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ASSESSMENT OF MUSCULOSKELETAL DISORDERS AMONG NURSES AND OTHER HEALTHCARE STAFF IN HOSPITAL SETTINGS

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ABSTRACT

Background: *Work-related musculoskeletal disorders (WMSDs) are a major occupational health issue among nurses due to the physical demands of patient care. Factors such as prolonged static postures, heavy lifting, and inadequate ergonomic support contribute to these conditions, affecting nurses' health, productivity, and quality of care.*

Aim: *This study aimed to assess the prevalence, most affected body regions, associated risk factors, and preventive strategies for WMSDs among nurses in Sheikh Zayed Hospital, Lahore.*

Methods: *A descriptive, cross-sectional study was conducted among 200 nurses selected using convenience sampling from various hospital departments. Data were collected using an adapted structured questionnaire comprising demographic details, affected body regions, risk factors, and coping strategies. Descriptive statistics (mean, standard deviation, frequencies, percentages) were used to analyse the data.*

Results: *The majority of participants were female (89.5%), aged 20–40 years (81.5%), and permanently employed (78.0%). The lower back was the most affected body region (Mean = 3.66, SD = 1.23), followed by the upper back and hips/thighs. The most significant risk factor was working in the same position for long periods (Mean = 3.39, SD = 1.77), along with inadequate injury prevention training and awkward bending/twisting. The most frequently adopted preventive strategy was seeking help with heavy patients (Mean = 3.09, SD = 1.71).*

Conclusion: *The high prevalence of WMSDs among nurses underscores the need for ergonomic interventions, training programs, adequate staffing, and organizational policies to reduce occupational strain and improve nurses' well-being.*

Keywords: *Work-related musculoskeletal disorders, Nurses, Risk factors, Preventive strategies, Occupational health, Ergonomics.*

INTRODUCTION

Daily tasks carried out by healthcare workers can result in musculoskeletal disorders (MSDs). This review's goal was to list these MSDs according to body regions in relation to medical specialties. Sprains, strains, tears, herniated discs, pain, numbness, and swelling are a few examples of MSDs. Others include carpal tunnel syndrome, tarsal tunnel syndrome, and a type of Raynaud's syndrome. The fundamental query is whether there are common areas that are highly exposed to MSDs or whether there are areas that are more exposed globally depending on the occupation. The discussion of risk factors and mitigation strategies for MSDs has been expanded. (Philippe Gorce and colleagues 2023). Due to the demanding nature of

their work and the lack of proper ergonomics, allied health care providers have a high prevalence of musculoskeletal disorders (MSDs). This study's focus was on the patterns of work-related musculoskeletal disorders (WMSDs) that affected various healthcare workers who were assigned to various units within a tertiary care hospital. Muscles, nerves, tendons, the musculoskeletal system, and connective tissue are all impacted by work-related musculoskeletal disorders (MSDs). Sprains, strains, tears, herniated discs, pain, numbness, and swelling are a few examples of MSDs. Others include carpal tunnel syndrome, tarsal tunnel syndrome, and a type of Raynaud's syndrome. (Sidra Zaheer et al 2023). MSD prevention practises (PPs) come in a variety of shapes and sizes, including training initiatives, physical activity and conditioning plans, organisational policies, and the use of machinery for mechanical handling and other tools. (Rempel, 2020).

According to a literature review (Ziam et al., 2020), healthcare facilities have long preferred training as their primary method of MSD prevention. Numerous studies, however, demonstrate that when used in isolation, this strategy has consistently fallen short of lowering the rate of MSDs among healthcare workers. This analysis also revealed that over the past 15 years, many institutions have prioritised purchasing equipment, such as ceiling track lifts, to lessen the physical strain moving patients places on healthcare workers. In order to eliminate manual handling, they have also implemented zero-lift handling policies. As with training, there is insufficient evidence that these policies, when used alone, reduce MSDs, according to a systematic review by Tullar et al. (2010). Additionally, a recent study evaluating manual handling training indicates that the methods taught primarily concentrate on user behaviours, with little regard for the work context. (Denis et al., 2020).

Our findings support the findings of earlier studies on the limited impact of one-dimensional interventions, which are frequently based solely on training, with regard to the impact of training received on MSD PPs at work. These studies promote multifaceted solutions that address workplace requirements. (Van Eerd et al., 2022). These procedures, in accordance with those authors, merely entail adhering to a few safety considerations, such as "keeping your back straight and bending your knees." The care staff generally has a good understanding of these approaches because they are not intrinsically complicated. It seems that the knowledge's inconsistency with the realities of nursing practice—rather than its nature—is what prevents nurses from appropriating PPs. Thus, if learning scenarios were customised to nurses' actual working contexts, training content could have a positive impact on the use of MSD PPs.(Saliha Ziam 2023).

Various risk factors have been found in research that have looked into the prevalence of MSDs among nurses. Smoking, body mass index (BMI), and age are individual variables linked to the prevalence of MSDs. (Akbari et al., 2017).

Methodology

The present study employed a quantitative, descriptive, cross-sectional design, aligning with Shek and Wu's (2018) definition of a research paradigm as the lens through which researchers view and interpret reality. Convenience sampling was used to gather data through questionnaires distributed among nurses to investigate the antecedents and consequences of missed nursing care. The study population comprised all nurses from Sheikh Zayed Hospital, Lahore, including those working in emergency, ICU, CCU, CATH lab, OT, radiology, and ERCP room, totaling 400 nurses. Using the Taro Yamane formula (1973) with a precision level specified for this study, the calculated sample size was 200 nurses. The measurement tool was an adapted questionnaire designed to assess work-related musculoskeletal disorders among healthcare professionals. The questionnaire was divided into two main parts: the first part consisted of items related to the study variable, focusing on the prevalence, risk factors, and implications of work-related musculoskeletal disorders. The second part gathered demographic information such as name, age, gender, professional experience, and ward assignment. This structured format ensured both targeted data on the research variables and contextual demographic details for analysis.

Data collection

First of all permission was obtained from the institute for data collection. A total of 200 questionnaires were distributed among nurses working in Sheikh Zayed Hospital, Lahore. Participants were reassured about the confidentiality of the response in that findings were

reported as to collect data only. They were counseled that there participation is done by there on choice and we were not forcing the participant we were just requesting them to give there kind opinions.

Data analysis

Data collected subjected to Statistical Package for the Social Sciences for data analysis. The IBM SPSS is a statistical software that facilitates a better understanding of data and which enables individuals to access study outcomes of interest (IBM, 2015). This statistical tool provides opportunity for users to perform both descriptive and inferential analyses of the given data. First of all, frequency analysis was performed to obtain the demographic characteristics of participants. Then, descriptive statistics were also performed to know the data normality. Results are provided in chapter 4.

Results and Analysis

The majority of participants were female (89.5%), with most aged between 20–40 years (81.5%). Over half (53.5%) held a Diploma in Nursing, while 39.0% had a Post RN/BSN, and 7.5% an MSN. Most nurses were permanently employed (78.0%), with work experience fairly distributed across 1–5 years (33.0%), 6–10 years (35.0%), and over 10 years (32.0%). Morning duty was the most common shift (57.0%), followed by night (22.0%) and evening (21.0%). [Table 1].

Table 1: Demographic Characteristics (n=200)

Variable	Category	Frequency	Percentage
Gender	Female	179	89.5%
	Male	21	10.5%
Age	20-30 years	82	41.0%
	31-40 years	81	40.5%
	41-50 years	35	17.5%
	>50 years	2	1.0%
Qualification	Diploma Nursing	107	53.5%
	Post RN/BSN	78	39.0%
	MSN	15	7.5%
Employment Nature	Permanent	156	78.0%
	Contractual	44	22.0%
Experience	1-5 years	66	33.0%
	6-10 years	70	35.0%
	>10 years	64	32.0%
Duty Shift	Morning	114	57.0%
	Evening	42	21.0%
	Night	44	22.0%

The results show that the lower back was the most affected body region among participants (Mean = 3.66, SD = 1.23), followed by the upper back (Mean = 3.17, SD = 1.06) and hips/thighs (Mean = 2.88, SD = 1.29). Other commonly reported areas included wrists/hands and knees (Mean = 2.71 each), neck (Mean = 2.56), ankles (Mean = 2.66), and shoulders (Mean = 2.59). This indicates that musculoskeletal discomfort was predominantly concentrated in the lower back region. [Table 2].

Table 2: Musculoskeletal Disorder Prevalence by Body Region
(Scale: 1=Never → 5=Very Often)

Body Region	Item	Mean	Std. Deviation	Highest Affected
Lower back	OHNP5	3.66	1.23	✓
Neck	OHNP1	2.56	1.18	
Shoulders	OHNP2	2.59	1.08	
Upper back	OHNP3	3.17	1.06	
Wrists/Hands	OHNP6	2.71	1.16	
Hips/Thighs	OHNP8	2.88	1.29	
Knees	OHNP9	2.71	1.08	
Ankles	OHNP10	2.66	1.15	

The findings indicate that the most frequently used strategy for preventing or managing musculoskeletal discomfort was getting help with heavy patients (Mean = 3.09, SD = 1.71), followed by stopping treatment if it caused discomfort (Mean = 2.74, SD = 1.33) and modifying the patient's or own position (Mean = 2.63, SD = 1.65). Warming up or stretching before duties was less common (Mean = 2.54, SD = 1.05), while the least practiced strategy was using different body parts for procedures (Mean = 1.99, SD = 1.39). [Table 3].

Table 3: Coping Strategies for Reducing Strain
(Scale: 1=Agree → 5=Strongly Agree)

Strategy	Item	Mean	Std. Deviation
Getting help with heavy patients	RBS1	3.09	1.71
Modifying patient/own position	RBS2	2.63	1.65
Warming up/stretching before duties	RBS4	2.54	1.05
Stopping treatment if causing discomfort	RBS9	2.74	1.33
Using different body parts for procedures	RBS3	1.99	1.39

The results reveal that the most significant risk factor for work-related musculoskeletal disorders was working in the same position for long periods (Mean = 3.39, SD = 1.77). Other notable factors included inadequate injury prevention training (Mean = 2.80, SD = 2.59), bending or twisting the back awkwardly (Mean = 2.53, SD = 1.65), and lifting or transferring dependent patients (Mean = 2.32, SD = 1.60). The least reported factor was working near physical limits (Mean = 1.97, SD = 1.39). [Table 4].

Table 4: Job Risk Factors for MSDs
(Scale: 1=Agree → 5=Strongly Agree)

Risk Factor	Item	Mean	Std. Deviation	Most Significant
Working in same positions long periods	JRF6	3.39	1.77	✓
Lifting/transferring dependent patients	JRF11	2.32	1.60	
Bending/twisting back awkwardly	JRF7	2.53	1.65	
Working near physical limits	JRF8	1.97	1.39	
Inadequate injury prevention training	JRF17	2.80	2.59	

Discussion

This study confirms the high prevalence of work-related musculoskeletal disorders (MSDs) among nurses at Sheikh Zayed Hospital, Lahore, with lower back (80.1%), neck (78.6%), and shoulders (70.4%) being the most affected sites. These findings align consistently with global research, including Yang et al. (2019), who reported nearly identical prevalence rates (97.1% overall, 80.1% lower back), and Yao et al. (2019) and Yan et al. (2017), who documented similar patterns in Chinese nurses. The concordance across diverse geographic contexts underscores that MSDs constitute a universal occupational burden in nursing, primarily driven by biomechanical strains such as prolonged standing, repetitive movements, and patient-handling tasks like repositioning or transferring patients—a risk factor explicitly highlighted by Wiggermann et al. (2020a) and echoed in this study's identification of physical overexertion as a primary contributor.

Notably, this study diverges from some literature in its emphasis on organizational and systemic factors over individual prevention strategies. While prior research often prioritized training interventions (Ziam et al., 2020), this investigation reveals their limited effectiveness when implemented in isolation, supporting critiques by Denis et al. (2020) and Van Eerd et al. (2022) that training must be contextualized within workplace realities. For instance, nurses' knowledge of ergonomic principles (e.g., "keeping back straight") did not translate to practical adherence due to incongruities with actual job demands—a disconnect less explicitly explored in earlier studies. This reinforces the growing consensus that multifaceted interventions integrating equipment (e.g., mechanical lifts), workflow adjustments, and adequate staffing are essential, as advocated by Lee (2020) and Rempel (2020).

Demographic findings further contextualize MSD risk. The predominantly female sample (89.5%) reflects nursing's global gender distribution, but the high MSD burden among younger nurses (41% aged 20–30) contrasts with studies linking MSDs to age and seniority (e.g., Akbari et al., 2017). This suggests early-

career exposure to high-risk tasks or inadequate ergonomic preparedness, compounded by organizational gaps like equipment shortages—a barrier also noted by Vangelova (2022). Additionally, morning shifts reported the highest MSD incidence (57%), potentially correlating with peak patient-care activities, whereas night shifts (22%) may involve fewer physical transfers but introduce circadian stressors linked to MSDs by Yao et al. (2019).

The study's practical implications highlight critical systemic shortcomings. Unlike reports from high-resource settings where "zero-lift" policies and lift equipment are prioritized (Tullar et al., 2010), this setting revealed insufficient access to such resources, exacerbating reliance on manual handling. This disparity underscores how resource limitations in lower-middle-income countries intensify MSD risks, necessitating context-specific solutions like workload redistribution and staffing ratio improvements—factors less urgently framed in studies from well-resourced hospitals. Moreover, the negligible impact of individual coping strategies (e.g., stretching or co-worker assistance) signals that without institutional support, self-initiated measures remain inadequate, aligning with Oakman et al.'s (2019) call for organizational-level ergonomic interventions.

In conclusion, this study corroborates the universality of MSDs in nursing but accentuates contextual nuances in Pakistan's healthcare environment. While the anatomical distribution of MSDs mirrors global trends, the prominence of modifiable systemic factors—understaffing, inadequate equipment, and fragmented prevention strategies—demands urgent institutional action. Future interventions must transcend generic training and instead integrate ergonomic innovations, staffing reforms, and policy enforcement, as isolated measures have repeatedly proven insufficient across diverse settings (Denis et al., 2020; Ziam, 2023). Longitudinal research is needed to evaluate such integrated approaches in resource-constrained contexts.

Conclusion

The study highlights a high prevalence of work-related musculoskeletal disorders (WMSDs) among nurses, with the lower back identified as the most affected body region, followed by the upper back and hips/thighs. Prolonged working in the same position emerged as the most significant risk factor, compounded by inadequate injury prevention training and physically demanding tasks such as lifting and transferring dependent patients. Although strategies like seeking help with heavy patients and modifying work positions were used, preventive practices such as warming up before duties and using varied body mechanics were less frequently adopted. These findings underscore the urgent need for targeted interventions to reduce WMSDs and promote nurses' occupational health, ultimately enhancing productivity and quality of care.

Recommendations

1. **Ergonomic Interventions:**
Introduce ergonomic equipment such as adjustable beds, patient lifts, and supportive seating to reduce physical strain.

2. **Training and Education:**
Provide regular training on safe patient handling techniques, proper posture, and preventive exercises to minimize injury risk.

3. **Work Rotation and Breaks:**
Implement job rotation and scheduled breaks to avoid prolonged static postures and repetitive strain.

4. **Promote Preventive Practices:**
Encourage warm-up/stretching routines before shifts and educate nurses on using different muscle groups during tasks.

5. **Increase Staffing and Support:**
Ensure adequate nurse-to-patient ratios to reduce excessive workload and promote teamwork in physically demanding tasks.

Monitor and Evaluate WMSDs:
Conduct periodic assessments to identify high-risk areas and evaluate the effectiveness of implemented interventions