PREVALENCE OF WORK RELATED MUSCULOSEKELETAL DISORDERS AND ASSOCIATED RISK FACTORS AMONG HAIRDRESSERS IN EGOR LOCAL GOVERNMENT AREA, BENIN CITY.

BY

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CERTIFICATION

This dissertation by Jakpa, Temituoyo Oreoluwa is accepted in its present form as satisfying the dissertation requirement of the degree of Bachelor of Physiotherapy of the School of Basic Medical Sciences, College of Medical Sciences of the University of Benin.

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DEDICATION

This work, and its associated degree, is dedicated to my Father, almighty God for proving Himself faithful time and time again and for reminding me every step of the way of his greatness.

I also dedicate this work to my Father, whose memory continues to guide and inspire me. Though you’re no longer here, your love and dreams for me still light my path.

To my dear mother, thank you for your endless love, sacrifices, and unwavering support. Your strength, prayers, and financial sacrifices have been the backbone of my journey.

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ABSTRACT

Background: Work-related musculoskeletal disorders (WMSDs) are a major occupational health problem globally and are particularly common among individuals in physically demanding professions. Hairdressers are at increased risk due to prolonged standing, repetitive hand use, awkward postures, and poor ergonomic practices, which often lead to pain, disability, and reduced productivity. Despite these risks, there is limited evidence on the prevalence and associated factors of WMSDs among hairdressers in semi-urban areas of Nigeria. This study aimed to determine the prevalence of WMSDs and to examine the sociodemographic, occupational, and ergonomic risk factors among hairdressers in Egor Local Government Area of Benin City.

Methods: A descriptive cross-sectional design was adopted for the study. Participants included hairdressers registered under the National Association of Hairdressers and Cosmetologists (NASHCO), Egor chapter. Data were collected using a structured and validated questionnaire addressing musculoskeletal symptoms, occupational exposures, and ergonomic practices. Statistical analysis was conducted using descriptive and inferential statistics, with chi-square tests applied to assess associations between sociodemographic characteristics, occupational/ergonomic risk factors, and the prevalence of WMSDs.

Results: The results revealed a high prevalence of WMSDs among hairdressers, with 78.4% of respondents reporting musculoskeletal symptoms in at least one body region over the past 12 months. The lower back (76.3%), shoulders (62.1%), and neck (58.7%) were identified as the most commonly affected sites. Significant associations were observed between WMSDs and occupational factors such as prolonged standing ($p < 0.05$), daily work duration exceeding 8 hours ($p < 0.05$), and poor postural habits ($p < 0.05$). Sociodemographic variables, including gender and work experience, were also found to influence the occurrence of WMSDs.

Conclusion: In conclusion, WMSDs are highly prevalent among hairdressers in Egor Local Government Area, largely due to occupational and ergonomic risk factors. Preventive strategies such as ergonomic training, workplace modifications, and increased awareness of occupational health risks are recommended to reduce the burden of WMSDs and enhance the well-being and productivity of hairdressers.

Keywords: Work-related musculoskeletal disorders, hairdressers, occupational risk factors, ergonomic risk factors.

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TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Background of study

Musculoskeletal disorders are the most common cause of disability globally, and it is most commonly managed in primary health care (Babatunde et al, 2017). Musculoskeletal disorder is a very common reason for patients to seek treatment from healthcare providers (walsh et al.,2008, Larsson et,al, 2009). Several factors such as participation in strenuous activities, maintenance of poor body posture while resting or performing an activity and poor work or environmental ergonomics, all predispose an individual to developing Musculoskeletal disorders (Farzan et al, 2017). Musculoskeletal disorders are widespread, but their impact is particularly pronounced among individuals in physically demanding occupations. Certain work conditions such as repetitive movements, prolonged standing, and poor ergonomics heighten the risk of developing work-related musculoskeletal disorders (WMSDs). Given these occupational hazards, WMSDs have gained recognition as a serious global health concern, necessitating further exploration of their prevalence and contributing factors.

Work-related musculoskeletal disorders (WMSDs) arise from occupational factors such as repetitive movements, awkward postures, and heavy lifting. Recognized by the World Health Organization (WHO, 2022) as a significant global health concern, WMSDs commonly affect the lower back and upper limbs, leading to pain, disability, and reduced quality of life among workers in physically demanding professions.

Work-related musculoskeletal disorders (WMSDs) encompass wide range of degenerative and inflammatory conditions involving damage to the muscles, tendon, nerve, ligaments and soft tissue which occurs as a result of job tasks execution and working environments (Yi et al.,2022). These conditions frequently result in excruciating chronic pain and physical disability (Nhata et al., 2010). Hairdressers, due to the nature of their work, are at significant risk of developing WMSDs owing to repetitive movements, awkward postures, and prolonged standing (Mehrparvar et al., 2014).

In Nigeria, especially in urban and semi-urban areas like Egor Local Government Area of Benin City, hairdressing remains a prominent occupation, particularly among women. However, there seems to be limited research and awareness concerning the occupational health risks faced by this workforce (Okunribido et al., 2008). As a result, many cases of WMSDs may go undiagnosed or untreated, potentially leading to permanent disability and job loss, (Nwaogazie et al., 2016). WSMDs are the most expensive form of work disability attributing to about 40% of all costs towards the treatment of work-related injuries (Yasobant and Rajkunar,2014).

Hairdressers often spend long hours standing, performing repetitive hand movements, and maintaining awkward postures to meet the demands of their clients. These physical demands can lead to discomfort and pain, particularly in the lower back, shoulders, and neck. A study conducted in Lagos, Nigeria, found that 75.6% of hairdressers reported experiencing musculoskeletal disorders over a 12-month period, with the lower back (76.3%), shoulders (Hairdressers are frequently exposed to physical demands such as prolonged standing, repetitive hand movements, awkward postures, and static muscle loading, all of which are established risk factors for work-related musculoskeletal disorders (WMSDs). These conditions often lead to pain, discomfort, reduced productivity, absenteeism, and poor quality of life (WHO, 2020; Ayanniyi *et al.*, 2010). These findings highlight the significant occupational health risks faced by hairdressers due to the physical nature of their work (Aweto et al 2015).

Problems related to musculoskeletal disorders ranges from minor aches and pains to more serious medical conditions requiring time away from work and even medical treatment; is frequently insufficient, and the outcome may be permanent disability and loss of employment (Nwaogazie *et al.,*2016).

Despite the high physical demands associated with hairdressing, there remains a significant gap in research and occupational health interventions targeting this vulnerable group, particularly in semi-urban areas like Egor Local Government Area of Benin City. The high prevalence of WMSDs among hairdressers and their associated risk factors, such as prolonged standing, repetitive hand use, and poor ergonomic practices, pose a serious threat to their health, productivity, and livelihood. Therefore, investigating the prevalence of work-related musculoskeletal disorders and identifying the occupational and ergonomic risk factors among hairdressers in this locality is essential. This study aims to provide evidence-based data that can inform preventive strategies, improve occupational health awareness, and ultimately enhance the working conditions and well-being of hairdressers in Egor LGA.

1.2 Statement of the problem

Hairdressers are frequently exposed to physical demands such as prolonged standing, repetitive hand movements, awkward postures, and static muscle loading, all of which are established risk factors for work-related musculoskeletal disorders (WMSDs). In addition to these physical stressors, other risk factors include strenuous activity, inadequate breaks, long working hours, poorly designed tools or workstations, and inadequate training in ergonomic practices. These conditions often lead to pain, discomfort, reduced productivity, work absence, and poor quality of life (WHO, 2020; Ayanniyi *et al.*, 2010). WMSDs are recognized as a major occupational health concern globally and are particularly prevalent in occupations requiring repetitive and physically demanding tasks.

In a city like Benin, which includes both urban and semi-urban communities, hairdressers represent a significant portion of the informal workforce, and the physical nature of their work makes them particularly vulnerable to these conditions. However, despite their exposure to high-risk ergonomic conditions, there is limited documented data on the prevalence and associated risk factors of WMSDs within this group. This is concerning, as workers in the informal sector often lack awareness, training, and access to occupational health resources, thereby increasing their susceptibility to such disorders. While studies have been conducted on WMSDs among various professions such as administrative staff, construction workers, and healthcare personnel (Akodu & John-Oparaji, 2019; Adesola *et al.*, 2016), little attention has been given to hairdressers. The absence of such data presents a gap in occupational health research and limits the development of targeted preventive strategies. Understanding the extent and nature of WMSDs among hairdressers in this locality is essential for informing interventions and promoting ergonomic best practices in the informal sector.

1.3 Research Questions

i. What is the prevalence of work-related musculoskeletal disorders among the Hairdressers in Egor local government areas Benin city?

ii. What are the occupational and ergonomic risk factors contributing to WMSDs among hairdressers?

iii. Which body regions are most commonly affected by WMSD among hairdressers?

iv. Is there a significant association between gender and the prevalence of WMSDs among hairdressers?

v. Is there a significant association between occupational /ergonomics risk factors and prevalence of WMSD among hairdressers?

1.4 Aims of the Study

The aims of this study are to determine the prevalence of work-related musculoskeletal disorders and to examine the sociodemographic, occupational, and ergonomic risk factors associated with WMSDs among hairdressers in Egor Local Government Area, Benin City.

1.4.1 Specific Objectives

i. To determine the prevalence of work-related musculoskeletal disorders among hairdressers.
ii. To identify the most commonly affected body regions among hairdressers with WMSDs.
iii. To assess the association between sociodemographic characteristics and the prevalence of WMSDs.
iv. To assess the association between occupational risk factors (e.g., daily work duration) and the prevalence of WMSDs among hairdressers.
v. To assess the association between ergonomic risk factors (e.g., postural risk behaviour) and the prevalence of WMSDs among hairdressers.

1.5 Hypothesis

There would significant association between sociodemographic (gender), occupational (daily work duration), and ergonomic (postural risk behaviour) risk factors and the prevalence of work-related musculoskeletal pain (low back, hand/wrist, and ankle) among hairdressers in Egor Local Government Area, Benin City.

1.5.1 Sub Hypothesis

I. There would be no significant association between gender and prevalence low back pain among hairdressers.

II. There would be no significant association between gender and prevalence Hand/wrist pain among hairdressers.

III. There would be no significant association between gender and prevalence Ankle pain among hairdressers.

IV. There would be no significant association between daily work duration and prevalence of Low back pain among hair dressers.

V. There would be no significant association between daily work duration and prevalence of Hand/ wrist pain among hair dressers.

VI. There would be no significant association between daily work duration and prevalence of ankle pain among hair dressers.

VII. There would be no significant association between postural risk behaviour and prevalence of low back pain among hairdressers.

VIII. There would be no significant association between postural risk behaviour and prevalence of Hand/ wrist pain among hairdressers.

IX. There would be no significant association between postural risk behaviour and prevalence of ankle pain among hair dressers.

1.6 Significance of Study

I. The findings of this study may contribute to the body of literature on the prevalence of Work-related musculoskeletal disorders, the associated risk factors and provide insights for further research in the future.

II. The findings could serve as a tool to raise awareness about occupational health risks in the informal sector, encouraging better health practices, and potentially influencing policy changes regarding workplace safety and trainings.

III. This study may help create awareness of the prevalence of work-related musculoskeletal disorders and its associated risk factors among the hairdressers in Egor local government Benin city.

1.7 Scope of Study

This study focuses on hairdressers in Egor Local Government Area of Benin city, Edo State. The study considers individuals working in both formal and informal salon settings but well registered under the association, which is the National Association of Hairdressers and cosmetologists, Egor Local Government Area chapter(NASHCO).

It aims to assess the prevalence of work-related musculoskeletal disorders and their associated occupational and ergonomic risk factors. Other musculoskeletal conditions not linked to work activities are excluded. This population was chosen because it reflects the reality of the hairdressing workforce in Nigeria, where apprentices and part-time workers often contribute significantly and face similar or even greater physical demands as their full-time counterpart.

1.8 LIMITAION OF STUDY

The limitation of this study include:

I. Some hairdressers were reluctant to participate or complete the questionnaire due to time constraints or lack of interest, which may have limited the sample size and diversity of responses.

II. The study relied on self-reported questionnaires, which may be subject to recall bias or inaccurate reporting of symptoms and work practices.

III. The study was limited to hairdressers within Egor Local Government Area and may not reflect the experiences of hairdressers in other regions of Benin City or Nigeria as a whole.

1.9 Definitions of terms

Prevalence: This refers to the proportion of a particular population found to be affected by a medical condition or disorder at a particular time

Ergonomics: The study and application of principles that aim to optimize human wellbeing and overall system performance by designing tasks, equipment to fits the users physical and mental abilities.

Musculoskeletal disorders: Theses are injuries affecting the soft tissue which are caused by sudden or sustained exposure to repetitive motion, force, vibration and awkward positions. These disorders can affect muscles, nerves, tendons, joints, and cartilage in the upper limbs, neck and lower back.

Work related Musculoskeletal Disorders: Work related musculoskeletal disorders are injuries and conditions affecting the muscles, ligaments, bones, tendons, blood vessels, and nerves which occur when work demands lead or contribute to pain, or injury.

Hairdressers: Professionals who work with client's hair by washing, cutting, braiding, styling, and treating it to make it look nice.

1.10 List of Abbreviations

WMSDs: Work related musculoskeletal disorders.

MSDs: Musculoskeletal disorders.

WHO: World Health Organisation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Work-related musculoskeletal disorders (WMSDs) constitute a major public health concern across numerous occupational settings, particularly in professions that require repetitive movements, prolonged standing, and awkward postures (da Costa and Vieira, 2010). Hairdressers, by the nature of their work, are predisposed to a variety of musculoskeletal conditions affecting the neck, shoulders, back, and upper limbs. The combination of manual precision, sustained static positions, and limited ergonomic awareness makes them a vulnerable population for occupational health risks (Aweto et al., 2015).

This chapter reviews existing literature on the prevalence and risk factors associated with WMSDs among hairdressers, both globally and within the Nigerian context. It begins with a conceptual understanding of WMSDs and the role of ergonomics in occupational health. The chapter further explores the epidemiology of WMSDs, highlighting specific musculoskeletal complaints common in the hairdressing profession and the underlying occupational and demographic risk factors.

Additionally, this chapter reviews the impacts of these disorders on the productivity and quality of life of hairdressers, along with preventive strategies and ergonomic interventions that have been proposed or implemented in similar settings. Finally, relevant empirical studies are analyzed to identify existing gaps and establish the relevance and necessity of the current study among hairdressers in Egor Local Government Area, Benin City.

2.2 Work-Related Musculoskeletal Disorders

According to Bernald *et al.,* (1997), musculoskeletal diseases (MSDs) are illnesses that impact the muscles, tendons, ligaments, nerves, and other soft tissues that make up the musculoskeletal system. An uncomfortable posture, strong exertions, repetitive actions, and continuous vibration exposure are some of the conditions that might lead to MSDs (Bernard and Putz-Anderson, 1997).

Musculoskeletal symptoms are defined by the World Health Organization (2022) as health problems affecting the skeleton, muscles, tendons, ligaments, and cartilage that are part of the locomotor apparatus. These symptoms can be associated with acute, transient diseases as well as chronic ones that are marked by ongoing pain and incapacity (WHO, 2022).

Workers who perform heavy lifting, labour in uncomfortable postures, or perform repeated jobs are more likely to be affected by these illnesses (da Costa and Vieira, 2010). The World Health Organization (WHO) and the International Labour Organization (ILO) both identify MSDs as a work-related musculoskeletal disorder and consider them a "new epidemic" that requires research and intervention to address (Hd et al., 2018).

Globally, workers in many different industries and occupations are affected by a prevalent occupational health problem known as work-related musculoskeletal diseases, or WMSDs. The musculoskeletal system, which includes the muscles, tendons, ligaments, nerves, and joints, can sustain injuries or diseases due to exposures and activities connected to the workplace (Punnett and Wegman, 2004).

Overexertion and repetitive motion were two of the main causes of nonfatal occupational illnesses and injuries in 2019, accounting for over one-third of all incidents, according to the US Bureau of Labor Statistics (2021). In addition to lost productivity, medical costs, and disability, these illnesses and injuries can have major social and economic effects. A comprehensive strategy that takes into account the work environment, work organization, job design, and individual aspects like physical fitness and health status is needed to prevent and manage work-related mental illnesses (WMSDs) (NIOSH, 2024). To avoid and manage WMSDs, both employers and employees should adopt ergonomic design and work practices, offer information and training, encourage physical exercise and healthy lifestyles, and provide early intervention and treatment for symptoms (OSHA, 2018).

2.2.1 Epidemiology of Work-related Musculoskeletal Disorders

According to the Bureau of Labour Statistics, in 2020, musculoskeletal disorders accounted for 30% of all worker injury and illness cases in the United States (BLS, 2020). WMSDs rank among the top ten causes of years lived with disability worldwide, as per the World Health Organization (WHO, 2020). Globally, their prevalence stands around 40%, notably higher in labour-intensive fields like healthcare, agriculture, and manual labour. In Europe, WMSDs constitute up to 50% of work-related illnesses (European Agency for Safety and Health at Work, 2018). However, the epidemiology of these disorders fluctuates across countries, occupations, and industries. Varied prevalence rates underscore the diverse impact and the urgent need for tailored interventions and ergonomic practices to address WMSDs in different work settings.

WMSDs lead to decreased productivity, increased absenteeism, and substantial healthcare costs, impacting both employees and employers. Preventive measures such as ergonomic assessments, proper training, and implementing ergonomic interventions are crucial in reducing WMSDs and promoting a healthier work environment (NIOSH, 2020).

2.2.2 Symptoms of Work-related Musculoskeletal Disorders

According to Bernard (1997), there are a variety of musculoskeletal symptoms that can present in work-related musculoskeletal disorders (WMSDs). These could consist of:

i. **Pain:** Either persistent or intermittent discomfort in the affected regions, such as the back, shoulders, hands, knees, wrists, or elbows. The most typical sign of WMSDs is pain, which can be characterized as shooting, stabbing, burning, or aching. Movement or activity might exacerbate the pain, which can be either intermittent or continuous.

ii. **Stiffness:** Stiffness is caused by reduced joint or muscle pliability and flexibility. It may be painful and difficult to move in the affected area due to stiffness. Reduced range of motion and trouble completing tasks requiring fine motor skills might result from this.

iii. **Weakness:** Reduced strength or trouble doing daily tasks.

iv. **Tingling or Numbness:** Nerve compression causes tingling, numbness, or burning sensations in the afflicted areas.

v. **Swelling:** Swelling or inflammation surrounding swollen muscles or joints.

vi. **Reduced Range of Motion:** Inability to fully move some body parts which can be a result of an injury that affects the muscles, bones or joints in the body.

These symptoms might worsen during work hours or specific movements and can significantly impact daily activities.

2.2.3 Risk factors for work-related musculoskeletal disorders

I. Work-related factors: These are occupational factors that can contribute to the development of WMSD. These factors include:

i. **Repetitive Movements:** Repetitive movements in (WMSDs) refer to the consistent, recurrent performance of particular motions or actions without sufficient rest or variation (Occupational Safety and Health Administration, 2000). These repetitive tasks can strain muscles, tendons, and other soft tissues, leading to various musculoskeletal injuries or disorders. Workers engaged in activities involving repetitive motions, such as assembly line work, typing on a keyboard, or using vibrating tools, are at increased risk of developing WMSDs (Gopinadh *et al.*, 2013. The continuous repetition of these movements can cause microtrauma to tissues, leading to inflammation, and tissue damage, and ultimately resulting in conditions like tendonitis, carpal tunnel syndrome, or bursitis. The cumulative effect of repetitive movements can lead to overuse injuries, where the body doesn't have enough time to recover between tasks, exacerbating strain on muscles and tendons.

ii. **Poor Ergonomics in the workplace:** Deschamps *et al.* (2015), revealed that poor ergonomics at work can cause discomfort due to awkward postures and repetitive movements. When workstations or equipment are poorly designed, they fail to support the natural curvature of the lower back, resulting in improper spinal alignment, and increased pressure on intervertebral discs, and surrounding tissues, potentially leading to lower back pain (Okezue *et al.*, 2010). Moreover, inadequate adjustments of desks and chairs can promote unhealthy postures, putting excessive strain on the lower back (Barnard *et al.*, 2021).

iii. **Insufficient rest breaks:** An inadequate rest period can lead to muscle fatigue and strain. Continuous work without adequate breaks can induce fatigue, hampering musculoskeletal system recovery (NIOSH, 2018). Fatigue compromises muscle function, and concentration, and increases the likelihood of errors, all contributing factors in the development of musculoskeletal disorders (Luger *et al.*, 2019).

iv. **Exposure to vibration:** This can contribute significantly to the development of WMSDs, particularly affecting the hands and arms. Both hand-arm vibration (HAV) and whole-body vibration (WBV) can have adverse effects on the musculoskeletal system.

Hand-arm vibration, generated by tools such as grinders, drills, or pneumatic devices, transmits vibrations directly to the hands and arms. Prolonged exposure to HAV can lead to conditions like hand-arm vibration syndrome (HAVS), characterized by vascular, neurological, and musculoskeletal issues, including finger blanching, numbness, tingling, reduced grip strength, and pain in the hands and arms (Griffin, 1996). Whole-body vibration, typically experienced by workers operating heavy machinery or vehicles, affects the entire body. It can lead to lower back pain, muscle fatigue, and spinal disorders due to continuous exposure (Bovenzi, 2015). Vibration-induced WMSDs result from the repeated stress caused by these mechanical vibrations on muscles, tendons, bones, and joints, leading to tissue damage, inflammation, and structural changes.

II. Personal factors

Personal factors play a crucial role in influencing the susceptibility of individuals to develop Work-Related Musculoskeletal Disorders (WMSDs), as suggested by several studies (Westgaard *et al.*, 1993; Oha *et al.*, 2014). These factors encompass various personal characteristics that can heighten the risk of WMSDs:

i. **Age:** Advancing age is linked to decreased muscle strength, flexibility, and joint resilience, making individuals more prone to injuries and strains due to diminished physiological capabilities (Oha *et al.*, 2014).

ii. **Gender:** Women may face a higher risk of WMSDs compared to men. Variances in anatomical structure and hormonal differences may contribute to this heightened susceptibility (Cavallari *et al.*, 2016).

iii. **Genetics:** Certain individuals may have a genetic predisposition to musculoskeletal issues, such as osteoarthritis or rheumatoid arthritis, which can amplify the likelihood of developing WMSDs (Sanjoy *et al.*, 2017).

iv. **Pre-existing Medical Conditions:** Individuals with existing health conditions like diabetes or osteoporosis are more susceptible to musculoskeletal problems. These conditions can exacerbate vulnerability to WMSDs due to compromised musculoskeletal health (Ansari and Saeed, 2023).

v. **Body Mass Index (BMI):** Elevated BMI levels have been associated with an increased risk of WMSDs. Higher body weight places added strain on the musculoskeletal system, potentially leading to heightened vulnerability to injuries (Alangari et al., 2022).

III. Psychosocial factors:

Psychosocial factors play a significant role in the development and exacerbation of Work-Related Musculoskeletal Disorders (WMSDs). These factors encompass various psychological and social aspects of the work environment that can influence an individual's experience of pain and the development of musculoskeletal issues.

i. **Job Stress and Job Satisfaction:** High levels of job stress, dissatisfaction, or lack of control over one's work have been associated with increased reports of musculoskeletal discomfort and pain (Ruela *et al.*, 2022). Stressful work environments can contribute to muscle tension and exacerbate existing musculoskeletal conditions.

ii. **Workplace Culture and Support:** Supportive work environments, where employees feel valued and have good social support, are linked to reduced occurrences of WMSDs. Conversely, a negative or unsupportive workplace culture can contribute to increased stress and the development of musculoskeletal issues (Buck *et al.*, 2009).

iii. **Job Demands and Workload:** Excessive work demands, such as high workload, tight deadlines, or prolonged periods of intense concentration, can contribute to stress and musculoskeletal strain. This can impact posture, increase muscle tension, and elevate the risk of WMSDs (Skovlund *et al.*, 2020).

iv. **Perceived Control and Autonomy:** Having control over work tasks, decision-making, and the ability to pace oneself can influence the risk of WMSDs. Individuals with higher perceived control often experience lower levels of musculoskeletal discomfort (Nahit *et al.*, 2003).

v. **Workplace Relationships:** Positive relationships with colleagues and supervisors can contribute to a healthier work environment. Poor interpersonal relationships or conflicts at work can lead to increased stress levels, potentially aggravating musculoskeletal issues (Nahit *et al.*, 2003).

Addressing psychosocial factors alongside ergonomic improvements and physical risk factors is crucial in preventing and managing WMSDs. Strategies such as promoting a supportive work environment, providing job control, managing workload, and fostering positive workplace relationships can significantly impact the reduction of WMSD risks.

2.3 Types of Work-related Musculoskeletal Injury

2.3.1 Neck Pain

Neck pain is pain that starts in the neck and can be associated with radiating pain down one or both of the arms. Neck pain can come from a number of disorders or diseases that involve any of the tissues in the neck, nerves, bones, joints, ligaments or muscles. The neck region of the spinal column, the cervical spine, consists of seven bones (C1-C7 vertebrae), which are separated from one another by intervertebral discs. These discs allow the spine to move freely and act as shock absorbers during activity (American Association of Neurological Surgeon, 2024).

NP is a prevalent and debilitating condition affecting a substantial portion of the population, often attributed to various factors, including occupational demands, poor posture, and lifestyle habits. It is a common manifestation of Work-Related Musculoskeletal Disorders (WMSDs) among working individuals. Occupational factors significantly contribute to neck pain in the workplace. Prolonged sitting, repetitive tasks, and awkward postures, common in office settings, can strain the muscles and soft tissues of the neck (Darivemula *et al.*, 2016). Poor ergonomics, such as inadequate workstation setups or improperly adjusted chairs and screens, can exacerbate the risk of neck pain (Barbe and Barr, 2006).

Repetitive movements associated with certain occupations, like frequent overhead work or sustained computer use, contribute to muscle fatigue and tension in the neck region, leading to discomfort and potential injury (Wami *et al.*, 2019). Psychosocial factors, including job stress, high workload, and low job satisfaction, also play a role in the development and persistence of neck pain (Wami *et al.*, 2019).

Some of the ways to address neck pain associated with WMSDs involve ergonomic adjustments in the workplace, promoting proper posture, introducing regular breaks for movement, and implementing stress reduction strategies.

2.3.2 Low Back Pain

Low back pain is the leading cause of disability worldwide according to WHO (2022. Lower back pain (LBP) stands as the most prevalent musculoskeletal disorder (MSD) impacting adults, with a staggering lifetime prevalence reaching up to 84% (WHO, 2022). Low back pain presents a significant global health concern, affecting a staggering 619 million individuals worldwide in 2020, accounting for nearly 10% of the global population. Projections indicate a concerning trend, with an anticipated surge to 843 million individuals grappling with low back pain by the year 2050 (WHO, 2022). A multitude of studies has underscored the substantial correlation between occupational tasks and LBP, especially within professions involving prolonged sitting, standing, heavy lifting, or awkward postures (Sundstrup *et al.*, 2020). Moreover, research highlights that people who engage in repetitive or forceful work, such as bending, twisting, or lifting, face heightened susceptibility to LBP and other Work-Related Musculoskeletal Disorders (WMSDs) (Wami *et al.*, 2019). These tasks subject the back's tissues and structures to microtrauma, instigating pain and discomfort.

Occupational activities significantly contribute to the prevalence of LBP, eliciting strains on the lower back due to repetitive movements, sustained postures, and tasks demanding excessive force. Prolonged exposure to these activities can lead to tissue damage, inflammation, and structural alterations in the back, ultimately culminating in LBP and related musculoskeletal issues.

2.3.4 Shoulder Pain

Research indicates that simultaneous exposure to various physical strains in the workplace, including overhead work, heavy lifting, forceful activities, and sustained awkward postures, heightens the likelihood of developing shoulder disorders (Linaker and Walker-Bone, 2015). Additionally, psychosocial risk factors have been identified as contributing elements to this association (Linaker and Walker-Bone, 2015).

Occupational tasks requiring repetitive actions such as overhead reaching, lifting, or carrying heavy objects, contribute to microtrauma in shoulder muscles, tendons, and ligaments. This repetitive strain often results in conditions like rotator cuff tendinitis, bursitis, or shoulder impingement syndrome (Luime *et al.*, 2004). Forceful activities, common in occupations like construction or manufacturing, put excessive stress on the shoulder joint, leading to acute injuries such as strains, sprains, or even dislocations (Pope *et al.*, 1997).

2.4 Pathophysiology of Musculoskeletal Pain

Musculoskeletal disorders arise from engaging in activities characterized by forceful exertion, repetitive movements, and prolonged awkward postures, as emphasized by da Costa and Vieira (2010). These disorders can exhibit symptoms such as pain, burning, and/or numbness and tingling, resulting in a reduction of work time and productivity. Initially, these symptoms may be intermittent and mild; however, without intervention, they have the potential to escalate in frequency and severity. The intricate structures of the musculoskeletal system may sustain injuries, triggering an inflammatory response initially intended for tissue repair. Persisting in injurious tasks can lead to a complex cycle, involving sustained tissue injury, the development of chronic or systemic inflammation, the onset of fibrosis in the affected tissue, and the potential breakdown of compromised structures. Over time, these intricate processes culminate in the manifestation of pain and a significant decline in the functional capacity of the affected region (Barbe & Barr, 2006).

2.4.1 Aetiology of Musculoskeletal Pain

2.4.1.1 Posture

Prolonged maintenance of a poor back position can lead to postural low back pain, inducing tension in the musculature and ligaments and resulting in minor injuries that manifest symptomatically as pain in the lower back (Casiano et al., 2024). Similarly, postural neck pain arises from the loading of the cervical spine and shoulder girdle due to sustained postures during work or leisure activities (Mahmoud et al., 2019). This type of pain is particularly prevalent among computer users who often subject the neck musculature and ligaments to strains through awkward postures and forward bending while working (Green, 2008). Notably, Blumenberg *et al., (*2021), reported a higher prevalence of neck pain among computer users spending at least 6 hours a day on the computer. The adoption of improper postures, especially in the context of prolonged computer use, underscores the significance of understanding and addressing postural-related musculoskeletal issues to promote overall well-being.

2.4.1.2 Force

The forces applied to the computer mouse and keyboard have been identified as potential risk factors for musculoskeletal pains (Wærsted et al., 2010). This risk is compounded by various factors, including heightened repetitiveness in finger and wrist movements, static loading on the thumb during mouse gripping, prolonged extension, ulnar deviation of the wrist, and extended durations of computer use. This intricate interplay of ergonomic elements creates a complex scenario that may collectively contribute to the development of musculoskeletal pains in the forearm and hand/wrist. Understanding and addressing these multifaceted aspects are crucial in managing discomfort and preventing potential musculoskeletal issues in these specific regions. Subjects experiencing more severe musculoskeletal pains have been noted to exert higher force during keyboarding (Feuerstein et al., 1997).

2.4.1.3 Ergonomics

A study by Edwards *et al.* (2025) underscored the importance of ergonomic considerations in the workplace. The field observations from this study revealed that workers were less likely to use armrests but generally preferred utilizing the desk surface for hand support when typing or using the mouse. This aligned with the study's emphasis on the role of chair features, such as armrests and the desk surface, in influencing workers' ergonomic behaviors and preferences. In the findings of the study, the researcher observed that if the seat height is less than the popliteal height, users tend to incline the spine, creating an acute angle between the thigh and the spine

2.5 Clinical Presentations of Musculoskeletal Pain

I. **Pain:** as defined by the International Association for the Study of Pain (IASP, 2020), pain is characterized as an unpleasant sensory and emotional encounter linked to, or resembling the sensations associated with actual or potential tissue damage. The sensation of pain can manifest as aching, burning, stabbing, sharp or dull, displaying a spectrum of intensity ranging from mild to severe. Occasionally, this pain might be intensified by movement or specific postures and could fluctuate based on the time of day (Raja et al., 2020).

II. **Joint Stiffness:** Joint stiffness can arise due to various musculoskeletal conditions such as spondylosis, arthritic conditions, or adhesive capsulitis, among others. It leads to a reduction or loss of the range of motion at the affected joint. The severity and cause of joint stiffness determine the extent of limitation, with some cases resulting in a complete loss of all joint movements, while in others, specific types of movements are restricted (Wojcieszek et al., 2022).

III. **Radiculopathy:** Radiculopathy denotes a pain syndrome characterized by pain, weakness, and numbness along the path of a nerve. This condition arises due to the compression or irritation of a nerve root (Zhang et al., 2018), commonly associated with degenerative conditions affecting the spine. The specific radicular symptoms experienced may vary depending on the level of the lumbar spine where the nerve compression occurs. In instances of L2, L3, and L4 radiculopathy, individuals may feel radiating pain at the anterior aspect of the thigh, which may progress to the knee and the medial aspect of the lower leg (Zhang et al., 2018). For L5 radiculopathy, radicular symptoms are experienced at the lateral leg and extend into the foot, while S1 radiculopathy leads to radiating symptoms in the posterior leg, extending into the foot and perineum (Zhang et al., 2018).

IV. **Reduced Range of Motion:** A decrease in the range of motion is characterized by limitations in the movement capabilities of a joint. The reduction in joint mobility can result from factors such as muscle stiffness, inflammation around the joint, prolonged immobilization, and joint pain (Rahmiati and Afrianti, 2018).

2.6 Diagnosis of Musculoskeletal Pain

2.6.1 Patient History

The initial and crucial step in the precise diagnosis of a patient presenting with musculoskeletal disorders involves a comprehensive and detailed patient history. This historical assessment should encompass various key aspects, including the onset period of the symptoms, any history of trauma or diseases, detailed information about the location and characteristics of the pain, family medical history, the patient's occupation, severity and duration of the symptoms, factors that worsen or alleviate the symptoms (considering positional and time-related factors), current medications and treatments, as well as a thorough exploration of past medical and surgical interventions (Alexandra, 2024; Vilella and Reddivari, 2025).

2.6.2 Physical Examination

Physical examination encompasses general observation, local examination, and an assessment of movement and muscle strength. Specific physical tests tailored to various musculoskeletal conditions can be conducted to either confirm or rule out a particular diagnosis. In terms of general observation, the examiner observes the patient's gait and posture as they enter the examination room, as well as during activities such as walking, standing, and sitting. Local observation involves closely examining the affected area for signs of swelling, abnormal contours, muscle atrophy, asymmetry in muscle distribution, and the presence of joint malalignments or deformities. The range of motion is evaluated using tools like a goniometer, providing a quantitative measure of the extent of movement in specific joints. Additionally, muscle strength is assessed and can be graded using standardized scales such as the Oxford muscle grading scale, offering a systematic approach to evaluating muscle function and strength. Various orthopedic tests can be conducted to ascertain or exclude specific pathologies. These assessments encompass the Straight Leg Raise Test for sciatic nerve irritation or lumbar disc herniation, Faber's Test for hip pathology and sacroiliac joint dysfunction, vertical oscillatory pressure (for low back pain), the Empty Can Test (for shoulder pain), and the cervical distraction test (for neck pain), among others (Alexandra, 2024; Vilella and Reddivari, 2025).

2.6.3 Radiographic Examination

Radiographic examination involves the use of X-rays, computerized tomography, and magnetic resonance imaging to examine internal tissues and detect the presence or absence of abnormalities

2.6.3.1. Computerized Tomography (CT) Scan

Computerized tomography is primarily employed to assess the osseous structures of the spine and the relationship of the vertebrae to the neural canal in the axial plane (Dieckmeyer et al., 2023). For musculoskeletal conditions, CT scans prove valuable in revealing the relationship between various bony structures, identifying tumours, fractures, and complete or partial dislocations (Dieckmeyer et al., 2023). (In diagnosing low back pain, a CT scan can be instrumental in visualizing the lumbar spine and detecting abnormalities such as spondylolisthesis (Dieckmeyer et al., 2023).

2.6.3.2 X-rays

X-rays are extensively employed in imaging to assess musculoskeletal deformities due to their ready availability and relatively low cost. This technique is particularly useful for evaluating fractures, bony deformities, and degenerative changes (Vijayanathan et al., 2009). In cases of low back pain where there is suspicion of non-mechanical causes or degenerative changes in the lumbar spine, X-rays are often recommended for further diagnostic purposes(Vijayanathan et al., 2009). Commonly, anteroposterior and lateral views are obtained to capture comprehensive angles. In instances of suspected spondylolysis, an oblique view may be requested to reveal any fractures at the pars interarticularis. The obtained film is then examined by clinicians for signs of degenerative changes, reduced intervertebral disc spaces, vertebral body fractures, or other noticeable deformities (Vijayanathan et al., 2009).

2.6.3.3 Magnetic Resonance Imaging (MRI)

Magnetic resonance imaging (MRI) uses the body's inherent magnetic properties to generate detailed radiographic images (Grover et al., 2015). Currently, MRI serves as the standard diagnostic tool for identifying abnormalities in neurologic structures related to low back pain (Arya, 2014). Providing high-resolution images in multiple axes and planes, MRI has the advantage of having no known biohazard effects. In contrast to computerized tomography, MRI is more adept at revealing the correlation between discs and nerves, pinpointing soft tissue and non-bony structures, and identifying conditions such as early osteomyelitis, discitis, and hematomas (Grover et al., 2015).

2.7 Management of Musculoskeletal Pain

Musculoskeletal Pain result from variety of causes and risk factors, management of these causes and risk factors will involve approaching the causes of the pain and correcting any associated deformity.

Management of musculoskeletal Pain include the following

i. Patient education and self-management
ii. Exercise therapy
iii. Manual therapy
iv. Pharmacological treatment (mainly analgesics). (Bergman, 2007)

Management of musculoskeletal pains vary depending on the type of disorder and the region affected.

For the management of low back pain, early involvement of the patient in physical activity and exercise is recommended, while bed rest, as a means of management should be discouraged (Goode et al., 2025). Analgesics as a means of management is also recommended (Goode et al., 2025). Manipulative therapy in the form of lumbar traction is also recommended in the treatment of low back pain (Borman et al., 2003). Specific back exercises are recommended in the management of chronic low back pain, but patients suffering from acute low back pain are advised to maintain a general state of physical activity, as opposed to performing exercises specifically for the back (Goode et al., 2025). Lumbar braces have also reported to be effective in the management of low back pain (Vick et al., 2024).

2.8 Prevention of Musculoskeletal Pain

Preventing musculoskeletal Pain entails steering clear of risk and causative factors that make individuals susceptible to these disorders (European Agency for Safety and Health at Work, 2008).

Preventive measures include various strategies:

i. Improving Ergonomics: Enhancing the ergonomics of work and school environments, including the selection of suitable chairs, appropriate work tables, maintaining proper posture with back and arm support, and adopting favorable positions during work and at home have demonstrated efficacy in reducing the occurrence of back and neck pain (European Agency for Safety and Health at Work, 2008).

ii. Behavioral Changes: Implementing proper positioning during desk work, daily activities, and load-carrying, along with adjustments to sleeping positions and work habits, such as incorporating short breaks during work hours, contribute to muscle relaxation and help mitigate musculoskeletal pains (Ming et al., 2004; European Agency for Safety and Health at Work, 2008).

iii. Wearing Protective Equipment: The use of protective equipment like back braces, wrist splints, and neck collars can play a crucial role in minimizing the development of musculoskeletal symptoms. Back belts, for instance, aid in stabilizing the trunk, increasing intra-abdominal pressure, and reducing the incidence of low back pain (European Agency for Safety and Health at Work, 2008).

iv. Physical Exercises: Engaging in exercises to strengthen neck and back muscles enhances their physical capacity, thereby reducing muscle overloading and lowering the risk of developing musculoskeletal pains (European Agency for Safety and Health at Work, 2008).

2.9 Outcome Measures

The Oswestry Disability Index (ODI): The Oswestry Disability Index (ODI) stands as a frequently employed outcome measure for evaluating individuals with low back pain. This self-administered questionnaire comprises ten sections, addressing pain intensity and the impact on various daily activities, including personal care, lifting, walking, sitting, standing, sleeping, sex life, social life, and traveling. Each section consists of six statements detailing scenarios in the patient's life in relation to their pain. Patients select one statement from each section, assigning a score of 0 to the first statement and 6 to the last. The total score is determined by summing the patient's scores, dividing by the total possible score (50), and multiplying by 100 to obtain a percentage (Mehra et al., 2008). The resulting percentage serves to estimate the perceived degree of disability, with a higher percentage indicating a greater perception of disability (Mehra et al., 2008). The test-retest reliability of the ODI ranges from $r = 0.83$ to 0.99(Grönblad et al., 1993).

Neck Disability Index (NDI): The Neck Disability Index (NDI) is a tool specifically designed to measure neck-related disability in patients. It comprises 10 sections, each addressing a different aspect of daily life that could be affected by neck pain, such as personal care, lifting, reading, headaches, concentration, driving, work, sleeping, and recreation. Each section contains six statements, scored from 0 (first statement) to 5 (sixth statement). The total score can be converted into a percentage by dividing it by the maximum possible score (50) and multiplying by 100. A higher percentage indicates a higher level of disability. The NDI has been found to have high test-retest reliability, with an intra-class correlation value of 0.93, 95% confidence limits of 0.86 – 0.97, and an internal consistency of 0.864. This tool was developed by Vernon and Mior (1991), and its reliability was confirmed by (McCarthy et al., 2007).

The Shoulder Pain and Disability Index (SPADI): This is a tool designed to evaluate the level of pain and disability experienced by patients with shoulder pathologies. It consists of a self-administered questionnaire containing 13 statements divided into two subscales: pain and disability. The pain subscale comprises 5 questions, while the disability subscale includes 8 questions (Breckenridge and McAuley, 2011). Respondents mark a point on a line indicating their pain or disability level, with descriptors ranging from "no pain/difficulty" to "worst pain imaginable/so difficult required help," similar to a Visual Analogue Scale (Breckenridge and McAuley, 2011).

Scoring the SPADI involves dividing the horizontal line into 12 segments, each scored from 0 to 11. The score corresponding to the segment where the patient's mark falls is assigned. Subscale scores are calculated by summing the scores for each marked point, dividing by the total possible scores for the answered items, and multiplying by 100. The total SPADI score is obtained by averaging the pain and disability subscale scores. Total scores range from 0 to 100, with higher values indicating greater pain and disability (Breckenridge and McAuley, 2011).

Roach et al. assessed the test-retest reliability of the SPADI, obtaining a coefficient of 0.6552, while criterion validity values ranged from -0.5555 to -0.8036 (Roach et al., 1991). A Dutch study on the validity and reliability of the SPADI in a similar population reported a test-retest reliability with an intra-class correlation value of 0.89 (95% CI 0.82 – 0.93) and a validity correlation between the SPADI and the shoulder disability questionnaire (SDQ) of r = 0.69 (Breckenridge and McAuley, 2011).

2.10 Summary of Literature Review

Musculoskeletal pains are health conditions that affect the musculoskeletal system of the body, affectations involve the muscles, tendons, skeletal structures, the ligaments and the nerve and vessels that supply these structures. Symptoms of musculoskeletal pains may be short lived or may be chronic and associated with an ongoing disability. Musculoskeletal pains are a common problem globally and can be found in both the young and adult population. Common causes of musculoskeletal pains include trauma, awkward and static body postures, non-ergonomic nature of the school, home or work environment. Musculoskeletal pains are known to affect different parts of the body such as the neck, the back, the shoulder and regions of the upper and lower limbs, symptoms can vary depending on the nature of one's activities of daily living and the kind of work or school environment one is exposed to. The symptoms of musculoskeletal pains mainly involve pain and affectation of the range of motion. In the management of musculoskeletal pains early diagnosis is a crucial factor and involves a detailed history of the patient, physical examination). Musculoskeletal pains can be prevented by improving the ergonomics of the home, school or work environment, postural and behavioural changes, wearing protective equipment and physical exercises. Management of musculoskeletal pains involve pharmaceutical, therapeutic and surgical interventions. Outcome measures can be u

2.11 Empirical literature review

AUTHOR/ YEAR/COUNTRY	**TITLE**	**SAMPLE SIZE**	**AIM OF STUDY**	**STUDY TYPE**	**FINDINGS**
Happiness *et al.*/2015/Nigeria	Prevalence of work-related musculoskeletal disorders among hairdressers	Two hundred and ninety-nine hairdressers (242 females and 57 males) from salons in Surulere and Mushin Local Government Areas of Lagos State.	This study has investigated the prevalence of work-related musculoskeletal disorders (WMSDs), the most commonly affected body parts, the risk factors of WMSDs and the coping strategies adopted by hairdressers.	cross-sectional descriptive survey design	The age of hairdressers, their years of working and the long hours they spent working in a standing position may be significant factors that contribute to the high prevalence of the WMSDs among them. The most commonly affected body parts included the low back, shoulders and neck.

Maharashtra et al/2022/India	Prevalence of Musculoskeletal Disorders among Hair Dressers in Urban Setup	280 hairdressers between age group of 25-35 years were recruited from hair salons Based in metropolitan city of Mumbai	To find out the prevalence of musculoskeletal disorders among hair dressers in urban set-up using brief pain inventory scale	A cross sectional study	The study concluded that the prevalence of work-related musculoskeletal disorder was majorly seen at lower back (81%) followed by shoulder (53%) and lastly the calf (45%).
Nidhi et al/2023/India	Incidence and Prevalence of Work-Related Musculoskeletal Disorders and Their Risk Factors among Hairdressers and Beauticians: A	150 study subjects largely from Mumbai and Gujarat metropolis in India	The aim of the present study was to assess the risk of work-related musculoskeletal disorder (WMSDs) and evaluate the prevalence of WRMSDs among hairdressers and beauticians.	A cross-sectional survey	The prevalence of the WMSDs among participants was 88.7%. The most commonly affected body region included the Neck (46%), Lumbo-pelvic region (44.7%), Shoulder (40.7%). Taking sufficient

	Cross- Sectional Study				rest breaks was one of the major coping strategies they adopted.
SukhDev &, Kamalesh *et al.*/2021/India	Work-related musculoskeletal disorders and associated risk factors among urban metropolitan hairdressers in India	768 study subjects (384 hairdressers and control subjects each) from Ahmedabad and New Delhi metropolis in India.	his study investigated the musculoskeletal problems among urban hairdressers and associated risk factors.	cross-section study design survey	A very large proportion of hairdressers suffered with work-related musculoskeletal disorders. The long daily working hours and gender of the hairdresser are associated with increased risk of developing WMSDs.

CHAPTER THREE

MATERIALS AND METHODOLOGY

3.1 Participants

3.1.1 Study Area

The study was conducted in Egor Local Government Area (LGA) of Edo State, located in the South-South geopolitical zone of Nigeria. Egor LGA is part of the greater Benin City metropolitan area and spans an estimated land area of 93 square kilometres. According to the 2006 national census, Egor had a population of 339,899.

The administrative headquarters of Egor is situated in Uselu. The LGA comprises several communities, including Okhoro, Use, Uwelu, Iguikpe, Ugbihoko, Iguediaye, Evbougide, and Oghedaivbiobaa. Egor is ethnically diverse, with predominant groups including the Esan, Bini, and Owan. It also accommodates people from other ethnic backgrounds, reflecting the area's cultural diversity.

Egor is a multi-faith community where Christianity, Islam, and traditional religions are practiced. English is the official language used in formal settings such as education, governance, and business. However, Nigerian Pidgin English is widely spoken in informal interactions and serves as a common medium of communication across the various ethnic and linguistic groups. This linguistic flexibility facilitates effective interpersonal communication in marketplaces, community gatherings, and day-to-day social interactions.

3.1.2 Participation selection

This study was conducted among Female and Male Hairdressers aged 18 years and above in Egor Local Government Benin city, Edo state, Nigeria.

3.1.3 Inclusion Criteria

I. Adult female and male individuals who reside and work in Benin City and are actively engaged in hair styling and maintenance.
II. Aged 18 years and above.
III. Have been involved in hairdressing practice for a minimum duration of one year.
IV. Willing to provide informed consent to participate in the study.

3.1.4 Exclusion Criteria

I. Presence of a congenital musculoskeletal deformity.
II. Presence of any musculoskeletal injuries to the spine, neck, or lower back regions.

3.2 Material.

3.2.1 Data collection Instruments

I. **The Standardized Nordic Musculoskeletal Questionnaire**: The Standardized Nordic Musculoskeletal Questionnaire was developed by Kuorinka et al in 1987 to serves as an instrument for the examination of musculoskeletal disorders among a given population within an ergonomic context and for occupational health services. The standardization questionnaire is divided into two parts, the general and the specific part. The general part of the standardize questionnaire consists of 27 questions with binary response (Yes/No) about musculoskeletal pains during the last 12 months or last 7 days and about the impact on activities during the last 12 months (kuorinka et al. 1987). All the questions refer to 9 areas (Neck, shoulders, elbows, wrists/hands, upper back, low back, hips/thighs, and ankles/feet). For facilitating the identifications of the anatomical areas. The specific parts of the questionnaire delve into the analysis of symptoms of the lumbar, neck and shoulder regions with binary response (Yes/No) or with the timing of the problem (Kuorinka et al.,1987).

Validity of The NMQ was developed based on extensive literature and expert input to assess musculoskeletal symptoms in specific body regions. It includes relevant anatomical areas most affected by work-related musculoskeletal disorders (WMSDs), ensuring good content coverage

Studies have confirmed that the NMQ successfully identifies patterns and risk factors related to work posture, ergonomics, and physical strain, supporting its theoretical foundation

Several studies have shown strong reliability when the questionnaire is administered at two different times (e.g., Cohen’s kappa values >0.70 in many cases).

Though it's mostly a symptom checklist, the questionnaire maintains consistent responses a cross different segments when used in homogenous populations.

II. **Proforma**: This was used to obtain information on sociodemographic variables and document anthropometric characteristics of the respondents (age, marital status, religion, ethnicity, educational level, years of hairdressing experience, hours spent hairdressing daily, height, and percentage body fat) which may be risk factors of WMSKDs.

Validity is usually established by experts in the field (e.g., physiotherapy, occupational health) reviewing the questions to ensure they appear to measure what they are supposed to.

It also Depends on how well the items comprehensively cover variables of interest. Researchers often consult literature and guidelines when designing proformas to ensure comprehensiveness.

Reliability can be established by administering the same proforma to a small group twice over a few days and measuring the consistency of responses.

If the proforma is interviewer-administered, consistency between different data collectors should be assessed.

3.3 Methods

3.3.1 Research Designs

The Research Designs used for this study was a cross-sectional analytic research design

3.3.2 Sampling Technique

This study employed a purposive sampling method in combination with convenience sampling**.**

3.3.3 Sample Size

The total number of Female and male hairdressers registered under the umbrella organization, National Association of Hairdressers and cosmetologists, Egor Local Government Area chapter(NASHCO) is one Hundred and one (101).

The sample sizes for this study was calculated using slovins sample size formula.

$n=N/(1+N(e)^2$

where n= the sample size

N= the population of study

e= the margin error in the calculation

For the number of hairdressers,

$N = 101$, $e = 0.05$

$n= 101/(1+100(0.05)^2$

$n=80$

3.3.4 Procedure for Data collection

Participants were recruited from registered salons and training centres affiliated with NASHCO within Egor LGA. Using purposive and convenience sampling methods, eligible hairdressers (based on inclusion/exclusion criteria) were approached and provided with information about the study. Those who agreed to participate were required to sign an informed consent form.

Data was collected using a structured, self-administered questionnaire developed based on existing literature and validated instruments for WMSDs assessment (the Nordic Musculoskeletal Questionnaire). The questionnaire will consist of sections covering:

- Socio-demographic information

- Work history and ergonomic practices
- Presence, location, and frequency of musculoskeletal symptoms
- Perceived work-related risk factors

Participants were given the questionnaire during a scheduled visit to their salon or training centre. A brief orientation on how to complete the questionnaire was provided. For participants who required assistance, trained research assistants read and recorded responses confidentially and objectively.

3.3.6 Data Analysis

Data was analysed using the International Business Machine (IBM) Statistical Package for Social Sciences (SPSS) version 27.0. Descriptive statistics of frequencies, percentages, means, and standard deviations was used to summarize demographic data and prevalence rates. Inferential statistics such as Chi-square tests was used to explore associations between musculoskeletal disorders and potential risk factors. A p-value of <0.05 was considered statistically significant.

3.3.5 Ethical Consideration

The Ethical approval for this study was sorted and obtained from the Ministry of Health, Benin City, Edo state.

CHAPTER FOUR

RESULTS

4.1 Results

4.1.1 Socio-demographic Characteristics of Respondents

As shown in **Table 4.1**, the majority of respondents (30.0%) were between 51–60 years, followed by those aged 31–40 years (26.3%), while only 7.5% were between 61–70 years. Females constituted the majority (82.5%) compared to males **(**17.5%**).** More than half were married (56.3%), while 21.3% were single and 22.5% fell into other categories (widowed, divorced, etc.).

Most of the respondents had attained tertiary education (66.3%), while fewer had secondary (23.8%) or primary (10.0%) education. With regard to work experience, 33.7% had 11–20 years, 26.2% had 21–30 years, and 25.0% had 1–10 years, showing that most participants had considerable experience in their profession.

Daily working hours revealed that the majority (63.7%) worked for more than 10 hours daily**,** while only 6.3% worked less than 4 hours. In terms of BMI, most respondents were either overweight (31.3%) or obese (32.5%), while 31.3% were within normal range and only 5.0% underweight. Notably, 71.3% did not engage in regular physical exercise. The mean height was 166.86 ± 9.75 cm, mean weight 76.07 ± 13.44 kg, and mean BMI 27.27 ± 0.91, suggesting that on average, respondents were overweight.

Table 4.1 Socio-demographic Characteristics of Respondents (N-80)

Variables	Category	N	%
Age	20-30Years	14	17.5
	31-40Years	21	26.3
	41-50Years	15	18.8
	51-60Years	24	30.0
	61-70Years	6	7.5
Gender	Male	14	17.5
	Female	66	82.5
Marital Status	Single	17	21.3
	Married	45	56.3
	Others	19	22.5
Educational Level	Primary	8	10.0
	Secondary	19	23.8
	Tertiary	53	66.3
Work Experience	1-10Years	20	25.0
	11-20Years	27	33.7
	21-30Years	21	26.2
	31-40Years	9	11.3
	41-50 Years	3	3.8
Daily Working Hours	<4hours	5	6.3
	4-6hours	9	11.3
	7-9hours	15	18.8
	>10hours	51	63.7
Body Mass Index	<18.5Underweight	4	5.0
	18.5-24.9 Normal	25	31.3

	25-29.9 Overweight	25	31.3
	>30 Obese	26	32.5
Engaged In Regular Physical Exercise	Yes	23	28.7
	No	57	71.3
Height Mean value	166.86 ± 9.75		
Weight Mean value	76.07 ± 13.44		
BMI Mean value	27.27 ± 0.91		

4.1.2 Pattern of Musculoskeletal Pain among Respondents

Table 4.2 shows that musculoskeletal pain was highly prevalent among respondents. In the last 12 months, the most affected regions were the ankles/feet (83.8%), wrists/hands (81.3%), and lower back (60.0%). The least affected region was the hips/thighs (33.8%).

Within the last 7 days, wrists/hands (62.5%), ankles/feet (56.3%), and lower back (47.5%) remained the most reported pain sites. Activity limitation due to pain was most notable for the lower back (25.0%), followed by the knees (15.0%) and neck (12.5%). Pain in the hips/thigh region was least reported (33.8% in 12 months, 16.3% in 7 days) and rarely interfered with daily activities (1.3%).

Table 4.2: Pattern of Musculoskeletal Pain among the Respondents(N=80)

Body Region	Pain in Last 12 Months		Pain in Last 7 Days		Prevents Daily Activities	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)
Neck	47 (58.8)	33 (41.3)	32 (40.0)	48 (60.0)	10 (12.5)	70 (87.5)
Shoulder	38 (47.5)	42 (52.5)	28 (35.0)	52(65.0)	9 (11.3)	71 (88.8)
Upper Back	35 (43.8)	45 (56.3)	26 (32.5)	54(67.5)	6 (7.5)	74 (92.5)
Elbow	32 (40.0)	48 (60.0)	20 (25.0)	60 (75.0)	7 (8.8)	73 (91.3)
Lower Back	48 (60.0)	32 (40.0)	38 (47.5)	42 (52.5)	20 (25.0)	60 (75.5)
Wrists/ Hands	65 (81.3)	15 (18.8)	50 (62.5)	30 (37.5)	4 (5.0)	76 (95.0)
Hips/Thigh	27(33.8)	53 (66.3)	13 (16.3)	67(83.8)	1(1.3)	79(98.8)
Knees	38 (47.5)	42(52.5)	20(25.0)	60(75.0)	12(15.0)	68(85.0)
Ankles/Feet	67(83.8)	13(16.3)	45(56.3)	35(43.8)	9(11.3)	71(88.8)

4.1.3 Musculoskeletal Pain Intensity and Duration

According to **Table 4.3**, most respondents described their pain as moderate (41.3%), while 33.8% reported mild pain and 25.0% severe pain. Regarding duration, pain typically lasted 1–3 days (30.0%), followed by less than one day (26.3%). However, 17.5% experienced pain persisting for more than a week.

Despite this, only 28.7% of respondents had ever sought medical attention for their pain, while the majority (71.3%) had not visited a clinic or hospital.

Table 1

Table 4.3: Musculoskeletal Pain Intensity and Duration

Questions	Options	N	%
What is the intensity of pain you experience most of the time	Mild	27	33.8
	Moderate	33	41.3
	Severe	20	25.0
How long does the pain usually last?	<1day	21	26.3
	1-3days	24	30.0
	4-7days	19	23.8
	>1week	14	17.5
Have you ever visited the clinic or hospital for this pain?	Yes	23	28.7
	No	57	71.3

4.1.4: Occupational Risk Factors

Work-related risk factors were common among respondents, as shown in **Table 4.4**. Standing for long periods (66.3% “always”), bending the neck forward while braiding (71.3% “always”), and raising arms above shoulder level (60.0% “always”) were frequent occupational activities. More than half (55.0%) also reported always working in awkward postures.

Only 28.7% took breaks between clients, and 40.0% used adjustable chairs/equipment. Stress and fatigue during work were reported by 75.0% of respondents. Overall, 77.5% exhibited high-risk postural behaviours, while only 22.5% demonstrated low-risk behaviours.

To relieve pain/fatigue, most respondents relied on rest (45.0%), massage (21.3%), exercise (13.8%), and medication (12.2%), with a smaller proportion using other methods (7.5%).

Table 4.4: Occupational Risk Factors

Occupational Risk Factors	Rarely	Sometimes	Often	Always
How often do you stand for long periods while working?	8(10.0)	3(3.8)	16(20.0)	53(66.3)
How often do you bend your neck forward while braiding or styling?	5(6.3)	8(10.0)	10(12.5)	57(71.3)
Do you raise your arms above shoulder level while fixing/weaving hair?	10(12.5)	11(13.8)	11(13.8)	48(60.0)
Do you work in awkward postures (e.g., bending, twisting, squatting)?	8(10.0)	10(12.5)	18(22.5)	44(55.0)
Variables	**Yes**		**No**	
Do you take breaks between clients?	23(28.7)		57(71.3)	
Do you use adjustable chairs or equipment for your clients?	32(40.0)		48(60.0)	
Do you experience stress or fatigue during work?	60(75.0)		20(25.0)	
Overall Risk Level:				
High Risk Behaviour: 62(77.5)				
Low Risk Behaviour: 18(22.5)				

What strategies do you use to relieve pain/fatigue?	
	36(45.0)
Rest	1(13.8)
Exercise	7(21.3)
Massage	0(12.2)
Medication	6(7.5)
Others	

4.1.5 Daily Working Hours

As illustrated in **Figure 4.1**, the majority of respondents (63.7%) worked for more than 10 hours daily. Only 18.8% worked 7–9 hours, 11.3% worked 4–6 hours, and 6.3% worked less than 4 hours. This demonstrates prolonged occupational exposure for most participants.

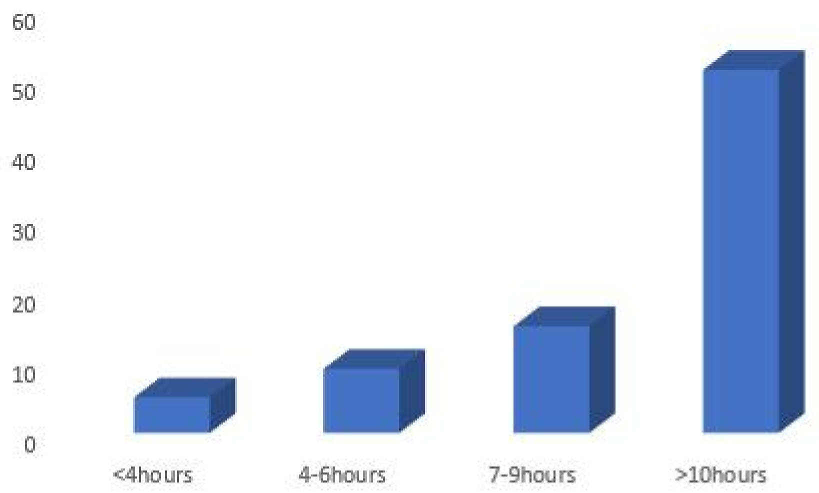

Figure 4.1: A Bar Chart Showing Daily Working Hours Among Respondents

4.1.6 Postural Risk Behaviour

The pie chart in **Figure 4.2** illustrates that high-risk postural behaviour predominates (77.5%), while only 22.5% of respondents engaged in low-risk behaviour, suggesting substantial ergonomic concerns in this population.

Figure 4.2: A Pie Chart Showing Level of Working Postural Risk Behaviour Among Respondents

4.1.7: Association Between Low Back Pain and Gender, Daily Work Hours, and Postural Risk Behaviour

Table 4.5 presents the association between low back pain (LBP) and selected variables. The chi-square analysis revealed no significant association between gender and low back pain in the last 7 days ($p = 0.466$) and no significant association between postural risk behaviour and low back pain ($p = 0.593$). However, there was a statistically significant association between daily working hours and low back pain ($\chi^2 = 16.186$, $p = 0.001$), indicating that longer work hours were linked with a higher prevalence of LBP.

Table 4.5: Chi Square Test of Association Between Prevalence of Low Back Pain in 7 Days and each of Gender, Daily work Hours and Postural Risk Behaviour (N=80)

Variables		**Low Back Pain In 7 Days**			
		Yes n (%)	No **n (%)**	**X^2**	**P Value**
Gender	Male	6 (15.8)	8 (19.0)	0.702	0.466
	Female	32 (84.2)	34 (81.0)		
Daily Work Hours	<4hours	5(13.2)	0(0.0)	16.186	0.001^{**}
	4-6hours	6(15.8)	3(7.1)		
	7-9hours	11(28.9)	4(9.5)		
	>10hours	16(42.1)	35(83.3)		
Postural Risk Behavior	High	28(73.3)	34(81.0)	0.604	0.593
	Low	10(26.3)	8(19.0)		

4.1.8: Association Between Wrist/Hand Pain and Gender, Daily Work Hours, and Postural Risk Behaviour

As shown in **Table 4.6**, there was no significant association between gender and wrist/hand pain ($p=1.000$) or between postural risk behaviour and wrist/hand pain ($p=0.437$). However, a significant association was observed between daily working hours and wrist/hand pain ($\chi^2=16.186$, $p=0.001$), suggesting that prolonged work hours increased the likelihood of wrist/hand pain.

Table 4.6: Chi Square Test of Association Between Prevalence of Wrist/Hand Pain in 7 Days and each of Gender, Daily work Hours and Postural Risk Behaviour (N=80)

Variables		**Wrist/Hand In 7 Days**			
		Yes n (%)	No **n (%)**	**X^2**	**P Value**
Gender	Male	9(18.0)	5(16.7)	0.023	1.000
	Female	41(82.0)	25(83.3)		
Daily Work Hours	<4hours	5(13.2)	0(0.0)	16.186	0.001
	4-6hours	6(15.8)	3(7.1)		
	7-9hours	11(28.9)	4(9.5)		
	>10hours	16(42.1)	35(83.3)		
Postural Risk Behavior	High	28(73.3)	34(81.0)	0.604	0.437
	Low	10(26.3)	8(19.0)		

4.19: Association Between Ankle/Feet Pain and Gender, Daily Work Hours, and Postural Risk Behaviour

According to **Table 4.7**, no significant associations were found between ankle/feet pain and gender (p=0.505), daily work hours (p=0.985), or postural risk behaviour (p=0.420). This indicates that ankle/feet pain occurred independently of these variables among respondents.

Table 4.7: Chi Square Test of Association Between Prevalence of Ankle/Feet Pain in 7 Days and each of Gender, Daily work Hours and Postural Risk Behaviour (N=80)

Variables		Ankle/Feet in 7 Days			
		Yes n (%)	No **n (%)**	**X^2**	**P Value**
Gender	Male	9(20.0)	5(14.3)	0.445	0.505
	Female	36(80.0)	30(85.7)		
Daily Work Hours	<4hours	3(6.7)	2(5.7)	0.154	0.985
	4-6hours	5(11.1)	4(11.4)		
	7-9hours	9(20.0)	6(17.1)		
	>10hours	28(62.2)	23(65.7)		
Postural Risk Behavior	High	33(73.3)	29(82.9)	1.024	0.420
	Low	12(56.3)	6(17.1)		

4.2 HYPOTHESES TESTING

1. There will be no significant association between gender and prevalence of low back pain among hairdressers.

- Test: Chi-square
- Alpha level: 0.05
- Observed p-value: 0.466
- **Judgement:** Since the observed p-value is greater than 0.05, the null hypothesis is therefore **NOT REJECTED.**

2. There will be no significant association between gender and prevalence of hand/wrist pain among hairdressers.

- Test: Chi-square
- Alpha level: 0.05
- Observed p-value: 1.000
- **Judgement:** Since the observed p-value is greater than 0.05, the null hypothesis is therefore **NOT REJECTED.**

3. There will be no significant association between gender and prevalence of ankle pain among hairdressers.

- Test: Chi-square
- Alpha level: 0.05
- Observed p-value: 0.505
- **Judgement:** Since the observed p-value is greater than 0.05, the null hypothesis is therefore **NOT REJECTED.**

4. There will be no significant association between daily work duration and prevalence of low back pain among hairdressers.

- Test: Chi-square
- Alpha level: 0.05
- Observed p-value: 0.001
- **Judgement:** Since the observed p-value is less than 0.05, the null hypothesis is therefore **REJECTED.**

5. There will be no significant association between daily work duration and prevalence of hand/wrist pain among hairdressers.

- Test: Chi-square
- Alpha level: 0.05
- Observed p-value: 0.001
- **Judgement:** Since the observed p-value is less than 0.05, the null hypothesis is therefore **REJECTED.**

6. There will be no significant association between daily work duration and prevalence of ankle pain among hairdressers.

- Test: Chi-square
- Alpha level: 0.05
- Observed p-value: 0.985
- **Judgement:** Since the observed p-value is greater than 0.05, the null hypothesis is therefore **NOT REJECTED.**

7. There will be no significant association between postural risk behaviour and prevalence of low back pain among hairdressers.

- Test: Chi-square
- Alpha level: 0.05
- Observed p-value: 0.593
- **Judgement:** Since the observed p-value is greater than 0.05, the null hypothesis is therefore **NOT REJECTED.**

8. There will be no significant association between postural risk behaviour and prevalence of hand/wrist pain among hairdressers.

- Test: Chi-square
- Alpha level: 0.05
- Observed p-value: 0.437
- **Judgement:** Since the observed p-value is greater than 0.05, the null hypothesis is therefore **NOT REJECTED.**

9. There will be no significant association between postural risk behaviour and prevalence of ankle pain among hairdressers.

- Test: Chi-square
- Alpha level: 0.05
- Observed p-value: 0.420
- **Judgement:** Since the observed p-value is greater than 0.05, the null hypothesis is therefore **NOT REJECTED.**

CHAPTER FIVE

DISCUSSION, CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS

5.1 DISCUSSION

The present study investigated the prevalence of work-related musculoskeletal disorders (WMSDs) and associated risk factors among hairdressers in Egor Local Government Area of Benin City.

The socio-demographic characteristics showed that the majority of respondents were females (82.5%) compared to males (17.5%). This finding is consistent with existing evidence that hairdressing in Nigeria is predominantly a female occupation (Chidozie, 2018). Similar gender patterns were reported in a Lagos study by Aweto et al. (2015), where over 80% of hairdressers were women. This trend may be explained by the cultural and social perception of hairdressing as a female-dominated profession in Nigeria, where women often seek economic independence through vocational trades such as hairdressing.

In terms of age distribution, 30.0% of respondents were between 51–60 years, and 26.3% were aged 31–40 years, reflecting a wide age range of active hairdressers. This suggests that hairdressing in Egor LGA accommodates both younger and older workers, possibly due to its relatively low entry barrier. Studies in similar informal occupational groups also noted wide age variability (Adesola et al., 2016). However, the relatively high proportion of older hairdressers could increase vulnerability to musculoskeletal pain, as age-related decline in musculoskeletal resilience is a recognized risk factor (Larsson et al., 2009).

Educational attainment revealed that 66.3% had tertiary education, suggesting that hairdressing is not limited to those with low education. This differs from findings in other Nigerian studies (Ayanniyi et al., 2010; Aweto et al., 2015), where most hairdressers had only primary or secondary education. The higher proportion of tertiary-educated respondents in this study may reflect the semi-urban characteristics of Egor LGA and the growing trend of educated individuals engaging in vocational trades due to unemployment.

Work experience showed that 33.7% had practiced hairdressing for 11–20 years, while 26.2% had 21–30 years, indicating long exposure to occupational risk factors. Prolonged years in hairdressing have been linked with cumulative musculoskeletal strain (Mehrparvar et al., 2014), which helps explain the high prevalence of WMSDs observed in this study.

Daily working hours were notably long, with 63.7% of respondents working more than 10 hours per day. This aligns with previous studies (Aweto et al., 2015; Yasobant & Rajkumar, 2014), which reported that hairdressers often exceed recommended occupational exposure limits, predisposing them to fatigue and musculoskeletal stress. In addition, only 28.7% of respondents reported taking breaks between clients, suggesting that inadequate rest exacerbates the burden of WMSDs.

The prevalence of musculoskeletal pain in this study was very high, with 83.8% of respondents reporting ankle/feet pain, 81.3% wrist/hand pain, and 60.0% lower back pain within the last 12 months. These findings corroborate the Lagos study by Aweto et al. (2015), where lower back and upper limb pain were most frequently reported. The high prevalence of ankle/feet pain in this study may be attributed to prolonged standing, reported by 66.3% of respondents as an "always" activity. This is consistent with evidence that static standing posture increases biomechanical load on the lower limbs (WHO, 2020).

Regarding severity, 41.3% described their pain as moderate, 25.0% as severe, and 33.8% as mild. Interestingly, despite these symptoms, only 28.7% had ever sought medical attention, which agrees with Nwaogazie et al. (2016), who noted that WMSDs among informal workers are often underdiagnosed and untreated due to poor awareness and limited access to occupational health services.

Occupational risk factors were strongly present, as 71.3% of respondents always bent their neck forward, 60.0% always raised their arms above shoulder level, and 55.0% always worked in awkward postures. These findings are in line with Mehrparvar et al. (2014), who emphasized awkward postures and repetitive hand use as key ergonomic risks in hairdressing. Notably, 75.0% of respondents reported stress and fatigue, confirming that psychosocial strain compounds physical strain in this occupation (Yi et al., 2022).

Overall, 77.5% of respondents exhibited high-risk postural behaviours, which explains the widespread distribution of WMSDs across multiple body regions. This aligns with international reports (WHO, 2022; Farzan et al., 2017) that emphasize poor ergonomics as a central driver of WMSDs. The reliance on rest (45.0%) and massage (21.3%) rather than structured medical or ergonomic interventions shows a lack of formal occupational health management among hairdressers in Egor.

Further analysis showed that daily working hours were significantly associated with both low back pain and wrist/hand pain suggesting that prolonged occupational exposure increases the likelihood of developing musculoskeletal pain. However, no significant associations were found between gender, postural risk behaviour, and pain occurrence. This implies that the duration of work may be a more critical determinant of musculoskeletal pain than gender or self-reported posture in this group. Similar findings were reported by Alghadir et al. (2021), who found that extended working hours among cosmetologists strongly correlated with neck, wrist, and back pain.

5.2 CONCLUSION

This study demonstrated a high prevalence of work-related musculoskeletal disorders among hairdressers in Egor Local Government Area, with the ankles/feet, wrists/hands, and lower back being the most commonly affected regions. Key occupational risk factors included prolonged standing, neck bending, raising arms above shoulder level, and awkward postures. Long daily working hours and insufficient breaks further exacerbated these risks. Despite significant discomfort, most hairdressers did not seek medical care, relying instead on rest or massage. These findings shows that hairdressers in Egor are a vulnerable occupational group requiring urgent ergonomic and health interventions.

5.3 RECOMMENDATIONS

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

1. **Ergonomic interventions**: Provision of adjustable chairs, tools, and workstations to reduce awkward postures.
2. **Health education**: Training programs on occupational health and ergonomic practices for hairdressers.
3. **Work–rest balance**: Encouragement of regular breaks between clients to reduce fatigue and musculoskeletal strain.
4. **Policy support**: Inclusion of hairdressers in occupational health policies and informal sector welfare programs.
5. **Physical activity promotion**: Encouraging regular exercise and stretching routines to enhance musculoskeletal resilience.
6. **Healthcare access**: Improved awareness and access to physiotherapy and occupational health services for early management of symptoms.

5.4 IMPLICATIONS FOR FURTHER STUDY

This study was limited to registered hairdressers under NASHCO in Egor LGA, which may exclude informal practitioners not affiliated with the association. Further research could:

- Compare WMSD prevalence between registered and unregistered hairdressers.
- Explore psychosocial and economic impacts of WMSDs on hairdressers' livelihoods.
- Assess the effectiveness of ergonomic and health promotion interventions in reducing WMSD burden among hairdressers.

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APPENDICES

APPENDIX 1

Ethical approval

EDO STATE MINISTRY OF HEALTH
HEALTH RESEARCH ETHICS COMMITTEE

EDO STATE HEALTH RESEARCH COMMITTEE
EDO HREC

PROTOCOL NUMBER	HA/737/25/D/07230837 (PLEASE QUOTE IN ALL ENQUIRIES)
APPROVAL NUMBER	HA/737/25/D/09080837
TITLE OF RESEARCH PROPOSAL	PREVALENCE OF WORK-RELATED MUSCULOSKELETAL DISORDERS AND ASSOCIATED RISK FACTORS AMONG HAIRDRESSERS IN EGOR LOCAL GOVERNMENT AREA, BENIN CITY
PRINCIPAL INVESTIGATOR (S)	JAKPA TEMITUOYO OREOLUWA
DATE CONSIDERED	8TH SEPTEMBER, 2025.
DECISION OF THE COMMITTEE	APPROVED

THIS APPROVAL DATES 08/09/2025 TO 08/09/2026. IF THERE IS A DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC EDO SMoH SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY

REMARK: Please kindly note that the HREC Edo SMoH seal authenticates this approval

DR (MRS) Omonyemen B. BELLO (MBBS, MPH, FPHCM) *(CHAIRMAN)* **SIGNATURE & DATE**............ 9/9/25

SUPERVISOR(S) ....

....

ATTESTATION BY INVESTIGATOR(S)

No participant accrual or activity related to this research may be conducted outside of the approval dates. All informed consent forms used in this study must carry the Edo SMoH HREC-assigned number and duration of your research. No changes are permitted in the research without prior approval of the Edo SMoH HREC except in circumstances outlined in the Code. The Edo SMoH HREC reserves the right to conduct compliance visits to your research site without previous notification.

EDO STATE MINISTRY OF HEALTH
SECRETARIAT
DATE 8/9/25
SIGN
RESEARCH & ETHICS COMMITTEE

Signature & Date............ 12/09/25

edohrec@edostate.gov.ng

Room 16, Block D, 2nd floor, State secetariat building.

APPENDIX II

INFORMED CONSENT

Dear Sir/Madam,

My name is Jakpa Temituoyo Oreoluwa, a final year student of the Department of Physiotherapy, Basic medical science I am conducting a study on the "Prevalence of Work-Related Musculoskeletal Disorders and Associated Risk Factors Among Hairdressers in Egor Local Government Area." This study is in partial fulfilment of the requirements for the award of a Bachelor of Physiotherapy degree.

I hereby solicit your cooperation in completing this questionnaire. Kindly note that all information provided will remain confidential and will be used solely for the purpose of this research. Your name will not be required and will not be linked with any information provided. Participation in this study is entirely voluntary, and you may withdraw at any point without consequence.

Please answer all questions as sincerely as possible.

Thank you for your participation.

Consent: Now that this study has been explained to me and I understand the nature and purpose, I willingly agree to participate.

Signature of Participant/Date Signature of Researcher/Date

APPENDIX III

QUESTIONNIARE

NORDIC MUSCULOSKELETAL QUESTIONNAIRE

(Please tick ✓ where appropriate or fill in the blanks. Apprentices are not eligible to participate.)

1. Age: ______ years

2. Sex: Male ☐ Female ☐

3. Marital Status: Single ☐ Married ☐ Others ☐

4. Educational Level: Primary ☐ Secondary ☐ Tertiary ☐ others ☐

5. Work Experience as a hairdresser: ______ years

6. Average daily working hours:

<4 hrs ☐ 4–6 hrs ☐ 7–9 hrs ☐ ≥10 hrs ☐

7. Height: ______ cm

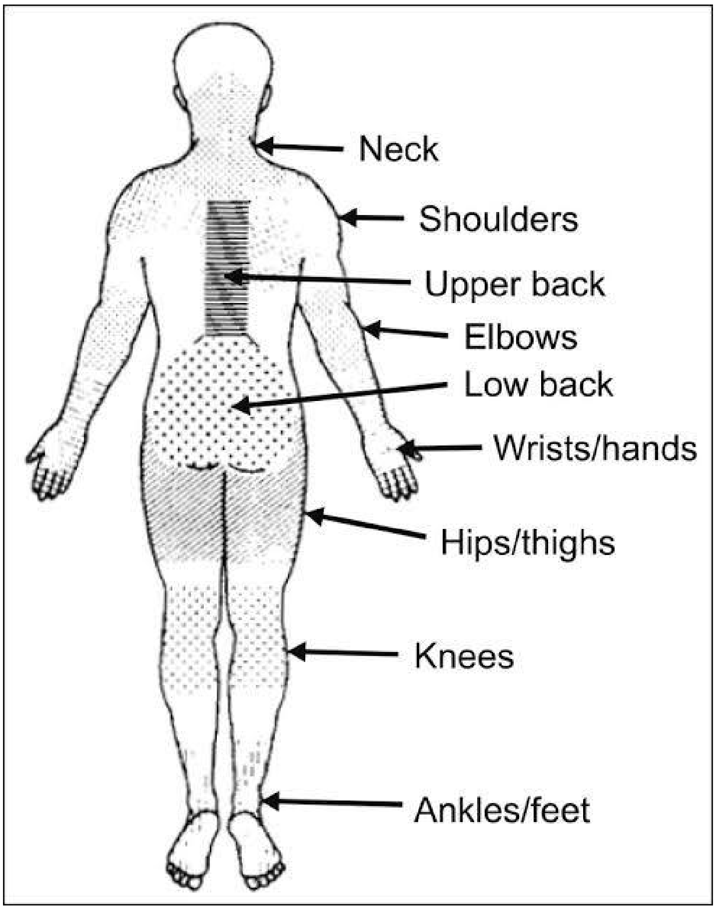
8. Weight: ______ kg

9. BMI: ______

(Classify: Underweight <18.5 ☐ Normal 18.5–24.9 ☐ Overweight 25–29.9 ☐ Obese ≥30 ☐)

10. Do you engage in regular physical activity/exercise? Yes ☐ No ☐

SECTION B: MUSCULOSKELETAL DISORDER PROFILE (Adapted from NMQ)



(Please indicate if you have experienced pain/discomfort in the following body regions during the last 12 months, the last 7 days, or if it prevents daily work activities.)

Body Region	Pain in Last 12 Months	Pain in Last 7 Days	Prevents Daily Work
Neck	Yes ☐ No ☐	Yes ☐ No☐	Yes☐ No ☐
Shoulders	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
Upper Back	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
Elbows	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
Lower Back	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐

Wrists/Hands	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
Hips/Thighs	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐
Knees	Yes ☐ No ☐	Yes☐ No ☐	Yes ☐ No ☐
Ankles/Feet	Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐

12. Which area(s) of your body experiences pain most frequently?

Neck ☐ Shoulder ☐ Lower Back ☐ Knee ☐ Others: ___________

13. Intensity of pain you experience most often:

Mild ☐ Moderate ☐ Severe ☐

14. Duration of pain:

<1 day ☐ 1–3 days ☐ 3–7 days ☐ >1 week ☐

15. Have you ever visited a clinic/hospital for this pain? Yes ☐ No ☐

SECTION C: OCCUPATIONAL RISK FACTORS

(Please respond based on your daily work as a hairdresser.)

16. How often do you stand for long periods while working?

Rarely ☐ Sometimes ☐ Often ☐ Always ☐

17. How often do you bend your neck forward while braiding or styling?

Rarely ☐ Sometimes ☐ Often ☐ Always ☐

18. Do you raise your arms above shoulder level while fixing/weaving hair?

Rarely ☐ Sometimes ☐ Often ☐ Always ☐

19. Do you work in awkward postures (e.g., bending, twisting, squatting)?

Rarely ☐ Sometimes ☐ Often Always ☐

20. Do you take breaks between clients?

Yes ☐ No ☐

21. Do you use adjustable chairs or equipment for your clients?

Yes ☐ No ☐

22. Do you experience stress or fatigue during work?

Yes ☐ No ☐

23. What strategies do you use to relieve pain/fatigue?

Rest ☐ Exercise ☐ Massage ☐ #Medication ☐ (5) Others: __________