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Musculoskeletal symptoms in nurses at a primary care hospital in Pachuca, Hidalgo. Mexico

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Abstract
Musculoskeletal disorders represent a major problem in developing countries as they generate high economic costs and are recognized as a considerable cause of absenteeism and disability. The objective of this research was to describe the main risk factors associated with musculoskeletal disorders affecting nursing staff working at a Primary Care Hospital in Pachuca, Hidalgo, Mexico.

Methodology. A quantitative study was conducted with a cross-sectional, observational design. Forty-nine nurses from the trauma service participated. Results. The most common gender was female (83.7%), while eight male nurses participated (16.3%). The mean age was 37 years, with a range of 25 to 53 years. Pain was observed to be the most common musculoskeletal symptom (87.5%). Similarly, the regions most affected by musculoskeletal injuries were the lower back (74.8%), followed by the neck (72.3%), and the upper back (64%).

Conclusion. There is a high prevalence of MSDs in nursing staff, with pain being the most common symptom and with varying frequencies in relation to the affected region, the main ones being the lower back, neck and upper back.

Keywords: *absenteeism from work, disability, muscle symptoms, musculoskeletal disorder.*

Introduction

The International Labour Organization (ILO) reports that more than 2.3 million deaths occur each year due to work-related injuries or conditions. Furthermore, it is estimated that more than 160 million people suffer from non-fatal work-related illnesses each year [1]. According to the Ministry of Labor and Social Welfare, the number of work-related illnesses in Mexico reached 12,622 cases, with musculoskeletal disorders (MSDs) being the leading work-related illness, accounting for 4,607 cases, pushing hearing loss into second place with 1,873 cases [2]. MSDs are degenerative syndromes characterized by pain, numbness, stiffness, swelling, fatigue, and irritation of the tissues that make up the musculoskeletal system, such as muscles, bones, ligaments, and joints [2] [3] [4]. Work-related MSDs are conditions affecting these bodily structures, exacerbated by the work and working conditions in which the employee operates. Most of these conditions are caused by repetitive manual activities, lifting heavy loads, standing for prolonged periods, and working in improper postures, all of which occur over extended periods of time. [5] [6] [7] [8] [9].

These syndromes not only affect workers' health but can also be considered social and economic problems, as they significantly impact quality of life; they are the leading cause of long-term sick leave, representing a major economic burden on healthcare systems and the business sector [6] [8] [10] [11]. Likewise, it has been demonstrated that work absenteeism due to MSDs is associated with a reduced likelihood of returning to work and a high likelihood of transferring to another job [12] [13]. In a study conducted by Sánchez (2019) titled "Musculoskeletal Disorders and Work Absenteeism Among Operating Room Nurses at the Hipólito Unanue el Agustino National Hospital," a significant association was observed between musculoskeletal disorders and work absenteeism [14].

Theoretical Framework

It has been observed that workers involved in healthcare and administrative activities are the group most frequently affected by musculoskeletal disorders [13] [15]. Similarly, various studies have concluded that nursing staff, among health science professionals, are at greater risk of developing MSDs, as the prevalence of these conditions in this population exceeds 80%, due to the unique conditions of their work environment [6] [8] [12] [13] [16]. Another study reports that 86.1% of nurses exhibited some type of musculoskeletal symptom and that the primary symptom was pain [17]. On the other hand, the most common physical demands linked to MSDs among nursing staff are: repetitive hand and arm movements, painful or tiring postures, and patient handling [12] [13] [18]. The risk factors associated with the onset of musculoskeletal disorders are well defined and can be classified as: • Physical factors: These include all activities related to overexertion and the use of excessive force. Cumulative and repetitive manual activities—such as moving and lifting patients and equipment, as well as extreme flexion, extension, and rotation movements—have been identified as the primary cause of these injuries. Another important factor is standing for prolonged periods of time. [13] [18] [19].

• Psychological factors: There is a significant relationship between MSDs and the mental health of nursing staff. Role conflicts, monotonous work, dissatisfaction with assigned tasks, perceived high workloads, limited social support, low pay (low effort-reward ratio), and unfair work environments are considered major causes of work-related stress, which is strongly linked to MSDs [18] [19] [21].

• Sociodemographic factors: The incidence of musculoskeletal symptoms increases gradually with age. A study conducted by Heiden found that young and middle-aged nurses primarily experienced MSDs in the shoulder and neck regions, whereas older staff were primarily affected in the lumbar spine. Similarly, women were more affected than men (17.7% versus 14.6%). A strong relationship has been demonstrated between overweight status and MSDs, with the risk increasing when the body mass index (BMI) is 30 kg/m^2. One study reported that a group of patients treated by medical staff for MSDs had an obesity rate of 35% to 55%. Similarly, it was observed that nurses presenting with musculoskeletal symptoms engaged in minimal physical activity. [13] [18] [19] [22].

• Factors associated with work organization: These include increased working hours (excessive overtime), an excessively fast work pace, and a lack of human resources [23]. Likewise, it has been observed that the risk of developing chronic musculoskeletal pain is largely related to exertion perceived as strenuous during the workday [24].

• Environmental factors: These include inadequate or insufficient infrastructure, which hinders the performance of work activities and is considered to increase the physical strain on workers [25]. According to data from the 7th National Survey on Working Conditions in Spain, the most common complaints are thoracic and lumbar back pain (50.3%), cervical pain (neck and nape) (32%), and shoulder pain (26.6%) [26]. According to the WHO, low back pain (pain confined to the lum-

bar spine that impairs normal mobility) is the leading cause of medical consultation worldwide, affecting 568 million people. [26-27].

Objective

To identify and describe the main risk factors associated with musculoskeletal disorders affecting nursing staff working at a tertiary care hospital in Pachuca, Hidalgo.

Materials and methods

0.1 Research design

A quantitative study was conducted using a cross-sectional observational design.

Samples

A non-random convenience sample of nursing staff was selected from those practicing at a tertiary care hospital in Pachuca, Hidalgo. A total of 49 nurses participated in the study.

Selection criteria

Inclusion criteria

Participants were selected from the nursing staff of a tertiary care hospital in Pachuca, based on the following inclusion criteria: staff members in the orthopedic surgery department, with at least 6 months of service and aged 55 or younger.

Exclusion criteria

Nursing staff with congenital musculoskeletal injuries, traumatic injuries resulting from car accidents or sports activities, systemic inflammatory and autoimmune diseases, and those working part-time due to their very low risk of developing MSDs were excluded.

Elimination criteria

Nursing staff whose questionnaire is incomplete or whose responses are inconsistent will be excluded from the study, as well as those who were transferred to another hospital during the study period or whose participation was interrupted.

Research tools

Data were collected using two questionnaires, which were distributed in paper form to the nursing staff to gather their responses.

1. Data were collected using two questionnaires, which were distributed in paper form to the nursing staff to gather their responses. Sociodemographic questionnaire: This questionnaire was used to collect general data such as age, sex, educational level, history of musculoskeletal injuries, and information about their working conditions (working hours, shifts, length of service, and strenuous activities).
2. Standardized Nordic Questionnaire: This questionnaire was developed by Kuorinka [17] and assesses work-related musculoskeletal symptoms and the most common injuries among employees in a workplace. It consists of 21 items divided into two sections (musculoskeletal problems and lumbar spine problems).

Statistical analysis

For the descriptive analysis, measures of central tendency and dispersion will be estimated for quantitative variables, while frequencies and proportions will be estimated for qualitative variables; these will be presented using tables, bar charts, and histograms as appropriate. An analysis of the measurement instrument was conducted using the SPSS-IBM statistical software package.

Ethical considerations

The research was conducted in accordance with the general guidelines and principles of the Regulations of the General Health Law regarding health research, in compliance with Articles 13, 14, 16, 17, and 22, emphasizing the principles of respect for human dignity, autonomy, data protection, confidentiality, biosafety, and the well-being of participants. After providing information about the study and addressing any questions, informed consent was obtained from the participants.

Results

Fifty questionnaires were distributed, and 49 participants agreed to take part in the study, resulting in a response rate of 98%. The majority of participants were female, with 41 participants (83.7%); 8 male nurses (16.3%) also participated. The mean age was 37 years, ranging from 25 to 53 years. Regarding the highest level of education, 57.8% of the sample had a technical degree in nursing, and 42.2% had a bachelor's degree in nursing. The average length of service was 5 years, ranging from a minimum of 8 months to a maximum of 18 years. Analysis of the data revealed that 75.5% of the staff had experienced MSDs in the past 12 months. Pain was the primary symptom in up to 87.5% of staff with MSDs, being more frequent among women (78%) than among men (62.2%), and similar in intensity across all age groups. Likewise, 74.8% reported experiencing pain in the lumbar spine, 72.3% in the cervical re-

gion, 64.6% in the thoracic spine, 58.3% in the shoulder, 31.3% in the elbow, and 10.1% in the wrist; conversely, 24.5% of the sample reported no symptoms. (Figure 1)

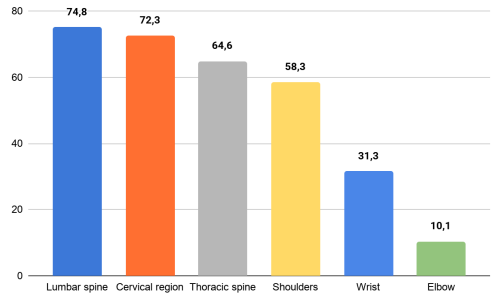

Figure 1. Prevalence of MSDs by region.

Source: Direct, Reynoso et al., 2024

As described in previous sections, musculoskeletal injuries are associated with long workdays and repetitive activities that require overexertion. Therefore, the working conditions of the nursing staff were examined, revealing that 100% were exposed to risk factors, the most common being: continuous patient mobilization (83.6%), physical activities requiring uncomfortable positions (79.3%), and lifting heavy loads (56.7%). Thirty-five percent considered their assigned tasks unfair, as the workload was excessive and there was insufficient staff. Likewise, 75% of staff with musculoskeletal symptoms identified their working conditions as the causal factor; however, 23% were unaware of the cause. Similarly, it was observed that 69.4% of the sample had been performing the same job for years, while 30.6% had been working there for only a few months. Regarding their work schedules, it was found that 15.6% worked shifts of more than 16 consecutive hours at least twice a week, while 52% worked more than 48 hours a week. They were asked whether, in the past 12 months, they had experienced total or partial limitations in their work, domestic, and recreational activities. The results showed that 34.7% of the sample reported limitations in performing work activities, particularly those involving the movement of patients and the lifting of heavy machinery or equipment; 100% reported no reduction in their domestic activities; and 26.54% had suspended some leisure activity (sports), as these activities intensified their pain. (Figure 2)

Regarding work absenteeism due to musculoskeletal symptoms, the study found that 33.3% of nurses were absent from work due to musculoskeletal disorders, reporting that pain prevented them from performing their duties normally. 66.7% reported having no difficulty performing their work due to musculoskeletal symptoms. 96.5% of participants reported not having required hospitalization for musculoskeletal injuries in the past 12 months, while 3.5% reported being hospitalized for chronic low back pain, accompanied by exercise intolerance and lower limb symptoms (paresthesia and reduced range of motion). 42.8% mentioned taking anti-inflammatory drugs or analgesics regularly, while 32.7% reported not taking any medication because the pain was tolerable; the remainder did not exhibit any musculoskeletal symptoms.

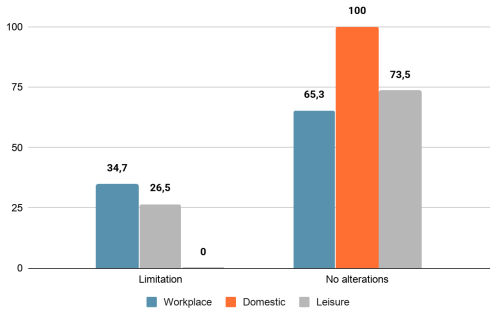

Figure 2. Limitations in work, domestic, and leisure activities due to MSDs

Source. Direct, Reynoso et al, 2024

Discussion

There is a high prevalence of MSDs among nursing staff in the Traumatology Department of the First-Level Hospital in Pachuca, reaching as high as 75.5%. After evaluating staff at six hospitals affiliated with a Turkish university, it was observed that the highest prevalence of MSDs was among nursing staff, at 77.1In another study on the prevalence of MSDs among professionals in rehabilitation and physical therapy services, it was found that 83.2% of nurses had experienced musculoskeletal symptoms in the past 12 months and 91.8% at some point in their lives [30]. Fajardo et al. (2015) found that 79.5% of nurses working in the intensive care units of two hospitals in Bogotá presented with musculoskeletal symptoms [31]. Among nurses at Sultan Abdul Halim Hospital in Malaysia, a high prevalence of MSDs (97.3%) was found, with pain as the primary symptom [32]. This is very similar to the results obtained in this study, where pain was the predominant symptom in 87.5Musculoskeletal disorders (MSDs) are most prevalent in the upper and lower back, the cervical region, and the shoulders. [11][13][14][34]. In a study conducted at a hospital in the Kingdom of Saudi Arabia, 63.9% of nursing staff reported experiencing discomfort in the lower back region in the past 12 months, making it the most affected region, followed by the shoulders (50%) and the upper back (48.9%) [16]. The observed prevalence of lumbar MSDs in this study was 74.8%, which is similar, as it is the most affected region; however, the cervical region ranks second with 72.3%, and the shoulders, although with a

similar prevalence of 58.3%, were not among the most affected areas. Yang et al. (2021) note that low back pain is the most frequently observed MSD (80.1%), followed by neck pain (78.1%) and shoulder pain (70.4%); they also found that young nurses were more likely to suffer from MSDs than male staff [33]. Activities related to patient care (lifting and transferring) are the most significant factor in the development of MSDs [31] [34] [35]; other contributing factors include repetitive movements, maintaining uncomfortable postures for long periods of time, and factors related to work organization [14] [16] [20] [36]. 83.6% of the nursing staff who participated in this study identified patient mobilization as the main causal factor for their musculoskeletal symptoms. Regarding sociodemographic factors related to MSDs, women have shown a higher risk of developing these syndromes [1] [11]. In a study conducted to assess the prevalence and risk factors for low back pain among nursing staff in specialized hospitals in Nigeria and Ethiopia, it was reported that low back pain was more common among female nurses (67.5%) than among male nurses (32.5%) [36]. This study found that women were more affected; however, the difference between the two sexes was 15.8%, so it cannot be considered a predictor of MSDs.

Strengths

This study sought to conduct a comprehensive review of the available literature in order to provide a thorough investigation, with the aim of serving as a useful reference for future studies involving similar populations.

Limitations

Some limitations identified in this study include the fact that the results were not reported by age group, nor were they analyzed in relation to Body Mass Index (BMI) or the influence of psychosocial factors. Therefore, it was not possible to determine the prevalence of TME by risk factors. Likewise, the cost of medications or medical consultations for the management of MSDs was not analyzed, nor was the impact on the finances of nursing staff or on health systems. Finally, the prevalence of MSDs in the upper and lower extremities was not investigated; rather, the study was limited to musculoskeletal symptoms in specific regions of the neck, chest, and lumbar region.

Conclusion

It was determined that there is a high prevalence of musculoskeletal disorders (MSDs) among nursing staff, with pain being the most common symptom and varying in frequency depending on the affected region; the lower back, neck, and upper back were identified as the most commonly affected areas. It was also observed that these injuries are associated with limitations in work activities and absenteeism. Regarding the causal factors for the development of musculoskeletal symptoms, patient mobilization was identified as the primary factor, followed by adopting uncomfortable postures and lifting heavy loads. It is therefore concluded that performing activities requiring overexertion and long work shifts contribute to the onset of MSDs. On the other hand, it was observed that MSDs are not a cause of hospitalization, suggesting that musculoskeletal pain or discomfort constitutes minor injuries that do not require special care. However, there is a high prevalence of anti-inflammatory or analgesic use, so it should be analyzed in detail whether MSDs affect patients' quality of life. Finally, it is recommended to implement patient mobilization using proper body mechanics, as improper handling and mobilization of patients within the hospital setting is a major contributing factor to musculoskeletal injuries.

Conflict of Interest Statement. The authors declare that there is no conflict of interest regarding the publication of this article.

Artificial intelligence. The authors declare that no artificial intelligence tools were used in any part of this article.

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