CULTURAL BELIEFS AND UTILIZATION OF PHYSIOTHERAPY FOR MUSCULOSKELETAL PAIN AMONG BASIC MEDICAL SCIENCE UNDERGRADUATES, UNIVERSITY OF BENIN

BY

IGHOGBOJA OGHENEKARO MIRACLE

(BMS2005145)

SUPERVISED BY

PROF A.O EZEUKWU

DEPARTMENT OF PHYSIOTHERAPY

SCHOOL OF BASIC MEDICAL SCIENCES

COLLEGE OF MEDICAL SCIENCES

UNIVERSITY OF BENIN

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CERTIFICATION

This dissertation by lghogboja Oghenekaro Miracle is accepted in its presented 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.

PROF A.O EZEUKWU. **SIGNATURE AND DATE**

SUPERVISOR **……...**

……..……... **……...**

EXTERNAL EXAMINER

APPROVED

……..

DR MRS C.O OBASEKI

HEAD

DEPARTMENT OF PHYSIOTHERAPY

COLLEGE OF MEDICAL SCIENCES

UNIVERSITY OF BENIN

DEDICATION

This work is lovingly dedicated to my Sweet Sugar Daddy — the Holy Spirit. You have been my strength in weakness, my help in hopelessness, my comfort in despair, and my closest friend through it all. Every step of this journey was only possible because You were with me. Without You, I would not have been able to do anything.

ABSTRACT

Background: Musculoskeletal (MSK) pain is a common health problem among students and young adults. Although physiotherapy is effective for managing MSK pain, cultural beliefs and personal perceptions often influence its utilization. Understanding these beliefs is essential for improving access to physiotherapy care and awareness.

Aim: This study aimed to determine the influence of cultural beliefs on the utilization of physiotherapy services for managing musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin.

Methods: A cross-sectional descriptive design was used. Data were obtained from undergraduate students through a self-administered questionnaire comprising socio-demographic details and items assessing cultural beliefs and physiotherapy utilization. Responses were rated on a five-point Likert scale from "Strongly Agree" to "Strongly Disagree." Descriptive and inferential statistics, including Chi-square and correlation analyses, were used to summarize data and test relationships between variables, with significance set at $p < 0.05$.

Results: The study showed a high prevalence of musculoskeletal pain, particularly in the lower back, neck, and shoulders. A statistically significant but weak relationship was observed between cultural beliefs and physiotherapy utilization ($r = 0.208$, $p < 0.001$). Gender was significantly associated with the 7-day prevalence of pain, with females reporting more pain than males, while other demographic variables showed no significant associations.

Conclusion: Musculoskeletal pain is highly prevalent among students. Although cultural beliefs significantly influence physiotherapy utilization, the effect is weak, suggesting other factors such as accessibility, affordability, and awareness also play key roles.

Keywords: Musculoskeletal pain, Physiotherapy, Cultural beliefs, Utilization, Undergraduate students

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Musculoskeletal disorders (MSDs) are conditions that interfere with the proper functioning of muscles, bones, joints, and related soft tissues. These ailments range from sudden injuries to long-term degenerative diseases and are among the leading causes of physical disability globally. MSDs commonly manifest through various musculoskeletal symptoms (MSS) such as stiffness, swelling, restricted movement, muscle weakness, numbness, tingling, and unusual joint noises like popping or clicking. Of these symptoms, musculoskeletal pain (MSP) is the most common and distressing. It refers to discomfort felt in the muscles, bones, joints, or connective tissues and is often the primary reason individuals seek medical or rehabilitative assistance. This pain may vary in intensity from mild to severely debilitating and often appears as aching, stiffness, sharp pain, or radiating discomfort, especially in areas exposed to repeated physical strain such as the lower back, neck, shoulders, and knees. Musculoskeletal Pain (MSP) may be acute, lasting a few days or weeks, or become chronic, persisting for more than three months and potentially causing functional impairments. Although some MSDs might initially present without pain, discomfort typically becomes a key feature as the condition progresses.

Musculoskeletal pain (MSP) poses a significant global health challenge. The World Health Organization (2022) reports that roughly 1.71 billion people worldwide live with musculoskeletal conditions, which remain the top contributors to years lived with disability (YLDs). Low back pain (LBP) is the most widespread of these conditions, with 619 million affected globally in 2020, and the number expected to rise to 843 million by 2050 (IASP, 2023). Other common Musculoskeletal issues such as neck pain and osteoarthritis also have high prevalence rates, affecting approximately 15% and 4% of the global population, respectively (Lucas et al., 2023). In Nigeria, MSP(Musculoskeletal Pain) is also highly prevalent. A

community study conducted in Lagos found that 58% of adults experienced MSP (Adedoyin et al., 2022). Occupational data further reveal its impact; 89.3% of drivers in Ibadan and 78% of nurses reported experiencing work-related MSDs within a year (Sanya et al., 2013; Smith et al., 2010). Although a hospital-based study in Edo State showed only a 3.1% prevalence of low back pain among patients at the Irrua Specialist Teaching Hospital over six months (Eromon et al., 2013), this figure likely underrepresents community-level prevalence.

Importantly, musculoskeletal pain is not confined to older populations. Recent research indicates high Musculoskeletal Symptoms (MSS) rates among younger individuals, including university students. For example, a study in Egypt showed a 72.2% prevalence among medical students, particularly in the neck and lower back (Soliman et al., 2023). Likewise, Ethiopian university staff reported a 65.2% prevalence, primarily due to long hours in static postures and high workloads (Mekonnen et al., 2021). In Nigeria, similar trends have been observed. A study at the University of Ibadan found that 54.5% of students had experienced Musculoskeletal Pain (MSP) in their lifetime, with lower back and neck pain being most common (Ayanniyi et al., 2010). At the University of Nigeria, Enugu Campus, 66.02% of students reported such pain, often linked to stress and poor posture (Ikenna et al., 2022). Among clinical physiotherapy students at Bowen University, 94.6% had suffered from MSP, with neck (78.4%) and lower back (75.7%) being the most affected areas (Adepoju et al., 2021). Contributing factors include lifestyle, ergonomics, and psychosocial stress. Globally, poor posture, lack of physical activity, and extensive screen time are significant contributors. Research by Tayama et al. (2022) highlights how poorly designed workstations can increase neck and back pain. Similarly, Alghadir et al. (2021) linked frequent smartphone use to upper limb strain. In Nigeria, extended sitting and inactivity, particularly among female students, are major causes (Anigbogu et al., 2023).

Physiotherapy offers a clinical and non-invasive solution for restoring function and reducing MSP. It involves exercise therapy, manual techniques, education, and movement correction. Despite its proven effectiveness, physiotherapy remains underutilized both globally and in Nigeria. For instance, only 18.4% of affected students in Pakistan sought physiotherapy, with most opting for self-care (Ali et al., 2020). In countries such as Canada and Brazil, students commonly turned to general practitioners or managed their symptoms independently instead of consulting physiotherapists (Coulombe et al., 2016; Barreto et al., 2022). In Nigeria, this trend is even more pronounced. Less than 20% of Muscoskeletal-affected students at the University of Nigeria had consulted a physiotherapist (Onyeukwu et al., 2021), with many preferring home remedies or spiritual practices (Akinbo et al., 2018). Barriers include low awareness, cost, travel difficulties, and inadequate referral systems (Makau et al., 2022; Ogunlana et al., 2019). Psychological factors such as fear of pain recurrence, academic demands, and time limitations also hinder care-seeking (Khumalo et al., 2023).

In addition to these barriers, cultural beliefs significantly shape health-seeking behaviours. These beliefs, often passed down through generations, inform how communities understand illness and recovery. In many societies, pain is perceived as more than a physical ailment. It may be viewed as a spiritual or moral condition. For example, some Aboriginal Australians view chronic back pain as a sign of social or spiritual imbalance. In Zulu culture, pain may be attributed to witchcraft, leading sufferers to consult traditional healers rather than medical professionals (Guilfoyle et al., 2009; Mothabeng et al., 2019). In Hispanic communities, stoicism and folk healing traditions may discourage professional care-seeking (Jimenez et al., 2012). Such beliefs can limit adherence to clinical care, including physiotherapy (Greenwood et al., 2020).

In Nigeria, spiritual interpretations of pain are widespread. Many communities, both rural and urban, consider Musculoskeletal Pain (MSP) as stemming from supernatural causes such as curses or ancestral punishment (Odebiyi et al., 2007; Eze et al., 2017). Consequently, individuals often seek relief from traditional healers or religious leaders instead of physiotherapists. Among university students, many of whom still subscribe to family and community values, these beliefs can influence their response to pain and may lead to self-treatment or neglect. Even among educated youth, peer and cultural influences may dissuade them from pursuing physiotherapy (Akinbo et al., 2018). This adds to the ongoing problem of low physiotherapy utilization, despite increasing MSP prevalence. These cultural perceptions act as unseen obstacles that shape views on the cause, severity, and appropriate treatment of pain. Students may not see physiotherapy as a viable option for conditions they perceive as spiritual in nature. Others may avoid formal care due to fear of stigma or cultural misunderstanding. As a result, physiotherapy is often not even considered. Gaining insights into how cultural beliefs affect physiotherapy use is key to improving access and encouraging appropriate treatment among young adults. Given the rising rates of Musculoskeletal Pain (MSP) and the persistent underuse of physiotherapy, especially in culturally diverse settings, it is crucial to investigate how belief systems influence the treatment decisions of undergraduate students.

1.2 Statement of the Problem

Musculoskeletal Pain (MSP) is a prevalent health issue among undergraduate students, with numerous studies reporting high incidence rates across institutions in Nigeria (Ayanniyi et al., 2016; Ikenna et al., 2022; Adepoju et al., 2021). Despite the proven effectiveness of physiotherapy as a treatment approach, its utilization among this population remains notably low (Onyeukwu et al., 2021; Akinbo et al., 2018). While existing research has examined several risk

factors and treatment preferences associated with MSP, much of the literature has focused primarily on structural barriers such as financial constraints, limited access to services, and low awareness (Makau et al., 2022; Ogunlana et al., 2019).

However, relatively few studies have explored how cultural beliefs might influence students' willingness or ability to seek physiotherapy care. In Nigeria, pain is often viewed through spiritual or traditional lenses. As a result, many individuals turn to herbalists, spiritual leaders, or traditional bone setters rather than medical professionals (Odebiyi et al., 2007; Eze et al., 2017; Akinpelu et al., 2015). Undergraduate students are often influenced by family and community belief systems, which may shape their understanding of pain and treatment. These perspectives can significantly affect how young people respond to chronic or disabling musculoskeletal conditions.

To the best of the researcher's knowledge, the role of cultural beliefs in shaping physiotherapy utilization has not been adequately investigated in universities within Edo State. Furthermore, no such study has been conducted in the School of Basic Medical Sciences, University of Benin. Previous studies have not fully addressed how local belief systems influence students' understanding of pain and their decisions regarding formal treatment within this population.

Hence, this study seeks to fill this gap by examining the influence of cultural beliefs on the use of physiotherapy services among undergraduate students in Edo State, with a specific focus on those in the School of Basic Medical Sciences, University of Benin.

1.3 Research Questions

This study is guided by the following research questions:

i. What is the prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin?

ii. What are the most commonly affected anatomical regions associated with musculoskeletal pain among these students?

iii. Is there a significant relationship between cultural beliefs and the utilization of physiotherapy services among undergraduate students with musculoskeletal pain?

1.4 Aim of the Study

This study aims to determine how cultural belief systems influence the utilization of physiotherapy services in the management of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin.

1.4.1 Specific Objectives

The specific objectives of this study are to:

i. Determine the prevalence of musculoskeletal pain and its relationship with demographic characteristics among undergraduate students in the School of Basic Medical Sciences, University of Benin.

ii. Identify the commonly affected anatomical regions associated with musculoskeletal pain among the students.

iii. Determine the relationship between cultural beliefs and the utilization of physiotherapy services among undergraduate students with musculoskeletal pain in the School of Basic Medical Sciences, University of Benin.

1.5 Hypotheses

1.5.1 Main Hypothesis

There would be no significant relationship between cultural belief systems and the utilization of physiotherapy services for musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin.

1.5.2 Sub-Hypotheses

i. There would be no significant relationship between the prevalence of musculoskeletal pain and the demographic characteristics of undergraduate students in the School of Basic Medical Sciences, University of Benin.

ii. There would be no significant difference in the prevalence of musculoskeletal pain across different anatomical regions among undergraduate students in the School of Basic Medical Sciences, University of Benin.

iii. There would be no significant relationship between cultural beliefs and the utilization of physiotherapy services among undergraduate students with musculoskeletal pain in the School of Basic Medical Sciences, University of Benin.

1.6 Significance/ Justification of the Study

The findings from this research are expected to benefit the following groups:

i. **Undergraduate Students**: By highlighting the benefits of evidence-based care such as physiotherapy, the study may empower students to make more informed and proactive decisions in managing musculoskeletal pain.

ii. **Physiotherapy Professionals:** The insights gained may assist physiotherapists in tailoring their health education efforts and patient communication strategies in ways that address cultural concerns and misconceptions.

iii. **Policy Makers and University Health Services:** Evidence from the study may support the development of culturally informed student health programmes and improve access to physiotherapy services on campus.

1.7 Scope and Delimitation of the Study

This study was delimited to undergraduate students within the School of Basic Medical Sciences, University of Benin. It focused on students who had experienced musculoskeletal pain and examined how their cultural belief systems (CBS) influenced their utilization of physiotherapy services.

Respondents included both male and female students from 200 level to final year, aged 18 years and above. First-year (100 level) students were excluded to ensure that participants had sufficient exposure to university life, which may influence both their health experiences and cultural interpretations.

The study focused exclusively on musculoskeletal pain conditions; other health conditions such as neurological disorders or systemic diseases were outside the scope of this research. Furthermore, it was limited to exploring cultural beliefs and did not investigate economic, institutional, or political factors influencing physiotherapy utilization.

Data were collected using a structured, self-administered questionnaire, and a cross-sectional study design was employed. Only students who provided informed consent and had experienced

musculoskeletal pain within the past 12 months were included, while individuals who declined participation or had not experienced musculoskeletal pain during this period were excluded.

1.8 Limitations of the Study

The limitations of this study include:

i. The data obtained were based on self-reported responses, which may be influenced by individual perceptions, personal bias, or misunderstanding of questions. As such, the findings reflect the subjective views of the respondents and may not represent absolute accuracy.

ii. The study was conducted among undergraduate students within the School of Basic Medical Sciences, University of Benin. Therefore, the results may not be generalizable to students in other faculties or universities, as cultural influences and exposure to physiotherapy awareness may differ across settings.

1.9 Definition of Terms

i. Physiotherapy (PT): a healthcare profession focused on promoting mobility, function, and quality of life through physical assessment, diagnosis, and evidence-based interventions.

ii. Musculoskeletal Disorders (MSDs): A group of conditions that affect the muscles, bones, joints, tendons, ligaments, and related soft tissues, leading to pain and impaired function.

iii. Musculoskeletal Symptoms: Musculoskeletal symptoms refer to pain, discomfort, or functional limitations arising from muscles, bones, joints, or related soft tissues.

iv. Musculoskeletal Pain: Discomfort or pain affecting muscles, bones, joints, tendons, or ligaments. It can result from overuse, injury, poor posture, or underlying health conditions and may range from acute to chronic.

v. Cultural Belief Systems: A set of values, traditions, and assumptions shared by a group of people, often passed down through generations, which shape their perceptions, attitudes, behaviors and decision-making toward health and illness.

vi. Physiotherapy Utilization: The extent to which individuals seek, access, and engage with physiotherapy services for the prevention or treatment of physical ailments, particularly musculoskeletal disorders.

vii. Undergraduate Students: Individuals enrolled in a first-degree programme (such as B.Sc., B.A., or BPT), specifically those in 200 level to final year within the School of Basic Medical Sciences, University of Benin.

viii. Health-Seeking Behavior: The actions and decisions individuals make when they experience health problems, including whether, where, and how they seek care or treatment.

ix. Cross-Sectional Analytical Study: A type of observational research design that collects data from a population or a representative subset at a single point in time to examine the prevalence of an outcome and explore relationships between variables.

1.10 List of Abbreviations

PT – Physiotherapy

MSK – Musculoskeletal

MSS – Musculoskeletal Symptoms

MSDs – Musculoskeletal Disorders

MSP – Musculoskeletal Pain

WHO – World Health Organization

CBS –Cultural Belief Systems.

UNIBEN –University of Benin.

IBM SPSS – International Business Machines Statistical Package for the Social Sciences.

CHAPTER TWO

LITERATURE REVIEW

2.1 Definition

2.1.1 Musculoskeletal Pain

Musculoskeletal Pain (MSP) refers to acute or chronic discomfort affecting the bones, muscles, ligaments, tendons, or nerves. It is a major global health concern, contributing to physical limitations, psychological distress, and economic burden (El-Tallawy et al., 2021). Though primarily somatic, MSP may occur alongside neuropathic or visceral symptoms, complicating diagnosis and treatment. Common types include low back pain (LBP), neck pain, and joint pain associated with osteoarthritis, rheumatoid arthritis, muscle strains, and shoulder dysfunction. While MSP can affect people of all ages, its prevalence rises significantly with age. Most individuals experience some form of it during their lifetime, with many reporting recurring or long-term symptoms (El-Tallawy et al., 2021; Bolarinde et al., 2023).LBP is the most widespread and disabling MSK condition. In 2020, it affected about 619 million people, and this figure is expected to rise to 843 million by 2050 (GBD 2021 LBP Collaborators, 2023). It is usually located between the lower ribs and gluteal folds, sometimes radiating into the legs. Based on duration, LBP is classified as acute (less than six weeks), subacute (six to twelve weeks), or chronic (more than twelve weeks) (WHO, 2022). LBP can be mechanical, often worsening with activity and improving with rest, or neural, involving radiculopathy with symptoms like shooting or burning pain, numbness, or weakness (BJA Education, 2022; Jani et al., 2024). Neck pain may result from trauma or postural stress, especially among students who sit for long periods or

frequently use digital devices. It is more common in females and is linked to both biomechanical and psychosocial factors (Binder, 2008; Olawale & Olajide, 2024; Zheng et al., 2022). Shoulder pain often involves the glenohumeral and surrounding structures. It may be caused by rotator cuff injuries, joint instability, poor posture, trauma, or frozen shoulder (Murphy & Carr, 2010; Ming et al., 2004). Rotator cuff disorders are commonly linked to degenerative changes, previous injury, hypertension, and scapular abnormalities (Zhao et al., 2021). Adhesive capsulitis, or frozen shoulder, is also associated with conditions such as diabetes and thyroid disease (Hannafin et al., 2020).

2.1.2 Physiotherapy Utilization

Physiotherapy utilization refers to how individuals access and engage with physiotherapy services for the assessment, treatment, and prevention of physical impairments, particularly those related to musculoskeletal conditions (World Health Organization, 2021). Several factors influence utilization, including accessibility, awareness, perceived effectiveness, cost, referral systems, and cultural beliefs (Mbada et al., 2019). In Nigeria, physiotherapy remains underutilized due to low public awareness, financial constraints, and misconceptions about its role. Among university students, additional barriers include academic workload, negative past experiences, and provider attitudes (Orok et al., 2024). At the University of Nigeria, fewer than 25% of students visited the campus clinic monthly, with many opting for traditional remedies or ignoring symptoms until severe (Ajaegbu et al., 2016). Despite its proven benefits as a non-invasive and evidence-based treatment option, physiotherapy is often overlooked. Understanding the factors that shape its utilisation is key to improving musculoskeletal health outcomes and informing public health strategies (Mbada et al., 2019; Orok et al., 2024).

2.1.3 Cultural Beliefs

Cultural beliefs refer to the shared values and norms that shape how individuals interpret health, illness, and treatment within their communities. These beliefs strongly influence health-seeking behaviors, often determining whether people pursue biomedical care or traditional remedies (Ugwu et al., 2024; Onuoha et al., 2024). In many Nigerian communities, particularly rural areas, musculoskeletal pain is frequently attributed to spiritual causes. As a result, individuals may prioritize herbal medicine, traditional healers, or spiritual rituals over physiotherapy. For instance, a study among rural farmers found that 96.8% used Complementary and Alternative Medicine (CAM), with 75.5% relying exclusively on it (Mbada et al., 2015). Cultural interpretations of pain—such as viewing it as divine punishment—can reinforce fear, delay formal treatment, and discourage physiotherapy utilization (Reis et al., 2022). While traditional beliefs are not inherently harmful, they underscore the need for culturally sensitive healthcare. This includes engaging community leaders and integrating respectful health education to bridge the gap between traditional values and evidence-based care (Ugwu et al., 2024; Onuoha et al., 2024).

2.2 Epidemiology of Musculoskeletal Pain

Musculoskeletal Pain (MSP) is a significant global health burden, contributing substantially to disability, reduced productivity, and diminished quality of life. According to the World Health Organization (2020), approximately 1.75 billion people, equivalent to 20 to 33 percent of the global population, live with chronic MSK conditions. These account for nearly 17 percent of all Years Lived with Disability (YLDs). Among these conditions, low back pain (LBP) is the most prevalent and disabling. In 2020, it affected around 619 million individuals globally and contributed to 69 million YLDs, ranking as the foremost cause of disability worldwide. By 2050,

the number of individuals living with LBP is projected to reach 843 million, primarily due to global population growth and ageing (Global Burden of Disease Collaboration, 2023; Institute for Health Metrics and Evaluation [IHME], 2020). The age-standardised global point prevalence of LBP stands at approximately 7.5 percent, with lifetime prevalence estimates ranging between 70 and 85 percent, and an occupational prevalence nearing 37 percent. The highest regional rates have been reported in Central and Eastern Europe, whereas Southeast and East Asia recorded a 14.5 percent decline from 1990 to 2020. Globally, 38.8 percent of YLDs from LBP are attributed to modifiable risk factors, including occupational ergonomic exposures (22 percent), smoking (12.5 percent), and high body mass index (11.5 percent). Adults aged 50 to 69 years bear the greatest burden, and women consistently report higher prevalence than men (GBD 2021 Low Back Pain Collaborators, 2023).

In Nigeria, LBP prevalence varies widely, with 12-month rates ranging from 32.5 to 73.5 percent depending on occupation and setting. Office workers report around 20 percent prevalence, while rates among farmers and manual labourers reach up to 67 percent (Omokhodion and Sanya, 2003; Birabi et al., 2012). Studies conducted in Ibadan and South-South Nigeria reported prevalence rates of 46.4 percent and 20.2 percent, respectively (Edomwonyi and Ogbue, 2013; Emorinken et al., 2022). Nationally, LBP ranks among the top ten contributors to Disability-Adjusted Life Years (DALYs) (GBD, 2019). Although the highest incidence is seen among adults aged 50 to 60, increasing prevalence among urban adults aged 31 to 50 suggests a shift related to lifestyle changes. Gender patterns are mixed, with some studies reporting female predominance, linked to reproductive and domestic roles, and others indicating higher prevalence among men, likely due to physically demanding occupations.

Data from Edo State reinforce these trends. At Irrua Specialist Teaching Hospital, Emorinken et al. (2022) reported a 3.1 percent point prevalence of LBP among adult outpatients within a six-month period. The condition was most common among women aged 51 to 60 years, who accounted for 68.6 percent of cases. Additionally, neck and joint pain were prevalent among women aged 40 to 60, with many cases presenting late and persisting chronically.

Undergraduate students represent a vulnerable yet underexplored group. Risk factors such as prolonged sitting, poor posture, physical inactivity, and extensive use of mobile devices contribute significantly to MSK pain in this population. Internationally, 68 percent of Canadian students and 40 percent of Chinese students who frequently used mobile devices reported neck pain (Weleslassie et al., 2020; Xie et al., 2016). In Nigeria, Adegoke et al. (2015) found a lifetime prevalence of LBP among students to be 58 percent, with 12-month and point prevalence rates of 43.8 percent and 14.7 percent, respectively. Similarly, Ayanniyi and Udofia (2016) reported that 54.5 percent of Nigerian students experienced Musculoskeletal Symptoms (MSS). Shoulder pain has also been identified as particularly common, with Hamzat et al. (2014) and Abaraogu (2019) reporting prevalence rates of 63.5 percent and 45.8 percent, respectively. Despite physiotherapy being a recommended and effective treatment for MSK conditions, its utilization remains low. In a rural Nigerian community, Mbada et al. (2019) found that only 21.7 percent of individuals had ever used physiotherapy services, with 12-month and point prevalence of use at just 7.4 percent and 2.7 percent, respectively. Common barriers included high travel costs, limited time, and inadequate referral systems. While satisfaction among users was high, at 87.7 percent, only 16.7 percent were formally referred, and awareness was mostly spread through social networks and media.

Among undergraduates, utilization patterns reflect similar challenges. A study conducted at Afe Babalola University found that 87.4 percent of students used campus health services; however, 66.9 percent expressed negative views, citing high costs and poor staff attitude as major concerns (Orok et al., 2024). These barriers, compounded by misconceptions and lack of awareness, likely contribute to delayed or inadequate engagement with physiotherapy services. Cultural beliefs add another layer of complexity. In a study among Nigerian farmers with MSP, 96.8 percent reported using complementary and alternative medicine, with 75.5 percent relying solely on such treatments. Nationwide, it is estimated that 70 percent of the population uses traditional medicine and up to 85 percent turn to herbal remedies for Musculoskeletal Symptoms (MSS) (Mbada et al., 2019). Pain is often attributed to spiritual forces, ageing, or ancestral displeasure, leading many to consult traditional healers or spiritual figures before seeking biomedical care. Among students, beliefs, peer influence, and self-treatment are common. Many assume symptoms are minor or self-limiting, reducing the likelihood of formal care-seeking. While economic hardship is frequently cited as a key barrier to physiotherapy utilization, cultural perspectives continue to shape health behaviors in important ways (Adewuyi et al., 2017; Ajaegbu and Ubochi, 2016; Apolot et al., 2023; Ugwu and Okpala, 2024). For instance, Ugwu and Okpala (2024) suggest that culture plays a central role in students' decision-making processes regarding treatment. However, other research offers differing insights. Mbada et al. (2019) found that logistical challenges, such as distance to facilities and lack of referrals, may outweigh cultural factors. Similarly, Orok et al. (2024) observed that perceptions of healthcare quality, rather than cultural beliefs, were more predictive of student engagement. These mixed findings suggest that physiotherapy utilization is influenced by a complex interaction of factors. Cultural beliefs may

be significant in some contexts, but economic, structural, and perceptual barriers also play important roles. This complexity underscores the importance of locally grounded studies.

The present research therefore focused on understanding how cultural beliefs specifically affected physiotherapy compliance among undergraduate students of the School of Basic Medical Sciences who had musculoskeletal pain (MSP). By examining this issue in a population that bridges traditional and modern health-seeking behavior, the study clarified the role of culture within the broader landscape of healthcare utilization determinants.

2.3 Pathophysiology of Musculoskeletal Pain

Musculoskeletal Pain (MSP) arises from the interplay between mechanical strain, immune activity, neural responses, and tissue degeneration. It often begins with micro trauma to muscles, ligaments, tendons, or joints, triggering an acute inflammatory response. Inflammatory mediators such as IL-1β, IL-6, TNF-α, nerve growth factor (NGF), prostaglandins, and bradykinin lower nociceptor thresholds, resulting in peripheral sensitisation and increased pain sensitivity (Puntillo et al., 2021).If tissue stress continues, inflammation may become neurogenic. Sensitised nociceptors release neuropeptides like substance P and CGRP, promoting further inflammation and creating a cycle that sustains pain even without new injury (Puntillo et al., 2021). Prolonged nociceptive input may lead to central sensitisation, where the central nervous system becomes hyper-responsive. This involves microglial activation, neuro-inflammation, and impaired pain inhibition, often presenting as widespread pain and altered pain perception (van Griensven et al., 2020; Puntillo et al., 2021). Low back pain illustrates this process well. Everyday movements place axial stress on the spine, requiring coordinated muscle engagement. Poor posture, repetitive strain, or spinal degeneration can disrupt this balance, leading to spasms, microtrauma,

and fatigue. Over time, structural changes like disc collapse and osteophyte formation contribute to chronic pain (Jani et al., 2024). Overall, MSP reflects more than just tissue damage. It is shaped by a dynamic interaction of biological and neurological factors. In student populations, these processes are further influenced by cultural beliefs, which affect pain perception and treatment-seeking behaviour.

2.3.1 Etiology of Musculoskeletal Pain

Musculoskeletal Pain (MSP) arises from a variety of direct pathological or mechanical processes affecting muscles, bones, joints, tendons, ligaments, intervertebral discs, and surrounding connective tissues. These causes can be classified into the following major categories:

2.3.1.1 Mechanical Causes

Mechanical factors are a leading cause of musculoskeletal pain, often resulting from acute injuries or cumulative strain. Sudden events such as sprains, falls, or strains can cause tissue damage and inflammation (Taguchi et al., 2003), while repetitive or forceful activities contribute to overuse injuries (Punnett & Wegman, 2004). Poor posture, particularly during prolonged sitting, bending, or standing, can lead to muscle fatigue and microtrauma. Eromon et al. (2024) identified postural stress as a major factor in low back pain among adults in Edo State. Among university students, musculoskeletal pain is frequently associated with sustained forward head posture, excessive smartphone use, and improper workstation ergonomics (Olawale et al., 2024). Structural abnormalities such as scoliosis or spinal misalignment may intensify mechanical stress, resulting in localised or radiating discomfort (Solomon et al., 2010).

2.3.1.2 Degenerative Changes

Degenerative changes often develop with age but may also occur earlier in individuals under physical stress. Intervertebral disc degeneration reduces disc height and shock absorption, potentially compressing spinal nerves and causing pain (Solomon et al., 2010). Osteoarthritis involves cartilage breakdown, leading to joint stiffness, swelling, and pain during movement (Nunes & Bush, 2012). Spondylosis, whether cervical or lumbar, can result in osteophyte formation and spinal canal narrowing, contributing to nerve impingement (Solomon et al., 2010). Age-related reductions in disc hydration and collagen weaken shock absorption, making degeneration a major contributor to chronic musculoskeletal pain (Murakami et al., 2022; Antoniou et al., 2012).

2.3.1.3 Disc Herniation

Disc herniation occurs when the nucleus pulposus protrudes through the annulus fibrosus, compressing nearby nerve roots. This leads to sharp local pain or radiating symptoms like sciatica, often worsened by movement. Affected individuals may adopt guarded postures to reduce discomfort. It frequently coexists with degenerative disc disease, further complicating diagnosis and management (Solomon et al., 2010).

2.3.1.4 Traumatic Causes

Musculoskeletal trauma may result from acute events like fractures, dislocations, or whiplash, or from cumulative stress such as poor lifting technique or repetitive strain. These injuries disrupt structural integrity, trigger inflammation and muscle spasms, and limit function (Solomon et al., 2010). Microtrauma from heavy backpacks or improper exercise techniques, common among

students, also contributes to pain (Taguchi et al., 2003). Amako et al. (2018) reported that nearly half of MSK complaints in Japanese workers were linked to exercise-related injuries, highlighting the role of cumulative trauma.

2.3.1.5 Inflammatory and Autoimmune Disorders

Chronic musculoskeletal pain can result from systemic inflammatory conditions like rheumatoid arthritis, ankylosing spondylitis, and lupus. These immune-mediated disorders cause joint inflammation, pain, stiffness, and possible deformity if untreated (Nunes & Bush, 2012). Psychological factors such as emotional distress and chronic stress may also intensify or prolong pain, even without active tissue damage, a phenomenon known as psychogenic pain—especially relevant among stressed student populations (Ren, 2021).

2.3.1.6 Idiopathic or Non-Specific Pain

In many young adults and students, musculoskeletal pain lacks a clear cause and is classified as non-specific. It often arises from subtle biomechanical strain, poor posture, repetitive use, or stress-related sensitisation of the nervous system (Punnett & Wegman, 2004). Despite the absence of a specific pathology, the pain is real and can persist due to central or peripheral sensitisation. Non-specific MSK pain is commonly linked to sedentary lifestyles and psychological stress, making it increasingly relevant in student populations. Recognising these diverse contributors is key to proper diagnosis and management.

2.3.2 Risk Factors for Musculoskeletal Pain

Musculoskeletal Pain (MSP) results from the interplay of multiple risk factors, which influence an individual's susceptibility to developing pain even in the absence of clear anatomical injury.

While aetiological factors describe the direct causes of pain, risk factors refer to predisposing conditions or characteristics that increase the likelihood of experiencing it. These can be classified as non-modifiable or modifiable, depending on whether they can be influenced through behavioural, medical, or ergonomic intervention (Punnett & Wegman, 2004; Nunes & Bush, 2012).

2.3.2.1 Non-Modifiable Risk Factors

Age : is a key risk factor, as age-related changes such as disc dehydration, reduced shock absorption, and collagen loss increase vulnerability to Musculoskeletal Pain (Murakami et al., 2022; Antoniou et al., 2012). Among undergraduates, early degeneration may also occur due to prolonged postural strain. Olawale et al. (2024) observed the highest low back pain prevalence (50%) in students aged 29 and above.

Gender: This influence pain patterns, with females more commonly affected, particularly in the neck and upper back (Cavallari et al., 2016; Ming et al., 2004). Olawale et al. (2024) found that 39.8% of female students reported neck pain, compared to 25.3% of males. Contributing factors include hormonal fluctuations, increased pain sensitivity, and poor ergonomic fit of equipment designed for males (Ren, 2021; Mogil, 2012).

Genetic predisposition and family history of MSK disorders: raise the risk for conditions like disc degeneration or early osteoarthritis, though this is less explored in student populations.

2.3.2.2 Modifiable Risk Factor

Postural habits : are a leading contributor to Musculoskeletal Pain (MSP) among students. Prolonged sitting without support, poor posture during lectures, and long study hours strain the

neck, shoulders, and lower back (Chen & Mu, 2018; Olawale et al., 2024). In Edo State, 48.6% of adults with low back pain reported extended sitting, and 33.9% cited frequent bending (Eromon et al., 2024). Poor posture during smartphone use is also linked to neck pain, affecting up to 60% of users in some studies (Namwongsa et al., 2024).

Digital device usage: especially smartphones and laptops, is associated with "text neck syndrome" due to prolonged neck flexion and poor ergonomics (Geetha et al., 2024; Olayinka et al., 2024). While statistical links vary, 68% of students perceive smartphones as a pain trigger (Olawale et al., 2024). Desktop computers may pose less risk due to better ergonomic setups (Lin et al., 2024).

Body Mass Index (BMI) : influences MSP by increasing joint load, particularly in the lumbar spine, hips, and knees. The Global Burden of Disease Study (2021) identified a dose-dependent link between high BMI and MSK conditions. Individuals with BMI ≥ 25 kg/m² face greater risk of lumbar disc degeneration (Like et al., 2020; Viester et al., 2013; Hershkovich et al., 2013).

Smoking: contributes to disc degeneration, with smokers showing up to 18% higher degeneration scores in the lumbar spine (Battie et al., 2019). Though less common among students, it remains a relevant long-term risk.

Physical activity levels : can either protect or harm. Sedentary habits weaken posture, while excessive or improper exercise can cause overuse injuries. Olawale et al. (2024) reported that 59.5% of physically active students still experienced MSP, highlighting the need for balanced activity.

2.4 Classifications of Musculoskeletal Pain

Musculoskeletal Pain (MSP) is categorized using various criteria, including how long it lasts, its biological origin, where it occurs in the body, and how it is perceived or described by individuals.

2.4.1 Based on Duration

Musculoskeletal pain (MSP) is commonly grouped into three categories based on how long the symptoms last: acute, subacute, and chronic.

Acute MSP: begins suddenly, usually after a specific incident such as a fall or strain, and typically resolves within six weeks with basic care (Maher et al., 2017; Qaseem et al., 2017).

Subacute MSP: lasts between six and twelve weeks and represents a critical stage where poor management may lead to chronic symptoms (Maher et al., 2017; Qaseem et al., 2017).

Chronic MSP : persists beyond twelve weeks, often outlasting the initial injury. It is linked to changes in nervous system sensitivity, making pain more widespread or intense (Maher et al., 2017; Qaseem et al., 2017).

2.4.2 Based on Underlying Mechanism

Musculoskeletal Pain (MSP) can also be classified based on the physiological mechanisms that drive it. This categorization helps explain variations in how pain is perceived and treated (IASP, 2017; Shraim et al., 2020).

Nociceptive pain : results from actual or potential damage to non-neural tissues such as muscles, ligaments, or joints. It is usually well-localised and described as dull, aching, or throbbing. This

form of pain is common in cases involving inflammation, overuse injuries, or mechanical stress (Treede et al., 2019; Shraim et al., 2020). Nociceptive pain may be further divided into:

i. Somatic pain : which is sharp and localised, often resulting from injury to muscle or connective tissue and transmitted by Aδ fibres.

ii. Visceral pain: which tends to be dull, deep, and poorly localised. It typically arises from internal organs and is mediated by slower-conducting C fibres (Dowell et al., 2022).

Neuropathic pain: stems from damage or dysfunction within the somatosensory nervous system. Patients often describe it as burning, stabbing, shooting, or electric-shock-like. Conditions such as herniated discs with nerve root compression or diabetic neuropathy are common causes. Neuropathic pain frequently becomes chronic and involves both peripheral and central nervous system components (Treede et al., 2019;Shraim et al., 2020).

Nociplastic pain : refers to pain arising from altered nociceptive processing without clear evidence of tissue damage or nerve injury. It is often widespread and persistent, characterised by hypersensitivity to normal stimuli (allodynia) and difficulty in localising the pain. Central sensitisation plays a key role in this form of pain, which is often seen in conditions like fibromyalgia and chronic non-specific low back pain (Shraim et al., 2020; Kosek et al., 2021).

These mechanisms are not just clinical classifications; they also influence how individuals interpret and respond to their pain. For instance, in cultural contexts like Nigeria, neuropathic symptoms such as burning, stabbing, or electric-shock sensations are sometimes interpreted as spiritual afflictions—especially when the pain has no visible injury or persists despite treatment. This perception can lead individuals to prioritise spiritual or traditional remedies over

physiotherapy, contributing to delayed or reduced use of professional care services (Shraim et al., 2020; Ugwu, 2020).

2.4.3 Based on Anatomical Region

Musculoskeletal Pain (MSP) can be classified by the body region affected, each involving specific anatomical structures. This classification aids targeted assessment and management, particularly in students whose habits and routines influence symptom patterns.

13. **Lumbar Region (Low Back Pain):** LBP refers to pain between the lower ribs and gluteal folds, with or without leg radiation (Sima & Diwan, 2025). It commonly arises from discs, joints, ligaments, muscles, or nerves, and is often linked to posture, prolonged sitting, or repetitive strain. Less commonly, it may result from infections or tumours (Ferdinandov et al., 2023; Pangarkar et al., 2019).

14. **Cervical Region (Neck Pain):** Neck pain originates from the cervical spine and surrounding muscles. In students, smartphone use and forward head posture are frequent causes (Namwongsa et al., 2024). Globally, neck pain ranks as the second leading cause of disability (Global Burden of Disease Collaborators, 2024).

15. **Shoulder and Upper Limb:** Pain here is often linked to the rotator cuff, glenohumeral joint, or subacromial bursa. Repetitive use of the arms for texting, typing, or lifting heavy bags contributes to its occurrence among students (Lucas et al., 2023; Olayinka et al., 2024).

16. **Thoracic Region (Mid-Back):** Mid-back pain affects the thoracic spine and paraspinal muscles, commonly due to poor posture during prolonged sitting or study (Maher et al., 2017).

2.4. 4. Based on Sensory Quality

Musculoskeletal Pain (MSP) is frequently described using sensory terms such as “burning,” “aching,” “sharp,” or “stabbing.” Though subjective, these descriptors offer meaningful clinical insight into the underlying pathophysiological mechanisms, including nociceptive, neuropathic, or inflammatory origins, and serve as valuable tools for diagnosis and treatment planning.

Sharp or stabbing pain is commonly associated with either nociceptive or neuropathic processes. Patients often characterize it as “knife-like” or “shooting,” which may indicate acute tissue injury or nerve root irritation. This form of pain typically suggests recent mechanical insult or neural involvement (Spahr et al., 2017; Nijs et al., 2015).

Burning or tingling sensations are hallmark features of neuropathic pain, often resulting from dysfunction or injury within the somatosensory nervous system. Descriptions such as “electric shock,” “pins and needles,” or “burning” are commonly reported in conditions like diabetic neuropathy, herniated discs, or postherpetic neuralgia (Baron et al., 2017; Finnerup et al., 2021).

Aching or throbbing pain typically reflects nociceptive or inflammatory origins. These sensations are often described as “dull,” “heavy,” or “pulsing” and are frequently observed in mechanical low back pain, osteoarthritis, or muscular overuse injuries (Shaygan & Böger, 2014; Heraughty & Ridehalgh, 2020).

Understanding the sensory quality of pain is clinically important, especially when physical signs are unclear. For example, burning or electric-like sensations often indicate neuropathic pain and may require specialised treatments such as anticonvulsants or nerve blocks instead of standard anti-inflammatory drugs (Baron et al., 2017; Freeman et al., 2014). Among Nigerian students, cultural beliefs shape pain perception—dull aches are often dismissed as stress-related, while

burning pain may be seen as spiritual. These interpretations can delay proper care and reduce physiotherapy use, increasing the risk of chronic pain (Ugwu, 2020).

2.5 Relevant Anatomy of Common Musculoskeletal Pain Region

2.5.1 Low Back (Lumbar Region)

The lumbar spine (L1–L5) is a key weight-bearing region that supports upper body movement and enables trunk flexibility. It lies between the thoracic spine and sacrum and has a natural lordotic curve that aids shock absorption (Waxenbaum et al., 2018). Structurally, it includes vertebrae, intervertebral discs, ligaments, tendons, muscles, and nerves. The discs act as cushions between vertebrae, while ligaments and tendons provide stability and mobility.The spinal cord ends around L1–L2, continuing as the cauda equina—a bundle of nerve roots that can be compressed, leading to pain, numbness, or weakness in the lower limbs. The lumbar plexus (L1–L4) innervates the pelvis and legs, making this region especially sensitive to nerve-related issues. Due to its structural complexity and load-bearing role, the lumbar spine is vulnerable to strain, particularly in students with poor posture, prolonged sitting, or improper ergonomics (Waxenbaum et al., 2023; Gilchrist, 2003).

2.5.1.1 Bones and Joints

2.5.1.1.1 Lumbar Vertebrae

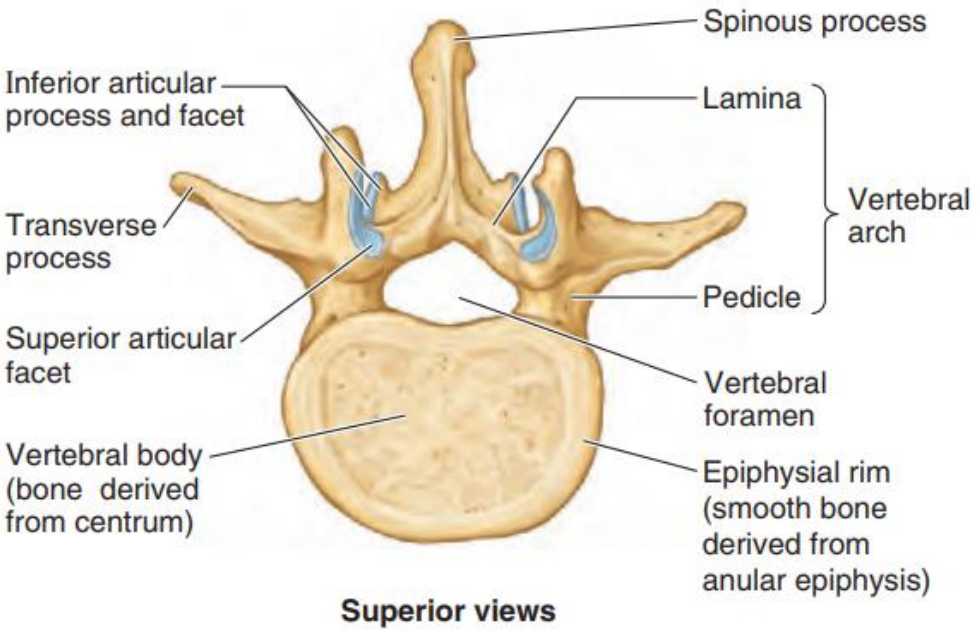


Figure 2.1. Superior view of the 2nd lumbar vertebrae

(Image source: Moore, Clinically Oriented Anatomy. 7th Edition. Pg. 442)

The lumbar vertebrae (L1–L5) are the largest and strongest in the spinal column, designed to support upper body weight while allowing flexibility and maintaining stability. Each vertebra comprises an anterior vertebral body and a posterior arch, forming a protective canal for the spinal cord. The vertebral bodies, composed of strong cortical and spongy cancellous bone, increase in size from L1 to L5 to handle greater load. Superior and inferior endplates on each body help distribute pressure and nourish intervertebral discs. Posteriorly, pedicles connect the body to laminae, forming the vertebral arch. These structures evolve in size and orientation from L1 to L5, changing the shape of the spinal canal. Transverse processes and mammillary

processes serve as attachment points for muscles and ligaments. The pars interarticularis, found between the superior and inferior articular processes, is prone to stress fractures (spondylolysis), especially in young individuals. L5 is considered atypical for its large size and prominent lumbosacral angle, aiding load transfer to the sacrum. Spinous and transverse processes extend from the posterior arch, and the interlaminar region is particularly stress-sensitive. Sensory innervation is provided by meningeal branches of the spinal nerves, responsible for proprioception and pain signaling in the lumbar region.

2.5.1.1.2 Intervertebral Discs (IVD)

Intervertebral discs are fibro cartilaginous structures situated between adjacent vertebrae, primarily functioning as shock absorbers and load distributors in the spine. Each lumbar disc comprises three main parts: the annulus fibrosus, nucleus pulposus, and cartilaginous endplates, which work together to maintain disc integrity and spinal mobility. The annulus fibrosus is composed of concentric collagen fibres arranged in alternating directions, providing tensile strength and resistance to twisting forces. It encases the nucleus pulposus and anchors to the vertebral bodies. The nucleus pulposus is a gel-like, water-rich centre that cushions compressive forces. Its slightly posterior position makes the rear disc wall more prone to herniation, especially under high spinal loads. The cartilaginous endplates, made of hyaline cartilage, attach the disc to adjacent vertebrae and allow nutrient diffusion into the avascular disc. They play a vital role in disc health and are among the last components to degenerate. Discs support spinal flexibility, alignment, and the patency of intervertebral foramina, through which spinal nerves exit. Clinically, the posterior annulus is considered the weakest area due to its thinner structure and lower vascular supply, making it a common site of disc degeneration and herniation in the lumbar spine.

2.5.1.1.3 Facet Joints

Facet joints, also known as zygapophyseal joints, are synovial joints formed between the inferior articular process of one vertebra and the superior process of the vertebra below. Each joint has cartilage-covered surfaces, a synovial membrane, synovial fluid, and a fibrous capsule. In the lumbar spine, facets are oriented in the sagittal plane at L1–L3, allowing flexion and extension while limiting rotation. At L4–S1, the orientation becomes more coronal, permitting slight rotation. The superior facets face medially and posteriorly, while the inferior ones face anterolaterally, contributing to spinal stability and controlled motion. Under normal conditions, facet joints bear little load, but disc degeneration can shift stress onto them, often leading to spondylarthrosis and pain. Mammillary processes on the superior facets anchor stabilising muscles like the multifidus, aiding posture control. These joints are innervated by the medial branches of the dorsal rami, making them a common pain source in lumbar disorders.

2.5.1.2 Muscles

The muscles associated with the lumbar spine play a vital role in facilitating movement, stabilising spinal segments, and providing proprioceptive feedback. These muscles enable controlled motion in multiple planes—flexion, extension, lateral flexion, and rotation—while maintaining posture and protecting spinal structures (Gilchrist et al., 2003). Lumbar musculature is broadly classified into flexors, extensors, lateral flexors, and rotators. Anatomically, they are further divided into intrinsic muscles (deep, segmental stabilisers) and extrinsic muscles (larger, superficial movers).

2.5.1.2.1 Extensor Group

Located posteriorly, the extensors are essential for trunk extension and spinal stability. They are arranged in three anatomical layers:

i. Superficial Layer: The erector spinae (or sacrospinalis) is the most prominent group, originating from a broad tendinous sheet attached to the iliac crest, sacral crests, and lumbar spinous processes. In the lumbar region, it primarily comprises the longissimus thoracis and iliocostalis lumborum, both of which generate powerful extension moments (Gilchrist et al., 2003).

ii. Intermediate Layer: The multifidus muscle lies beneath the erector spinae and spans from each lumbar spinous process to the laminae of vertebrae one to three levels below. Its fan-like arrangement provides segmental stabilisation and aids in controlled extension and postural correction (Gilchrist et al., 2003).

iii. Deep Layer: This layer includes small segmental muscles such as the rotatores and interspinales, which support fine adjustments in posture and assist with extension, lateral flexion, and rotation.

2.5.1.2.2 Flexor Group

Positioned anteriorly, flexors contribute to forward bending and hip flexion:

i. Intrinsic Flexors: These include the psoas major, psoas minor, and iliacus muscles. The psoas major originates from the transverse processes of T12 to L4 and joins the iliacus in the thigh to form the iliopsoas. This powerful hip flexor also influences lumbar lordosis (Gilchrist et al., 2003).

ii. Extrinsic Flexors: The abdominal wall muscles—namely the rectus abdominis, internal oblique, and external oblique—play a dominant role in trunk flexion and increase intra-abdominal pressure during movement and lifting.

iii. Lateral Flexors and Rotators: Lateral bending and rotation require the coordination of several muscles: The quadratus lumborum, extending from the iliac crest to the 12th rib and lumbar transverse processes, is the principal muscle for pure lateral flexion (Gilchrist et al., 2003).Other contributors include the internal and external obliques, intertransversarii, and multifidus, which work together to produce and control both lateral flexion and rotation of the lumbar spine.

2.5.1.3 Ligaments

The stability and controlled motion of the lumbar spine are supported by a complex arrangement of ligaments, classified broadly into longitudinal and segmental groups. These structures provide passive resistance to spinal movements and play a key role in maintaining vertebral alignment (Waxenbaum et al., 2023; Devereaux et al., 2007)

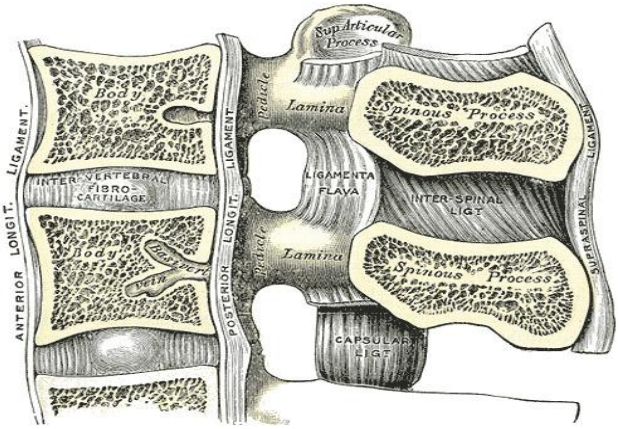


Figure 2.2 Ligaments of the lumbar vertebrae, shown in a sagittal section.

Key ligaments include the anterior and posterior longitudinal ligaments, ligamenta flava, interspinous, supraspinous, and capsular ligaments. Adapted from Gray's Anatomy (42nd edition, chapter 46).

2.5.1.2.1 Longitudinal Ligaments

Two major longitudinal ligaments run along the vertebral bodies:

i. **Anterior Longitudinal Ligament (ALL):** This broad, dense band extends from the base of the skull to the anterior surface of the sacrum. It firmly attaches to vertebral bodies and the outer layers of the annulus fibrosus, resisting lumbar extension and anterior vertebral translation (Waxenbaum et al., 2023).

ii. **Posterior Longitudinal Ligament (PLL):** Thinner and narrower than the ALL, the PLL runs along the posterior surfaces of the vertebral bodies within the vertebral canal. It primarily resists flexion and helps prevent posterior disc herniation. At the disc level, its lateral extensions support annular integrity and contribute to disc stability (Devereaux et al., 2007).

2.5.1.2.2 Segmental Ligaments

Segmental ligaments connect adjacent vertebrae and enhance spinal stability:

i. Ligamentum Flavum: Rich in elastin, this ligament connects the laminae of adjacent vertebrae and maintains tension throughout movement. Its elasticity helps preserve disc height and aids in recoiling the spine to a neutral position (Waxenbaum et al., 2023).

ii. Interspinous Ligament: Positioned between spinous processes, this ligament consists of obliquely oriented fibres that stabilise the spine during flexion and extension. Its structure allows for some buckling during extension (Devereaux et al., 2007).

iii. Supraspinous Ligament: Running along the tips of the spinous processes, this strong, cord-like ligament contributes to resisting spinal flexion and merges with surrounding fascia and musculature (Waxenbaum et al., 2023).

iv. **Intertransverse Ligaments**: These thin bands connect adjacent transverse processes and work with spinal muscles to limit lateral bending (Devereaux et al., 2007).

v. Iliolumbar Ligaments: Extending from the L5 transverse process to the iliac crest, these strong ligaments stabilise the lumbosacral junction. They limit side bending, rotation, and anterior displacement of L5 over the sacrum (Waxenbaum et al., 2023).

2.5.1.4 Nerve Supply

2.5.1.4.1 Nerve Roots

The radicular canal houses the intraspinal, extrathecal nerve root, which includes both a dural sheath and nerve fibres. Mild compression or inflammation typically affects only the dural sleeve, resulting in localised pain and restricted movement. In contrast, more severe compression that impacts the nerve fibres themselves can lead to paraesthesia, weakness, and sensory or motor deficits (Basit et al., 2023). Five pairs of mixed spinal nerves emerge bilaterally from the lumbar spinal cord. Each nerve contains both sensory and motor fibres and exits through the neural foramina before dividing into ventral and dorsal rami. The dorsal rami innervate the erector

spinae muscles and overlying skin, while the ventral rami supply the anterior trunk and lower limbs (Basit et al., 2023).

The lumbar plexus, formed by the ventral rami of T12 to L4, gives rise to several major nerves including: Femoral and obturator nerves (L2–L4),Iliohypogastric (T12–L1),Ilioinguinal (L1),Genitofemoral (L1–L2),Lateral femoral cutaneous nerve (L2–L3).

The lumbosacral plexus arises from L4 to S4 and includes the lumbosacral trunk (L4–L5), which joins the sacral plexus. This network gives rise to:

Sciatic nerve (L4–S3), later dividing into the common peroneal and tibial nerves

Superior gluteal (L4–S1) and inferior gluteal (L5–S2) nerves

Posterior femoral cutaneous (S1–S3) and pudendal (S1–S4) nerves (Singh et al., 2023)

Each lumbar spinal nerve exits below its corresponding vertebra. For example, the L4 nerve root exits through the L4–L5 neural foramen. Most lumbar disc herniations affect the traversing nerve root, meaning an L4–L5 disc herniation typically impinges the L5 root. Far lateral herniations, though less common, compress the exiting root at the same level (e.g., L4) (Basit et al., 2023). Each nerve also corresponds to a dermatome, which supplies a specific skin region, and a myotome, which innervates particular muscle groups. These are clinically useful for identifying nerve root involvement, though overlap often prevents complete loss of function from a single lesion. Dermatomal and myotomal overlap explains why isolated nerve root compression rarely results in total numbness or paralysis (Basit et al., 2023).

2.5.1.4.2 Summary of lumbar nerve functions:

L1–L2: Motor to iliopsoas; sensory to inguinal region and upper medial thigh

L3: Motor to iliopsoas, quadriceps, and adductors; sensory to anterior-medial thigh

L4: Motor to quadriceps and tibialis anterior; sensory to anterior thigh and medial lower leg; contributes to the patellar reflex (with L3)

L5: Motor to gluteus medius, hamstrings, tibialis posterior, and peroneal group; sensory to lateral leg and dorsum of the foot.

2.5.1.5 Blood Supply and Lymphatics

The spinal cord receives its primary blood supply from the anterior spinal artery, which serves the anterior two-thirds, and two posterior spinal arteries that supply the remaining third (Kaiser et al., 2023). These are supplemented by radicular arteries that follow the dorsal and ventral nerve roots. Among these, the artery of Adamkiewicz is the most significant. It typically originates between T8 and L2, often from a posterior intercostal or lumbar artery, and plays a vital role in maintaining blood flow to the lower thoracic and lumbar spinal cord. In the lumbar region, four paired lumbar arteries branch from the abdominal aorta to supply the vertebrae and nearby muscles, including the transversus abdominis and internal oblique (Kaiser et al., 2023).The lumbar lymphatic system supports drainage from the pelvis and lower limbs. Lumbar lymph nodes, located along the abdominal aorta and inferior vena cava, receive lymph from the common iliac nodes and direct it into the thoracic duct, which returns lymph to systemic circulation.

2.6 Clinical Presentations of Musculoskeletal Pain

Musculoskeletal pain (MSP) is a primary and often defining symptom of musculoskeletal disorders. While MSK conditions may involve additional features such as joint stiffness,

weakness, or restricted mobility, pain remains the most frequently reported and functionally limiting symptom. The clinical features of MSP include the following:

i. **Pain as a Primary Symptom**: Pain is the most frequent complaint among individuals with MSP. It may be described as aching, burning, stabbing, sharp, or dull, and can be localised or referred. Its intensity ranges from mild discomfort to debilitating episodes, often rated above 7 on a 0–10 pain scale during flare-ups (El-Tallawy et al., 2021). In joint-related conditions, pain may worsen with movement or sustained postures and improve with rest (Dieppe, 2013).

ii. **Joint Stiffness and Body Aches**: Joint stiffness, especially in the morning or after inactivity, is common and typically improves with movement (Russell, 2011). General body aches and fatigue may occur, particularly in those maintaining prolonged static postures.

iii. **Reduced Range of Motion**: Musculoskeletal pain often discourages normal joint or muscle use, leading individuals to limit movement in the affected area. This reduced activity can contribute to muscle tightness and inflammation surrounding the joint, which gradually impairs flexibility and functional range. Over time, the cycle of pain, disuse, and stiffness may result in significant limitations in joint mobility (Kaneguchi et al., 2016).

iv. **Radiculopathy**: When spinal nerve roots are compressed, radiculopathy may occur, presenting with radiating pain, numbness, or weakness along the nerve pathway (Alexander & Varacallo, 2020). Common patterns include:

L2–L4 involvement: Pain in the anterior thigh, possibly extending to the knee and medial lower leg

L5 involvement: Pain radiating to the lateral leg and dorsum of the foot

S1 involvement: Symptoms in the posterior leg, heel, and foot, potentially extending to the perineal region (Dydyk, et al., 2021)

These patterns help distinguish radiculopathy from other musculoskeletal pain types such as joint strain or muscular tension.

v. **Muscle Twitching and Unusual Sensations**: Patients may also experience tingling, twitching, or "pins and needles," often indicating neuropathic involvement or central sensitisation (El-Tallawy et al., 2021).

Cultural beliefs influence how pain is perceived. Among Nigerian undergraduates, mild aches may be dismissed as normal stress, while burning or electric-like pain is sometimes seen as spiritual. These interpretations can delay appropriate care, reduce physiotherapy utilisation, and contribute to chronic pain development (Ugwu, 2020; Marchand, 2024).

2.7 Diagnosis of Musculoskeletal Pain

2.7.1 Patient History

The first and most essential step in evaluating musculoskeletal (MSK) pain is obtaining a detailed patient history, which forms the foundation of subjective assessment. Initial information should include age and gender, as certain MSK conditions are more common in specific demographic groups (Ming et al., 2004; Porter & Tidy, 2013). Clinicians should determine how the pain began, whether it started suddenly or developed gradually, and assess its duration to classify it as acute, subacute, or chronic. Patients should also describe the nature of the pain, using terms such as sharp, dull, burning, stabbing, or electric-like, and indicate whether the pain is localised or radiates to other areas. Pain intensity can be measured using tools such as the

Visual Analogue Scale (VAS), Numerical Rating Scale (NRS), and Verbal Rating Scale (VRS), especially in acute cases (Schug et al., 2016; El-Tallawy et al., 2020).

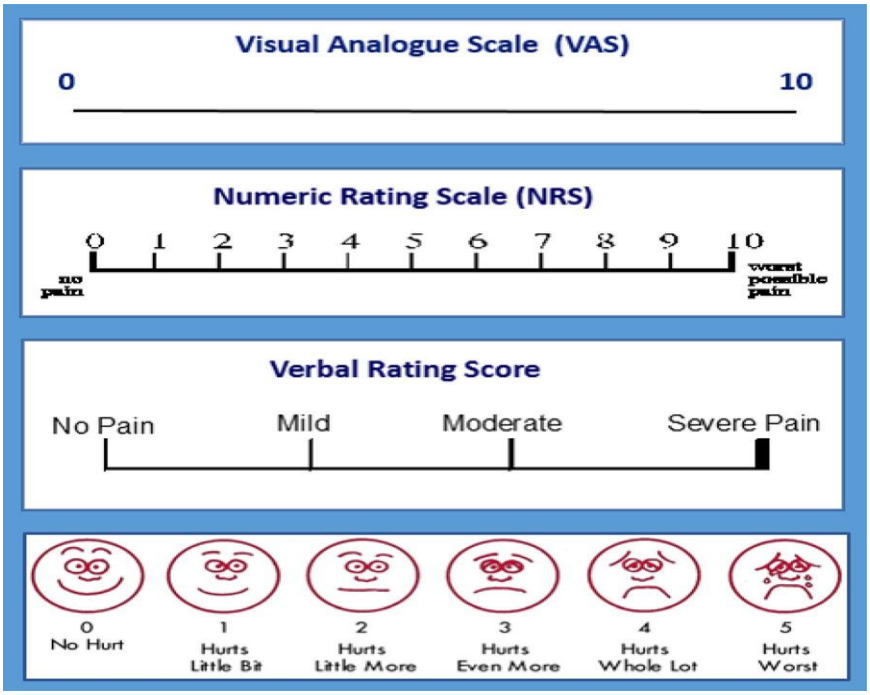


Figure 2.3. Common uni-dimensional pain assessment tools: Visual Analogue Scale (VAS), Numeric Rating Scale (NRS), Verbal Rating Scale (VRS), and Faces Pain Scale.(Adapted from El-Tallawy et al., 2020)

For chronic pain, multi-dimensional tools like the McGill Pain Questionnaire and Pain Inventory Scale are more appropriate, as they assess not just intensity but also the impact on mood, sleep, and daily function. Where neuropathic pain is suspected, instruments like the Leeds Assessment of Neuropathic Symptoms and Signs (LANSS), Douleur Neuropathique en 4 Questions (DN4), and PainDETECT may be applied (Bennett et al., 2007; El-Tallawy et al., 2020).A thorough history should also explore aggravating and relieving factors, such as posture, time of day, and physical activity. Additional details should include any previous MSK injuries, surgeries, medications, and relevant family, occupational, or social background.A complete and well-

structured history is vital for accurate diagnosis and helps guide an effective, individualised treatment plan for musculoskeletal pain.

2.7.2 Physical Examination

Physical examination plays a crucial role in assessing musculoskeletal pain (MSP) by providing objective findings that complement the patient's history. It helps determine the origin, type, and severity of pain, guiding diagnosis and treatment planning. The process begins with general observation, where gait, posture, and ease of movement are evaluated. Abnormalities such as limping, asymmetry, or difficulty changing positions may indicate specific dysfunctions. This is followed by local inspection for swelling, muscle wasting, deformities, or joint misalignment, which may reflect trauma, inflammation, or chronic disuse. Range of motion is assessed using a goniometer to detect movement limitations that may suggest stiffness, joint restriction, or pain avoidance. Muscle strength is tested manually and graded using tools such as the Oxford Muscle Grading Scale to identify weakness caused by nerve compression, disuse, or muscle injury. A structured physical exam links physical signs to underlying pathology and is essential for distinguishing mechanical, inflammatory, or neuropathic causes of pain. Specific orthopaedic tests may be employed, including:

i. Straight Leg Raise Test – used to identify lumbar disc herniation or nerve root compression.

ii. FABER's Test (Flexion, Abduction, External Rotation) – to assess for hip joint or sacroiliac joint pathology.

iii. Vertical Oscillatory Pressure – used to evaluate spinal segmental mobility, particularly in cases of low back pain.

iv. Empty Can Test – used to assess for rotator cuff injury, a common cause of shoulder pain (Lucas et al., 2022).

v. Cervical Distraction Test – to detect cervical radiculopathy or nerve root compression.

(Porter & Tidy, 2013)

These targeted tests are essential in differentiating between various MSK conditions and refining the diagnosis. For instance, a positive FABER's Test may indicate sacroiliac involvement, while a positive Empty Can Test may confirm shoulder impingement due to rotator cuff dysfunction. Physical examination not only validates the patient's complaints but also informs the formulation of precise and tailored physiotherapeutic strategies,

2.7.3 Radiographic Examination

Radiographic evaluation plays a crucial role in diagnosing musculoskeletal (MSK) conditions by providing visual insight into internal structures. Common modalities include X-rays, computed tomography (CT), and magnetic resonance imaging (MRI), each offering varying levels of detail regarding bone and soft tissue abnormalities.

2.7.3.1 X-rays

X-rays remain the most widely used imaging tool in musculoskeletal assessment due to their accessibility, speed, and affordability. They are particularly effective in detecting bone-related abnormalities such as fractures, structural deformities, and degenerative joint changes (Lateef & Patel, 2009). In cases of low back pain, X-rays are typically recommended when the clinical history suggests a non-mechanical origin or when degenerative spinal conditions are suspected. Standard imaging views such as anteroposterior and lateral are commonly taken to assess

vertebral alignment, disc space narrowing, and other pathological changes. Additionally, when spondylolysis is suspected, an oblique view may be requested to visualise potential defects in the pars interarticularis, which may not be visible in standard projections (Lateef & Patel, 2009).

2.7.3.2 Computerized Tomography (CT) Scan

Computed tomography (CT) is a valuable diagnostic tool in musculoskeletal evaluation, particularly for examining bony structures with greater precision than conventional radiographs. It provides detailed cross-sectional images that allow for clear visualisation of the spine in the axial plane, including the alignment of vertebrae relative to the neural canal (Arya, 2014).In musculoskeletal assessments, CT scans are especially useful for evaluating the spatial relationships between bones. They can effectively detect fractures, joint dislocations, and bone tumours. When investigating low back pain, CT imaging is often employed to examine the lumbar spine for abnormalities such as spondylolisthesis or other structural pathologies that may not be apparent on standard X-rays (Arya, 2014).

2.7.3.3 Magnetic Resonance Imaging (MRI)

Magnetic Resonance Imaging (MRI) is a non-invasive imaging technique that uses magnetic fields and radio waves to produce detailed images of soft tissues without radiation exposure (Pai et al., 2023). It is considered the gold standard for diagnosing musculoskeletal pain due to its ability to visualise discs, nerves, joints, and soft tissue abnormalities (Turner and Schmidt, 2022; Arya, 2014).

MRI is especially useful in evaluating low back pain when structural issues such as disc herniation, stenosis, nerve root compression, infections, or tumours are suspected (Gupta et al.,

2022). For neck pain with neurological signs like balance problems, it helps detect spinal cord compression and cervical myelopathy (Pompan, 2011). It is also effective for diagnosing rotator cuff injuries in the shoulder, revealing tendon tears and muscle atrophy (Smith et al., 2024; Vasquez-Lopez et al., 2024). When X-rays are inconclusive, MRI or ultrasound is often recommended (Lee et al., 2023). Newer methods such as Magnetic Resonance Elastography (MRE) can assess tissue stiffness, aiding in the evaluation of spinal muscle degeneration (Laine et al., 2025).

2.8 Management of Musculoskeletal Pain

2.8.1 Medical Management of Musculoskeletal Pain

Medication remains a key option in the treatment of musculoskeletal pain, particularly in the early stages or when symptoms are acute. Paracetamol is frequently used due to its low risk of side effects, although it may not provide adequate relief in more persistent or severe conditions. NSAIDs (non-steroidal anti-inflammatory drugs) are more effective for short-term management of pain and inflammation, especially in conditions like low back pain. However, their long-term use requires caution due to possible gastrointestinal and cardiovascular complications (Salah et al., 2021). For more intense or unresponsive cases, opioids may be considered as a secondary option, although their use is limited because of the risk of dependence and adverse effects such as drowsiness and digestive disturbances. Additionally, adjuvant medications like anticonvulsants and tricyclic antidepressants have shown benefits in treating pain with a neuropathic component by acting on central pain pathways (Salah et al., 2021).

2.8.2 Physiotherapy Management

Physiotherapy is a key conservative treatment for musculoskeletal (MSK) pain, focusing on symptom relief, functional restoration, and long-term prevention. Its core elements include manual therapy, exercise, physical modalities, and patient education.

i. Manual Therapy: This involves hands-on techniques to reduce pain and improve joint mobility, influenced by neurophysiological responses and the patient–therapist relationship (Fullen et al., 2023).

ii. Exercise Therapy: Exercise helps restore strength, flexibility, and function. Early stages may involve cryotherapy and compression to manage inflammation, followed by progressive stretching and strengthening as symptoms improve (Salah et al., 2021; El-Tallawy et al., 2020).

iii. Physical Modalities : Modalities like cryotherapy and thermal therapy are used for short-term pain relief. Cryotherapy reduces inflammation but is unsuitable for those with circulatory issues (Swenson et al., 1996). Heat therapy increases tissue flexibility and circulation, aiding mobility but should be avoided in certain medical conditions (French et al., 2006). TENS, based on the Gate Control Theory, may relieve pain but is contraindicated in individuals with pacemakers and has mixed evidence (Melzack, 1965; Vance et al., 2014).

iv. Condition-Specific Approaches : Treatment is tailored to pain location. For low back pain, early mobilisation and targeted strengthening are preferred (Koes et al., 2010). Neck and shoulder pain may benefit from posture correction and mobility work. Persistent symptoms or nerve involvement may require surgical referral (Ming et al., 2004; Arya, 2014).

v. Patient Education : Education empowers patients by explaining that pain can persist without ongoing tissue damage, often due to psychological factors. Pain neuroscience education helps

reduce fear, improve coping, and enhance outcomes when combined with active therapies (Fullen et al., 2023; Watson et al., 2019).

2.8.3 Surgical Management

Surgical options are typically reserved for cases where conservative treatment fails or when anatomical abnormalities such as disc herniation or nerve compression are identified. Interventions may include orthopaedic procedures to correct the underlying pathology or neurosurgical approaches such as decompression or spinal fusion. Other minimally invasive techniques like nerve blocks or radiofrequency ablation may also be considered for chronic, treatment-resistant pain (Salah et al., 2021).

2.8.4 Psychological Management

Musculoskeletal pain is not solely a physical condition. Psychological variables such as anxiety, fear, depression, and negative pain beliefs can influence the intensity and duration of symptoms. These factors are also linked to the transition from acute to chronic pain (Salah et al., 2021; NICE, 2016). Addressing psychological contributors is therefore essential. Recommended strategies include cognitive behavioural therapy (CBT), reassurance, stress reduction techniques, pain education, and counselling. These approaches improve mental well-being and play a supportive role in reducing pain-related disability and enhancing engagement with physiotherapy interventions (Salah et al., 2021; NICE, 2016).

2.9 Prevention of Musculoskeletal Pain

Preventing musculoskeletal pain (MSP) involves identifying and reducing exposure to modifiable risk factors, especially those common in student populations. While factors such as

age or sex cannot be changed, habits related to posture, physical activity, stress, and device use can be addressed to lower the risk of developing pain (European Agency for Safety and Health at Work, 2008).

i. Promoting Healthy Postural Habits: Maintaining good posture during lectures, study sessions, and daily tasks is essential in preventing neck, shoulder, and back pain. Strategies include sitting upright with lumbar and arm support, using well-aligned desks and chairs, and avoiding slouching or prolonged bending. Physiotherapists often teach postural awareness and correction to reduce physical strain (Ming et al., 2004; Chen and Mu, 2018).

ii. Physical Activity and Exercise Balance: Engaging in regular, balanced physical activity helps condition postural and stabilising muscles. However, overtraining or incorrect exercise form may increase pain risk. Preventive strategies should promote flexibility, core strength, and appropriate rest — ideally guided by physiotherapy professionals (Olawale et al., 2024).

iii. Wearing of protective equipment: In certain contexts, protective devices such as back belts, wrist splints, or neck collars may reduce mechanical stress and offer temporary support. For example, lumbar braces may help stabilise the lower back during extended sitting or lifting, potentially lowering the risk of pain in vulnerable individuals (European Agency for Safety and Health at Work, 2008).

iv. Lifestyle and Stress Management : Preventive care also involves maintaining a healthy weight and avoiding harmful habits like smoking, which can contribute to joint and disc degeneration. In addition, addressing academic stress through counselling, exercise, or relaxation techniques can reduce the combined impact of psychological and physical stressors on the body (Battie et al., 2019; Geetha et al., 2024).

By integrating these preventive strategies into everyday routines and physiotherapy guidance when needed, students can significantly reduce their risk of developing MSK pain. Encouraging these habits early is essential in promoting long-term musculoskeletal health within the undergraduate population.

2.10 Outcome Measures For Musculoskeletal Pain

2.10.1 Oswestry Disability Index (ODI)

The Oswestry Disability Index (ODI) is a widely recognised tool used to assess the extent of disability in individuals experiencing low back pain. It is a self-administered questionnaire comprising 10 sections, each addressing a specific aspect of daily living, such as personal care, lifting, walking, sitting, standing, sleep, social activities, and travel. Each section presents six response options, ranked from 0 to 5, with 0 indicating minimal or no difficulty and 5 representing severe limitation. Respondents select the statement that best reflects their current experience. To determine the overall score, the total points are summed, divided by the maximum possible score (50), and then multiplied by 100 to yield a percentage. Higher scores reflect a greater level of perceived disability (Fairbank and Pynsent, 2000; Mehra et al., 2008).The ODI has demonstrated strong reliability in various populations. Reported test-retest reliability ranges from 0.83 to 0.99 (Vianin, 2008), with Fairbank and Pynsent (2000) documenting a value as high as 0.99. In a Nigerian context, a study assessing its cross-cultural adaptation among Yoruba speakers found a test-retest reliability of 0.80 (95% CI: 0.74–0.84) and a convergent validity of $r = 0.30$ ($p = 0.001$) when compared with the Yoruba version of the Visual Analogue Scale (Mbada et al., 2020).

2.10.2 Neck Disability Index (NDI)

The Neck Disability Index (NDI) is a condition-specific questionnaire developed to evaluate functional limitations related to neck pain. It consists of 10 items, each targeting a different daily activity or symptom domain such as personal care, lifting, reading, concentration, driving, working, sleeping, recreation, and pain intensity (Vernon & Mior, 1991).Each item presents six response options, scored from 0 (no difficulty) to 5 (maximum limitation). The total score, derived by summing responses across all items, is converted to a percentage by dividing by the maximum score (50) and multiplying by 100. A higher percentage indicates greater neck-related disability (Vernon and Mior, 1991).The NDI has demonstrated strong psychometric properties, with reported intra-class correlation coefficients (ICCs) as high as 0.93, and confidence intervals ranging from 0.86 to 0.97, along with an internal consistency of 0.864 (McCarthy et al., 2007). Its reliability and content validity have also been confirmed in Nigerian populations, with a study by Odole et al. (2011) reporting a test-retest reliability of 0.96, supporting its use in culturally relevant settings.

2.10.3 Shoulder Pain and Disability Index (SPADI)

The Shoulder Pain and Disability Index (SPADI) is a self-report tool designed to evaluate both the pain intensity and functional limitations associated with shoulder conditions. It consists of 13 items, which are split into two subscales: five items assess pain and eight items measure disability (Roach et al., 1991). Each question is rated on a visual analogue scale, where respondents are asked to mark a point along a horizontal line that best represents the severity of their pain or difficulty. The ends of the line are anchored with descriptors ranging from “no pain/difficulty” to “worst imaginable pain” or “so difficult, assistance is required,” making it

similar in structure to the Visual Analogue Scale (VAS) (Roach et al., 1991). To calculate scores, each line is divided into 12 equal segments scored from 0 to 11, and the score corresponding to the respondent's mark is recorded. Subscale scores are computed by summing the values of the answered items, dividing by the total possible score for applicable items, and multiplying by 100. The final SPADI score is the average of the pain and disability subscale percentages, yielding a value between 0 and 100, where higher scores reflect greater pain and disability (Roach et al., 1991).In terms of psychometric properties, Roach et al. reported a test-retest reliability coefficient of 0.6552 and criterion validity values ranging from –0.5555 to –0.8036. A separate validation study among Dutch patients found an intra-class correlation coefficient (ICC) of 0.89 (95% CI: 0.82–0.93), and a convergent validity of r = 0.69 when compared with the Shoulder Disability Questionnaire (Graaf et al., 2014).

2.11 Empirical Review of Related Literature

Table 2.1: Summary of Empirical Review of Related Literature

Author/Year	Title	Methodology	Results	Conclusion
.Adesola et al. (2020)	Role of cultural beliefs in musculoskeletal pain management among Nigerians	Qualitative interviews with 100 urban and rural adults in Nigeria	Participants preferred traditional remedies (e.g., herbal medicine) over physiotherapy due to belief systems	Cultural resistance toward physiotherapy is prevalent and must be addressed through culturally relevant community health outreach
Akinwale et al. (2020)	Cultural practices and their impact on treatment of	Mixed-method study with 150 undergraduates involving surveys and	55% reported using herbal remedies; 35% avoided physiotherapy	Cultural practices reduce physiotherapy utilization—

	musculoskeletal pain in Nigerian university students	focus groups	due to cultural beliefs	highlighting the need for culturally tailored educational interventions
Mbada et al	Characteristics and determinants of community physiotherapy utilization and supply	Cross-sectional household survey of 336 Adults Using a three-section validated self-developed questionnaire	Lifetime utilization was 21.7%, 12-month utilization 7.4%; utilization was significantly linked to cultural and spiritual beliefs about pain.	Low utilization of physiotherapy services in rural Nigeria was significantly influenced by cultural beliefs about pain.
Oluwole et al. (2019)	Impact of socio-cultural factors on physiotherapy for musculoskeletal pain	Cross-sectional survey of 150 university students across Nigeria	Supernatural beliefs linked to reliance on traditional healers instead of	Culturally rooted pain beliefs influence health-seeking behavior,

	among Nigerian students		physiotherapy	necessitating culturally sensitive physiotherapy education
Onuoha et al. (2024)	Influence of cultural factors on health-seeking behavior in Ebonyi State, Nigeria	Structured survey of 255 rural respondents	Health-seeking behavior was shaped by beliefs, traditions, and social norms	Culturally grounded beliefs influence healthcare decisions—community-based awareness is essential
Ugwu et al. (2024)	Cultural barriers and intervention on healthcare utilization in Anambra State, Nigeria	Mixed-methods design with 400 urban/rural residents using questionnaires and interviews	Cultural norms delayed medical care despite participants downplaying cultural influence	Education and partnerships with traditional leaders are necessary to shift health-seeking practices

CHAPTER THREE

MATERIALS AND METHODOLOGY

3.1 Materials

3.1.1. Population

Participants were undergraduate students (200 level to final year, aged 18 years and above) from the School of Basic Medical Sciences, University of Benin, Nigeria. The study included both male and female students. Respondents were drawn from the seven departments within the faculty, and data were collected from them using physically administered questionnaires

3.1.2 Selection Criteria

3.1.2.1 Inclusion Criteria

Participants were required to:

i. Be registered undergraduate students (200 level to final year) in the School of Basic Medical Sciences, University of Benin.

ii. Be aged 18 years or older.

iii. Have experienced musculoskeletal pain within the last 12 months.

iv. Be willing and able to provide informed consent.

3.1.2.2 Exclusion Criteria

Participants who met the inclusion criteria were excluded if they:

i. Had a diagnosed neurological or systemic condition that significantly affected pain perception, as this could result in pain experiences not comparable to those of the general study population.

ii. Were receiving treatment for an acute injury or condition that could confound responses about typical musculoskeletal pain (MSP) experiences (e.g., recent fracture surgery or plaster immobilization).

iii. Had participated in a similar study within the last six months, to avoid potential bias from repeated exposure to similar questions or influence from previous responses.

3.1.3 List of Instruments

A self-administered questionnaire: The primary instrument that was employed for data collection in this study was a self-administered questionnaire.

3.1.4 Description of Instruments

A validated self-administered questionnaire was designed to gather relevant information across three major domains: sociodemographic background, musculoskeletal pain history, and cultural perceptions related to pain and physiotherapy. The questionnaire incorporated items adapted from the Standardized Nordic Musculoskeletal Questionnaire (NMQ), originally developed by Kuorinka et al. (1987) to evaluate musculoskeletal discomfort within occupational and ergonomic contexts. The NMQ has demonstrated high sensitivity (ranging from 66% to 92%) and specificity (ranging from 71% to 88%) in detecting pain over the past seven days (Ohlsson et al., 1994). Its reliability was also established through test–retest methods, with a kappa

coefficient varying from 0.64 to 0.71 for one-week pain recall and up to 0.82 for 12-month recall (Palmer et al., 1999).

In addition to Section B based on the NMQ, Section C of the instrument included researcher-designed items structured on a 5-point Likert scale (Strongly Agree to Strongly Disagree). These questions were aligned with the study's research questions and were intended to assess students' cultural beliefs about the causes of pain, their perceptions of physiotherapy, and the influence of family, religion, media, and peer groups on their health-seeking behavior.

The questionnaire was divided into the following three sections:

Section A – Sociodemographic Data: This section collected background information including age, gender, department, level of study, tribe, and religion.

Section B – Musculoskeletal Pain History: Adapted from the NMQ, this section focused on identifying the presence, frequency, and location of musculoskeletal pain experienced in the past 7 days and past 12 months. It also assessed whether the pain interfered with academic or daily activities and if any treatment was sought.

Section C – Cultural Beliefs and Perceptions: This section, developed by the researcher with insights from related studies (e.g., Onuoha, 2024), explored students' cultural beliefs regarding the causes of musculoskeletal pain, their perceptions of physiotherapy as a treatment option, and the influence of family, peers, religion, and media on their health-seeking behavior. Responses were measured using a 5-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

The questionnaire was distributed in printed form and administered in a supervised environment to minimize non-responses and ensure completeness of data collection.

3.2 Methods

3.2.1 Research Design

This research was a cross-sectional analytical study.

3.2.2 Sampling Technique

A stratified purposive sampling technique was employed in this study. This approach was appropriate because the study targeted a specific subset of the population: students within the School of Basic Medical Sciences who had experienced musculoskeletal pain (MSP) in the past 12 months. It also ensured representation across all departments and academic levels.

First, the total student population (N = 3,285) was stratified by department and academic level to reflect the population structure of the faculty. Then, within each stratum, purposive selection was used to identify only those students who met the inclusion criteria (i.e., those with MSP). Where the number of eligible respondents in any subgroup exceeded the proportionally allocated quota, random selection was applied among the qualified individuals to maintain balance and avoid bias.

The proportional allocation of the sample size (n = 357) across strata was determined using the formula:

$n_i = (N_i / N) * n$

Where:

n_i = sample size for each department/level

N_i = population of that department/level

N = total population (3,285)

n = total sample size (357)

This strategy allowed for a focused yet representative sample. It aligned with the objectives of the study while upholding methodological rigour. Details of the proportional allocation across departments and levels are provided in Table 3.1.

Table 3.1: Proportional Allocation of Sample Size Across Departments and Levels

Department	Level	Population	Allocated Sample
Anatomy	200	150	16
Anatomy	300	120	13
Anatomy	400	56	6
MBC	200	123	13
MBC	300	139	15
MBC	400	106	12
MLS	200	128	14
MLS	300	125	14
MLS	400	60	7
MLS	500	128	14
Nursing	200	218	24

Nursing	300	200	22
Nursing	400	170	18
Nursing	500	163	18
Physiology	200	130	14
Physiology	300	146	16
Physiology	400	55	6
Physiotherapy	200	140	15
Physiotherapy	300	137	15
Physiotherapy	400	136	15
Physiotherapy	500	115	12
Radiography	200	110	12
Radiography	300	150	16
Radiography	400	153	17
Radiography	500	127	14
Total		3,285	357

3.2.3 Sample Size Calculation

The target population for this study comprised undergraduate students in the School of Basic Medical Sciences, University of Benin — specifically those in 200 to 500 level. Based on figures obtained from departmental course representatives across Physiotherapy, Nursing, Medical Laboratory Science, Radiography, Anatomy, Physiology, and Medical Biochemistry, the total population was estimated to be 3,285 students.

The minimum sample size was determined using Yamane's formula (Yamane, 1967):

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

Where:

n = minimum sample size

N = total population (3,285)

e = margin of error (0.05)

Yamane's formula was chosen for its simplicity and effectiveness in calculating sample size for finite populations with known total size.

Substituting into the formula:

$n = (3,285) / (1 + 3,285(0.05)^2)$

$= (3,285)/ (1 + 8.21)$

$= (3,285)/ (9.21)$

$= 356.678$

Thus, the minimum sample size used for this study was approximately 357 participants.

3.2.4 Ethical Consideration

Ethical approval for this study was obtained from the Ethics and Research Committee of the College of Medical Sciences, University of Benin. A copy of the ethical approval certificate is presented in Appendix 2. Informed consent was sought and obtained from all participants before the commencement of data collection. Participants were adequately informed about the purpose of the study, what it entailed, and their right to decline or withdraw at any stage without penalty. All data collected were treated with strict confidentiality and used solely for academic research purposes.

3.2.5 Procedure For Data Collection

Data collection involved the use of a self-administered questionnaire designed to explore cultural beliefs and the utilization of physiotherapy for musculoskeletal pain (MSP). The questionnaire was distributed to eligible undergraduate students (200–500 level) in the School of Basic Medical Sciences, University of Benin, who had experienced MSP in the past 12 months. Respondents were approached in lecture halls and other designated gathering areas within the faculty.

The researcher was present during the administration of the questionnaire to provide guidance, clarify any questions, and ensure proper and complete filling of the forms. Before completing the questionnaire, all respondents were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. Only students who provided

informed consent were allowed to participate. Completed questionnaires were collected immediately after completion to minimize the risk of loss and to ensure high response quality.

3.2.6 Data Analysis

The data collected were analyzed using descriptive and inferential statistics. Descriptive statistics (frequency, percentages, mean, and standard deviation) summarized participants' demographic characteristics, cultural perceptions, and patterns of physiotherapy utilization for musculoskeletal pain (MSP). Chi-square tests were used to assess associations between cultural beliefs and the utilization of physiotherapy for musculoskeletal pain. Additionally, subgroup analyses were conducted to explore potential relationships between demographic factors (such as gender and academic level) and cultural perceptions or physiotherapy utilization.

All statistical analyses were performed using IBM SPSS version 25, selected for its reliability, wide adoption in health research, and robust tools for both descriptive and inferential analysis. The level of significance was set at $p < 0.05$.

CHAPTER FOUR

RESULTS

This chapter presents the results of the data analysis according to the research objectives and hypotheses of the study.

4.1 Introduction

The primary aim of this study was to determine how cultural belief systems influence the utilization of physiotherapy services in the management of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin. A total of 357 undergraduate students (200 level to final year, aged 18 years and above) from the School of Basic Medical Sciences, University of Benin, Nigeria were recruited for this study

4.1.1 Sociodemographic variables of the participants

Out of the three hundred and fifty-seven participants recruited for this study, 198(55.5%) were females while 159(44.5%) were males. 119(33.3%) of the respondents were between the ages of 18-20years. 182(51.0%) were between the ages of 21-23years. 82(23.0%) of the respondents were nursing students, 58(16.2%) were radiography students, 57(16.0%) were physiotherapy students. 108(30.3%) of the respondents were in 200L, 111(31.1%) were in 300L. 84(23.5%)

were Binis, 67(18.8%) were Esans, 51(14.3%) were Igbos. 298(83.5%) of the respondents were Christians, 55(15.4%) were Muslims.

Table 4.1: Sociodemographic variables of the participants

Variable	Frequency	Percentages
Gender		
Female	198	55.5
Male	159	44.5
Age		
18-20	119	33.3
21-23	182	51.0
24-26	49	13.7
27&above	7	2.0
Department		
Anatomy	35	9.8
Medical biochemistry	40	11.2
Medical laboratory science	49	13.7
Nursing	82	23.0
Physiology	36	10.1
Physiotherapy	57	16.0
Radiography	58	16.2
Level		
200	108	30.3
300	111	31.1
400	81	22.7
500	57	16.0
Tribe		
Afemai	48	13.4
Bini	84	23.5
Esan	67	18.8
Hausa	10	2.8
Igbo	51	14.3
Others	52	14.6
Yoruba	45	12.6
Religion		
Traditional	4	1.1
Christianity	298	83.5
Islam	55	15.4

4.1.2 Prevalence of Musculoskeletal Pain (MSP)

The 12-month prevalence of low back pain, neck pain and shoulder pain were 80.1%, 79.0% and 55.0% respectively. The 7-day prevalence of low back pain, neck pain and shoulder pain among the respondents were 39.8%, 16.5% and 19.6% respectively as shown in table 2.

Table 4. 2: Prevalence of Musculoskeletal Pain (MSP)

Variable	Frequency	Percentages
12-month		
Low back pain		
No	71	19.9
Yes	286	80.1
Neck pain		
No	75	21.0
Yes	282	79.0
Shoulder pain		
No	159	44.5
Yes	198	55.5
7-days prevalence		
Low back pain		
No	215	60.2
Yes	142	39.8
Neck pain		
No	298	83.5
Yes	59	16.5
Shoulder		
No	287	80.4
Yes	70	19.6

4.1.3 Cultural beliefs and utilization of physiotherapy for Musculoskeletal Pain (MSP)

115(32.2) of the respondents disagreed that body pain (like neck, back or shoulder pain) can be caused by spiritual or ancestral forces. 11(3.1%) of the respondents strongly agreed that they prefer traditional remedies (herbs, massage, rituals) over hospital treatment for body pain. 118(33.1%) of the respondents disagreed that prayer and rest are usually enough to treat body pain and therapy is not necessary. 246(68.9%) of the respondents strongly agreed that believe physiotherapy is effective for managing neck, back, or shoulder pain. 210(58.8%) of the respondents strongly agreed that they understand what physiotherapists do and how they can help with body pain. 184(51.5%) of the respondents strongly agreed that they would willingly go for physiotherapy if referred for neck, back, or shoulder pain. 114(31.9%) of the respondents strongly disagreed that physiotherapy is only for people with serious or permanent disabilities. 129(36.1%) of the respondents agreed that they get most of my information about pain and treatment from media (TV, social media, etc.) as shown in table 3.

Table 4.3: Cultural beliefs and utilization of physiotherapy for Musculoskeletal Pain(MSP)

Questions	SA	A	N	D	SD
I believe body pain (like neck, back or shoulder pain) can be caused by spiritual or ancestral forces	26(7.3%)	62(17.4%)	84(23.65)	70(19.6%)	115(32.2)
I prefer traditional remedies (herbs, massage, rituals) over hospital treatment for body pain	11(3.1%)	35(9.8%)	126(35.3%)	91(25.5%)	94(26.3%)
Prayer and rest are usually enough to treat body pain — therapy is not necessary	15(4.2%)	70(19.6%)	89(24.9%)	118(33.1%)	65(18.2%)
Body pain is sometimes seen as a test	9(2.5%)	16(4.5%)	39(10.9%)	125(35.0%)	186(47.1%)

of faith or destiny and may not need medical treatment					
My culture encourages me to visit traditional healers when I have body pain	10(2.8%)	28(7.8%)	57(16.0%)	98(27.5%)	164(45.9%)
I believe physiotherapy is effective for managing neck, back, or shoulder pain	246(68.9%)	98(27.5%)	4(1.1%)	9(2.5%)	
I understand what physiotherapists do and how they can help with body pain	210(58.8%)	110(30.8%)	31(8.7%)	4(1.1%)	2(0.6%)
I would willingly go for physiotherapy if referred for neck, back, or shoulder pain	184(51.5%)	125(35.0%)	35(9.8%)	10(2.8%)	3(0.8%)
Physiotherapy is only for people with serious or permanent disabilities	11(3.1%)	40(11.2%)	52(14.6%)	140(39.2%)	114(31.9%)
In my community, people don't talk much about physiotherapy or know what it is	79(22.1%)	155(43.4%)	61(17.1%)	40(11.2%)	22(6.2%)
My family or religious beliefs influence where I go for treatment when I'm in pain	16(4.5%)	80(22.4%)	59(16.5%)	121(33.9%)	81(22.87%)
What people in my community believe about pain affects where I go for help	8(2.2%)	40(11.2%)	61(17.1%)	117(32.8%)	131(36.7%)
I get most of my information about pain and treatment from media (TV, social media, etc.)	33(9.2%)	129(36.1%)	88(24.6%)	65(18.2%)	42(11.8%)
I have used physiotherapy services before for body pain	28(7.8%)	59(16.5%)	81(22.7%)	133(37.3%)	56(15.7%)
In my culture or environment, people are not encouraged to go for physiotherapy	27(7.6%)	37(10.4%)	55(15.4%)	79(22.1%)	159(44.5%)

SA=STRONGLY AGREE, A=AGREE, N=NUETRAL, D=DISAGREE, SD=STRONGLY DISAGREE

4.1.4 Chi-square association between demographic variables and 12-month prevalence of Musculoskeletal Pain (MSP)

Chi-square was conducted to examine the association between demographic variable and the 12-month prevalence of 12-month prevalence of Msk pain. The findings revealed there was no significant association between demographic variables and the 12-month prevalence of 12-month prevalence of Msk pain (p=>0.05) as shown in table 4.

Table 4.4: Chi-square association between demographic variables and 12-month prevalence of Musculoskeletal Pain(MSP)

Variable		12-month Prevalence of Msk			
		No	Yes	X^2	P
Age	18-20	0	119	0.964	0.810
	21-23	1	181		
	24-26	0	49		
	27&above	0	7		
Gender	Female	1	197	0.805	0.370
	Male	0	159		
Department	ANA	0	35	5.170	0.522
	MBC	0	40		
	MLS	0	49		
	NUR	0	82		
	PHS	0	36		
	PST	0	57		
	RAD	1	57		
Level	200	0	108	2.222	0.528
	300	1	110		
	400	0	81		
	500	0	57		
Tribe	Afemai	0	48	6.017	0.421
	Bini	0	84		
	Esan	0	67		
	Hausa	0	10		
	Igbo	1	50		
	Others	0	52		
	Yoruba	0	45		
Religion	Traditional	0	4	0.199	0.905
	Christianity	1	297		
	Islam	0	55		

4.1.5 Chi-square association between demographic variables and 7-day prevalence of Musculoskeletal Pain (MSP)

Chi-square was conducted to examine the association between demographic variable and the 12-month prevalence of 7-day prevalence of Msk pain. The findings revealed there was a significant association between gender and 7-day prevalence of Msk pain (p=0.025) as shown in table 5.

Table 4.5: Chi-square association between demographic variables and 7-day prevalence of Musculoskeletal Pain(MSP)

Variable		7-days Prevalence of Msk			
		No	Yes	X^2	P
Age	18-20	57	62	0.996	0.802
	21-23	80	102		
	24-26	24	25		
	27&above	4	3		
Gender	Female	81	117	5.042	0.025
	Male	84	75		
Department	ANA	19	16	5.563	0.474
	MBC	20	20		
	MLS	18	31		
	NUR	42	40		
	PHS	18	18		
	PST	26	31		
	RAD	22	36		
-					
Level	200	43	65	6.592	0.086
	300	47	64		
	400	46	35		
	500	29	28		
Tribe	Afemai	26	22	2.489	0.870
	Bini	39	45		
	Esan	32	35		
	Hausa	5	5		
	Igbo	20	31		
	Others	23	29		
	Yoruba	20	25		
Religion	Traditional	2	2	0.192	0.908
	Christianity	139	159		
	Islam	24	31		

4.1.6 Pearson correlation between cultural belief and utilization of physiotherapy services

Pearson correlation was done to examine the relationship between cultural belief and the utilization of physiotherapy services. The findings revealed there was a positive significant relationship between the cultural belief and the utilization of physiotherapy services among the respondents (r=0.208, p=<0.001) as shown in table

Table 4.6: Pearson correlation between cultural belief and utilization of physiotherapy services

Variable	R	p
Cultural belief * utilization of physiotherapy services	0.208	<0.001

4.2 Hypothesis testing

1. There will be no significant association between age and the 12-month prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.810

Decision: 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 the 12-month prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.370

Decision: 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 department and the 12-month prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.522

Decision: 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 level and the 12-month prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.528

Decision: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED

5. There will be no significant association between tribe and the 12-month prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.421

Decision: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED

6. There will be no significant association between religion and the 12-month prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.905

Decision: 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 age and the 7-day prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.802

Decision: 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 gender and the 7-day prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.025

Decision: Since the observed p value is less than 0.05, the null hypothesis is therefore REJECTED

9. There will be no significant association between department and the 7-day prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.474

Decision: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED

10. There will be no significant association between level and the 7-day prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.086

Decision: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED

11. There will be no significant association between tribe and the 7-day prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.870

Decision: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED

12. There will be no significant association between religion and the 7-day prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.908

Decision: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED

There will be no significant association between religion and the 7-day prevalence of musculoskeletal pain among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Chi-square

Alpha level: 0.05

Observed p value: 0.908

Decision: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED

17. There will be no significant relationship between cultural beliefs and the utilization of Physiotherapy services among undergraduate students in the School of Basic Medical Sciences, University of Benin

Test: Pearson correlation

Alpha level: 0.05

Observed p value: <0.001

Decision: Since the observed p value is less than 0.05, the null hypothesis is therefore REJECTED

4.3 Summary of Findings

In summary, the findings of this study revealed no significant associations between demographic variables (age, department, level, tribe, religion) and the 12-month prevalence of musculoskeletal pain among undergraduate students. A significant association was observed between gender and the 7-day prevalence of musculoskeletal pain ($p = 0.025$). Furthermore, a weak but statistically significant positive relationship was found between cultural beliefs and the utilization of physiotherapy services among the respondents ($r = 0.208$, $p < 0.001$).

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

The primary aim of this study was to determine the relationship between cultural beliefs and the utilization of physiotherapy services among students of the School of Basic Medical Sciences, University of Benin. A total of 357 respondents participated in the study, comprising students aged 18 years and above from seven departments within the school. The findings revealed a high prevalence of musculoskeletal pain among the respondents, particularly in the lower back, neck, and shoulder regions. This aligns with reports by Akinwale et al. (2020) and Joseph et al. (2018), who observed similar trends among university students and attributed them to prolonged sitting, poor posture, and extended study hours.

The results also showed a significant association between gender and the 7-day prevalence of musculoskeletal pain, with females reporting more pain than males. This finding is consistent with earlier research linking higher rates of musculoskeletal pain among females to physiological and ergonomic factors such as reduced muscle mass, hormonal influence, and differences in daily activity patterns. Other demographic variables such as age, department, and level of study did not show significant association with musculoskeletal pain, which agrees with the findings of Ogunjimi and Adeyemi (2017).

A major finding of this research was the statistically significant relationship between cultural beliefs and physiotherapy utilization ($r = 0.208$, $p < 0.001$). The p-value indicates that cultural beliefs indeed influence the use of physiotherapy services. However, the weak correlation coefficient ($r = 0.208$) suggests that while cultural beliefs play a role, they are not the sole determinant of whether students seek physiotherapy care. This implies that other factors—such as access to care, financial capability, and personal experience—also contribute to the observed utilization patterns.

This finding agrees with Adesola et al. (2020), who reported that although cultural and spiritual beliefs still influence healthcare decisions, the impact of such beliefs tends to reduce among educated populations with better health literacy. Similarly, Mbada et al. (2015) observed that increased awareness and education about physiotherapy reduce dependence on traditional or faith-based healing practices. In this study, most respondents demonstrated good awareness of physiotherapy, yet actual utilization remained moderate—supporting Okafor and Osho (2016), who noted that awareness alone does not necessarily translate into service use.

During questionnaire administration, informal interviews with some participants revealed additional insights. Several students indicated that limited access to physiotherapy facilities within the university influenced their health-seeking behavior. Many stated that if there were a physiotherapy clinic within the school's health center, they would be more likely to seek care for musculoskeletal pain. Financial constraints were also mentioned as a major barrier, as some students felt they could not afford private physiotherapy services. These observations suggest that structural and economic factors, in addition to cultural beliefs, influence physiotherapy utilization among students.

It is also noteworthy that the respondents were medical science undergraduates, a group likely to possess better understanding of pain mechanisms and the role of physiotherapy than the general population. This may explain why cultural beliefs showed only a weak correlation with physiotherapy utilization. In populations with less medical knowledge—such as non-science students, artisans, or market women—cultural beliefs might exert a stronger influence. Future studies involving these groups could therefore provide a more comprehensive understanding of how culture shapes physiotherapy utilization in Nigeria.

Overall, the findings of this study underscore that while cultural beliefs still exert some influence on physiotherapy utilization, their effect is diminishing within educated groups. Accessibility, affordability, and perceived relevance of physiotherapy appear to be more pressing determinants of service use. These results highlight the need for better access to physiotherapy services, continuous health education, and integration of physiotherapy awareness into broader student health initiatives.

5.2 Conclusion

In conclusion, this study assessed the relationship between cultural beliefs and the utilization of physiotherapy services among students of the School of Basic Medical Sciences, University of Benin. The findings revealed a high prevalence of musculoskeletal pain among the respondents, indicating that musculoskeletal discomfort remains a common health concern even among young adults in health-related disciplines.

The study also demonstrated that although the majority of respondents possessed adequate knowledge and awareness of physiotherapy, cultural beliefs still exerted a weak but statistically significant influence on their utilization of physiotherapy services. This implies that while education and exposure to health sciences have reduced the strength of cultural misconceptions, such beliefs continue to subtly shape perceptions and health-seeking behavior. Gender was the only demographic variable that showed a significant association with the prevalence of musculoskeletal pain, with females reporting a higher occurrence. Other demographic factors such as age, department, and level of study did not significantly influence either the prevalence of pain or the utilization of physiotherapy services.

Overall, the findings suggest that increasing awareness and accurate understanding of physiotherapy within the student population have contributed to improved attitudes toward the profession. However, underlying cultural and social influences remain relevant factors that can affect the extent of physiotherapy utilization. Efforts to further promote physiotherapy should therefore take into account the cultural context and belief systems of the target population.

5.3 Recommendations

Based on the findings and observations from this study, the following recommendations are made:

5.3.1. Establishment of a Physiotherapy Unit within the University Health Centre:

Many students reported that limited access discouraged them from using physiotherapy services. The University of Benin management should consider setting up a physiotherapy unit within the school health centre to make physiotherapy services more accessible to students with musculoskeletal pain. The payment for such services should also be subsidized to encourage students to patronize them.

5.3.2 Regular Health Awareness and Education Campaigns:

Although cultural beliefs showed only a weak relationship with physiotherapy utilization, some misconceptions about physiotherapy still exist. The Department of Physiotherapy, in collaboration with the Students' Affairs Division, should organize periodic health talks and awareness campaigns to educate students on the benefits of physiotherapy in managing musculoskeletal pain.

5.4. Implications for Further Study

Given that this study focused on undergraduate students within the School of Basic Medical Sciences, who possess some prior health-related knowledge, future research should extend to

non-medical students and the general population. Expanding the scope beyond medical undergraduates will provide deeper insights into how cultural and social factors influence awareness, perceptions, and utilization of physiotherapy services among individuals with diverse educational and cultural backgrounds.

References

Adegoke, B. A., Odole, A. C., & Adeyinka, A. A. (2015). Adolescent low back pain among secondary school students in Ibadan, Nigeria. *African Health Sciences*. **15**(2):429–437.

Ajaegbu, O. O., & Ubochi, I. I. (2016). Health seeking behaviour among undergraduates in the Faculty of Health Sciences and Technology, University of Nigeria Enugu Campus. *International Journal of Evaluation and Research in Education (IJERE).* **5**(3):181–188.

Amako, M., et al. (2018). Exercise-related musculoskeletal injuries in Japanese workers: Frequency and determinants. *Journal of Occupational Health*. **60**(3):225–234.

Antoniou, J., Steffen, T., Nelson, F., Winterbottom, N., Hollander, A. P., Poole, R. A., & Aebi, M. (2012). The human lumbar intervertebral disc: Evidence for changes in the biosynthesis and denaturation of the extracellular matrix with growth, maturation, aging, and degeneration. *Spine*. **21**(10):1234–1241.

Arya, C. (2014). MRI in spinal disorders: A review of current applications. *Journal of Orthopaedic Sciences.* **19**(3):321–330.

Ayanniyi, O., Mbada, C.E. & Ayanniyi, A.A., 2016. Prevalence and pattern of musculoskeletal pain among undergraduates from a Nigerian university. *African Journal of Physiotherapy and Rehabilitation Sciences.* **8**(1–2):Pp.1–6.

Ayanniyi, O., Mbada, C.E. & Iroko, O.P., 2010. Neck pain occurrence and characteristics in Nigerian university undergraduates. *TAF Preventive Medicine Bulletin.* **9**(3):Pp.167–174

Babatunde, O., Jordan, J., van der Windt, D., Hill, J., Foster, N., & Protheroe, J. (2017). Effective treatment options for musculoskeletal pain in primary care: A systematic overview of current evidence. *PLOS ONE.* **12**(6).

Barbe, M. F., & Barr, A. E. (2006). Work-related musculoskeletal disorders: What we know, what we do not know, and what we should do. *Journal of Electromyography and Kinesiology.* **16**(1):1–16.

Baron, R., Binder, A., & Attal, N. (2017). Neuropathic low back pain in clinical practice. *The Lancet Neurology.* **16**(11):1017–1024.

Baron, R., Maier, C., Attal, N., Binder, A., & Bouhassira, D. (2017). Peripheral neuropathic pain: A mechanism-related organizing principle based on sensory profiles. *Pain*. **158**(2):261–272.

Battie, M. C., Videman, T., Levalahti, E., Gill, K., & Kaprio, J. (2019). Heritability of low back pain and the role of disc degeneration. *Spine*. **34**(3):281–286.

Bennett, M. I., Attal, N., Backonja, M. M., Baron, R., Bouhassira, D., Freynhagen, R., Scholz, J., Tölle, T. R., Wittchen, H. U., & Staehelin, T. (2007). Using screening tools to identify neuropathic pain. *Pain*. **127**(3):199–203.

Binder A. (2008). Neck Pain. *Biomedical Journal of Clinical Evidence.* **8**(1103):1 – 34

Bolarinde, S. O., Ajomale, B. O., Ani, O. E., & Kayode-Imoru, O. O. (2023). Prevalence of musculoskeletal disorders and its impact on quality of life among the elderly attending geriatric clinic in a Nigeria tertiary health institution. *Journal of Community Medicine and Public Health Reports.* **4**(8).

Canthen, J. C., & Renner, E. J. (1975). Transcutaneous and peripheral nerve stimulation for chronic pain states. *Surgical Neurology.* 11:102–104.

Cavallari, J. M., Woskie, S. R., & Christiani, D. C. (2016). Gender differences in musculoskeletal symptoms and disorders among workers. *Occupational and Environmental Medicine.* **73**(2):92–99.

Chen, Y., & Mu, J. (2018). Effects of backpack carriage on posture and discomfort in school students. *Ergonomics*. **61**(5):745–755.

Cohen, S. P., Argoff, C. E., & Carragee, E. J. (2008). Management of low back pain. *BMJ*. 337, a2718.

Cohen, S. P., & Mao, J. (2014). Neuropathic pain: Mechanisms and their clinical implications. *BMJ.* 348:f7656.

Darlow, B., Dowell, A., Baxter, G. D., Mathieson, F., Perry, M., & Dean, S. (2013). The enduring impact of what clinicians say to people with low back pain. *Annals of Family Medicine.* 11:527–534.

DeLisa, J. A. (2010). Treatment of the patient with chronic pain. In DeLisa's Physical Medicine & Rehabilitation: Principles and Practice (5th ed., pp. 1273–1318). Philadelphia, PA: Lippincott, Williams & Wilkins.

Dellaroza MS, Pimenta CA, Matsuo T (2007) Prevalence and characterization of chronic pain among the elderly living in the community. *Cad Saude Publica.* **23**(5):1151–60

Dieppe, P. (2013). *Chronic musculoskeletal pain*. BMJ, 346, f3146.

Dommerholt, J., Bron, C., & Franssen, J. (2006). Myofascial trigger points: An evidence-informed review. *Journal of Manual & Manipulative Therapy.* **14**(4):203–221.

Dowell, D., Haegerich, T. M., & Chou, R. (2022). CDC clinical practice guideline for prescribing opioids for pain — United States, 2022. *MMWR Recommendations and Reports.* **71**(3):1–95.

Dydyk, A., Khan, A., & Das, A. (2021). Radiculopathy. In StatPearls. StatPearls Publishing.

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.

Emorinken, A. D., Erameh, C. O., & Blessy, A. (2022). Epidemiology of low back pain: Frequency, risk factors, and patterns in South-South Nigeria. Nigerian Journal of Medical Rehabilitation. **25**(1):12–20.

Eromon, P. E., Awunor, N. S., Enobakhare, E., & Neba, F. (2024). Prevalence of low back pain among adult patients attending family medicine clinics in Irrua Specialist Teaching Hospital, Edo State, Nigeria. *African Journal of Family Medicine.* **8**(1):45–52.

European Agency for Safety and Health at Work. (2008). Work-related musculoskeletal disorders: Prevention report. Publications Office of the European Union.

Fairbank J & Pynsent P. (2000). The Oswestry Disability Questionnaire. *Spine*. **25**(22):2940 – 22953

Ferdinandov, D., Al-Sharifi, M., Low, S., & Rajan, R. (2023). Low back pain. In StatPearls. StatPearls Publishing.

Finnerup, N. B., Attal, N., Haroutounian, S., McNicol, E., Baron, R., Dworkin, R. H., … Wallace, M. (2021). Pharmacotherapy for neuropathic pain in adults: A systematic review and meta-analysis. *The Lancet Neurology.* **20**(2):169–182.

Fischer, E., & Solomon, S. (1965). Physiological responses to heat and cold. In S. Licht (Ed.), Therapeutic Heat and Cold (2nd ed., pp. 126–169). Baltimore, MD: Waverly Press.

French, S. D., Cameron, M., Walker, B. F., Reggars, J. W., & Esterman, A. J. (2006). Superficial heat or cold for low back pain. *Cochrane Database of Systematic Reviews.* 1: CD004750.

Freeman, R., Baron, R., Bouhassira, D., Cabrera, J., & Emir, B. (2014). Sensory profiles of patients with neuropathic pain. *Neuroscience Letters.* 579:28–33.

Fullen, B. M., Wittink, H., De Groef, A., Hoegh, M., McVeigh, J. G., Martin, D., & Smart, K. (2023). Musculoskeletal pain: Current and future directions of physical therapy practice. Archives of Rehabilitation & Clinical Translation.

GBD 2021 Low Back Pain Collaborators. (2023). Global, regional, and national burden of low back pain, 1990–2020, its attributable risk factors, and projections to 2050: A systematic analysis of the Global Burden of Disease Study 2021. *The Lancet Rheumatology.* **5**(6):e316–e329.

Geetha, K., Almanasef, M., Almeleebia, T., Orayj, K., Shorog, E., Alshahrani, A. M., … Almutairi, F. (2024). Prevalence of musculoskeletal pain among undergraduate students. *Frontiers in Medicine.* 11, Article 1403267.

Global Burden of Disease Study 2021 Low Back Pain Collaborators. (2023). Global, regional, and national burden of low back pain, 1990–2020, its attributable risk factors, and projections to 2050. *The Lancet Rheumatology.* **5**(7):e402–e414.

Gupta, V., Kumar, A., & Sharma, N. (2022). Value of imaging examinations in diagnosing lumbar disc herniation: A systematic review. *Frontiers in Surgery.* 9, Article 1020766.

Hannafin, J. A., & Chiaia, T. A. (2020). The puzzling pathophysiology of frozen shoulders: A scoping review. *Journal of Experimental Orthopaedics.* **7**(1):54.

Heraughty, M., & Ridehalgh, C. (2020). Sensory descriptors identifying neuropathic pain in low back pain: A review. *Current Medical Research and Opinion.* **36**(12):2037–2048.

Hershkovich, O., Friedlander, A., Gordon, B., Derazne, E., Tzur, D., Wolach, B., & Afek, A. (2013). Association of body mass index and body height with low back pain in 829,791 adolescents. *American Journal of Epidemiology.* **178**(4):603–609.

Jani, B. K., Swaminathan, S., Ashwath, K. G., & Tripathi, S. P. (2024). Mechanical low backache: Review of anatomical basis of low back pain and significance of muscle strengthening exercises. *Clinical Archives of Bone and Joint Diseases*. **7**(1), Article 019.

Koes, B., Tudler, M., Lin, C., Macedo, L., McAuley, J., & Maher, C. (2010). An updated overview of clinical guidelines for the management of non-specific low back pain in primary care. *European Spine Journal.* 19:2075–2094.

Kosek, E., Clauw, D., Nijs, J., Baron, R., Gilron, I., Harris, R. E., … Sterling, M. (2021). Chronic nociplastic pain affecting the musculoskeletal system: Clinical criteria and grading system. *Pain.* **162**(10):2629–2634.

Laine, A., Østensvik, Å., & Bruvik, Å. (2025). Magnetic resonance elastography of the lumbar spine: A scoping review. *BMC Medical Imaging.* 25, Article 16.

Lateef H & Patel D. (2009). What is the role of imaging in acute low back pain. Current Reviews in Musculoskeletal Medicine. **2**(2):69 – 73

Lee, K.-C., Cho, Y., Ahn, K.-S., Park, H.-J., Kang, Y.-S., Lee, S., Kim, D., & Kang, C. H. (2023). Deep-learning-based automated rotator cuff tear screening in three planes of shoulder MRI. *Diagnostics.* **13**(20):3254.

Lin, R., & Lin, Y. (2023). Musculoskeletal pain and computer/mobile phone use in Chinese medical students: A cross-sectional study. *BMC Musculoskeletal Disorders.* **24**(1):123.

Lucas, J., van Doorn, P., Hegedus, E., Lewis, J., & van der Windt, D. (2023). A systematic review of the global prevalence and incidence of shoulder pain. *British Journal of Sports Medicine.* **57**(1):12–20.

Maher, C., Underwood, M., & Buchbinder, R. (2017). Non-specific low back pain. *The Lancet.* **389**(10070):736–747.

Marchand, F. (2024). Cultural beliefs and pain perception: A systematic review. Pain Medicine. **25**(5):985–1000.

Mbada, C. E., Adeyemi, T. L., Adedoyin, R. A., Badmus, H. D., Awotidebe, T. O., Arije, O. O., & Omotosho, O. S. (2019). Prevalence and modes of complementary and alternative medicine use among peasant farmers with musculoskeletal pain in a rural community in South-Western Nigeria. *BMC Complementary and Alternative Medicine.* **19**(1):147.

Mbada, C. E., Odole, A. C., Oyewole, O. O., & Fatoye, F. (2019). Characteristics and determinants of community physiotherapy utilisation in rural Nigeria. *BMC Health Services Research.* 19:168.

McCarthy M., Grevitt M., Silcocks P. & Hobbs G. (2007). The reliability of the Vernon and Mior neck disability index and its validity compared with the short form-36 health survey questionnaire. *European Spine Journal.* **16**(12):2111 – 2117

Mehra A., Baker D., Disney S. & Pynsent PB. (2008). Oswesty Disability Index Scoring Made Easy. *Annals The Royal College of Surgeons England.* **90**(6):497 – 499

Ming, L. E., Zhang, Y. H., & Liu, Y. P. (2004). Common causes of shoulder pain and diagnostic methods. *Journal of Musculoskeletal Medicine.* **21**(6):297–303.

Murakami, K., Tanaka, M., & Sudo, H. (2022). Age-related changes in intervertebral disc composition and biomechanics. *Spine Journal.* **22**(2).132–141.

Murphy, R. J., & Carr, A. J. (2010). Shoulder pain. In A. J. Carr & D. N. Buchbinder (Eds.), Oxford Textbook of Musculoskeletal Medicine (pp. 145–162). Oxford University Press.

Namwongsa, T., Puntumetakul, R., Neubert, M. S., & Boucaut, R. (2024). Risk factors for neck pain in smartphone users: A systematic review. *Work*. **76**(2):401–412.

National Institute for Health and Clinical Excellence. (2016, November 30). Low back pain and sciatica in over 16s: Assessment and management (NICE Guideline NG59). London, UK: Author.

Nijs, J., Apeldoorn, A., Hallegraeff, H., Clark, J., & Smeets, R. (2015). Low back pain: Guidelines for the clinical classification. *Manual Therapy.* **20**(3):411–417.

Nunes, I. L., & Bush, P. M. (2012). Ergonomic and individual risk factors for musculoskeletal disorders in university students. *Work.* **41**(1):2159–2165.

Odole AC., Adegoke BA. & Akomas NC. (2011). Validity and test-retest reliability of the neck disability index in the Nigerian clinical setting. *African Journal of Medicine and Medical Sciences.* 40:135 – 137

Olayinka, A., Osunwoke, E., & Adebayo, K. (2024). Musculoskeletal pain among undergraduate laptop users in a Nigerian university. *Nigerian Journal of Ergonomics.* **6**(1):14–23.

Olawale, H., & Oke, A. (2019). The relationship between backpack use and musculoskeletal pain among students. *Nigerian Journal of Physiotherapy.* **23**(2):45–51.

Olawale, S., Adebiyi, B., & Ogunleye, A. (2024). Prevalence and risk factors for neck pain and low back pain among college students in Nigeria. Research Square.

Omokhodion, F. O., & Sanya, A. O. (2003). Risk factors for low back pain among office workers in Ibadan. *Occupational Medicine.* **53**(4):287–289.

Onuoha, O. O., Okereke, O. J., Ngwoke, G. O., & Ekpechu, J. O. A. (2024). Influence of cultural factors on health-seeking behavior in Ebonyi State, South East, Nigeria: The Ishiagu-Ebonyi exemplar. *Nigerian Journal of Social Psychology*. **7**(2):290–305.

Orok, E., Nwifama, S., Oni, O., Ojo, T., Oluwadare, T., Bamitale, T., Jaiyesimi, B., Saka, A., Apara, T., & Kukoyi, O. (2024). Students' perception of healthcare services and factors affecting their utilization at a Nigerian university: a cross-sectional study. Scientific Reports.

Pai, A., Shetty, R., Hodis, B., & Chowdhury, Y. S. (2023). Magnetic resonance imaging physics. In StatPearls. StatPearls Publishing.

Pangarkar, S. S., Kang, D. G., Sandbrink, F., et al. (2019). VA/DoD clinical practice guideline: Diagnosis and treatment of low back pain. *Journal of General Internal Medicine.* 34(Suppl 1), 2620–2629.

Pompan D. (2011). Appropriate Use of MRI for Evaluating Common Musculoskeletal Conditions. American Family Physician. 15(83). [online].

Popoola, T. O., & Akinpelu, A. O. (2009). Low back pain among medical students. Spine (Phila Pa 1976), **34**(17):E592–E596.

Porter, S. B., & Tidy, N. M. (2013). Tidy's physiotherapy (15th ed., pp. 207–235). Elsevier.

Punnett, L., & Wegman, D. H. (2004). Work-related musculoskeletal disorders: The epidemiologic evidence and the debate. *Journal of Electromyography and Kinesiology*. **14**(1):13–23.

Puntillo, F., Giglio, M., Brienza, N., Viswanath, O., Urits,l., Kaye, A. D., & Paladini, A. (2021). Pathophysiology of musculoskeletal pain: A narrative review. *Pain and Therapy* **10**(1):287–306.

Qaseem, A., Wilt, T. J., McLean, R. M., & Forciea, M. A. (2017). Noninvasive treatments for acute, subacute, and chronic low back pain: A clinical practice guideline. *Annals of Internal Medicine.* **166**(7):514–530.

Ren, K. (2021). Chronicity, comorbidity, immune regulation, sex differences, diagnosis, and treatment opportunities in musculoskeletal pain. Frontiers in Pain Research, 2, Article 721484. https://doi.org/10.3389/fpain.2021.721484 / Grand challenges in musculoskeletal pain research: Chronicity, comorbidity, immune regulation, sex differences, diagnosis, and treatment opportunities. *Frontiers in Pain Research.* 2,Article 745210.

Reis, F. J. J., Nijs, J., Parker, R., Sharma, S., & Wideman, T. H. (2022). Culture and musculoskeletal pain: Strategies, challenges, and future directions to develop culturally sensitive physical therapy care. *Brazilian Journal of Physical Therapy*. 26:100442.

Roach KE., Budiman-Mak E., Songsiridej N. & Lertratanakul Y. (1991). Development of a Shoulder Pain and Disability Index. *Arthritis Care and Research*. **4**(4):143 – 148

Russell, I. J. (2011). Future perspectives in generalized musculoskeletal pain syndromes. *Best Practice & Research Clinical Rheumatology*. **25**(2):321–331.

Samuel Olawale, Tobi Olajide, Abigail Oyedokun et al. (2024). Prevalence and Risk Factors for Neck Pain and Low Back Pain Among College Students in Nigeria, 04 September 2024, PREPRINT (Version 1) available at Research Square

Schug, S. A., Palmer, G. M., Scott, D. A., Halliwell, R., & Trinca, J. (2016). Acute pain management: Scientific evidence (4th ed.). *Medical Journal of Australia*, **204**(8):315–317.

Shaygan, M., & Böger, A. (2014). Neuropathic sensory symptoms: Pain and psychological factors. Neuropsychiatric Disease and Treatment, 10, 1191–1199 / Pain descriptors and classification of pain types. *Journal of Clinical Neuroscience*. **21**(7):1105–1108.

Shraim, M. A., Massé-Alarie, H., Hall, L. M., & Hodges, P. W. (2020). Mechanism-based classification systems for pain experienced in the musculoskeletal system: A systematic review. *Clinical Journal of Pain.* **36**(10):793–812

Sima, S., & Diwan, A. (2025). Contemporary clinical perspectives on chronic low back pain: The biology, mechanics, etc. underpinning clinical and radiological evaluation. *JOR Spine.* **8**(1):e70021.

Smith, E, Hoy DG, Cross M, et al. (2014). The global burden of other musculoskeletal disorders: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis*. 73:1462–9.

Smith, J. P., Carr, E. J., & Fung, P. (2024). Rotator cuff tear patterns: MRI appearance and surgical relevance. Insights into Imaging.

Solomon, L., Warwick, D., Nayagam, S., & Bartholomew, M. (2010). Apley's system of orthopaedics and fractures (9th ed.). Hodder Arnold.

Spahr, A., Stämpfli, P., Hollenstein, C., & Imboden, M. (2017). Clinical characteristics of musculoskeletal pain in patients with fibromyalgia vs osteoarthritis. *Clinical Rheumatology.* **36**(2):431–438.

Spahr, N., Hodkinson, D., Jolly, K., & Williams, S. (2017). Distinguishing nociceptive and neuropathic pain. *Musculoskeletal Science and Practice*. 28:1–8.

StatPearls. (2023). Low back pain. StatPearls Publishing.

Swenson, C., Sward, L., & Karlsson, J. (1996). Cryotherapy in sports medicine. Scandinavian *Journal of Medicine & Science in Sports.* **6**(4):193–200.

Taguchi, T., Hagino, H., & Ikeda, M. (2003). The relationship between poor posture and the prevalence of low back pain in workers. *Journal of Occupational Health*. **45**(5):300–307.

Treede, R.-D., Rief, W., Barke, A., Aziz, Q., Bennett, M. I., Benoliel, R., … Wang, S.-J. (2019). Chronic pain as a symptom or a disease: The IASP Classification of Chronic Pain for the International Classification of Diseases (ICD-11). *Pain*. **160**(1):19–27.

Ugwu, R. (2020). Cultural interpretations of chronic pain and their impact on health-seeking behaviour among Nigerians. *African Journal of Physiotherapy and Rehabilitation Sciences.* **12**(2):87–94.

Ugwu, U. T., & Okpala, C. (2024). Cultural barriers and intervention on healthcare utilization in Anambra State, Nigeria. *IGBOCHOLARS International Journal of Igbo Scholars Forum, Nigeria*, **17**(2):1–15.

Viester, L., Verhagen, E. A., Bongers, P. M., & van der Beek, A. J. (2013). The relation between body mass index and musculoskeletal symptoms in the working population. *BMC Musculoskeletal Disorders.* 14:238.

Weleslassie, G. G., Meles, H. G., Haile, T. G., et al. (2020). Burden of neck pain among medical students in Ethiopia. *BMC Musculoskeletal Disorders.* 21:14.

World Health Organization. (2021). Rehabilitation in health systems: Guide for action.

World Health Organization. (2022). Low back pain clinical care standard [PDF].

World Health Organization. (2023, June 19). Low back pain fact sheet.

Xie, Y., Szeto, G. P., & Dai, J. (2016). Prevalence and risk factors associated with musculoskeletal complaints among users of mobile handheld devices: A systematic review. *Applied Ergonomics*. 59:132–142.

Yu, S., Chen, C., Pan, Y., Kurz, M. C., Datner, E., Hendry, P. L., … Nugent, T. F. (2019). X-chromosome escape genes and co-morbid chronic musculoskeletal pain in women post-trauma. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*. **180**(6):415–427.

Zheng, B., Zheng, L., Li, M., et al. (2022). Sex differences in factors associated with neck pain among undergraduate healthcare students: A cross-sectional survey. *BMC Musculoskeletal Disorders.* **23**(1):842.

APPENDICES

APPENDIX I

QUESTIONNAIRE

SECTION A: Socio-Demographic Data

Please fill in or tick the appropriate responses.

1. Age: _____

2. Gender: _____

3. Department: _____

4. Level of Study: _____

5. Tribe: _____

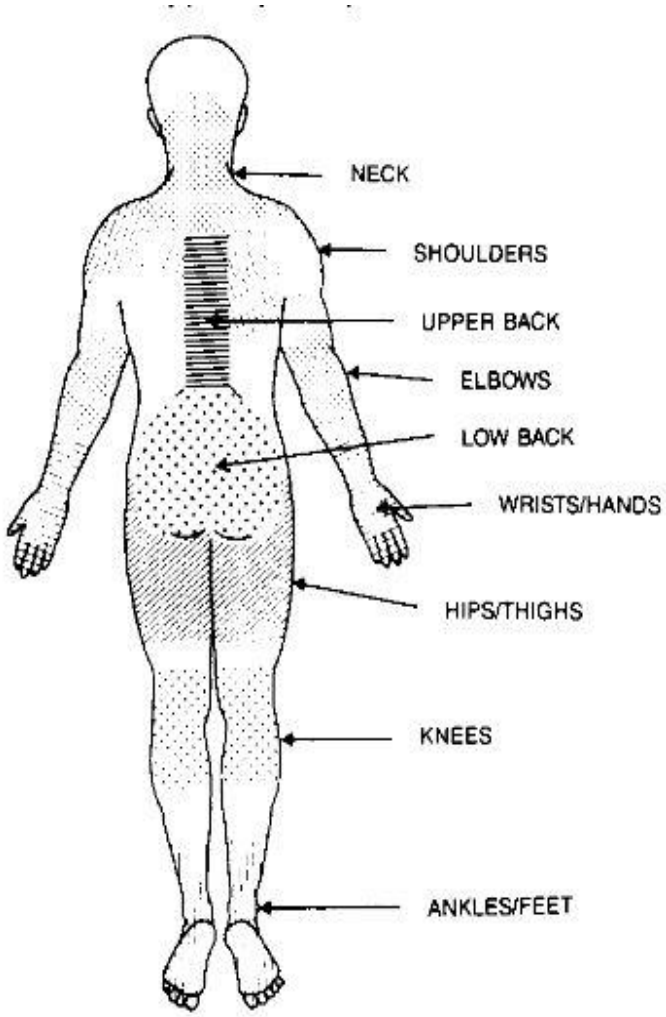
6. Religion:

☐ Christianity ☐ Islam

☐ African Traditional Religion ☐ Others: _____

SECTION B: NORDIC MUSCULOSKELETAL QUESTIONNAIRE (Adapted)

This section asks about any pain or discomfort you may have experienced in different parts of your body. Please look at the diagram below for help in identifying each body region. For each question, tick the option that best describes your experience. If you have never had pain in a particular area, you can simply select "No" or leave it unticked if instructed. Try to answer all the questions as carefully and honestly as you can.



Low Back Pain Questionnaire

Please answer the following questions about low back pain (ache, pain, or discomfort):

1. Have you ever had low back trouble?

☐ No ☐ Yes

(If "No", skip questions 2 to 8)

2. Have you ever been hospitalized because of low back trouble?

☐ No ☐ Yes

3. Have you ever had to miss class or school due to low back trouble?

☐ No ☐ Yes

4. How long in total have you experienced low back trouble in the last 12 months?

☐ 0 days

☐ 1–7 days

☐ 8–30 days

☐ More than 30 days, but not every day

☐ Every day

(If you selected "0 days", skip questions 5 to 7)

5. Has low back trouble reduced your daily activities in the last 12 months?

a. School activity ☐ No ☐ Yes

b. Leisure activity ☐ No ☐ Yes

6. How long has low back trouble prevented you from doing normal school work in the last 12 months?

☐ 0 days

☐ 1–7 days

☐ 8–30 days

☐ More than 30 days

7. Have you consulted a doctor, physiotherapist, chiropractor, or similar professional for low back trouble in the last 12 months?

☐ No ☐ Yes

8. Have you experienced low back trouble in the past 7 days?

☐ No ☐ Yes

Neck Pain Questionnaire

Please answer the following questions about neck pain (ache, pain, or discomfort):

9. Have you ever had neck trouble?

☐ No ☐ Yes

(If "No", skip questions 10 to 16)

10. Have you ever injured your neck in an accident?

☐ No ☐ Yes

11. Have you ever had to miss class or school due to neck trouble?

☐ No ☐ Yes

12. How long in total have you experienced neck trouble in the last 12 months?

☐ 0 days

☐ 1–7 days

☐ 8–30 days

☐ More than 30 days, but not every day

☐ Every day

(If you selected "0 days", skip questions 13 to 15)

13. Has neck trouble reduced your daily activities in the last 12 months?

a. School activity ☐ No ☐ Yes

b. Leisure activity ☐ No ☐ Yes

14. How long has neck trouble prevented you from doing normal school work in the last 12 months?

☐ 0 days

☐ 1–7 days

☐ 8–30 days

☐ More than 30 days

15. Have you seen a doctor, physiotherapist, chiropractor, or similar professional for neck trouble in the last 12 months?

☐ No ☐ Yes

16. Have you experienced neck trouble in the past 7 days?

☐ No ☐ Yes

Shoulder Pain Questionnaire

Please answer the following questions about shoulder pain (ache, pain, or discomfort):

17. Have you ever had shoulder trouble?

☐ No ☐ Yes

(If "No", skip questions 18 to 25)

18. Have you ever injured your shoulder in an accident?

☐ No

☐ Yes, my right shoulder

☐ Yes, my left shoulder

☐ Yes, both shoulders

19. Have you ever had to miss class or school because of shoulder trouble?

☐ No ☐ Yes

20. Have you had shoulder trouble during the past 12 months?

☐ No

☐ Yes, my right shoulder

☐ Yes, my left shoulder

☐ Yes, both shoulders

21. How long in total have you experienced shoulder trouble in the last 12 months?

☐ 0 days

☐ 1–7 days

☐ 8–30 days

☐ More than 30 days, but not every day

☐ Every day

(If you selected "0 days", skip questions 22 to 24)

22. Has shoulder trouble caused you to reduce your daily activities in the last 12 months?

a. School activity ☐ No ☐ Yes

b. Leisure activity ☐ No ☐ Yes

23. How long has shoulder trouble prevented you from doing your normal school work in the last 12 months?

☐ 0 days

☐ 1–7 days

☐ 8–30 days

☐ More than 30 days

24. Have you seen a doctor, physiotherapist, chiropractor, or similar professional for shoulder trouble in the last 12 months?

☐ No ☐ Yes

25. Have you experienced shoulder trouble in the past 7 days?

☐ No ☐ Yes

SECTION C: Cultural Beliefs and Perceptions about Physiotherapy

This section explores your beliefs, cultural influences, and understanding of body pain (like neck, back, or shoulder pain) and physiotherapy.

Instructions:

Please indicate how much you agree or disagree with each of the following statements using this scale:

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD)

1. I believe body pain (like neck, back or shoulder pain) can be caused by spiritual or ancestral forces.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

2. I prefer traditional remedies (herbs, massage, rituals) over hospital treatment for body pain.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

3. Prayer and rest are usually enough to treat body pain — therapy is not necessary.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

4. Body pain is sometimes seen as a test of faith or destiny and may not need medical treatment.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

5. My culture encourages me to visit traditional healers when I have body pain.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

6. I believe physiotherapy is effective for managing neck, back, or shoulder pain.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

7. I understand what physiotherapists do and how they can help with body pain.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

8. I would willingly go for physiotherapy if referred for neck, back, or shoulder pain.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

9. Physiotherapy is only for people with serious or permanent disabilities.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

10. In my community, people don't talk much about physiotherapy or know what it is.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

s11. My family or religious beliefs influence where I go for treatment when I'm in pain.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

12. What people in my community believe about pain affects where I go for help.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

13. I get most of my information about pain and treatment from media (TV, social media, etc.).

SA [ ] A [ ] N [ ] D [ ] SD [ ]

14. I have used physiotherapy services before for body pain.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

15. In my culture or environment, people are not encouraged to go for physiotherapy.

SA [ ] A [ ] N [ ] D [ ] SD [ ]

APPENDIX II

SCORING SCHEME FOR SECTION B (NORDIC MUSCULOSKELETAL QUESTIONNAIRE – ADAPTED)

This scoring scheme corresponds to Section B of the questionnaire presented in Appendix I.

1. Coding of Responses

Yes/No Items: Yes = 1, No = 0

Duration of Pain (Last 12 Months):

0 days = 0

1–7 days = 1

8–30 days = 2

More than 30 days but not every day = 3

Every day = 4

Activity Limitation Items (School/Leisure):

Yes = 1

No = 0 (each)

Work Prevention (Days Missed):

0 days = 0

1–7 days = 1

8–30 days = 2

More than 30 days = 3

Consultation with Health Professional:

Yes = 1

No = 0

Pain in the Past 7 Days:

Yes = 1

No = 0

2. Maximum Scores per Region

Region.	Maximum Possible Score
Low Back	14
Neck	14
Shoulder	15
Total Possible Score	43

3. Grading of Severity

Total Score Range.	Interpretation
0–14	Mild musculoskeletal burden

15–28	Moderate musculoskeletal burden
29–43	Severe musculoskeletal burden

APPENDIX III

SCORING SCHEME FOR SECTION C (CULTURAL BELIEFS AND PERCEPTIONS ABOUT PHYSIOTHERAPY)

This scoring scheme corresponds to Section C of the questionnaire presented in Appendix I.

1. Coding of Responses

Each item uses a 5-point Likert scale:

Response Option	Assigned Score
Strongly Agree (SA)	5
Agree (A)	4
Neutral (N)	3
Disagree (D)	2
Strongly Disagree (SD)	1

2. Maximum Score

15 items × 5 points each = 75 points

3. Grading of Relationship between Cultural Beliefs and Physiotherapy Utilization

Score Range.	Interpretation
15–45	Poor relationship between cultural beliefs and utilization of physiotherapy for

musculoskeletal pain

46–75 Strong relationship between cultural beliefs and utilization of physiotherapy for musculoskeletal pain

APPENDIX IV

RAW DATA SHEET (EXCERPT)

This appendix presents an excerpt of the raw data collected for the study.

The complete dataset (357 responses) is retained in the researcher's record.

Only a representative portion is shown here due to the large volume of data.

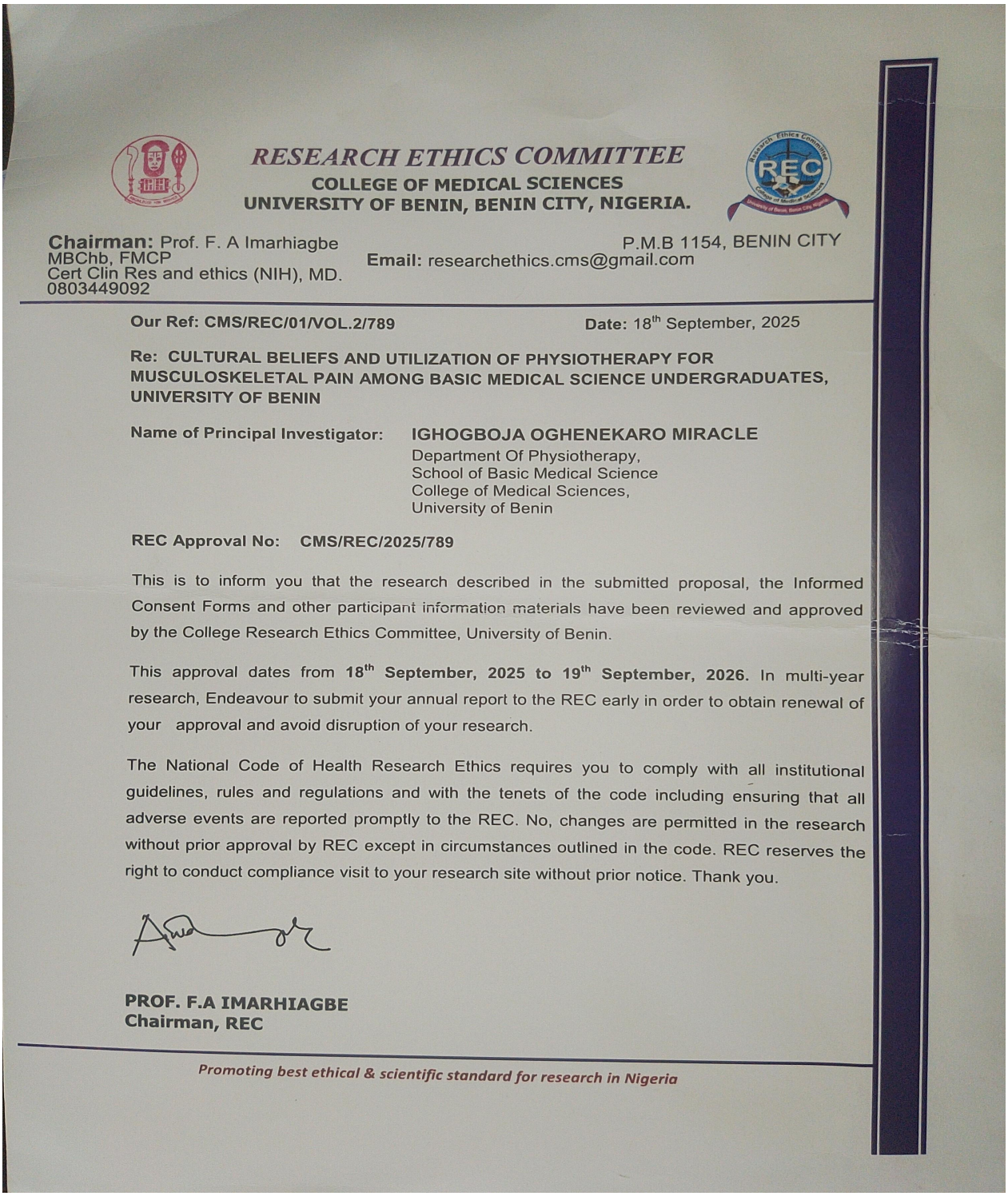
VARIABLE	Respondent 1	Respondent 2	Respondent3	Respondent 4	Respondent 5	Respondent 6	Respondent 7	Respondent 8	Respondent 9	Respondent 10
AGE	18–20	21–23	21–23	18–20	18–20	18–20	18–20	18–20	21–23	18–20
GENDER	F	F	F	F	M	F	M	M	M	F
DEPT	ANA	ANA	ANA	ANA	ANA	ANA	ANA	ANA	ANA	ANA
LEVEL	200	200	200	200	200	200	200	200	200	200
TRIBE	BINI	AFEMAI	IGBO	OTHERS (IJAW)	IGBO	BINI	YORUBA	ESAN (ISHAN)	IGBO	IGBO
RELIGION	CHRISTIANITY	ISLAM	CHRISTIANITY	CHRISTIANITY	CHRISTIANITY	CHRISTIANITY	AFRICAN TRAD	CHRISTIANITY	CHRISTIANITY	CHRISTIANITY
LBP	1	1	1	1	1	0	1	1	1	1
Hospitalized	0	0	0	0	0	0	0	0	0	0
Miss school	0	0	0	0	0	0	0	0	0	1
Duration	1	2	1	1	1	0	1	1	1	1
School limitation	0	0	1	0	0	0	0	1	1	1
Leisure	1	0	1	1	0	0	1	1	1	0

VARIABLE	Respondent 1	Respondent 2	Respondent3	Respondent 4	Respondent 5	Respondent 6	Respondent 7	Respondent 8	Respondent 9	Respondent 10
limitation										
Duration of school lim	0	0	1	1	0	0	0	1	1	1
DOC OR PT	0	0	0	0	0	0	0	0	0	0
LBP in 7 days	0	0	0	0	1	0	0	0	0	0
NP	1	1	1	1	0	1	1	0	0	1
ACCIDENT	0	0	0	0	0	0	0	0	0	0
Miss school (NP)	0	0	0	0	1	1	1	1	1	0
Duration (NP)	3	0	1	2	0	1	2	0	0	1
School lim (NP)	1	0	0	1	1	0	1	0	0	0
Leisure lim (NP)	1	0	1	1	1	0	1	1	1	0
Duration of lim (NP)	1	0	1	2	0	0	1	1	1	0
DOC OR PT (NP)	0	0	0	1	0	0	0	0	0	0
NP in 7 days	0	0	0	0	1	0	1	1	0	0
SP	0	1	0	1	1	0	1	0	1	1
ACCIDENT (SP)	0	0	0	0	3	0	2	0	0	0
Miss school (SP)	0	1	0	0	1	0	1	1	1	3
SP in 12 months	0	1	0	0	1	0	1	1	1	1

VARIABLE	Respondent 1	Respondent 2	Respondent3	Respondent 4	Respondent 5	Respondent 6	Respondent 7	Respondent 8	Respondent 9	Respondent 10
Duration of pain (12m)	0	1	0	0	0	0	1	1	1	0
School lim (SP)	0	0	0	0	0	0	1	1	1	3
Leisure lim (SP)	0	0	0	0	0	0	3	1	1	1
Duration of lim (SP)	0	0	0	0	0	0	1	1	1	1
DOC OR PT (SP)	0	0	0	0	0	0	0	0	0	0
SP in 7 days	0	0	0	0	0	0	0	0	0	1
TOTAL (SP)	10	9	10	14	13	4	18	11	15	15
GRADE	MILD	MILD	MILD	MILD	MILD	MILD	MODERATE	MILD	MODERATE	MODERATE
Q1–Q15 TOTAL	36	39	46	38	51	45	44	46	45	45
RELATION	POOR	POOR	STRONG	POOR	STRONG	POOR	POOR	STRONG	STRONG	POOR

APPENDIX V

ETHICAL APPROVAL CERTIFICATE



RESEARCH ETHICS COMMITTEE
COLLEGE OF MEDICAL SCIENCES
UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

Chairman: Prof. F. A Imarhiagbe
MBChb, FMCP
Cert Clin Res and ethics (NIH), MD.
0803449092

P.M.B 1154, BENIN CITY
Email: researchethics.cms@gmail.com

Our Ref: CMS/REC/01/VOL.2/789 **Date:** 18th September, 2025

Re: CULTURAL BELIEFS AND UTILIZATION OF PHYSIOTHERAPY FOR MUSCULOSKELETAL PAIN AMONG BASIC MEDICAL SCIENCE UNDERGRADUATES, UNIVERSITY OF BENIN

Name of Principal Investigator: **IGHOGBOJA OGHENEKARO MIRACLE**
Department Of Physiotherapy,
School of Basic Medical Science
College of Medical Sciences,
University of Benin

REC Approval No: CMS/REC/2025/789

This is to inform you that the research described in the submitted proposal, the Informed Consent Forms and other participant information materials have been reviewed and approved by the College Research Ethics Committee, University of Benin.

This approval dates from **18th September, 2025 to 19th September, 2026.** In multi-year research, Endeavour to submit your annual report to the REC early in order to obtain renewal of your approval and avoid disruption of your research.

The National Code of Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the code including ensuring that all adverse events are reported promptly to the REC. No, changes are permitted in the research without prior approval by REC except in circumstances outlined in the code. REC reserves the right to conduct compliance visit to your research site without prior notice. Thank you.

PROF. F.A IMARHIAGBE
Chairman, REC

Promoting best ethical & scientific standard for research in Nigeria