.5%), followed by the lower back (55.6%) and neck (53.5%) regions. The presence and severity of pain were more pronounced in females ($p<0.05$). There was a statistically significant relationship between the presence of pain and female gender ($p=0.003$, $r=0.179$). Pain severity was higher in females ($p<0.001$, $r=0.226$). 69.8% of healthcare workers reported that ergonomic arrangements were not made in the hospital, and 81.4% reported not receiving training in ergonomics.
Conclusion: Work-related musculoskeletal pain was highly prevalent among hospital healthcare workers, and it was found that healthcare workers did not receive ergonomic arrangements in their work environments or education on protecting the musculoskeletal system. Inference: We believe that making ergonomic adjustments in the work environments of hospital employees, providing education on musculoskeletal system protection, and integrating these into the quality system would be important.

Keywords: Ergonomics, education, musculoskeletal pain

INTRODUCTION

Work-related musculoskeletal disorders are one of the common health issues nowadays. The most frequent cause is inflammatory and degenerative conditions of ligaments, muscles, bones, and joints resulting from repetitive injuries. Pain and loss of function are the most significant symptoms. Musculoskeletal pain leads to limitations and inadequacies in a person's job performance. In Northern Europe, musculoskeletal disorders account for 28% of absenteeism from work. Moreover, they are a cause of high treatment expenses, loss of workforce, insurance compensations, and economic loss (1,2).

The risk factors causing work-related musculoskeletal disorders are divided into three categories: physical-ergonomic, psychosocial, and personal risk factors, which are interrelated (3). Healthcare system employees perform daily activities that may lead to musculoskeletal disorders. Prolonged work in inappropriate posture, improper use of chairs or desks, heavy lifting, repetitive and vibrational movements, prolonged bending, and strenuous activities are physical and ergonomic risk factors. Psychosocial risk factors include job stress, lack of a production standard, monotony, tension in the work environment, excessive job expectations, inadequate support in job relationships, and lack of support from supervisors. Personal risk factors include being female, age, smoking, overweight, low muscle strength, physical inactivity, and existing musculoskeletal diseases. The intense pace of workload, long and uninterrupted work hours, and tension at work pose a higher risk for healthcare workers compared to other professional groups (3,4).

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Ergonomics is a work method used to understand the complex relationship between humans, machines, and job demands and to minimize the gap between human capacity and job demand in daily life and work activities (5). Recently, research evaluating the impact of ergonomics training provided to hospital employees on musculoskeletal disorders has gained importance (6). Hospital workers are constantly interacting with technology, including fixed and portable tools. This interaction significantly affects human performance. Physical, verbal, and non-verbal communication such as lighting, temperature, noise, radiation, clutter, patient access, and inadequate tool usage, cognitive factors such as workload and stress, decision-making, human-machine interaction, system design, appropriate human placement, employer and employee training, employee supervision, rotational work, regulation of work and rest periods, behavior modification, and use of protective equipment are organizational factors directly affecting system performance in the hospital environment (5,6).

Our aim is to determine the frequency of work-related musculoskeletal pain and factors that may contribute to this problem in order to protect the health of healthcare personnel working in our hospital, increase job satisfaction, and prevent situations that may lead to job loss.

MATERIAL AND METHOD

A descriptive, cross-sectional study was conducted with voluntary female and male individuals aged 18 and above who signed the informed consent form and worked in various departments of İzmir Bakırçay University Faculty of Medicine Çiğli Training and Research Hospital. Ethics committee approval was obtained from İzmir Bakırçay University (Ethics Committee No: 475). The demographic data, work environment characteristics, whether they received ergonomic training to protect the musculoskeletal system, and the presence of musculoskeletal pain were queried. The severity of pain was evaluated using the visual analog scale (VAS) and the Nordic Musculoskeletal Questionnaire (NMQ) (7). The participants' personal characteristics such as age, gender, height, weight, occupation, years and type of employment, presence of chronic diseases, smoking status, and job stress were also examined. Data regarding the characteristics of the work environment such as ventilation, presence of noise, lighting, and relationships with colleagues were collected.

The presence of musculoskeletal pain was questioned. In those experiencing pain, the severity of pain was evaluated using the visual analog scale (VAS). VAS scores were grouped as one to four points=mild, five to six points=moderate, and seven and above points=severe. The Nordic Musculoskeletal Questionnaire (NMQ) was used to assess the pain status and disability. The cultural adaptation study of the NMQ questionnaire was conducted by Kahraman et al. (8). The NMQ questionnaire evaluates complaints of the back, neck, shoulders, and general musculoskeletal system. The individual fills out the questionnaire by self-reporting or through interview technique, marking specific nine symptom areas mapped on the body (feet-ankles, knees, thighs-hips, wrists-hands, back, elbows, shoulders, neck) (9).

Statistical Analysis

Descriptive statistics were used to present parameters as mean (SD) or n (%). Spearman rank-order correlation test was applied to show factors affecting pain. A p-value of $p<0.05$ was defined for statistical significance.

RESULTS

A total of 275 hospital employees participated in the study. Of the participants, 199 (72.4%) were female and 76 (27.6%) were male. The most common age range among participants was 35-54 years, accounting for 71.3%. Among the participants, 103 (37.4%) were auxiliary healthcare staff, 84 (30.5%) were nurses, 31 (11.3%) were security guards, 21 (7.6%) were data entry clerks, 20 (7.3%) were doctors, and 16 (5.8%) were cleaning staff. Table 1 shows the demographic data of hospital employees.

Table 1. Demographic data of hospital employees

	n (%)
Gender	
Female	199 (72.4)
Male	76 (27.6)
Age range	
18-24 years	6 (2.2)
25-34 years	68 (24.7)
35-44 years	125 (45.5)
45-54 years	71 (25.8)
55-64 years	5 (1.8)
Marital status	
Married	197 (71.6)
Single	70 (25.4)
Widowed	8 (3.0)
Presence of chronic illness	
Yes	58 (21.1)
No	217 (78.9)
Exercise status	
Regular	42 (15.3)
Irregular	98 (35.6)
No	135 (49.1)

n: number of patients, %: percentage

When queried about the work and working environment, the average working duration was found to be 14.0±9.1 years. Table 2 presents the characteristics of the work and working environment.

Table 2. Characteristics of job and work environment, risk factors of hospital employees

	n (%)
Work mode	
Standing for >2 hours	**118 (42.9)**
Sitting for >2 hours	64 (23.3)
Maintaining the same position for >2 hours	28 (10.2)
Pushing/pulling loads of 5 kg and >5 kg	10 (3.6)
Repetitive movements	55 (20)
Daily working hours	
8 hours	197 (71.6)
16 hours	39 (14.2)
24 hours	37 (13.5)
Perceived difficulty of work	
None	13 (4.7)
Mild	21 (7.6)
Moderate	**165 (60)**
Severe	**76 (27.6)**
Presence of stress at work	
Yes	**236 (85.8)**
No	39 (14.2)
Ventilation in the workplace	
Centralized	139 (50.5)
Window	13 (4.7)
Centralized+window	123 (44.7)
Presence of noise in the workplace	
Yes	245 (89.1)
No	30 (11.9)
Lighting in the workplace	
Positive	234 (85.1)
Negative	41 (14.9)
Work relationships in the workplace	
Positive	245 (89.1)
Negative	30 (10.9)
Ergonomic arrangements in the workplace	
Yes	83 (30.2)
No	**192 (69.8)**
Training for musculoskeletal system protection in the workplace	
Yes	52 (18.9)
No	**223 (81.4)**

n: number of patients, %: percentage

In the query regarding musculoskeletal pain, it was reported that 218 cases (79.3%) experienced pain. Among those with pain, the severity was as follows: 90 cases (41.2%) reported moderate pain, 72 cases (33.1%) reported mild pain, and 56 cases (25.6%) reported severe pain. There was a statistically significant relationship between the presence of pain and female gender (p=0.003, r=0.179). Pain severity was statistically higher in females (p<0.001, r=0.226). As the duration of work increased, both the occurrence and severity of pain increased (p=0.009, p=0.008). When painful areas were evaluated with the NMQ (Nordic Musculoskeletal Questionnaire) in Table 3, spinal pain in the last twelve months was reported in the following order of frequency: back, lower back, and neck. In the extremities, shoulder pain was most common in the upper extremity, while knee pain was predominant in the lower extremity.

Table 3. The nordic musculoskeletal questionnaire (NMQ)

	Pain in the last 12 months		Work limitation due to pain in the last 12 months		Pain in the last 7 days	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)
Neck	**147 (53.5)**	128 (46.5)	**82 (29.8)**	193 (70.2)	87 (31.6)	188 (68.4)
Shoulder	**134 (48.7)**	141 (51.3)	60 (21.8)	215 (78.2)	101 (36.7)	174 (63.3)
Elbows	46 (16.7)	229 (83.3)	29 (10.5)	246 (89.5)	64 (23.3)	211 (76.7)
Hand	88 (32)	187 (68)	47 (17.1)	228 (82.9)	59 (21.5)	216 (78.5)
Sırt	**169 (61.5)**	106 (38.5)	**82 (29.8)**	193 (70.2)	**118 (42.9)**	157 (57.1)
Back	**153 (55.6)**	122 (44.4)	**85 (30.9)**	190 (69.1)	**113 (41.1)**	162 (58.9)
Hip/thig	75 (27.3)	200 (72.7)	46 (16.7)	229 (83.3)	58 (21.1)	217 (78.9)
Knee	105 (38.2)	170 (61.8)	47 (17.1)	228 (82.9)	66 (24)	209 (76)
Ankle/ foot	89 (32.4)	186 (67.6)	42 (15.3)	233 (84.7)	59 (21.5)	126 (78.5)

n: number of patients, %: percentage

DISCUSSION

In our study, we found a high incidence of musculoskeletal pain among hospital employees. Hou et al. reported musculoskeletal disorders in nurses at 92%, while Smith et al. reported it at 86% in our country. In studies conducted by Sançar et al., this rate reached up to 48% (10-13). A study investigating musculoskeletal disorders related to working conditions and profession in physicians reported a problem in 33% of 123 physicians, most commonly seen in surgeons. The prevalence of musculoskeletal disorders in nurses varies between 35-80% (14).

Healthcare workers engage in daily activities that lead to musculoskeletal pain. Inappropriate postural positions, ergonomic deficiencies, and heavy work conditions during

hospital work lead to occupational problems. Bret et al. reported that prolonged work in the same position and inappropriate posture are significant factors, which is consistent with our study, especially emphasizing their occurrence in the back and lower back regions (3). The prevalence of back pain was high, reaching around 70% in surgeons and dentists. The frequency of lower back pain was above 50% in surgeons, physiotherapists, and nurses. Davis et al. reported that the highest prevalence of pain in nurses and nursing assistants was in the lower back, followed by the shoulder and neck regions. This prevalence was even higher in the home care group, which deals with patients with chronic diseases who live for long periods with reduced mobility (15).

Maintaining a certain posture for a long time during work depends on stabilizing and manipulative forces, leading to prolonged isometric muscle contractions and increasing stress on muscles and ligaments. This, in turn, leads to muscle fatigue. Studies show that early degenerative changes in the lumbar region are due to compression, bending, and shearing stresses resulting from incorrect movements (16). Standing for a long time and working in a bent position increases the load on the spine and affects posture. Posture is directly related to mechanical efficiency and physiological function. Regular exercise strengthens muscles, provides soft tissue flexibility, and ensures mechanical efficiency. The fact that only 15% of participants in our study engaged in regular exercise may pose a risk factor for pain.

In our study, 85.8% of the participants reported experiencing stress in the workplace. The healthcare sector is considered an environment with higher levels of work-related stress compared to other work environments, both due to serving individuals experiencing high levels of stress and the frequent encounters of the staff with stressful situations. Dilek and colleagues reported a close relationship between musculoskeletal pain and stress levels (17). Hamming et al. evaluated musculoskeletal and sleep disorders related to work and stress in healthcare professionals, finding a high association between musculoskeletal pain, stress, and sleep disorders, emphasizing that work stress, especially when combined with physical workload, significantly increases pain (18). Yona et al. highlighted the necessity of assessing individuals for depressive symptoms accompanying musculoskeletal pain among hospital employees (19). According to the literature, being female is considered a risk factor for pain, with women having a lower pain threshold and experiencing musculoskeletal pain twice as often as men. The high number of female participants in our study may also contribute to this finding (20). Additionally, Shirzai et al. found that in their study evaluating upper extremity pain among hospital employees, pain severity was higher in women (21).

It is reported that providing ergonomics training focused on body biomechanics to nurses increases work capacity. When there is a mismatch between the physical requirements of the job and the worker's physical capacity, the incidence of work-related illnesses increases (22). Attention to posture and prevention principles, along with ergonomic factors, plays a significant role in the development of occupational pain and illnesses among healthcare workers. Implementing ergonomic principles in hospitals can help reduce repetitive movements and physical strain. Additionally, teaching regular exercise and pain management techniques to employees is beneficial. Furthermore, providing regular breaks during work contributes to productivity and positive effects on work performance by allowing muscles to rest and reducing fatigue. To improve the quality of life of employees working in hospital environments, an ergonomic patient care system should be established that is compatible with physical, social, and psychological characteristics.

For this purpose, we believe that making ergonomic adjustments in work environments, providing musculoskeletal protection training, and integrating these into the quality system would be important.

Limitations of the study include the small number of participants and the disproportionate distribution of occupational groups.

CONCLUSION

In our study, there was a high incidence of musculoskeletal pain among hospital employees. Pain was most commonly reported in the back, lower back, and neck. The presence and severity of pain were particularly pronounced in females. Prolonged inappropriate posture and repetitive movements were significant contributing factors.

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