Original Article

doi:10.31674/mjn.2026.v18i03.005

MJN

Prevalence of Musculoskeletal Disorders among Healthcare Workers in Public Hospitals in Erbil City, Iraq: A Cross-Sectional Study

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ABSTRACT

Background: Musculoskeletal disorders are a major issue for occupational health globally, impacting people across many different jobs, such as those in the healthcare field. **Objectives:** The study was conducted to identify musculoskeletal disorders among healthcare workers in public hospitals located in Erbil city, Iraq. **Methods:** A descriptive cross-sectional study was carried out at seven public hospitals in Erbil city, Iraq, from September 2024 until May 2025. Three hundred and seventy healthcare workers were included. A proportional random sampling approach was employed to select the necessary sample from each hospital. The survey covered demographic characteristics and identified the musculoskeletal disorders that healthcare workers experience as a result of their routine duties. **Results:** In the past 12 months, the prevalence of musculoskeletal disorders among healthcare workers showed the following distribution: lower back pain was the most common, affecting 306 individuals (82.70%), followed by neck pan, which affected 262 individuals (70.81%). Among other musculoskeletal disorders, hip joint pain had the lowest prevalence, affecting 129 individuals (34.86%). Nurses were more frequently consulting orthopedic clinics due to musculoskeletal disorders than physicians, with 131 (61.79%) of the nurses and 59 (37.34%) of the physicians affected. **Conclusion:** Lower Back Pain (LBP) was the most prevalent musculoskeletal condition among healthcare workers, followed by neck pain. LBP occurred across all age groups, with the highest prevalence among those aged 55 years and older; however, the differences across age groups were not statistically significant. Nurses tend to visit orthopedic clinics more frequently than physicians when managing musculoskeletal pain.

Keywords: Erbil City; Healthcare Workers; Musculoskeletal Disorders; Public Hospitals

INTRODUCTION

Musculoskeletal Disorders (MSDs) are injuries that affect the soft tissues of the body. They occur due to unexpected or prolonged exposure to force, vibration, awkward postures, or repetitive movements. These disorders can impact the muscles in a person's upper and lower limbs, as well as their joints, cartilage, tendons, nerves, and neck. Elderly workers might be more susceptible to MSDs, especially lower back pain, and are more likely to need hospitalization due to these conditions. They may also require longer periods of hospital care compared to others (Centers for Disease Control and Prevention [CDC], 2024).

Musculoskeletal disorders are a major and widespread problem in the healthcare field. Healthcare workers such as nurses, doctors, and other allied health personnel are more likely to develop musculoskeletal disorders because their jobs often require a lot of physical effort. Tasks like lifting patients, performing

Received: April 21, 2026 Received in revised form: September 29, 2026 Accepted: October 18, 2026

repetitive movements, and staying in one position for long periods can put significant stress on the musculoskeletal system (Zheng *et al*., 2022).

Musculoskeletal disorders are often seen as a significant issue in many workplaces. Work-related musculoskeletal disorders (WRMSDs) are conditions that are either caused by work or made worse by work activities. These conditions are marked by the presence of pain, limited ability to function, impairment, or continuous discomfort. It has been mentioned that these conditions have a major impact on the quality of life (Clari *et al*., 2021).

Musculoskeletal disorders are a significant issue in occupational health that impact nurses' quality of life, their ability to perform their job effectively, and their overall well-being. Studies from developing countries show that 37% of general workers suffer from musculoskeletal disorders, while the rate is much higher, reaching 92% among nurses. It is estimated that about 33% of all nurses' sick leave instances are linked to musculoskeletal disorders (Zare *et al*., 2021).

The National Institute for Occupational Safety and Health explains that MSDs refer to injuries or harm that occur in the musculoskeletal system, which consists of bones, ligaments, tendons, joints, spinal discs, cartilage, ligaments, nerves, and blood vessels. WRMSDs are particular kinds of conditions in which the work environment and the activities carried out at work are significant factors in the development of the disorder (Suganthirababu *et al*., 2023). In both nursing and other healthcare fields, there is a connection between mental and physical health issues. Nursing workers are frequently recognized as being at a higher risk for experiencing such injuries. This higher risk is due to the physical and mental challenges that are part of their job. It is important to take into account both physical and psychological factors when working to prevent and manage musculoskeletal disorders among nursing staff (Valim *et al.,* 2024).

The aim of this study is to investigate MSDs among healthcare workers (HCWs) in public hospitals in Erbil City, Kurdistan Region, Iraq. Specifically, it seeks to determine the prevalence of MSDs within this population, identify the most commonly affected body regions, and provide recommendations for preventive strategies and workplace interventions to reduce the burden of MSDs among HCWs.

METHODOLOGY

Design and Setting

A descriptive cross-sectional study was carried out to assess the prevalence of musculoskeletal pain among healthcare professionals. A study was conducted among a total population of 2881 healthcare workers, of whom 370 participated in the study. All participants were working in seven public hospitals located in Erbil City, Kurdistan Region, Iraq. The public hospitals located in Erbil city include the emergency hospital (EMC), Hawler Psychiatric Hospital, Raparin Teaching Hospital for Children, Maternity Teaching Hospital, Rozhawa Emergency Hospital, Erbil Teaching Hospital, and Rizgary Teaching Hospital. However, the Planning Department of the Erbil General Directorate of Health did not approve conducting this study at Nanakali Hospital. The research was done throughout the period from September 2024 to May 2025.

Sampling Technique

An online calculator from the website (www.calculator.net/sample-size-calculator) was utilized to calculate the required sample size, taking into account a 5% margin of error and a 95% confidence level. The initial calculated sample size for the study was 340 healthcare workers; however, to ensure better representation of smaller hospitals, the sample size was increased to 400 participants. A proportional random

sampling approach was employed to select the necessary sample from each hospital. Then, based on the proportion of healthcare professionals in each hospital, a random sampling method was employed to select the required number of HCWs from each group. A total of 370 healthcare personnel were enrolled in the study. The response rate was calculated by dividing the number of healthcare workers who agreed to participate in the study by the total sample size, which was 92.5%.

Inclusion Criteria

The study included healthcare professionals who had worked in public hospitals in Erbil city for at least two years and who agreed to take part were included in the study.

Exclusion Criteria

The exclusion criteria included nurses or physicians involved only in administrative tasks. Anyone who refused to take part in the study was also excluded. Volunteers or temporary healthcare workers were not considered for the study.

Method of Data Collection

A modified structured questionnaire was designed as an instrument for data collection. The researcher with the supervisor's assistance created the questionnaire by looking at published studies (Abdulrahman & Jibraeel, 2023). Errors and unclear questions in the questionnaire were resolved with the help of experts prior to conducting the study. The questionnaire consisted of two sections. The first section of the study gathered details about the participants' socio-demographic background, such as their age, gender, job role, length of time they have been working, workplace, and their level of education. The second section was designed to explore the work-related discomfort experienced in various parts of the musculoskeletal system among HCWs. It involved asking them to report how often they had experienced pain in different musculoskeletal areas, including the back, neck, shoulders, elbows, wrists, thighs, hips, knees, and feet. Data were collected by face-to-face interview between the researcher and the participants.

The Content Validity of the Tool and Reliability

Four experts reviewed and validated the questionnaire before starting the data collection process among different specialists (community medicine and internal medicine); their comments were taken into account, and the necessary changes were made accordingly. Reliability was calculated by Cronbach's alpha coefficients in measuring the internal consistency of the survey test. Cronbach's alpha value of the instrument was 0.700, implying that the test is acceptable.

Data Analysis

All data were analyzed using SPSS version 26. Inferential statistics were performed to assess associations between categorical variables using the chi-square (χ^2) test. When the expected cell counts were less than 5, Fisher's Exact Test was applied to ensure accuracy. A p-value of ≤ 0.05 was considered statistically significant.

Ethical Consideration

The study was granted approval by Ethical Committee of the General Directorate of Health in the Duhok Governorate with reference number 31072024 -6- 59, on 3rd July 2024.

RESULTS

The result in Table 1 shows the distribution of participants according to their jobs: 158 were physicians (42.7%) and 212 were nurses (57.3%). Concerning the sex distribution of the study sample, males constituted 188 (50.81%). In terms of educational qualifications among nurses, 127 (34.32%) held a technical diploma, representing the highest proportion, while only 2 nurses (0.54%) had a master's degree in nursing science. Among physicians, 102 (27.57%) held a bachelor's degree in medicine, and 56 (15.14%) had qualifications above the bachelor's degree, such as a master's degree or Ph.D. The average work experience of HCWs in public hospitals was 13.67 years. Those with less than 5 years of experience constituted the largest group, comprising 81 (21.89%) HCWs, whereas the ≥35-year experience category had the fewest HCWs, with only 9 (2.43%).

Table 1: Sociodemographic Characteristics of Participants

Variables		**No.**	**%**
Job	Physicians	158	42.70%
	Nurses	212	57.30%
Sex	Male	188	50.81%
	Female	182	49.19%
Education	Secondary school (Nurses)	33	8.92%
	Technical diploma (Nurses)	127	34.32%
	Bachelors' degree (Nurses)	50	13.51%
	Master's degree (Nurses)	2	0.54%
	Bachelor's degree (Physicians)	102	27.57%
	Higher than bachelor (Physicians)	56	15.14%
Years of experience	< 5 years	81	21.89%
	5-9 years	61	16.49%
	10-14 years	70	18.92%
	15-19 years	51	13.78%
	20-24 years	58	15.68%
	25-29 years	18	4.86%
	30-34 years	22	5.95%
	≥35 years	9	2.43%

The results in Table 2 show the prevalence of MSDs among HCWs over the past 12 months. The lower back pain was the most common disorder among them, as 306 (82.70%) of the HCWs experienced discomfort in their lower back. Additionally, 218 (58.92%) of them had more than three episodes of pain. In comparison, hip pain was the least common, with a prevalence rate of 129 (34.86%).

Table 2: Distribution of Musculoskeletal Pain Between Healthcare Workers

Types of MSDs	Once (%)	Two times (%)	Three times (%)	> Three times (%)	Never (%)
Neck pain	40 (10.81)	23 (6.22)	36 (9.73)	163 (44.05)	108 (29.19)
Elbow pain	37 (10.0)	29 (7.84)	33 (8.92)	121 (32.70)	150 (40.54)
Low back pain	24 (6.49)	27 (7.29)	37 (10.0)	218 (58.92)	64 (17.30)
Hip pain	33 (8.92)	16 (4.32)	16 (4.32)	64 (17.30)	241 (65.14)
Thigh pain	29 (7.84)	27 (7.30)	19 (5.14)	92 (24.86)	203 (54.86)
Feet pain	21 (5.68)	27 (7.30)	27 (7.30)	184 (49.73)	111 (30.0)
Shoulder pain	58 (15.68)	39 (10.54)	29 (7.84)	134 (36.22)	110 (29.73)
Wrist/ Hand pain	25 (6.76)	18 (4.86)	18 (4.86)	87 (23.51)	222 (60.0)
Knee pain	28 (7.57)	26 (7.03)	34 (9.19)	152 (41.08)	130 (35.14)

The result in Table 3 indicates that there is a significant prevalence of neck pain among healthcare professionals. A total of 262 (70.81%) of HCWs experienced episodes of neck pain. Additionally, 163 (44.05%) individuals reported having neck pain more than three times within the past year. The highest rate of neck discomfort was observed in the 45-49 age group, with 79.59% of individuals reporting it, followed by the 50-54 age group, which had 26 (74.29%) individuals experiencing neck discomfort.

Table 3: Distribution of Neck Pain According to Age Groups

Age group	Once (%)	Two times (%)	Three times (%)	> Three times (%)	Never (%)	Total (%)
25-29 years	17 (17.71)	10 (10.42)	9 (9.38)	31 (32.29)	29 (30.21)	96 (100)
30-34 years	6 (9.23)	2 (3.08)	6 (9.23)	33 (50.77)	18 (27.69)	65 (100)
35-39 years	6 (9.23)	6 (9.23)	5 (7.69)	29 (44.62)	19 (29.23)	65 (100)
40-44 years	1 (2.27)	3 (6.82)	3 (6.82)	19 (43.18)	18 (40.91)	44 (100)
45-49 years	5 (10.20)	1 (2.04)	6 (12.24)	27 (55.10)	10 (20.41)	49 (100)
50-54 years	3 (8.57)	1 (2.86)	5 (14.29)	17 (48.57)	9 (25.71)	35 (100)
55 years and older	2 (12.50)	0 (0.0)	2 (12.50)	7 (43.75)	5 (31.25)	16 (100)
Total	**40 (10.81)**	**23 (6.22)**	**36 (9.73)**	**163 (44.05)**	**108 (29.19)**	**370 (100)**

Note: P-value = 0.345 (NS). NS = Not statistically significant (p > 0.05).

The results in Table 4 indicate the distribution of lower back pain (LBP) across all age groups. Healthcare professionals who reported LBP more than three times were 218 (58.92%), which is the highest rate compared to other categories based on how many times the pain occurred. Fifteen out of sixteen, which is 93.75%, of individuals aged 55 and older experience LBP; within the 50 to 54 age group, twenty-five out of thirty-five, or 71.43%, have LBP. It appears that LBP occurs across all age groups among healthcare staffing, with the group aged 55 years and older showing a higher rate compared to other age groups.

Table 4: Distribution of Lower Back Pain According to Age Groups

Age group	Once (%)	Two times (%)	Three times (%)	> Three times (%)	Never (%)	Total (%)
25-29 years	8 (8.33)	9 (9.38)	15 (15.63)	45 (46.88)	19 (19.79)	96 (100)
30-34 years	2 (3.08)	5 (7.69)	5 (7.69)	48 (73.85)	5 (7.69)	65 (100)
35-39 years	3 (4.62)	4 (6.15)	11 (16.92)	37 (56.92)	10 (15.38)	65 (100)
40-44 years	1 (2.27)	2 (4.55)	2 (4.55)	31 (70.45)	8 (18.18)	44 (100)
45-49 years	6 (12.24)	3 (6.12)	0 (0.0)	29 (59.18)	11 (22.45)	49 (100)
50-54 years	2 (5.71)	3 (8.57)	2 (5.71)	18 (51.43)	10 (28.57)	35 (100)
55 years and older	2 (12.50)	1 (6.25)	2 (12.50)	10 (62.50)	1 (6.25)	16 (100)
Total	**24 (6.49)**	**27 (7.30)**	**37 (10.0)**	**218 (58.92)**	**64 (17.30)**	**370 (100)**

Note: P-value = 0.054 (NS). NS = Not statistically significant (p > 0.05).

The results in Table 5 show that there is a notable presence of shoulder pain among healthcare workers. The total of 260 (70.27%) of the healthcare professionals reported had shoulder pain. The highest rate of pain was detected in the age group of 45 to 49 years; 38 out of the total 49 (77.55%) of healthcare professionals in this group experienced pain. This was followed by the age group of 40 to 44 years, where 33 out of 44 HCWs (75%) reported pain. The prevalence of pain in the group aged 55 years and older was 7 (43.75%).

Table 5: Distribution of Pain in the Shoulder According to Age Groups

Age group	Once (%)	Two times (%)	Three times (%)	> Three times (%)	Never (%)	Total (%)
25-29 years	19 (19.79)	12 (12.50)	8 (8.33)	29 (30.21)	28 (29.17)	96 (100)
30-34 years	8 (12.31)	2 (3.08)	7 (10.77)	31 (47.69)	17 (26.15)	65 (100)
35-39 years	9 (13.85)	7 (10.77)	6 (9.23)	22 (33.85)	21 (32.31)	65 (100)
40-44 years	5 (11.36)	6 (13.64)	3 (6.82)	19 (43.18)	11 (25.0)	44 (100)
45-49 years	12 (24.49)	7 (14.29)	2 (4.08)	17 (34.69)	11 (22.45)	49 (100)
50-54 years	4 (11.43)	4 (11.43)	2 (5.71)	12 (34.29)	13 (37.14)	35 (100)
55 years and older	1 (6.25)	1 (6.25)	1 (6.25)	4 (25.0)	9 (56.25)	16 (100)
Total	**58 (15.68)**	**39 (10.54)**	**29 (7.84)**	**134 (36.22)**	**110 (29.73)**	**370 (100)**

Note: P value = 0.470 (NS). NS = Not statistically significant (p > 0.05).

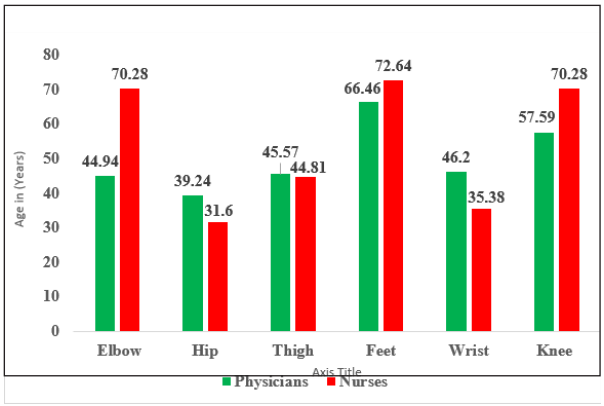


Figure 1: Percent Prevalence of Other Pain Sites among HCWs by Type of Job

Figure 1 Shows how other MSDs are spread across different body parts among healthcare professionals. For example, 220 individuals, which is (59.46%) of the total, experienced elbow pain. In addition, 71 physicians, which is (44.94%) of the total, experienced pain in their elbow, while 149 nurses, representing (70.28%) of the total, also reported elbow pain. Statistically, the difference among nurses and physicians was significant (*P* value <0.001). The prevalence of hip pain was 129 (34.86%), and the number of physicians experiencing hip pain was 62 (39.24%). When compared, 67 (31.60%) of the nurses experienced pain in the hip joint over the past year; there is no significant difference in the prevalence of hip pain among nurses and physicians. Among healthcare professionals, 72 physicians (45.57%) and 95 nurses (44.81%) experienced thigh pain. The prevalence of thigh pain was slightly higher between physicians compared to nurses. Of the total number of HCWs, 259 (70%) experienced foot pain. It happened more often in nurses compared to physicians, as it affected 154 out of 212 nurses (72.64%) and 105 out of 158 physicians (66.46%). However, there was no statistically significant difference among nurses and physicians concerning the occurrence of pain in the feet over the past 12 months before the study. Out of the total 148 healthcare professionals, (40%) experienced pain in their hand or wrist. Among them, 73 (46.20%) of physicians and 75 (35.38%) of nurses reported hand or wrist pain. A significant number of healthcare workers, specifically 240 individuals (64.86%), have experienced discomfort in the knee joint. The percentage of nurses who had it was 149, which is (70.28%), and this was slightly higher than the percentage among physicians, which was 91 (57.59%).

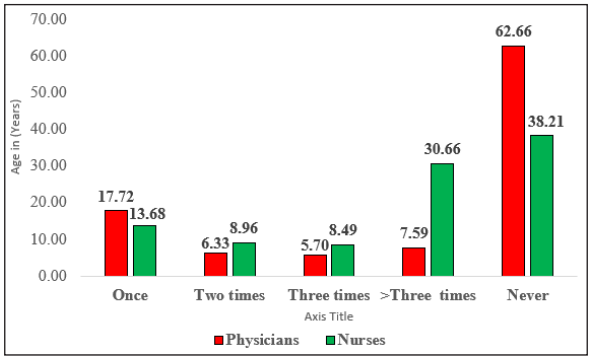


Figure 2: Percent Consulting an Orthopedist Due to MSDs by Type of Job

Figure 2 indicates that 190 out of the total healthcare personnel, which is (51.35%), visited an orthopedic clinic due to musculoskeletal pain. Among these, 59 physicians, representing (37.34%), and 131 nurses, making up (61.79%), sought consultation at orthopedics clinic for MSDs. Statistically, there was a notable difference among nurses and doctors regarding the need for orthopedic treatments, with nurses requiring these services more frequently than physicians, mainly due to musculoskeletal pain, *p* value <0.001.

DISCUSSION

The results of the current study show that the most commonly reported musculoskeletal disorders among healthcare workers were low back pain, neck pain, shoulder pain, and foot pain. A cross-sectional study carried

out between nurses and physicians in public hospitals within the Duhok province revealed that the most commonly affected area for MSDs was lower back pain, reported by 78.5% of participants, followed by neck pain, which was reported by 66.75% of the participants. The elbow was the least affected area, with a prevalence rate of 32.75% (Abdulrahman & Jibraeel, 2023). In addition, the prevalence of MSDs that require medical consultation in orthopedic or neurological clinics was 51.35%. In another study carried out by Abdulrahman and Jibraeel (2023), it was discovered that 46% of cases involved musculoskeletal disorders that required medical consultation in either orthopedic or neurological clinics.

A study of data from South Korean nurses in general and tertiary hospitals revealed that 83.9% of them had symptoms related to musculoskeletal problems in the last week (Kang *et al.,* 2025). The prevalence of musculoskeletal disorders varies across different parts of the world, with Nigeria 86% (Fatudimu *et al.*, 2022), Pakistan 85.5% (Hamid *et al.,* 2018), China 84.2% (Tang *et al.*, 2022), and Cameroon 83.4% (Meh *et al.,* 2023), all showing higher rates compared to Saudi Arabia 72.4% (Alruwaili *et al.*, 2023), Australia 68.1% (Rahman *et al.*, 2017), Tunisia 65.4% (Ben Jmaa *et al.*, 2020), and Japan 56.6% (Sasanuma *et al.*, 2026).

The evidence indicated that almost three out of every four nursing staff 73.2% experienced discomfort in at least one body area within the past 12 months (Soylar & Ozer, 2018). In the current study, the prevalence of lower back pain among HCWs was 82.70%. A study carried out with health workers at two major hospitals in Erbil city found that 55.3% of them experienced low back pain over a 12-month period (Usf & Ali, 2024). According to Almuhammady *et al*. (2026), the lifetime prevalence of low back pain was 85.9%, with 73.6% of people reporting symptoms within the last year and 43.7% experiencing pain at the time of the study, based on data collected from major hospitals in Al Madinah, Saudi Arabia. A study involving Jordanian emergency medical service workers found that every participant had experienced musculoskeletal pain in at least one part of their body within the past 12 months; the most frequently reported areas of pain were the lower back, affecting 70.8% of participants, and the neck, affecting 57.9% (Nazzal *et al*., 2024). A cross-sectional analytical study was carried out involving HCWs at a tertiary care hospital in Pakistan, and it was found that the lifetime prevalence of low back pain among these workers was 62.62% (Sindhu *et al.,* 2026). In another study conducted among HCWs in Accra, Ghana, the prevalence of LBP was 81.6% (Alnaami *et al.,* 2019; Tawiah *et al*., 2025).

A total of 70.81% of healthcare professionals reported experiencing episodes of neck pain, which is consistent with the results of a study conducted among healthcare professionals in public hospitals in Duhok province. In that study, the prevalence of neck pain among HCWs was 66.75% (Abdulrahman & Jibraeel, 2023). In another study conducted among nurses working in teaching hospitals in Erbil city, the prevalence rate was found to be 46% (Abdulla, 2018). A survey was carried out across different hospitals in Damascus, Syria, involving medical residents and trainee nurses who work in the public health system, specifically in 11 hospitals; the prevalence of neck pain was 54%. In general, 69% of the participants reported experiencing musculoskeletal pain in the past week, and 85% said they had experienced it within the last 12 months (Zahrawi *et al*., 2024). A study was carried out in 2019 involving 145 nurses from ICU departments at seven teaching hospitals in Rasht, Iran. The overall frequency of neck pain among nurses was 82.5% (n = 99), while 17.5% of nurses had no disability. Among those with neck pain, 51.7% had mild disability, 26.7% had moderate disability, and 4.2% had severe disability (Ashraf *et al*., 2024). A systematic review and meta-analysis on WRMSDs among nurses in Europe found that the prevalence of neck pain was 49.9% (Gorce & Jacquier-Bret, 2025).

The prevalence rate of shoulder pain among healthcare professionals was 70.27%. The rate at which healthcare workers in governmental hospitals in Duhok governorate are affected by the condition is 62.75%, as reported by Abdulrahman and Jibraeel in 2023. In a study conducted between physicians in Saudi Arabia, the occurrence of shoulder pain was found to be 15.92% in the one week before the study and 33.62% in the 12 months prior to the study (Alomar, 2021). In a study by Nazzal *et al*. (2024), it found that the prevalence of shoulder pain was 52.0% in the last 12 months. A cross-sectional descriptive analysis was carried out among nurses who provide care to critically ill patients in hospitals located in Gaza City, and it was found that 64.5% of them experienced shoulder pain within the past 12 months (Eleiwa & Khadoura, 2026). Another study was carried out involving nurses from three hospitals in the Kingdom of Bahrain, and it found that 52.8% of them experienced shoulder pain (Nasaif *et al.,* 2023).

In this study, it was found that 51.35% of healthcare workers visited an orthopedic clinic because they

experienced musculoskeletal pain. In another study, results were observed among healthcare professionals at public hospitals in Duhok province; it was found that 46% of healthcare workers visited an orthopedic clinic because of musculoskeletal pain within the past 12 months (Abdulrahman & Jibraeel, 2023).

Limitations

The study has several limitations. The study employed a cross-sectional design, which limits the ability to determine the musculoskeletal disorders, since it only examines associations at one specific point in time. Second, the study was carried out solely in public hospitals located in Erbil city, Kurdistan Region, Iraq, which restricts the ability to apply the findings to private hospitals or other healthcare environments in different areas. Finally, MSDs were evaluated using participants' self-reported data instead of clinical examinations or diagnostic tests, which could influence the accuracy and reliability of the findings due to recall bias.

Future Scope

Future research should include long-term and multi-site studies involving healthcare workers from various hospitals and healthcare environments throughout Iraq in order to gain a more thorough understanding of musculoskeletal disorders. Further research should also examine the occupational, ergonomic, and organizational factors that contribute to these conditions. Evaluating how well ergonomic interventions, workplace changes, and training programs work can help lower the rate of musculoskeletal disorders and enhance the health, safety, and overall quality of life for healthcare workers.

CONCLUSIONS

Lower back pain was the most common musculoskeletal disorder among HCWs, followed by neck pain. LBP was observed across all age groups among healthcare professionals, with the highest prevalence found among those aged 55 years and older. However, the differences in LBP prevalence across age groups were not statistically significant. Nurses tend to visit orthopedic clinics more often than physicians when dealing with musculoskeletal disorders. Statistically, a notable difference was observed between physicians and nurses in terms of their need for orthopedic consultation.

Recommendation

To decrease physical strain among healthcare workers, hospital management should implement ergonomic measures such as improved workstation design, adjustable equipment, and safe patient-handling practices. In addition, healthcare professionals need regular training on proper body mechanics, posture correction, and risk reduction to increase awareness and prevent injury. Addressing excessive workload is also essential, which can be achieved by increasing staffing levels and distributing shifts more effectively to reduce long working hours. Furthermore, early screening programs and regular medical check-ups are important for detecting initial signs of musculoskeletal problems and preventing them from developing into chronic conditions.

CRediT Authorship Contribution Statement

S.Y.M.: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Project Administration, Visualization, and writing of the original draft. **M.T.H.:** Contributed To The Conceptualization, Methodology, Supervision, Validation, and Critical Review and editing of the manuscript. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

AI Assistance Declaration

During manuscript preparation, the authors used ChatGPT to support English-language editing, organization, and grammar correction. The authors subsequently reviewed the manuscript, verified the data and references, and took full responsibility for the final content.

Conflict of Interest

The authors declare no conflict of interests.

ACKNOWLEDGEMENT

The authors would like to thank all the respondents who took the time to engage in the study.

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