



كلية التمريض العالي
Faculty of Higher Nursing

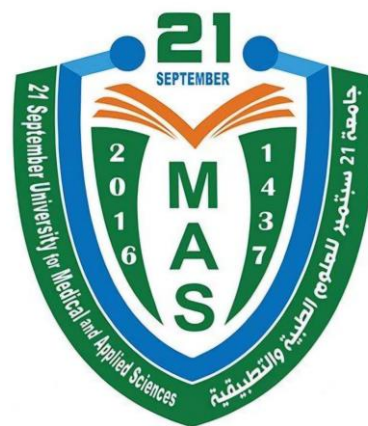
Republic of Yemen

Ministry of Higher Education and

Scientific Research September 21

University of Medical and Applied

Sciences Faculty of Higher Nursing



Factors Affecting Musculoskeletal Disorders among Nurses in Government Hospitals in the Capital Sana'a – 2026

**A research submitted in partial fulfillment of the requirements for the
Bachelor's Degree in the Faculty of Nursing, September 21 University**

Prepared by

Eqbal Mohammed Ali Al-mutahiny

Radman Ali Hamoud Al- Habbari

Hanan Awadh Qaid Abdullah

Eshraq Mohammed Qaid Sunbal

Saba Mohammed Saleh Al-Sufyani

Samah mohammed Yahia Albidani

Ahmed Naser Saleh hamod

Nabeha Hassan msleh Abd Almogni

Zaid Yahya Saleh Al-Jalal

Hanan Abdelhamid Hamoud Ghazi

Atef Mohammed Ali alhamaty

Khadigh abdulh ahemed hnaif

Safana Tawfeek Ahmed Al-Hakemi

Shimaa Abdulkareem Ahmed Aldaoos

Muna Abd Aljappar Almnsuri

Wafaa Abdulrahman Ali Al-Soudi

**Supervised by
Dr.Horia Al-Sabri
Ass. Prof. Community Medicine**



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَلَقَدْ مَنَنَّا عَلَيْكَ مَرَّةً أُخْرَىٰ ﴿٣٧﴾

صدق الله العظيم

Dedication

Our dear fathers and mothers, who have always been, and continue to be, like candles lighting our path toward success. We will always appreciate and remember everything you have done for us.

We also dedicate this work to our brothers and sisters—thank you for your love and support.

Acknowledgment

First and foremost, we praise Almighty God, the Giver of knowledge and wisdom, for granting us the health to complete this research.

Second, we express our sincere gratitude, appreciation, and respect to our distinguished supervisor, Dr. Horia Al-Sabri, for her guidance, continuous support, and assistance throughout the course of this research.

We also extend our sincere thanks and appreciation to Dr. Naji Gaber for his help in analyzing the research data.

Finally, we would like to thank all faculty members for their continuous support and assistance throughout our years of study at the university.

Abstract

Background: Musculoskeletal disorders (MSDs) represent a significant burden in the field of occupational health, affecting a wide range of professions and constituting a large proportion of occupational diseases

Objective: To identify the factors affecting musculoskeletal disorders among nurses working in governmental hospitals in the Capital Secretariat during the year 2026.

Methodology: This study employed a descriptive cross-sectional design. The study population consisted of nurses working in governmental hospitals in the Capital Secretariat, Sana'a. The study sample included 900 nurses selected using a purposive sampling approach. The data collection tool used in this study was a structured questionnaire

Results: The causes of these disorders, the study identified prolonged standing (27.1%), sudden movements (15.9%), and repetitive bending (14.3%) as the most common contributing factors, In terms of occupational exposure, a large proportion of nurses reported a high physical workload, where 89.1% stated that they care for a large number of patients daily, 87.4% reported lifting immobile patients, and 86.3% indicated maintaining prolonged static postures.

Conclusions: The findings indicate that these disorders are mainly associated with the physical demands of nursing work, such as prolonged standing, repetitive movements, and manual patient handling.

Recommendations: Increase the number of nursing staff to reduce workload, Regulate working hours and reduce long shifts, Provide adequate rest breaks during working hours.

Table of Content

Dedication.....	B
Acknowledgment.....	C
Abstract.....	D
Table of Content.....	E
List of tables.....	F
List of shapes.....	G
CHAPTER ONE: INTRODUCTION.....	2
CHAPTER TWO: LITERATURE REVIEW	25
CHAPTER THREE: METHODOLOGY.....	34
CHAPTER FOUR: RESULTS	43
CHAPTER FIVE : DISSCUSSION.....	60
CHAPTER SIX : CONCLUSION & RECOMMENDATIONS	63
REFERENCECS.....	66
APPENDIX.....	75

List of tables

Table NO	Content	Page NO
Table4:1	Distribution of Socio–demographic Characteristics among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)	46
Table4:2	Distribution of contribute factors Musculoskeletal Disorders factors among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)	48
Table 4:3	Distribution of Causes Musculoskeletal Disorders among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)	48
Table4:4	Distribution of contribute factors Musculoskeletal Disorders factors among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)	50
Table4:5	Distribution of Preventive measures Musculoskeletal Disorders factors among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)	51
<i>Table4:6:</i>	Bivariate analysis of socio–demographic factors associated with musculoskeletal disorders among nurses working in governmental hospitals in the Capital Secretariat during the year 2026 among nurse (<i>n=860</i>)	53
Table4:7	Bivariate analysis of Causes Musculoskeletal Disorders Among nurses working in governmental hospitals in the Capital Secretariat during the year 2026 among nurse (n=860)	56
<i>Table4:8</i>	Bivariate analysis of preventive factors associated with musculoskeletal disorders among the Capital Secretariat during the year 2026 among nurse (n=860)	58

List of shapes

Figure NO	Content	Page NO
Figure 0.1	Prevalence of work–related musculoskeletal disorders by body region	13
<i>Figure 0.2:</i>	Distribution of Musculoskeletal Disorder among nurses working in governmental hospitals in the Capital Secretariat during the year 2026	43
<i>Figure4.3:</i>	Distribution of gander among nurses working in governmental hospitals in the Capital Secretariat during the year 2026	44
Figure4.4:	Distribution of <i>age group</i> among nurses working in governmental hospitals in the Capital Secretariat during the year 2026	44
Figure4.5:	Distribution of Years Experience among nurses working in governmental hospitals in the Capital Secretariat during the year 2026	45

CHAPTER ONE: INTRODUCTION

CHAPTER ONE: INTRODUCTION

1.1 Background

Musculoskeletal disorders (MSDs) are among the most common occupational health problems worldwide, accounting for nearly one-third of work-related injuries each year (Greggi et al., 2024). They affect muscles, joints, ligaments, tendons, nerves, and intervertebral discs, causing symptoms such as pain, stiffness, swelling, and numbness (Tallawy et al., 2024). Nurses are considered one of the occupational groups most vulnerable to work-related musculoskeletal disorders (WRMSDs) due to frequent patient handling, repetitive movements, prolonged standing, awkward body postures, and heavy physical workloads (Yang et al., 2020).

In addition to physical factors, psychosocial factors such as job stress, inadequate supervisory support, poor workplace justice, sleep deprivation, and long working hours significantly increase the risk of WRMSDs (Chang et al., 2024). Demographic characteristics including age, gender, body mass index, and years of professional experience have also been identified as important predictors (Lin et al., 2020; Salama & Eleshenamie, 2018).

WRMSDs range from mild to severe conditions and are a major cause of absenteeism, reduced work productivity, increased healthcare costs, and

decreased quality of life among nurses (Nasiry et al., 2017). Poor ergonomic practices, inadequate training, and insufficient use of assistive devices further contribute to the development of these disorders (Wang et al., 2017).

Globally, the prevalence of WRMSDs among nurses is high, with a systematic review reporting an overall prevalence of 77.2%, although rates vary across countries and body regions (Sun et al., 2019). These findings highlight the need for preventive strategies aimed at reducing occupational risk factors and improving the health and well-being of nurses.

1.1.1 Risk factors WRMSD

is a multifactorial phenomenon influenced by various direct and indirect risk factors, The nursing profession is a very demanding occupation (physically, psychologically, socially, and mentally), which makes nurses more vulnerable to WRMSD. Due to the complexity and abundance of risk factors, researchers usually opt for a framework that narrows the field and facilitates understanding of their interplay. In the workplace, these factors can generally be divided into biomechanical (physical), psychosocial, sociocultural, individual (personal), organisational, and environmental risk factors.

1.1.2 Symptoms of Musculoskeletal Disorders

The Symptoms of MSDs vary depending on the affected area of the body. Common symptoms include pain, stiffness, swelling, and weakness, People with MSDs may also experience tingling or numbness in the affected area. Symptoms can range from mild to severe and can significantly impact a person's quality of life. Preventing MSDs involves taking steps to reduce the risk of injury. This can include using ergonomic equipment, taking frequent breaks, and practicing good posture. Employers can also implement training programs to teach employees how to avoid injury and provide access to resources such as physical therapy. Additionally, maintaining a healthy lifestyle by exercising regularly and eating a balanced diet can help reduce the risk of developing MSDs(Cline,2023).

The MSD symptoms create sensations of pain, fatigue and paraesthesia, especially in shoulder and upper limbs, often accompanied by nerve or muscle tendon lesions⁴ . Thus, besides the direct effect on the health of the worker and the incapacity for work, MSDs impose a large socioeconomic burden due to extensive use of health services, absenteeism due to illness, disability pensions and loss of productivity(Dosea,2016).

Symptoms of MSDs To facilitate the respondents, a diagram of human body region which comprised of nine body part (neck, shoulders, upper and lower back, hands/wrists, arms, knees, thighs, and feet) was attached for the identification of the part that are having trouble and discomfort. A local study grouped the discomfort in region one (neck, shoulders and upper back), region two (elbows, wrists/hands), region three (low back) and region four (hips, knees, ankles and feet) (2). Based on the manual of the respondents were asked to selfreport the discomfort/ pain at the body part listed in the questionnaire for the past 12 months to indicate chronic occurrence and for the past 7 days to indicate acute occurrence of MSS. Respondents shall give answer yes or no for each body part. Higher scores indicate more discomfort (Abd. Rahman,2021).

1.1.3 Common Types of Musculoskeletal Disorders

MSDs can be classified into different categories based on the affected structures. Some of the most common types include:

- 1– **Osteoarthritis (OA)**: Osteoarthritis is a degenerative joint disease characterized by the breakdown of cartilage, leading to pain, stiffness, and swelling. It commonly affects weight-bearing joints such as the

knees, hips, and spine. Aging, obesity, joint injuries, and repetitive stress contribute to its development.

2– **Rheumatoid Arthritis (RA):** RA is an autoimmune disorder that causes chronic inflammation of the joints. It leads to joint pain, swelling, and deformities. The immune system mistakenly attacks the synovial membrane, causing joint damage over time. RA can also affect other organs, making early diagnosis and treatment crucial.

3– **Osteoporosis:** Osteoporosis is a condition characterized by low bone density, making bones fragile and susceptible to fractures. It commonly affects postmenopausal women due to decreased estrogen levels. A diet low in calcium, vitamin D deficiency, and a sedentary lifestyle increase the risk of osteoporosis.

4– **Lower Back Pain (LBP):** LBP is one of the most common MSDs, often resulting from poor posture, muscle strain, herniated discs, or underlying spinal conditions. Sedentary behavior, improper lifting techniques, and excessive weight can exacerbate back pain.

5– **Tendinitis and bursitis:** Tendinitis is the inflammation of tendons, usually caused by repetitive movements or overuse. Bursitis occurs when the bursae, fluid-filled sacs that cushion joints, become

inflamed. These conditions are common among athletes and individuals with physically demanding jobs.

6– Carpal Tunnel Syndrome (CTS): CTS occurs due to compression of the median nerve in the wrist, leading to numbness, tingling, and weakness in the hand. Repetitive hand movements, prolonged computer use, and wrist injuries contribute to its development (Mullen,2025).

1.1.4 Diagnose of Musculoskeletal Disorders

Musculoskeletal disorders have been diagnosed for many years in the medical field. In the eighteenth century the Italian physician Bernardino Ramazzini, was the first to recognize the relationship between work and certain disorders of the musculoskeletal system due to the performance of sudden and irregular movements and the adoption of awkward postures. In the nineteenth century, Raynaud's phenomenon, also called dead finger or jackhammer disease, was found to be caused by a lack of blood supply and related to repetitive motions. Nurses have one of the highest rates of MSD of any occupation (Anap, Iyer, Rao, 2013). Although number of studies were done to find out prevalence of Work related musculoskeletal disorders (WRMSD s) among nurses across the world, there is limited information on

its prevalence in Uganda. This study aims at investigating the prevalence of muscular–skeletal conditions, the cause and predisposing factors and preventive strategies of musculoskeletal conditions among nurses working in Mulago National Referral hospital(Amuge,2025)

1.1.5 Prevalence and Trend of MSDs among Critical Care Nurses

due to the specific nature of their tasks, including unusual movements, static postures, repetitive motions, and the handling of heavy instruments, exhibit an even higher risk of developing MSDs compared to other nursing specialties ,MSDs are a major occupational health concern that affect nurses' quality of life, job performance, and general well–being. According to an analysis of research conducted in developing nations, the prevalence of MSDs among general workers was 37%, whereas it was as high as 92% among nurses. An estimated 33% of all nurses' sick leave cases are thought to be related to MSDs(Onovughe,2025).

1.1.6 Prevalence of work–related musculoskeletal disorders by body region

The neck and lower back were the most afflicted regions across all healthcare occupations, with an average frequency of between 26.7% and 70.1% Compared to dentists and surgeons, nurses had a lower average

prevalence for the neck (33.1%)The most common complaints among nurses are lower back, shoulder, neck ,hands, and legs (Figure 1)

The prevalence of WRMSDs on the feet and the whole body was higher in developed areas than in developing areas. Conversely, the prevalence of WRMSDs at other anatomical sites was higher in developing areas than in developed areas WRMSDs in the neck, upper back, and other anatomical sites decreased over time, while the prevalence of WRMSDs in the shoulder and knee showed an increasing trend(Jakovljevic.2024).

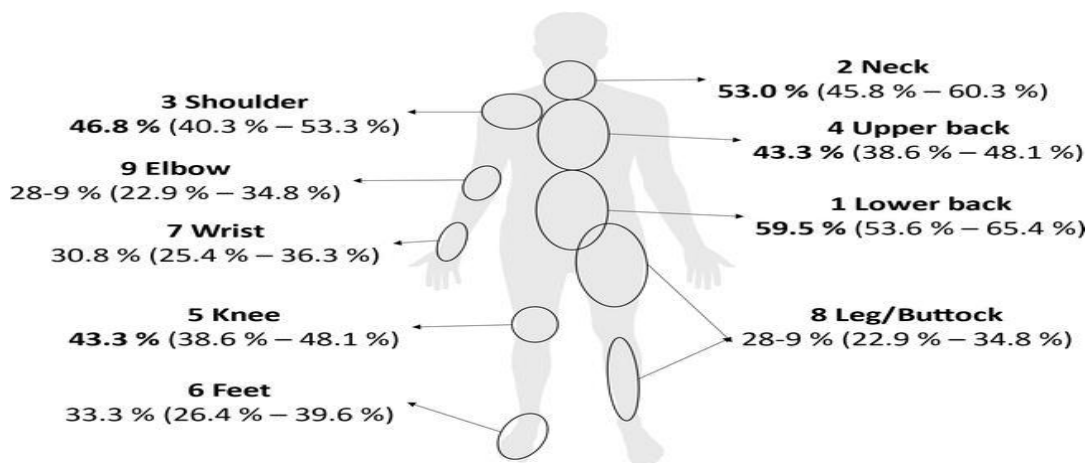


Figure 0.1: Prevalence of work-related musculoskeletal disorders by body region

Work- related musculoskeletal disorders (WRMSD s) are defined as musculoskeletal conditions that results from a work-related event. MSDs occur in certain industries and occupations with rates up to three or four times higher than the overall frequency. High-risk sectors include nursing facilities; air transportation; mining; food processing; leather tanning; and

heavy and light manufacturing (vehicles, furniture, appliances, electrical and electronic products, textiles, apparel and shoes). Back and lower limb disorders occur disproportionately among truck drivers, warehouse workers, airplane baggage handlers, construction trades, nurses, nursing aides and other patient-care workers, and operators of cranes and other large vehicles. (Tinubu, Mbada, Oyeyemi, Fabunmi, 2010). Work related musculoskeletal disorders have been described as one of the main health problems among healthcare workers. Recently, the physical handling of elderly people has been increasing as society ages. Consequently, physical workloads related to tasks handling people are becoming heavier, raising the possibility of a higher prevalence of serious work related musculoskeletal disorders among healthcare workers. A higher prevalence of Low Back Pain (LBP) has often been shown among healthcare workers, particularly compared with other hospital and industrial workers(Amuge,2025).

1.1.7 Cause of nurses' musculoskeletal disease

The biggest cause of nurses' musculoskeletal disease is the character of their works requiring excessive tension and concentration, such as always lifting heavy objects, standing work, and dealing with dangerous goods. Another one is the character of their jobs requiring the postures damaging

the waist and the body, such as bending, twisting hands, and dealing with patients, Domestic nurses do repetitive jobs mainly using their upper limbs, like writing medical records and test records, and have the character of works requiring the frequent use of their lower body part in stations, which need improper and atypical postures, such as injection and medical care for patients. Also it is known that they receive psychosocial stress because of their job character of giving assistance for patient treatment, and experience severe conflict on account of the different work scope of occupations in hospital, where there are many different occupations(Kim,2014).

1.1.8 The implications of developing MSDs among nurses

Most of the studies included in this SLR suggested that MSDs is associated with physical and psychological health risks that would further influence the effectiveness of nurses in providing care. 6.2.1 Physical impact The primary impact of musculoskeletal disorders is low back pain. According to the findings of the included studies there is high prevalence of lower backpain in both intervention and control groups who participated in the studies. Ratzon, Bar-Niv, & Froom (2016) reported that the frequency of pain in the lower back region among study participants was 44.32% followed by the neck region (34.4%). Yilmaz & Isik Andsoy (2022) reported that surgical 20

nurses frequently experienced pain in their lower back (68%). The study observed that that lower backpain experienced by surgical nurses affected their nursing care and had negative impacts on their daily lives. The findings of Zakerian et al. (2021) show that among ICU nurses the incidence of back pain was high with the most relevant complaint being pain in the lumbar region followed by pain in the shoulder and arm.

6.2.2 Psychological impact

Two studies suggested that MSD led to psychological health issues. Bagheri et al. (2021) found that the prevalence of MSDs among nurses caused work–family conflict. The study reports MSDs as strain–based work interference with family. According to the study, nurses who suffer depression or stress as a result of the role–induced strain from MSDs find it difficult to be an attentive spouse or responsible parent. Similarly, Yang et al. (2021) found that nurses with WRMDs reported experience of stress at work. Najafabadi et al. (2020) found that MSDs affect the quality of life of nurses as it leads to physical and mental degradation resulting in resignation, fragile professional communication, deterioration of the quality of care, professional dissatisfaction and leaving the profession. Participants in the study report that MSDs and experience of high rates of pain was responsible for absence from work, fatigue, and high turnover. Yilmaz & Isik Andsoy (2022) found that MSDs in the health industry especially among

surgical nurses has implications for work, social life, and personal well-being and health. In summary, the research indicates that MSDs among nurses are associated with both physical and psychological health risks, impacting their ability to provide care effectively. Lower back pain is the most common issue, with studies reporting high prevalence rates among nurses, particularly in surgical and ICU settings. For example, Ratzon et al. (2016) found a 44.32% incidence of lower back pain, while Yilmaz & Isik Andsoy (2022) reported 68% among surgical nurses, negatively affecting their work and daily lives. Additionally, MSDs contribute to psychological distress, including work-family conflicts, stress, and professional dissatisfaction. Studies by Bagheri et al. (2021) and Yang et al. (2021) highlighted how MSD-related stress impacts personal and professional roles. Najafabadi et al. (2020) further reported that MSDs lead to resignations, absenteeism, and diminished quality of care. Overall, MSDs significantly affect nurses' physical health, mental well-being, job performance, and quality of life (Onovughe, 2025).

1.1.9 Treatment for musculoskeletal disorders

Treatment Options Treatment for musculoskeletal disorders is tailored to the specific condition and severity of symptoms. Common treatment options

include: Medications: Pain Relievers: Over-the-counter pain relievers like acetaminophen and NSAIDs, as well as prescription medications for more severe pain

Anti-Inflammatory Drugs: To reduce inflammation and pain in conditions like arthritis. Muscle Relaxants: For muscle spasms and stiffness. Disease-Modifying Antirheumatic Drugs (DMARDs): For autoimmune conditions like rheumatoid arthritis. Bisphosphonates: To strengthen bones and prevent fractures in osteoporosis. Physical Therapy: Exercise programs and therapies to improve strength, flexibility, and range of motion. Surgery: In severe cases, surgical interventions may be necessary, such as joint replacement, tendon repair, or spinal surgery [9]. Weight Management: Reducing weight to decrease stress on the musculoskeletal system. Ergonomic Adjustments: Improving posture and using ergonomic tools to prevent strain. Alternative Therapies: Acupuncture: To alleviate pain and improve function. Chiropractic Care: For spinal alignment and pain relief. Massage Therapy: To reduce muscle tension and improve circulation. Musculoskeletal disorders (MSDs) are a diverse group of conditions affecting the muscles, bones, joints, ligaments, tendons, and nerves. These disorders can be caused by a variety of factors, including injury, overuse, poor posture, and age-related degeneration. MSDs are a significant cause of

disability worldwide, affecting people of all ages and backgrounds. Understanding the causes, symptoms, and treatments of MSDs is crucial for effectively managing these conditions and improving quality of life. This article provides an overview of common MSDs, their causes, symptoms, and available treatments(Patel,2024)

1.2 Problem Statement

Musculoskeletal disorders are among the most significant health challenges faced by nurses due to the physically demanding nature of their work, such as lifting and repositioning patients, prolonged standing, and repetitive movements (Aleid et al., 2021). These activities place excessive strain on the musculoskeletal system and increase the risk of both acute and chronic injuries. Although global research has extensively documented this phenomenon—particularly in stressful work environments (Jacquier-Bret & Gorce, 2019)—the city of Sana’a, Yemen, has not witnessed sufficient studies in this field.

The absence of systematic data on the prevalence, risk factors, and consequences of musculoskeletal disorders among nurses in Yemen represents a serious knowledge gap. While international studies highlight the physical and psychological burden of these disorders, the unique challenges

faced by Yemeni nurses—such as limited resources, variable working conditions, and weak occupational health policies—remain underexplored. Without a clear understanding of the magnitude of the problem, the Yemeni healthcare system remains unable to develop targeted strategies to reduce these occupational risks. This may lead to poor patient care, increased absenteeism, reduced job satisfaction, and high nurse turnover rates.

Therefore, this study aims to address this gap by investigating the prevalence, risk factors, and effects of musculoskeletal disorders among nurses in Sana'a city, emphasizing the need for effective interventions to protect nurses' health and well-being. Accordingly, the research problem is formulated as follows:

What are the factors affecting musculoskeletal disorders among nurses working in governmental hospitals in the Capital Secretariat?

1.3 Research Question

1. What are the factors affecting musculoskeletal disorders among nurses in governmental hospitals in the Capital Secretariat?
2. What is the level of prevalence of work-related musculoskeletal disorders among nurses in governmental hospitals in the Capital Secretariat?

3. What are the causes of work-related musculoskeletal disorders among nurses in governmental hospitals in the Capital Secretariat?
4. What is the impact of social and demographic factors (age, gender, years of experience, educational level, daily working hours, and work shifts) on the prevalence of musculoskeletal disorders among nurses?

1.4 Objectives

1.4.1 General Objective

- To identify the factors affecting musculoskeletal disorders among nurses working in governmental hospitals in the Capital Secretariat during the year 2026.

1.4.2 Specific Objectives

- To assess the prevalence of work-related musculoskeletal disorders among nurses in governmental hospitals in the Capital Secretariat.
- To identify the causes of work-related musculoskeletal disorders among nurses in governmental hospitals in the Capital Secretariat.
- To examine the social and demographic factors (such as age, gender, years of experience, educational level, daily working hours, and work shifts) associated with musculoskeletal disorders among nurses.

1.5 Significance of the study

- There is a statistically significant relationship between demographic characteristics (age, gender, years of experience, and educational level) and the occurrence of musculoskeletal disorders among nurses.
- There is a statistically significant relationship between certain factors (department, daily working hours, and work shifts) and the prevalence of work-related musculoskeletal disorders among nurses in governmental hospitals in the Capital Secretariat.
- There is a statistically significant relationship between long working hours, night shifts, and increased risk of musculoskeletal disorders among nurses.

1.6 Definition of Terms

- **Musculoskeletal disorders (MSDs)":**

are soft-tissue traumas resulting from sudden or extended exposure to force, vibration, uncomfortable postures, and repetitive motion(Onovughe,2025).

- **Disorder:**

Is variously defined as an alteration in an individual's usual sense of wellness or ability to function. A disorder may or may not interfere with usual activities of daily living or work activities. A disorder may or may not be associated with well-recognized anatomic, physiologic, or psychiatric pathology(National Research Council and Institute of Medicine).

CHAPTER TWO: LITERATURE REVIEW

CHAPTER TWO: LITERATURE REVIEW

1. Study by (Amwoye et al., 2025) entitled “Musculoskeletal Disorders among Nurses: A Case Study at the National Referral Hospital – Uganda”.

The study aimed to identify cases of musculoskeletal disorders among nurses working at the National Referral Hospital in Uganda, in order to provide information to support decision-makers in developing strategies to address this problem. The study was conducted at Mulago National Referral Hospital using a descriptive cross-sectional design and a quantitative approach for data collection. The sample size was 204 participants (160 nurses and 44 midwives), selected using simple random sampling. Data were collected using a pre-tested semi-structured questionnaire. The results showed that the prevalence rate was 701 per 1,000 for muscular disorders and 598 per 1,000 for skeletal disorders. About 29.4% of participants reported workload as the main cause, while 24.2% cited prolonged standing. The most frequently suggested preventive measure was hiring more nurses to reduce workload (22.9%). The study concluded that musculoskeletal disorders among nurses and midwives are a major problem requiring urgent attention from all relevant stakeholders.

2. Study by (Bousari et al., 2024) entitled “Prevalence of Work–Related Musculoskeletal Disorders and Associated Factors among Nurses”.

This study was conducted in Iran and aimed to assess work–related musculoskeletal disorders and their associated factors among nurses. The cross–sectional study was carried out in educational–therapeutic centers in Rasht city, Iran, during 2018–2019. A two–part questionnaire was used: the first part covered demographic characteristics, and the second was the Nordic Musculoskeletal Questionnaire. A total of 353 nurses participated in the study. The results showed that 88.1% suffered from musculoskeletal disorders in different parts of the body. About 72.52% had experienced these disorders during the past 12 months, while only 7.1% required hospitalization. The study concluded that the high prevalence of these disorders is attributed to heavy workload, shortage of nursing staff, poor tools and equipment, unsuitable work environment, and inadequate knowledge of ergonomic principles. The study recommended implementing training programs and improving the work environment.

3. Study by (Alam et al., 2023) entitled “Work–Related Risk Factors for Musculoskeletal Disorders among Nurses in Indian Hospitals”.

The study was conducted in the Kingdom of Saudi Arabia and aimed to assess work-related risk factors affecting musculoskeletal disorders among nurses in Indian hospitals. This descriptive cross-sectional study included 200 nursing staff working at Jawaharlal Nehru Medical College and Hospital, Aligarh Muslim University, Uttar Pradesh, India. A modified self-administered Nordic questionnaire was used to assess the occurrence of musculoskeletal disorders over the past 12 months. The results showed that lower back pain was the most prevalent (79%), followed by right shoulder and neck pain (67%), and knee pain (63%) among nurses during the past 12 months. The highest prevalence of disorders was recorded in the dental department (81.25%), followed by orthopedics (62.5%) and surgery (57.78%). For tasks requiring sitting, lower back pain was the most common (49.4%), followed by neck pain (40.6%) and elbow pain (38.4%). Lower back pain was higher among those working more than six hours per day (76.1%). About 53.5% of nurses reported that manual patient handling leads to musculoskeletal disorders, and 63.5% reported experiencing work-related stress and strain associated with these disorders. The study concluded that nurses face a high risk of musculoskeletal disorders, particularly in the lower back and neck, highlighting the need to provide an ergonomic work environment and apply proper body mechanics principles to reduce these risks.

4. Study by (Stanchev & Vangelova, 2022) entitled “Musculoskeletal Disorders among Hospital Nurses”.

This study was conducted in Bulgaria and aimed to identify risk factors related to the frequency and localization of musculoskeletal complaints among hospital nurses. A cross-sectional study was conducted involving 1,412 nurses from 19 hospitals in Sofia, Bulgaria. The results showed that the prevalence of musculoskeletal complaints was highest in the lower back (74.2%), followed by the back, neck, and shoulders. Musculoskeletal disorders were diagnosed in 35.6% of participants. The findings indicate poor organization of the work environment and high demands for prolonged standing and awkward movements, accompanied by high rates of injury and treatment.

5. Study by (Olutende, 2022; Wanzala, 2022) entitled “Risk Factors for Work-Related Musculoskeletal Disorders among Nurses in Kakamega County”.

This study was conducted in Kenya and aimed to investigate risk factors for work-related musculoskeletal disorders among nurses in Kakamega County. The study was descriptive cross-sectional and adopted a quantitative approach. It was carried out in hospitals in Kakamega County, Kenya. A

self-administered questionnaire was used to collect data from randomly selected nurses ($n = 130$). Data were presented using descriptive statistics in the form of frequencies and percentages for categorical variables, and means and standard deviations for quantitative variables. The chi-square test of independence was used to analyze relationships between quantitative variables, sociodemographic data, and risk factors for work-related musculoskeletal disorders. Statistical significance was set at $p \leq 0.05$. The results showed that the majority of nurses were female (76.9%). The mean age was 35 years with a standard deviation of 8.076 (35 ± 8.07). A large proportion of nurses were over 40 years old (40%), and 49% had one to five years of work experience. Only 3.1% reported no problem when performing the same task repeatedly, while 76.9% experienced major problems when dealing with a high number of patients and performing manual orthopedic techniques. Additionally, 81.5% experienced major problems when they did not have rest breaks during work. Regarding awkward and cramped positions, only 1.5% reported no problem. Concerning work schedules, only 26.9% reported minimal or moderate problems when work schedules were extended (overtime, irregular shifts, and long workdays). Significant associations were found between lack of adequate breaks, working in awkward and cramped positions, continuing to work while injured or in pain,

and the occurrence of work-related musculoskeletal disorders ($p < 0.05$). Only 6.2% reported no problem continuing to work while injured or in pain. The study concluded that prolonged work in the same positions, treating a high number of patients, and carrying or transferring dependent patients are major risk factors for work-related musculoskeletal disorders. The study recommended changing work techniques, using lifting equipment, rotating tasks regularly, reducing the excessive number of patients treated per day, taking breaks, and avoiding awkward and cramped positions, repetitive work, and strenuous tasks.

6. Study by (Abdulrahman & Abdullah, 2021) entitled “Risk Factors Associated with Musculoskeletal Symptoms among Healthcare Workers in a Public Hospital”.

This study was conducted in Malaysia and aimed to identify risk factors associated with musculoskeletal symptoms (MSS) among healthcare workers in a public hospital. A cross-sectional study was conducted among 121 healthcare workers (physicians, nurses, and physiotherapists) working in the emergency and trauma department and the physiotherapy department, using a census sampling method. A self-administered questionnaire was used, including sociodemographic data, work characteristics, body movements and

work tasks, the standardized Nordic Musculoskeletal Questionnaire to assess musculoskeletal symptoms, and the Job Content Questionnaire (JCQ) to measure psychosocial risk factors. The study achieved a response rate of 81.88%, and 95% of participants reported at least one symptom in one body part. The most common symptom was neck pain (80.2%), followed by lower back pain (79.3%) and shoulder pain (71.9%). Physiotherapists reported more musculoskeletal symptoms compared to physicians and nurses ($\chi^2 = 6.84$, $p = 0.033$). Among demographic characteristics, education level was the only factor significantly associated with musculoskeletal symptoms ($\chi^2 = 7.25$, $p = 0.008$). Fourteen body movements and work tasks showed a significant (moderate) association with musculoskeletal symptoms. Regarding psychosocial risk factors, high job insecurity was significantly (moderately) associated with increased musculoskeletal symptoms ($r = -0.302$). The study concluded that the prevalence of musculoskeletal symptoms in multiple body regions was high and was associated with sociodemographic background, work task characteristics, body movements, and psychosocial risk factors.

7. Study by (Kim, 2014) entitled “Risk Factors for Musculoskeletal Symptoms among Nurses in University Hospitals”.

This study was conducted in South Korea and aimed to determine the prevalence of musculoskeletal symptoms among nurses in a university hospital and examine their relationship with work-related factors. The results showed that the overall prevalence rate was 70.8%, with the highest prevalence in the shoulder (44.8%), followed by the lower back (40.7%) and the neck (33.3%). The findings indicate that factors such as job stress, years of service, department type, and shift work are associated with increased musculoskeletal symptoms, highlighting the need for ergonomic solutions and strategies to reduce job stress.

CHAPTER THREE: METHODOLOGY

CHAPTER THREE: METHODOLOGY

3.1 Study design:

This study used a descriptive, cross-sectional design in governmental Hospitals in the Capital Sana'a.

3.2 Study Setting:

This study was conducted at Government Hospital in the Capital Sana'a (Al-Thawra General Hospital Authority, and Kuwait University Hospital, Al-Gmohory Teaching Hospital Authority)

3.3 Study Population:

The study population was represented by nurses working in Al-Thawra General Hospital Authority, and Kuwait University Hospital, Al-Gmohory Teaching Hospital Authority, which is geographically and administratively affiliated to the Capital Municipality – Sana'a

3.4 Sampling method:

The study sample consisted of nurses working at Al-Thawra General Hospital Authority, Kuwait University Hospital, and the Republican Teaching Hospital Authority – Al-Sabeen Hospital for Maternity and

Childhood, who were on duty during the data collection period and agreed to participate voluntarily in the study.

3.5 Sample Size

The researchers adopted a purposive sampling method, and the sample size was determined to be 1,000 nurses. A total of 900 questionnaires were distributed across Al-Thawra General Hospital Authority, Al-Sabeen Hospital for Maternity and Childhood, and Kuwait University Hospital. Of these, 860 questionnaires were retrieved, representing 95% of the study population. A total of 40 questionnaires (5%) were excluded from the analysis due to incomplete data or the reluctance of some participants to fully complete the questionnaire.

3.6 Inclusion and Exclusion criteria

3.6.1 Inclusion criteria

Studies were included if they met the following conditions:

- (a) Focused on musculoskeletal disorders and reported at least one of the following: prevalence, risk factors, incidence, mortality, or economic costs related to MSD.
- (b) Targeted nurses only (both male and female) as the study population.

(c) specifically investigated lower back pain among nurses.

(d) cross-sectional study design.

3.6.2 Exclusion criteria

The following were excluded from the review:

(a) studies published as a poster rather than full articles.

(b) articles lacking an abstract.

(c) studies that do not focus exclusively on nurses (e.g., mixed populations without subgroup analysis for nurses).

(d) non-original research, such as commentaries, opinions, or secondary analyses of previously published data.

(e) studies that lack clear reporting on outcomes related to prevalence, incidence, mortality, risk factors, or economic costs.

3.7 Data collection:

To ensure the quality of the data collection process, the researchers prepared a paper questionnaire that was distributed face-to-face to the targeted nurses at their workplaces, and a face-to-face reminder visit to the target group was conducted intermittently during the application

period of the tool, which lasted from 10 to 30 November 2026 over a period of twenty-five days to increase the response rate, and Participation in the study was voluntary, and students were assured of the confidentiality of their responses and anonymity, the questionnaire consists of multiple choice questions and Likert scale items designed to obtain demographic information of participants and know the work pressures facing workers in the hospitals under study and their impact on the quality of nursing care..

3.7.1 Data collection methods

Data were collected using a self-administered written questionnaire.

3.7.2 Study instrument:

The questionnaire was modified based on previous studies (Abd. Rahman,2021, Kim,2014),The research instrument consists of the following parts:

Part I: Demographic Data

This part includes demographic information such as: age, gender, educational qualification, years of experience in the nursing field, number

of daily working hours, department, work shift, and a question asking whether the participant suffers from any musculoskeletal health problems.

Part II: Main Research Domains

This part includes the main domains of the research:

- The first domain: Causes of musculoskeletal disorders, and it consists of three questions.
- The second domain: Factors contributing to the development of work-related musculoskeletal disorders, and it includes ten questions.
- The third domain: Prevention of musculoskeletal disorders, and it contains nine questions.

3.8 Validity and reliability:

The questionnaire was adopted from previously validated and reliable studies and was reviewed by seven experts to determine if all questions were clearly worded and were not be misinterpreted. As a result, some questions were omitted, some added, and others rephrased. Other questions added were formulated by the researchers with the help of literature supervisor and experts were modified to add or omitted to clearly and corrected

misinterpreted and doubtlessness from credence and completeness of study tools. Reliability was assessed using cronbach,s alpha= (0.60).

3.9 Data Analysis:

The collected data was cleaned, entered, organized, encoded, tabular and analyzed using version 26 of the Statistical Package for the Social Sciences (SPSS) program, and for the purpose of data analysis and presentation , the following were used:

Descriptive Analysis: – Frequencies and percentages to recognize the evaluation of nursing care provided to patients. – Arithmetic averages and standard deviations to calculate differences between averages. – Cronbach's alpha coefficient to measure the stability of study instruments.

Inferential Analysis: – logistic regression analysis was performed to identify the significant predictors of musculoskeletal disorders among nurses and p-value of less than 0.05 was considered statistically significant.

3.10 Ethical considerations:

The official approval for the application of the study was obtained by the Deanship of the Faculty of Higher Nursing at September 21 University for

Medical and Applied Sciences, and dispatches were obtained from the Faculty of Higher Nursing to the specified hospitals to facilitate the task, and approval was obtained from hospitals to participate in conducting the study, and approval was taken from the study participants, and the use of personal identifiers was avoided, and confidentiality was maintained for all participants in the study.

- Ethical and technical approval from the September 21 University of Medical and Applied Sciences Faculty of Higher Nursing.
- Ethical approval from Al-Thawra General Hospital Authority, and Kuwait University Hospital, Al-Gmohory Teaching Hospital Authority.
- Permission from nurses of hospitals.
- Research purpose and objectives were explained to participant in clear simple words.
- Participant was given right to withdraw at any time without any deprivation.
- Participant was given right to no harm (privacy and confidentiality by using written questionnaire).
- Participant was given right to benefit from the researchers knowledge and skills.
- Questionnaires was filled by the nurses in their rest time without any interruption to their work.

CHAPTER FOUR: RESULTS

CHAPTER FOUR: RESULTS

4.1 Descriptive analysis

This study examines the prevalence and contributing factors of musculoskeletal disorders (MSDs) among nurses working in governmental hospitals in the Capital Secretariat in 2026 (n = 860).

4.1.1 Distribution of socio-demographic characteristics of Musculoskeletal Disorder among nurses working in governmental hospitals in the Capital Secretariat during the year 2026

The prevalence of MSDs was considerably high (69.4%), indicating a substantial occupational health burden among nurses. Figure 2.

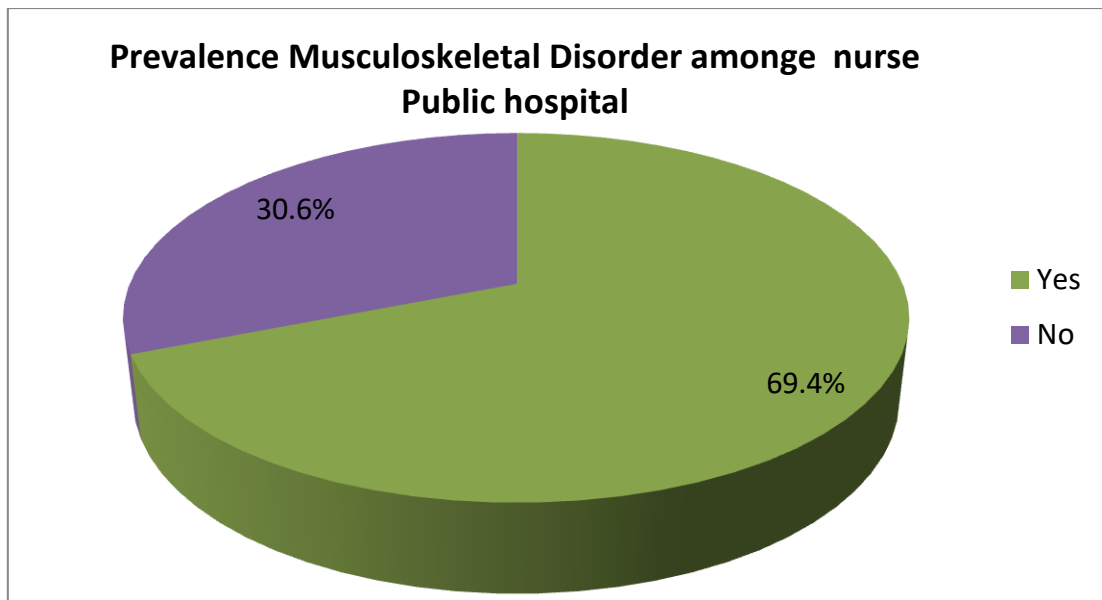


Figure 0.1: Distribution of Musculoskeletal Disorder among nurses working in governmental hospitals in the Capital Secretariat during the year 2026

Regarding gender of nurse, the data shows that, The highest percentage of musculoskeletal disorders (56.6%) was observed among female nurses, accounting for 43.4% of the total, was male comprised **Figure 3**.

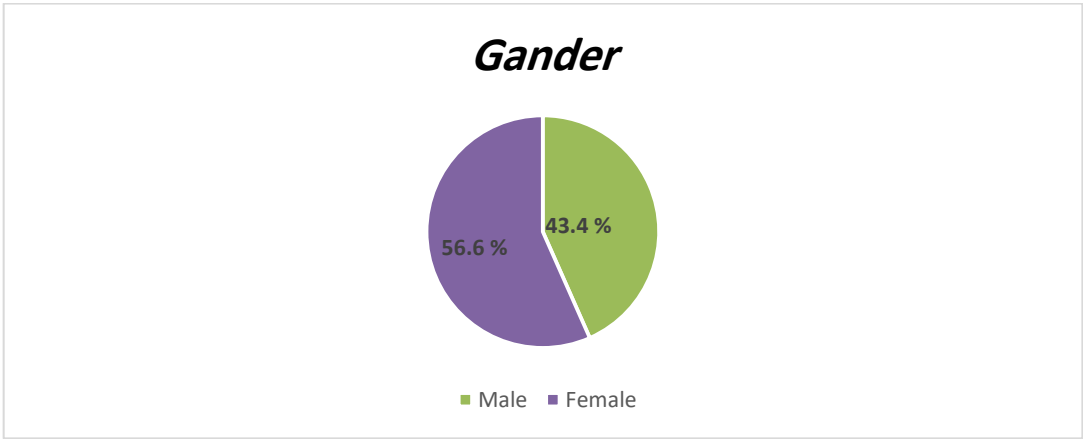


Figure4.3: Distribution of gander among nurses working in governmental hospitals in the Capital Secretariat during the year 2026

Regarding age group, the data shows that the highest percentage of nurse (49.9%) occurred in nurse under the age of 30 years, followed by those aged 30 –40 years (43.3%) and over 40 years (6.7%) Figure 4

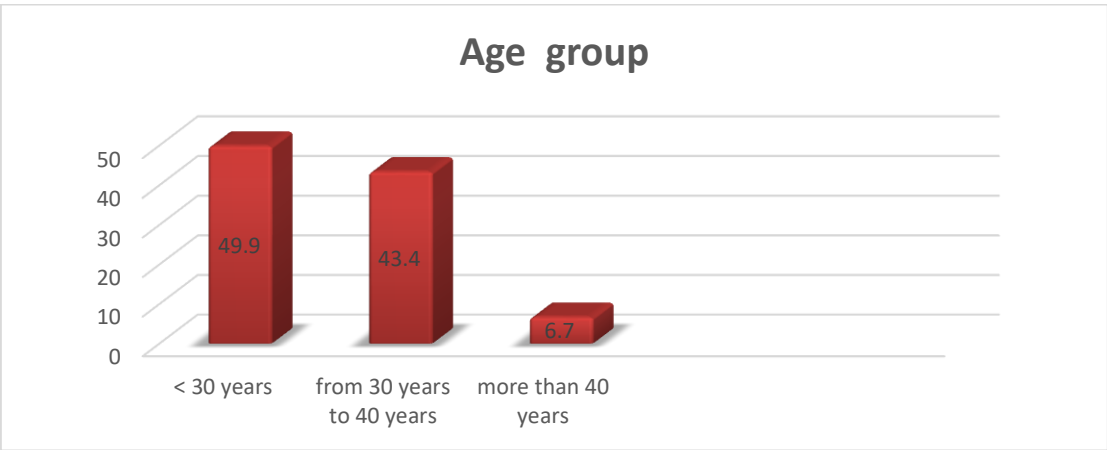


Figure4.4: Distribution of age group among nurses working in governmental hospitals in the Capital Secretariat during the year 2026

Regarding years experiences, the data shows that the highest percentage of nurse (36.9%) occurred in nurse has experience working from 3 to 6 years, followed by those less than 3 years (26.2%) and followed by more than 10 years (6.7%), finally (15.9%) om 7 to 10 years, Figure 5



Figure4.5: Distribution of Years Experience among nurses working in governmental hospitals in the Capital Secretariat during the year 2026

Table1: shows Work hours data show a significant proportion working extended shifts (31.3% work 12 hours, 25.1% work 16 hours, 7.3% work 24 hours), which is a major risk factor for physical and mental fatigue, increasing MSD susceptibility While the distribution of nurses by department, with ICU at 26.4% and ER at 20.2%, which is expected given their frequent involvement with blood transfusions. The "Others" category at 26.9% is a limitation because it lacks specificity and weakens interpretation. Combining "work shift" with "department" in the same table is a methodological error; the variables should be separated. It is recommended to reformat the table and break down the "Others" category before finalizing the results.

The work shift distribution Morning 41.3%, Evening 29.0%, "Shift of duty" 19.5%, Afternoon 10.2%.

The prevalence is alarmingly high: 69.4% of nurses reported suffering from musculoskeletal disorders vs 30.6% who do not. This rate indicates a serious occupational hazard that impacts nursing care quality

The table shows that the main causes of musculoskeletal disorders among nurses are directly work-related: "Standing for long time" is highest at 27.1%, followed by " Sudden movement" at 15.9%, " Repetitive bending" at 14.3%, "Change patient position" at 10.6%, and "Lifting heavy things" at 9.9%. These five causes account for over 77% of cases and clearly point to occupational hazards linked to the nursing work environment.

Table4:1 Distribution of Socio-demographic Characteristics among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)

Socio-demographic			
Variable		F	%
gender	Male	373	43.4
	Female	487	56.6
Age group	< 30 years	429	49.9
	from 30 years to 40 years	373	43.4
	more than 40 years	58	6.7
Level of education nurse	Diploma	480	55.8
	Bachelor	333	38.7
	Master and above	47	5.5
Years experiences	Less than 3years	225	26.2
	From 3 years to 6 years	317	36.9
	From 7 years to 10 years	137	15.9
	More than 10 years	181	21.0
Average number of daily work hours	8 hours≤	312	36.3
	12 hours	269	31.3
	16 hours	216	25.1
	24 hours	63	7.3
The department in working it	ER	174	20.2
	Surgery	112	13.0

	Internal medicine	47	5.5
	ICU	227	26.4
	Maternity	69	8.0
	Others	231	26.9
Work shift	Morning	355	41.3
	Afternoon	88	10.2
	Evening	249	29.0
	Shift of duty	168	19.5

Table 2 shows Comprehensive occupational hazard: Most risk factors exceed 80%, indicating the nursing work environment is systemically high-risk, not isolated individual cases.

Highest risks: Caring for large numbers of patients 89.1%, lifting immobile patients 87.4%, and prolonged static postures 86.3%. These three directly explain the 69.4% prevalence of MSDs.

Dangerous work culture: 80.9% continue working while injured or in pain. This behavior converts acute injuries to chronic and explains why one-third of the sample has had MSDs for over a year.

Training and rest gaps: 45.7% are not adequately trained in injury prevention, and 57.4% lack sufficient rest breaks. These two variables are the real root cause of all unsafe practices. The problem is administrative and organizational before it is individual. The 69.4% MSD rate cannot be reduced without mandatory policies for training, rest, and prohibiting work while injured.

Table 4:2 Distribution of contribute factors Musculoskeletal Disorders factors among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)

Socio-demographic			
Variable	Category	F	%
DO you suffer from Musculoskeletal Disorders?	Yes	597	69.4
	No	263	30.6
Yes Period Musculoskeletal Disorders	Less than 4 months	101	11.7
	From 4 months to 8 months	81	9.4
	From 9 months to 12 months	141	16.4
	More than 1 years	274	31.8
	Total	597	69.4

Table 3 shows that the main causes of musculoskeletal disorders among nurses are directly work-related: "Standing for long time" is highest at 27.1%, followed by "Suddenly" at 15.9%, " Prolonged standing" at 14.3%, "Change patient position" at 10.6%, and "Lifting heavy things" at 9.9%. These five causes account for over 77% of cases and clearly point to occupational hazards linked to the nursing work environment.

Table 4:3 Distribution of Causes Musculoskeletal Disorders among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)

Variable	Category	F	%
Causes Musculoskeletal Disorders	Suddenly	276	32.1
	Change patient position	261	30.3
	Standup for long time	137	15.9
	Prolonged standing	91	10.6
	Fall down	233	27.1
	RTA	123	14.3
	After delivery	20	2.3
	Hard work	21	2.4

	Continuous movement	19	2.2
	Lifting heavy things	41	4.8
	Not sure	46	5.3
	Others	85	9.9
The department in working it when did the problem start?			
Department	ER	201	23.4
	Surgery	98	11.4
	Internal medicine	52	6.0
	ICU	218	25.3
	Others	228	26.5
	Maternity	63	7.3
Period of work and number of years			
	Less than 3years	151	17.6
	From 3 years to 6 years	250	29.1
	From 7 years to 10 years	225	26.2
	More than 10 years	234	27.2

Table4: shows Comprehensive occupational hazard: Most risk factors exceed 80%, indicating the nursing work environment is systemically high-risk, not isolated individual cases, Highest risks: Caring for large numbers of patients 89.1%, lifting immobile patients 87.4%, and prolonged static postures 86.3%. These three directly explain the 69.4% prevalence of MSDs, Dangerous work culture: 80.9% continue working while injured or in pain. This behavior converts acute injuries to chronic and explains why one-third of the sample has had MSDs for over a year.

Training and rest gaps: 45.7% are not adequately trained in injury prevention, and 57.4% lack sufficient rest breaks. These two variables are the real root cause of all unsafe practices. The problem is administrative and

organizational before it is individual. The 69.4% MSD rate cannot be reduced without mandatory policies for training, rest, and prohibiting work while injured.

Table4:4 Distribution of contribute factors Musculoskeletal Disorders factors among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)

Variable	Category	F	%
Have you ever treated and cared for a large number of patients in a single day.	Yes	766	89.1
	No	94	10.9
Do you get sufficient rest breaks during your working hours?	Yes	366	42.6
	No	494	57.4
Have you ever worked in uncomfortable or cramped positions?	Yes	724	84.2
	No	136	15.8
Have you ever performed the same task in the same position for extended periods?	Yes	742	86.3
	No	118	13.7
Have you ever bent or twisted your back improperly while working?	Yes	729	84.8
	No	131	15.2
Do you continue working while injured or in pain?	Yes	696	80.9
	No	164	19.1
Have you ever lifted or moved a patient who was unable to move?	Yes	752	87.4
	No	108	12.6
Have you ever handled heavy materials or equipment?	Yes	622	72.3
	No	238	27.7
Have you ever assisted a patient during walking activities?	Yes	703	81.7
	No	157	18.3
Are you adequately trained in injury prevention?	Yes	467	54.3
	No	393	45.7

Table5 Strong consensus on preventive measures: 8 of 9 preventive actions received >89% approval, with the top three being: use of adjustable beds 93.7%, rotation between shifts 93.4%, and avoiding risk factors like lifting and bending 92.1%. This shows nurses fully recognize the required solutions.

The key problem is staffing shortage: 57.4% reported insufficient staff availability. This is the only negative variable in the table and directly explains why 89.1% treated a large number of patients daily in the previous table. Nurses know the solutions and endorse them at >90%, but implementation is blocked by staffing shortages. The missing link between "knowledge" and "practice" is adequate staffing. The 69.4% MSD rate is associated with staff shortage, not lack of awareness.

Table4:5 Distribution of Preventive measures Musculoskeletal Disorders factors among nurses working in governmental hospitals in the Capital Secretariat during the year 2026(n=860)

Variable		F	%
Availability of sufficient staff	Yes	366	42.6
	No	494	57.4
Rotation between shifts	Yes	803	93.4
	No	57	6.6
Training staff on patient handling and lifting	Yes	773	89.9
	No	87	10.1
Improving work conditions (motivation & annual leave)	Yes	785	91.3
	No	75	8.7

Use of adjustable or high beds	Yes	806	93.7
	No	54	6.3
Use of effective equipment	Yes	781	90.8
	No	79	9.2
Encouraging teamwork	Yes	784	91.2
	No	76	8.8
Avoiding risk factors (lifting & bending)	Yes	784	91.2
	No	76	8.8
For protection assistants should be hired to help with the work	Yes	792	92.1
	No	68	7.9

4.2 Bivariate analysis

4.2.1 Simple logistic regression socio–demographic factors

Table6 presents a bivariate analysis of socio–demographic factors associated with Musculoskeletal Disorders in among nurses working in governmental hospitals in the Capital Secretariat during the year 2026. The analysis examines the relationships between various variables and the likelihood of a musculoskeletal disorder's outcome.

Illustrates a statistically significant relationship between various socio–demographic factors and the prevalence of MSDs among nurses (n=860). The findings indicate that females have a higher prevalence (77.4%) compared to males (59.0%), with a high statistical significance Male nurses had higher odds of MSDs compared to females (OR = 2.83, 95% CI: 1.77–3.20, $p < 0.001$), Age also plays a crucial role, as nurses over 40 years old

reported the highest prevalence at 84.5% and high risk for MSDs the odds ratio (OR) for more than 40 years is 1.45 (95% CI: 1.07– 1.97, $p=0.04$). Interestingly, nurses with less than 3 years of experience showed a significantly higher risk (OR=3.62, $P=0.000$) compared to those with more experience. Regarding hospital departments, the Emergency Room (ER) showed the most significant association with MSDs ($P=0.001$). These results align with biomechanical theories that explain MSDs as a result of cumulative trauma and physical strain. The higher prevalence among females may be attributed to physiological differences and the double burden of professional and domestic responsibilities. The strong correlation between limited experience and increased MSDs supports the 'Motor Learning Theory,' suggesting that novice nurses often lack proper body mechanics and patient-handling techniques, making them more susceptible to acute injuries. Furthermore, the high incidence in the ER department is consistent with the nature of emergency work, which involves rapid movements, sudden heavy lifting, and prolonged awkward postures.

Table4:6: Bivariate analysis of socio–demographic factors associated with musculoskeletal disorders among nurses working in governmental hospitals in the Capital Secretariat during the year 2026 among nurse (*n=860*)

Variable/Factor	Category	Total n (%)	Dependent variable		OR (95%CI)	P–Value
			Yes n (%)	No n (%)		
Gander	Male	373 (43.4)	220 (59.0)	153 (41.0)	2.38 (1.77 –3.20)	0.000
	Female	487 (56.6)	377 (77.4)	110 (22.6)	REF.	1.000
Age group (years)	< 30 years	429 (49.9)	277 (64.6)	152 (35.4)	0.48 (.23– 1.02)	.060
	from 30 years to 40 years	373 (43.4)	271 (72.7)	102 (27.3)	REF.	
	more than 40 years	58 (6.7)	49 (84.5)	9 (15.5)	1.45 (1.07– 1.97)	0.014
Education level	Diploma	480 (55.8)	344 (71.7)	136 (28.3)	0.69 (0.37–1.30)	0.26
	Bachelor	333 (38.7)	223 (67.0)	110 (33.0)	0.87 (0. 46–1.64)	0.67
	Master and above	47 (5.5)	30 (63.8)	17 (36.2)	REF	
Experience Years	< 3 years	225 (26.2)	133 (59.1)	92 (40.9)	3.62 (2.24 – 5.84)	0.000
	From 3– 6	317 (36.9)	208 (65.6)	109 (34.4)	2.74 (1.73 – 4.35)	0.000
	From 7– 10	137 (15.9)	104 (75.9)	33 (24.1)	1.66 (0. 95 – 2.90)	0.074
	> 10 years	181 (21.0)	152 (84.0)	29 (16.0)	REF.	
Average number of daily work hours	8 hours≤	312 (36.3)	204 (65.4)	108 (34.6)	1.13 (1.00 –2.16)	0.52
	12 hours	269 (31.3)	191 (71.0)	78 (29.0)	1.29 (0. 70 –2.39)	0.40
	16 hours	216 (25.1)	159 (73.6)	57 (26.4)	REF.	

	24 hours	63 (7.3)	43 (68.3)	20 (31.7)	1.47 (1.00 – 2.16)	0.04
Department	ER	174 (20.2)	99 (56.9)	75 (43.1)	3.26 (1.66 – 6.40)	0.001
	Surgery	112 (13.0)	81 (72.3)	31 (27.7)	1.64 (0. 79 – 3.42)	0.18
	Internal medicine	47 (5.5)	32 (68.1)	15 (31.9)	2.01 (0. 85 – 4.77)	0.10
	ICU	227 (26.4)	157 (69.2)	70 (30.8)	1.92 (0.89– 3.73)	0.05
	Others	231 (26.9)	172 (74.5)	59 (25.5)	1.47(0.75– 2.89)	0.25
	Maternity	69 (8.0)	56 (81.2)	13 (18.8)	REF.	
Work shift	Morning	355 (41.3)	240 (67.6)	115 (32.4)	1.27(0.84– 1.90)	0.24
	Afternoon	88 (10.2)	68 (77.3)	20 (22.7)	0.78 (0.42 – 1.42)	0.41
	Evening	249 (29.0)	167 (67.1)	82 (32.9)	1.30 (0.84 – 2.00)	0.22
	Shift of duty	168 (19.5)	122 (72.6)	46 (27.4)	REF.	

4.2.2 Simple logistic regression Causes or factors Musculoskeletal

Disorders factors

This analysis explores the causes or factors associated with Musculoskeletal Disorders among nurses working in governmental hospitals in the Capital Secretariat during the year 2026. The bivariate analysis presented in Table 5.2 highlights several statistically significant associations between causes or factors associated with Musculoskeletal Disorders.

Table 7 highlights the primary causes of MSDs among the surveyed nurses. 'Standing for long periods' emerged as the most frequent cause (27.1%), followed by Repetitive bending' (14.5%). Statistically, 'Falling down' was associated with the highest odds of injury (OR=4.730, P=0.001), followed by 'Hard work' (P=0.049). The 'Not sure' category also showed high statistical significance (P=0.008), which may point towards the cumulative nature of these disorders where the exact onset or cause is difficult for the nurse to pinpoint. These findings underscore the role of 'Ergonomic Factors' and the physical work environment in the development of injuries. Prolonged standing leads to continuous muscle fatigue and reduced blood circulation to the extremities, paving the way for chronic disorders. The strong association between falling and injury highlights the 'Sudden Event Theory' as opposed to 'Cumulative Strain.' The results support the necessity of implementing occupational safety standards and improving the work environment to minimize forced movements and violent physical exertion, which are primary drivers of musculoskeletal morbidity according to modern occupational health models.

Table4:7 Bivariate analysis of Causes Musculoskeletal Disorders Among nurses working in governmental hospitals in the Capital Secretariat during the year 2026 among nurse (n=860)

Variable/Factor	Category	Total n (%)	Dependent variable Yes n (%)	Dependent variable No n (%)	OR (95%CI)	P- Value
Causes Musculoskeletal Disorders	Sudden movement	137 (15.9)	100 (16.8)	37 (14.1)	0.862 (0.468–1.587)	0.633
	Change patient position	91 (10.6)	69 (11.6%)	22 (8.4)	0.796 (0.490–1.294)	0.357
	Prolonged standing	233 (27.1)	180 (30.2%)	53 (20.2)	1.368 (0.806–2.322)	0.246
	Repetitive bending	125 (14.5)	83 (13.9%)	42 (16.0)	2.252 (0.898–5.652)	0.084
	Fall down	22 (2.6)	12 (2.0%)	10 (3.8)	4.730 (1.835–12.193)	0.001
	RTA	22 (2.6)	8 (1.3%)	14 (5.3)	3.378 (0.860–13.266)	0.081
	After delivery	9 (1.0)	4 (0.7%)	5 (1.9)	0.772 (0.348–1.714)	0.525
	Hard work	45 (5.2)	35 (5.9%)	10 (3.8)	2.002 (1.004–3.993)	0.049
	Continuous movement	47 (5.5)	27 (4.5%)	20 (7.6)	1.328 (0.737–2.392)	0.346
	Lifting heavy things	85 (9.9)	57 (9.5%)	28 (10.6)	2.703 (0.522–13.99)	0.236
	Not sure	6 (0.7)	3 (0.5)	3 (1.1)	2.703 (1.290–5.661)	0.008
	Others	38 (4.4)	19 (3.2)	19 (7.2)	Ref	

4.2.3 Simple logistic regression preventive measure factors

presents the bivariate analysis of preventive measure factors associated with Musculoskeletal Disorders (MSDs) among nurses working in governmental

hospitals in the Capital Secretariat during the year 2026. The analysis examines the relationship between various factors Musculoskeletal Disorders outcome.

Table 8 examines the impact of preventive measures on the prevalence of MSDs. The results show that 'Adequate training on injury prevention' significantly reduces the likelihood of injury ($P=0.028$). Similarly, the 'Availability of sufficient staff' was significantly associated with lower injury rates ($P=0.044$). The most influential factor was 'Improving work conditions' (e.g., motivation and annual leave), which showed a very strong statistical significance ($P=0.001$) with an odds ratio of ($OR=2.353$), confirming that organizational and psychosocial factors play a crucial role in prevention. These findings align with the 'Psychosocial Model' in occupational health, which suggests that work pressure and lack of organizational support increase muscle tension and pain perception. Improving work conditions and providing leave reduces 'Job Burnout' and allows the body necessary recovery periods to prevent minor strain from evolving into chronic injury. Furthermore, the effectiveness of training and staff availability supports the 'Risk Control Theory,' where distributing the physical load and increasing awareness of proper techniques lead to reduced direct exposure to biomechanical hazards within the hospital environment.

Table4:8 Bivariate analysis of preventive factors associated with musculoskeletal disorders among the Capital Secretariat during the year 2026 among nurse (n=860)

Variable/Factor	Category	Total n (%)	Dependent variable		OR (95%CI)	P- Value
			Yes n (%)	No n (%)		
Adequate training on injury prevention	Yes	467 (54.3)	310 (66.4)	157 (33.6)	0.713 (0.527–0.964)	0.028
	No	393 (45.7)	287 (73.0)	106 (27.0)		
Availability of sufficient staff	Yes	783 (91.0)	536 (68.5)	247 (31.5)	0.538 (0.295–0.982)	0.044
	No	77 (9.0)	61 (79.2)	16 (20.8)		
Rotation between shifts	Yes	760 (88.4)	530 (69.7)	230 (30.3)	1.049 (0.638–1.726)	0.849
	No	100 (11.6)	67 (67.0)	33 (33.0)		
Training staff on patient handling and lifting	Yes	803 (93.4)	562 (70.0)	241 (30.0)	1.468 (0.812–2.655)	0.204
	No	57 (6.6)	35 (61.4)	22 (38.6)		
Improving work conditions (motivation & annual leave)	Yes	773 (89.9)	549 (71.0)	224 (29.0)	2.353 (1.403–3.945)	0.001
	No	87 (10.1)	48 (55.2)	39 (44.8)		
Use of adjustable or high beds	Yes	785 (91.3)	546 (69.6)	239 (30.4)	0.996 (0.565–1.756)	0.989
	No	75 (8.7)	51 (68.0)	24 (32.0)		
Use of effective equipment	Yes	806 (93.7)	558 (69.2)	248 (30.8)	0.946 (0.492–1.818)	0.867
	No	54 (6.3)	39 (72.2)	15 (27.8)		

Encouraging teamwork	Yes	781 (90.8)	539 (69.0)	242 (31.0)	0.837 (0.475–1.475)	0.538
	No	79 (9.2)	58 (73.4)	21 (26.6)		
Avoiding risk factors (lifting & bending)	Yes	784 (91.2)	540 (68.9)	244 (31.1)	0.582 (0.320–1.061)	0.077
	No	76 (8.8)	57 (75.0)	19 (25.0)		
Hiring assistants for lifting patients/loads	Yes	792 (92.1)	552 (69.7)	240 (30.3)	0.936 (0.520–1.686)	0.826
	No	68 (7.9)	45 (66.2)	23 (33.8)		

CHAPTER FIVE : DISSCUSSION

CHAPTER FIVE : DISSCUSSION

The findings of this study revealed that the prevalence of musculoskeletal disorders (MSDs) among nurses working in governmental hospitals in the Capital Secretariat reached 69.4%, indicating a substantial occupational health burden. This high prevalence is consistent with several previous studies. For instance, Bousari et al. (2024) reported a prevalence of 88.1%, while Kim (2014) found a prevalence of 70.8% among hospital nurses. These similarities confirm that nursing is a high-risk profession for developing MSDs worldwide.

Regarding the causes of MSDs, the present study identified prolonged standing (27.1%), sudden movements (15.9%), and repetitive bending (14.3%) as the most common contributing factors. These findings align with Alam et al. (2023), who emphasized that manual patient handling, repetitive tasks, and awkward postures are major contributors to musculoskeletal pain, particularly in the lower back and neck. Similarly, Stanchev and Vangelova (2022) highlighted prolonged standing and poor working postures as key risk factors.

In terms of occupational exposure, a large proportion of nurses reported high physical workload, with 89.1% caring for a large number of patients daily,

87.4% lifting immobile patients, and 86.3% maintaining prolonged static postures ,These results are consistent with Olutende (2022), which identified handling many patients and working in uncomfortable positions as significant predictors of MSDs.

The study also revealed important organizational issues. More than half of the nurses (57.4%) reported insufficient rest breaks, and 45.7% lacked adequate training in injury prevention , .These findings are supported by Abdulrahman and Abdullah (2021), who found that inadequate training and psychosocial factors, such as job stress, significantly contribute to the development of musculoskeletal symptoms.

A concerning finding is that 80.9% of nurses continued working while injured or in pain, This reflects a negative work culture that may exacerbate acute conditions and lead to chronic musculoskeletal problems. This observation is consistent with previous literature indicating that occupational stress and workload pressures often force healthcare workers to ignore early symptoms.

Furthermore, the study demonstrated statistically significant relationships between MSDs and socio-demographic factors such as gender, age, and years of experience. These findings are in agreement with earlier studies,

which reported higher risks among older nurses, less experienced staff, and those working in high-demand departments such as emergency units.

Overall, the findings of this study are consistent with existing literature, confirming that MSDs among nurses are multifactorial in nature, involving physical, organizational, and psychosocial factors, and require comprehensive intervention strategies.

CHAPTER SIX : CONCLUSION & RECOMMENDATIONS

CHAPTER SIX : CONCLUSION & RECOMMENDATIONS

Conclusion

This study concludes that musculoskeletal disorders represent a significant occupational health problem among nurses working in governmental hospitals in the Capital Secretariat, with a high prevalence rate of 69.4%. The findings indicate that MSDs are primarily associated with the physical demands of nursing work, including prolonged standing, repetitive movements, and manual patient handling.

In addition, organizational factors such as staff shortages, inadequate rest breaks, and insufficient training play a crucial role in increasing the risk of these disorders. The continuation of work despite pain or injury further aggravates the problem and contributes to long-term health complications.

MSDs not only affect nurses' physical and psychological well-being but also negatively impact the quality of healthcare services provided. Therefore, addressing this issue is essential to ensure both workforce sustainability and patient safety.

Can negatively affect nurses performance and quality of patient care.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. Increase the number of nursing staff to reduce workload.
2. Regulate working hours and minimize prolonged shifts.
3. Ensure adequate rest breaks during working hours.
4. Provide ergonomic equipment such as adjustable beds and patient lifting devices.
5. Improve workplace design to reduce physical strain.
6. Minimize exposure to awkward and harmful working postures.
7. Implement regular training programs on Proper body mechanics
8. Raise awareness about MSD risks and prevention strategies.
9. Establish policies that prevent working while injured or in pain.
10. Introduce job rotation systems to reduce physical stress.
11. Provide psychological and professional support for nurses.

12. Conduct further studies on MSDs among healthcare workers in Yemen.
13. Evaluate the effectiveness of preventive interventions.
14. Explore psychosocial and organizational factors in greater depth.

.١٥

REFERENCES

- Abd. Rahman, Siti Hasrina ,Rasdi , Irniza, Karrupiah , Karmegam, Abdullah, Abdul Mujid, (2021), Risk Factors Associated with Musculoskeletal Symptoms among Healthcare Workers in a Public Hospital, Malaysian Journal of Medicine and Health Sciences (eISSN 2636-9346).
- Ann Adamczyk M. (2018). Reducing Intensive Care Unit Staff Musculoskeletal Injuries With Implementation of a Safe Patient Handling and Mobility Program. Critical care nursing quarterly, 41(3), 264–271. <https://doi.org/10.1097/CNQ.000000000000205>
- Alam, Mohd Mukhtar, Ali, Abdulelah M, Rafey, Mohammad, Sufyaan, Mohd, Ahmad, Israr, Zarrin, Saima, (2023) entitled “Work-Related Risk Factors for Musculoskeletal Disorders among Nurses in Indian Hospitals, Nr 2023;13 (2):273–282,
- Aleid, A. A., Eid Elshnawie, H. A., & Ammar, A. (2021). Assessing the Work Activities Related to Musculoskeletal Disorder among Critical Care Nurses. Critical care research and practice, 2021, 8896806. <https://doi.org/10.1155/2021/8896806>
- Ali, D. A., Oukhouya, K., Aziz, A., Bouhali, H., El Khiat, A., El Koutbi, M., ... & Khabbache, H. (2024). Prevalence of musculoskeletal

- disorders among healthcare professionals: A hospital-based study. *Advances in Medicine, Psychology, and Public Health*, 1(1), 12–25.
- Almogbil IH, Alrashidi LR, Alhajlah RS, et al. Prevalence of Shoulder and Neck Pain Among Healthcare Workers in the Central Region of Saudi Arabia. *Cureus*. 2023;15(7):e42286. Published 2023 Jul 22. doi:10.7759/cureus.42286
 - Alruwaili, S. H., Thirunavukkarasu, A., Alanazi, R. M., Alsharari, A. Y., Alruwaili, D. K., Alenzi, H. A., Alruwaili, A. N., & Alruwaili, G. Q. (2023). Prevalence, Patterns, and Associated Factors for Musculoskeletal Disorders Among the Nurses of Northern Saudi Arabia: A Multicenter Cross-Sectional Study. *Journal of pain research*, 16, 3735–3746. <https://doi.org/10.2147/JPR.S415919>
 - Amuge, Beatrice, Namirimu, Sylvia, Oliver Norah, Nabachwa, (2025), Musculoskeletal Disorders among Nurses: A Case Study at the National Referral Hospital – Uganda, *South Florida Journal of Development*, Miami, v.6, n.6. p. 01–15, 2025. ISSN 2675–5459.
 - Bosari, Sayareh Rezai Fard, Sabet, Mitra Sedghi, Leyli, Ehsan Kazemnezhad, Sedighi–Chafjiri, Asieh, (2024) entitled “Prevalence of Work-Related Musculoskeletal Disorders and Associated Factors among Nurses, Journal homepage: <https://www.jnursrcp.com>

- Chang, F.–Y., Chiang, C.–C., & Huang, C.–L. (2024). Factors related to musculoskeletal disorders among hospital nurses. *Hu Li Za Zhi: The Journal of Nursing*, 71(1), 36–46.
- Cline, Paul, (2023) Musculoskeletal Disorders: Causes, Symptoms, and Prevention, Department of Production and Systems, University of Minho, Guimaraes, Portugal, Cline P, *J Ergon Res* 2023, 6:1
- Dhas, B. N., Joseph, L., Jose, J. A., Zeeser, J. M., Devaraj, J. P., & Chockalingam, M. (2023). Prevalence of work-related musculoskeletal disorders among pediatric long-term ventilatory care unit nurses: Descriptive 13 cross-sectional study. *Journal of pediatric nursing*, 69, e114–e119. <https://doi.org/10.1016/j.pedn.2022.12.015>
- El-Tallawy, S. N., Nalamasu, R., Salem, G. I., LeQuang, J. A. K., Pergolizzi, J. V., & Christo, P. J. (2021). Management of Musculoskeletal Pain: An Update with Emphasis on Chronic Musculoskeletal Pain. *Pain and therapy*, 10(1), 181–209. <https://doi.org/10.1007/s40122-021-00235-2>
- Fray M, Davis KG. Effectiveness of Safe Patient Handling Equipment and Techniques: A Review of Biomechanical Studies. *Hum Factors*. 2024;66(10):2283–2322. doi:10.1177/00187208231211842

- Gaowgzeh R. A. M. (2019). Low back pain among nursing professionals in Jeddah, Saudi Arabia: Prevalence and risk factors. *Journal of back and musculoskeletal rehabilitation*, 32(4), 555–560.
<https://doi.org/10.3233/BMR-181218>
- Greggi, C., Visconti, V. V., Albanese, M., Gasperini, B., Chiavoghilefu, A., Prezioso, C., Persechino, B., Iavicoli, S., Gasbarra, E., Iundusi, R., & Tarantino, U. (2024). Work-Related Musculoskeletal Disorders: A Systematic Review and Meta-Analysis. *Journal of clinical medicine*, 13(13), 3964.
<https://doi.org/10.3390/jcm13133964>
- Huang Q, Tian C, Zeng XT. Poor Sleep Quality in Nurses Working or Having Worked Night Shifts: A Cross-Sectional Study. *Front Neurosci*. 2021;15:638973. Published 2021 Aug 3.
doi:10.3389/fnins.2021.638973
- Jacquier-Bret, J., & Gorce, P. (2023). Prevalence of Body Area Work-Related Musculoskeletal Disorders among Nurses Professionals: A Systematic Review. *International journal of environmental research and public health*, 20(1), 841.
<https://doi.org/10.3390/ijerph20010841>

- Jakovljević, Miroljub ,(2024), Numbers displayed above are based on latest data collected. For more information visit www.intechopen.com
- Kim, Jungwon, Youngil Yi, Ye, Byeongjin, Ryu, Eunkwang,(2014),Risk Factors for Musculoskeletal Symptoms among Nurses in University Hospitals, Ryu et al. Annals of Occupational and Environmental Medicine 2014, 26:47 <http://www.aoemj.com/content/26/1/47>.
- Lin, S., Lin, L., Liu, C.–J., Fang, C., & Lin, M.–H. (2020). Exploring the factors affecting musculoskeletal disorders risk among hospital nurses. PLoS ONE.
- Marcum, J., & Adams, D. (2017). Work-related musculoskeletal disorder surveillance using the Washington state workers' compensation system: 14 Recent declines and patterns by industry, 1999–2013. American journal of industrial medicine, 60(5), 457–471. <https://doi.org/10.1002/ajim.22708>
- Mullen, Nicholas,(2025), Musculoskeletal Disorders: Understanding, Causes, and Management, Department of Internal Medicine, The University of Newcastle, Australia, Journal of Medicine and Medical Sciences Vol.16 (1) pp. 1–3, March, 2025 Available online, <https://www.interestjournals.org/medicine-medical-sciences.html>

- Mitseas, P., Naoum, S., & Konstantinidis, T. (2023). Risk factors for musculoskeletal disorders in nursing personnel and prevention strategies. Romanian Journal of Military Medicine.
- Nasaif, H., Alaradi, M., Hammam, R., Bucheeri, M., Abdulla, M., & Abdulla, H. (2023). Prevalence of self-reported musculoskeletal symptoms among nurses: a multicenter cross-sectional study in Bahrain. International journal of occupational safety and ergonomics : JOSE, 29(1), 192–198.
<https://doi.org/10.1080/10803548.2021.2025315>
- Olutende, Micky, Kweyui1, Issah W, Wanzala, Maximilla, Mse, Elizabeth,(2022), Risk Factors for Work-Related Musculoskeletal Disorders among Nurses in Kakamega County, 9: e8564.
<https://doi.org/10.4236/oalib.1108564>
- Onovughe, Ejiroghene Chukwuemeka, (2025), Musculoskeletal Disorder among Nurses, Degree Thesis in Health Care and Social Welfare Education: Bachelor of Health Care, Nursing Vaasa, 2025
- Patel, Vishal,(2024), Musculoskeletal Disorders: Understanding Causes, Symptoms and Treatments, Department of Orthopaedics, Chandigarh of Medial Education and Research, India,

<https://www.alliedacademies.org/orthopedic-surgery-and-rehabilitation>

- Ribeiro, T., Serranheira, F., & Loureiro, H. (2017). Work related musculoskeletal disorders in primary health care nurses. *Applied nursing research* : ANR, 33, 72–77.
<https://doi.org/10.1016/j.apnr.2016.09.003>
- Salama, L. A. A., & Eleshenamie, H. A. M. (2018). Musculoskeletal disorder: Risk factors and coping strategies among nurses. *Journal of Nursing Education and Practice*, 8(11), 50.
- Sezgin, D., & Esin, M. N. (2019). Use of the Omaha System to identify musculoskeletal problems in intensive care unit nurses: a case study. *British journal of nursing* (Mark Allen Publishing), 28(5), 300–306. <https://doi.org/10.12968/bjon.2019.28.5.300>
- Soares, C. O., Pereira, B. F., Pereira Gomes, M. V., Marcondes, L. P., de Campos Gomes, F., & de Melo-Neto, J. S. (2020). Preventive factors against work-related musculoskeletal disorders: narrative review. *Revista brasileira de medicina do trabalho : publicacao oficial da Associacao Nacional de Medicina do Trabalho-ANAMT*, 17(3), 415–430. <https://doi.org/10.5327/Z1679443520190360>

- Stanchev, Verislav , Vangelova, Katya,(2022),Musculoskeletal Disorders among Hospital Nurses, Open Access Macedonian Journal of Medical Sciences. 2022 Mar 17; 10(E):439–443.
<https://doi.org/10.3889/oamjms.2022.8920>
- Sun, W., Yin, L., Zhang, T., Zhang, H., Zhang, R., & Cai, W. (2023). Prevalence of Work-Related Musculoskeletal Disorders among Nurses: A Meta-Analysis. Iranian journal of public health, 52(3), 463–475. <https://doi.org/10.18502/ijph.v52i3.12130> 15
- Wang, K., Zeng, X., Li, J., Guo, Y., & Wang, Z. (2024). The prevalence and risk factors of work-related musculoskeletal disorders among nurses in China: A systematic review and meta-analysis. International Journal of Nursing Studies, 104826.
- Wang, Y. N., Yan, P., Huang, A. M., & Dai, Y. L. (2017). Status quo of injury of nursing personnel with occupational musculoskeletal disorders and their protection knowledge, attitude and behaviour in third grade hospitals. Chinese Nursing Research, 31, 294–298.
- Wang, Y. N., Yan, P., Huang, A. M., & Dai, Y. L. (2017). Status quo of injury of nursing personnel with occupational musculoskeletal disorders and their protection knowledge, attitude and behaviour in third grade hospitals. Chinese Nursing Research, 31, 294–298.

- Yang, S., Li, L., Wang, L., Zeng, J., & Li, Y. (2020). Risk Factors for Work-Related Musculoskeletal Disorders Among Intensive Care Unit Nurses in China: A Structural Equation Model Approach. *Asian nursing research*, 14(4), 241–248.
<https://doi.org/10.1016/j.anr.2020.08.004>
- Yang, S., Lu, J., Zeng, J., Wang, L., & Li, Y. (2019). Prevalence and Risk Factors of Work-Related Musculoskeletal Disorders Among Intensive Care Unit Nurses in China. *Workplace health & safety*, 67(6), 275–287. <https://doi.org/10.1177/2165079918809107>
- Yao, Y., Zhao, S., An, Z., Wang, S., Li, H., Lu, L., & Yao, S. (2019). The associations of work style and physical exercise with the risk of work-related musculoskeletal disorders in nurses. *International journal of occupational medicine and environmental health*, 32(1), 15–24.
<https://doi.org/10.13075/ijomeh.1896.01331>
- Zhu, B., Hsieh, C. W., & Mao, Y. (2019). Addressing the licensed doctor Maldistribution in China: a demand-and-supply perspective. *International journal of environmental research and public health*, 16(10), 1753.

APPENDIX



جامعة 21 سبتمبر للعلوم الطبية والتطبيقية

المحترم / ة

..... : / الخ

نحن طلاب استبيان كلية التمريض العالي دفعة سابعة مستوى رابع ، جامعة 21 سبتمبر للعلوم الطبية والتطبيقية نقوم بإجراء دراسة بعنوان " (العوامل المؤثرة على اضطرابات الجهاز العضلي الهيكلي لدى الممرضين في المستشفيات الحكومية بأمانة العاصمة - 2026م) أستكمالاً للحصول على درجة البكالوريوس تخصص تمريض عالي وتحقيقاً لأهداف البحث قام الباحثون بإعداد الاستبيان الذي بين ايديكم نرجو من سيادتكم التعاون معنا من خلال تعبئة بيانات فقرات الاستبيان بوضوح و بكل مصداقية و شفافية علماً بأن هذه المعلومات لن تستخدم إلا لأغراض البحث العلمي فقط.

شاكرين و مقدرين تعاونكم ولكم خالص احترامنا..

اولا: البيانات الديموغرافية:

١. الجنس: ☐ ذكر ☐ أنثى

٢. العمر: ☐ اقل من 30 سنة ☐ 30-40 سنة ☐ اكثر من 40 سنة

٣. المؤهل العلمي: ☐ دبلوم ☐ بكالوريوس ☐ ماجستير فأعلى

٤. سنوات الخبرة في العمل (ك ممرض - ممرضة):

☐ أقل 3 سنوات ☐ 3-6 سنوات ☐ 7-10 سنوات ☐ أكثر من 10 سنوات

٥. عدد ساعات العمل اليومية:

☐ 8 ساعات فأقل ☐ 12 ساعة ☐ 16 ساعة ☐ 24 ساعة

٦. القسم الذي تعمل فيه حاليا:

٧. فترة العمل: ☐ 2-8 ☐ 8-2 ☐ 8-12 ☐ 8 مساءً - 8 صباحاً

٨. هل تعاني من مشاكل في العظام والعضلات ؟ ☐ نعم ☐ لا

٩. اذا كنت تعاني من مشاكل في العضلات والعظام من متى تعاني من هذه الاصابة ؟

☐ أقل من 4 أشهر ☐ من 4 - 8 اشهر ☐ 9 - 12 شهر ☐ أكثر من سنة

ثانياً: المحاور الأساسية للبحث

المحور الأول: أسباب حدوث اضطرابات الجهاز العضلي الهيكلي.

١- ما سبب حدوث اضطرابات الجهاز العضلي الهيكلي ؟

☐ بشكل فجأة

☐ رفع/تغيير وضع المرضى

☐ الوقوف لفترات طويلة

☐ الانحناء المفرط

☐ الحوادث/الانزلاق والسقوط

☐ حوادث الطرق/حوادث المركبات

☐ بعد الولادة (للإناث)

☐ الإفراط في العمل/زيادة عبء العمل

☐ كثرة الحركة

☐ دفع/رفع الأشياء الثقيلة مثل الأسرة والعربات

☐ غير متأكد/لا يعرف

☐ أسباب أخرى

٢- ما القسم الذي كنت تعمل فيه عند بدء المشكلة؟

٣- فترة العمل في القسم نفسه وعدد السنوات التي تم قضائها فيه سنة

المحور الثاني: العوامل المساهمة في تطور الاضطرابات العضلية الهيكلية المرتبطة بالعمل

م	البند	☐ نعم	☐ لا
١	هل سبق وقمت بمعالجة ورعاية عدد كبير من المرضى في يوم الواحد؟	☐	☐
٢	هل تحصل على فترات راحة كافية أثناء ساعات العمل؟	☐	☐
٣	هل سبق وعملت بأوضاع عمل غير مريحة أو ضيقة؟	☐	☐
٤	هل قمت بإداء العمل في نفس الوضعية لفترات طويلة؟	☐	☐
٥	هل سبق اثناء العمل قمت بالانحناء أو ليّ الظهر بطريقة غير مناسبة؟	☐	☐
٦	هل تستمر بالعمل أثناء الإصابة أو الشعور بالألم؟	☐	☐
٧	هل سبق وقمت برفع أو نقل مريض غير قادر على الحركة؟	☐	☐
٨	هل سبق وقمت بالتعامل مع مواد أو معدات ثقيلة؟	☐	☐
٩	هل سبق وقمت بمساعدة مريض أثناء أنشطة المشي؟	☐	☐
١٠	هل لديك التدريب الكافي حول الوقاية من الإصابات؟	☐	☐

المحور الثالث: الوقاية من اضطرابات الجهاز العضلي الهيكلي

م	البند	☐ نعم	☐ لا
١	للووقاية من اضطرابات الجهاز العضلي الهيكلي يجب توفر عدد كافٍ من الكادر (توظيف المزيد من الموظفين)؟	☐	☐
٢	للووقاية من اضطرابات الجهاز العضلي الهيكلي يجب التبديل الروتيني بين الورديات؟	☐	☐
٣	للووقاية من اضطرابات الجهاز العضلي الهيكلي يجب تدريب وتعليم الموظفين حول التعامل مع المرضى ورفعهم وتقليل عبء العمل وساعات العمل؟	☐	☐
٤	للووقاية من اضطرابات الجهاز العضلي الهيكلي يجب تحسين ظروف العمل مثل التحفيز ومنح الإجازات السنوية؟	☐	☐
٥	للووقاية من اضطرابات الجهاز العضلي الهيكلي يجب توفير واستخدام أسرة جيدة مرتفعة أو قابلة للتعديل؟	☐	☐

٦	للوفاية من اضطرابات الجهاز العضلي الهيكلي يجب استخدام معدات جيدة وفعّالة (العربات المتحركة/الكراسي المتحركة)؟	☐ نعم	☐ لا
٧	للوفاية من اضطرابات الجهاز العضلي الهيكلي يجب تشجيع العمل الجماعي؟	☐ نعم	☐ لا
٨	للوفاية من اضطرابات الجهاز العضلي الهيكلي يجب تجنب العوامل المتهينة مثل الرفع والانحناء؟	☐ نعم	☐ لا
٩	للوفاية من اضطرابات الجهاز العضلي الهيكلي يجب توظيف عمال مساعدين للمساعدة في رفع وحمل المرضى والصناديق؟	☐ نعم	☐ لا

الباحثون

الملخص

الخلفية: تمثل اضطرابات الجهاز العضلي الهيكلي عبئاً كبيراً في مجال الصحة المهنية حيث تؤثر على مجموعة واسعة من المهن وتشكل نسبة كبيرة من الأمراض المهنية.

الهدف من الدراسة: تحديد العوامل المؤثرة على اضطرابات الجهاز العضلي الهيكلي بين الممرضين العاملين في المستشفيات الحكومية في أمانة العاصمة خلال عام ٢٠٢٦.

منهجية الدراسة: استخدمت هذه الدراسة تصميمًا وصفيًا مقطعيًا، تكوّن مجتمع الدراسة من الممرضين العاملين في المستشفيات الحكومية في أمانة العاصمة صنعاء بلغت عينة الدراسة (٩٠٠) ممرض تم اختيارهم بطريقة قصدية وتمثلت اداءة الدراسة بالاستبانة.

النتائج : أظهرت نتائج هذه الدراسة أن معدل انتشار اضطرابات الجهاز العضلي الهيكلي (MSDs) بين الممرضين العاملين في المستشفيات الحكومية بأمانة العاصمة بلغ ٦٩,٤ %، حددت الدراسة الحالية الوقوف لفترات طويلة (٢٧,١ %)، والحركات المفاجئة (١٥,٩ %)، والانحناء المتكرر (١٤,٣ %) كأكثر العوامل شيوعاً، أما من حيث التعرض المهني، فقد أفادت نسبة كبيرة من الممرضين بوجود عبء عمل بدني مرتفع، حيث ذكر ٨٩,١ % أنهم يعتنون بعدد كبير من المرضى يوميًا، و ٨٧,٤ % يقومون برفع مرضى غير قادرين على الحركة، و ٨٦,٣ % يحافظون على وضعيات ثابتة لفترات طويلة.

الاستنتاجات: وأظهرت النتائج أن هذه الاضطرابات ترتبط بشكل رئيسي بمتطلبات العمل التمريضي البدنية، مثل الوقوف لفترات طويلة، والحركات المتكررة، والتعامل اليدوي مع المرضى.

التوصيات: زيادة عدد الكادر التمريضي لتقليل عبء العمل، و تنظيم ساعات العمل وتقليل المناوبات الطويلة، كذلك توفير فترات راحة كافية أثناء ساعات العمل



كلية التمريض العالي
Faculty of Higher Nursing

الجمهورية العربية السورية

وزارة التربية والتعليم والبحث العلمي

جامعة 21 سبتمبر للعلوم الطبية والتطبيقية

كلية التمريض العالي



العوامل المؤثرة على اضطرابات الجهاز العضلي الهيكلي لدى الممرضين في المستشفيات الحكومية بأمانة العاصمة -

٢٠٢٦م

بحثٌ مقدّم لاستيفاء جزء من متطلبات درجة البكالوريوس في كلية التمريض،
جامعة ٢١ سبتمبر

إعداد

زيد يحيى صالح الجلال	اقبال محمد علي المطحني
حنان عبدالحميد حمود غازي	ردمان علي حمود الحباري
عاطف محمد علي الحماطي	حنان عوض قايد عبدالله
خديجة عبدالله احمد هناف	اشراق محمد قائد عبدالله سنبل
سفانة توفيق أحمد الحكيمي	سباء محمد صالح السفيناني
شيماء عبدالكريم احمد الدعوس	سماح محمد يحيى البيضاني
منى عبد الجبار المنصوري	احمد ناصر صالح حمود
وفاء عبدالرحمن علي السوداني	نبيهة حسان مصلح عبدالمغني

إشراف

د. حورية الصبري

استاذ مساعد في طب المجتمع

1446هـ - 2026م