OUT OF POCKET EXPENDITURE ON PHYSIOTHERAPY MANAGEMENT OF LOW BACK PAIN AMONG PATIENTS IN TERTIARY HEALTHCARE FACILITIES IN BENIN CITY.

BY

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CERTIFICATION

This dissertation by KENDRA UFOMA KEVWE OKUNA is accepted in its present form as satisfying the dissertation requirement of the degree of Bachelor of Physiotherapy of the School of Basic Medical Sciences, College of Medical Sciences of the University of Benin.

SUPERVISOR **SIGNATURE**

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EXTERNAL EXAMINER

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DEDICATION

This research work is dedicated to God almighty, my Father Mr Kevwe Okuna for his support, Prayers and unending Love. And also to myself, the future limitless and unstoppable me.

ABSTRACT

Background: Low back pain (LBP) is a global health challenge with a lifetime prevalence of 60-85%, being the leading cause of years lived with disability worldwide and significantly affecting African populations, including Nigeria. Physiotherapy is a crucial non-invasive treatment option for LBP management, offering various evidence-based interventions including exercise therapy, manual therapy, and electrotherapy. Nigeria's healthcare system faces significant challenges, with over 70% of healthcare expenses paid through out-of-pocket (OOP) payments due to limited insurance coverage and underfunding. This study aims to examine the out-of-pocket expenditures on physiotherapy for LBP in Benin City, Edo State, and its implications for healthcare access and policy.

Method: A cross-sectional study design was used recruiting 99 participants. A non-probability purposive sampling technique was used to recruit participants. The sample size was determined using an online calculator with an 80% confidence level. Data was collected using self-administered questionnaires, with ethical approval obtained from UBTH's Medical Advisory Committee. Data analysis was performed using SPSS version 22.0, employing descriptive statistics (mean, frequency, standard deviation) and chi-square test of independence, with significance level set at $p<0.05$.

Result: The study involved 99 participants, predominantly female (58.6%), married (83.8%), and businesspersons (35.3%), with a mean age of 63.65 ± 17.59 years and 27.56 ± 9.72 years of work experience. The average total out-of-pocket expenditure was ₦127,527.58 ± 18,712.44, comprising direct medical costs (₦72,363.64 ± 15,048.53), direct non-medical costs (₦20,315.45 ± 6,006.12), and indirect costs (₦34,848.48 ± 8,638.26). Disability levels were moderate, with mean scores of 31.08 ± 2.61 (Oswestry Disability Index) and 31.06 ± 2.07 (Rolland Morris Disability Questionnaire). Gender comparisons showed females had slightly higher expenditures (₦130,051.72 ± 18,924.06) than males (₦123,956.83 ± 18,034.77), but differences were not statistically significant ($p > 0.05$).

Conclusion: This study highlights the substantial economic burden of managing low back pain in tertiary healthcare facilities in Benin City, Edo State, with significant out-of-pocket expenditures for both direct and indirect costs. Despite these challenges, no significant gender differences in costs were observed.

Keywords: Out of pocket Expenditure, Physiotherapy management, Low back pain, UBTH, Benin city.

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CHAPTER ONE
INTRODUCTION

1.1 Background of the study

Low back pain (LBP) is one of the most prevalent musculoskeletal conditions worldwide, affecting individuals across all age groups, socioeconomic statuses, and geographic regions (WHO 2019). According to the Global Burden of Disease Study (2017), LBP is the leading cause of years lived with disability (YLDs) globally, with a lifetime prevalence ranging from 60% to 85% (James et al., 2018). LBP is not only a medical condition but a significant public health challenge due to its disabling nature and the chronic pain it causes, resulting in diminished quality of life and compromised functional capacity (Geurts et al., 2018). LBP is a pervasive global health problem that significantly affects the quality of life and productivity of individuals, particularly among working-age populations (Hoy et al., 2010). In Africa, the prevalence of LBP varies widely but remains high, with studies reporting rates ranging from 32% to 79% in different populations (Louw et al., 2007). In Nigeria, the prevalence of LBP is notably high among working-age adults and populations engaged in physically demanding jobs such as farming and manual labor (Adegoke et al., 2015)

Physiotherapy plays a critical role in the non-invasive management of low back pain (LBP) by addressing the underlying musculoskeletal imbalances and providing tailored interventions that aim to alleviate pain, restore function, and prevent recurrence (Chigbundu et al., 2021). As a conservative treatment option, physiotherapy is often recommended as a first-line approach for managing both acute and chronic LBP, especially in cases where surgery or pharmacological interventions

may not be appropriate (Ibrahim et al., 2019). Physiotherapists employ a wide range of evidence-based interventions, including exercise therapy, manual therapy, and electrotherapy, to reduce pain, improve mobility, and enhance patients' overall quality of life (Adje et al., 2023). Despite the recognized efficacy of physiotherapy in managing LBP, access to these services remains constrained by economic barriers, particularly in low and middle income countries (LMICs) like Nigeria, where the burden of healthcare costs is often shouldered by patients (Balogun, 2021).

Nigeria's healthcare system operates with a blend of public and private providers, but it is largely underfunded and burdened by significant challenges, particularly regarding access and affordability (Lawrence, 2024). A key issue within the system is the heavy reliance on out-of-pocket (OOP) payments due to limited insurance coverage (Olugbile et al., 2013). OOP payments occur when individuals pay directly for healthcare services at the point of use, which places a significant financial burden on many Nigerians (Sirag & Mohammed 2021). According to the World Health Organization (WHO), over 70% of healthcare expenses in Nigeria are paid out-of-pocket, which severely limits access to care for a large portion of the population (WHO, 2010). This financial burden is exacerbated by the scarcity of public health services and the predominance of fee-for-service private healthcare providers (Onwujekwe et al., 2019).

The socioeconomic implications of high OOP expenditures on LBP management are profound (Aregbeshola & Khan 2018). Households may experience catastrophic health spending, leading to impoverishment and financial insecurity (Onah & Govender 2014). Moreover, disparities in access to care may emerge, with economically disadvantaged groups being disproportionately affected by the inability to afford necessary treatments (Kruk et al., 2018). Understanding the magnitude and

determinants of OOP expenditures on physiotherapy for LBP is critical for informing health policy, designing targeted interventions, and ensuring equitable access to essential healthcare services.This study, therefore, aims to fill this knowledge gap by examining the OOP expenditures incurred by patients undergoing physiotherapy for LBP in tertiary healthcare facilities in Benin City, Edo State.

1.2 Statement of the problem

Despite the high prevalence of low back pain and its associated economic burden, there is a notable deficiency of research focusing on the financial implications for patients seeking physiotherapy in Nigeria, especially in Benin City, Edo State. Existing literature indicates that out-of-pocket (OOP) payments constitute a substantial portion of healthcare financing in Nigeria, with many individuals facing catastrophic health expenditures that can lead to poverty (Aregbeshola & Khan 2018). Studies have shown that patients often incur significant costs for physiotherapy, which can be unaffordable for those with limited income, particularly in urban areas where the cost of living is higher (Adeniji, 2021).

In Benin City, the absence of specific data on OOP expenditures related to physiotherapy for LBP limits the understanding of how financial barriers affect patient access to care. Previous studies in other Nigerian contexts have highlighted that many patients, particularly those in low-income brackets, are deterred from seeking professional treatment due to the high costs associated with physiotherapy sessions (Habib & Awotidebe 2021) . Furthermore, the economic burden of LBP management has been documented in various studies, indicating that direct costs, such as physiotherapy fees, often represent a significant portion of overall healthcare expenses for affected individuals (Mbada et al., 2019). However, these findings have not been adequately explored in the context of Benin City, making it imperative to

investigate the specific out-of-pocket expenditures incurred by patients undergoing physiotherapy treatment for low back pain in tertiary healthcare facilities.

1.3 Aim of the study

The aim of the study is to examine the out-of-pocket expenditure on physiotherapy management of low back pain among patients in tertiary healthcare facilities in Benin City, Edo State, and to assess the financial burden this expenditure imposes on affected individuals.

1.4 Objectives of the study

i. To determine the average out-of-pocket expenditure on physiotherapy management for low back pain among patients in tertiary healthcare facilities in Benin City, Edo State.
ii. To identify and categorize the different components of out-of-pocket costs associated with physiotherapy management of low back pain (e.g., consultation fees, treatment costs, transportation expenses).
iii. To evaluate the impact of out-of-pocket expenditure on patients' adherence to prescribed physiotherapy treatment regimens for low back pain.
iv. To assess the relationship between patients' socioeconomic characteristics (such as income level, occupation, and education) and their out-of-pocket expenditure on physiotherapy for low back pain.

1.5 Research questions

i. What are the sociodemographic characteristics of individuals with low back pain in this population?
ii. What is the out-of-pocket expenditure for low back pain treatment among the participants?
iii. Is there a significant difference in out-of-pocket expenditure between male and female participants?

1.6 Research Hypothesis

i. There is no statistically significant difference in out-of-pocket expenditures between male and female participants across all cost categories (direct medical costs, direct non-medical costs, and indirect costs).
ii. The total out-of-pocket expenditure for low back pain treatment will be significantly high, with direct medical costs accounting for the largest proportion of total expenses

1.7 Significance of the study

i. **Improvement of Healthcare Policy:** The findings of this study will provide valuable data on the financial burden of out-of-pocket expenditure on physiotherapy for low back pain, which can be used to inform healthcare policymakers. This data can support the formulation of policies aimed at reducing these financial barriers, particularly through improving health insurance coverage under schemes like the National Health Insurance Scheme (NHIS), Edo Health insurance Scheme (EDO HIS).

ii. **Enhanced Accessibility to Physiotherapy Services:** By highlighting the relationship between out-of-pocket expenditures and patients' access to and adherence to physiotherapy, the study can inform strategies to enhance the affordability and accessibility of essential physiotherapy services, especially for patients with chronic conditions like low back pain.

iii. **Socio-economic Insight:** The study will provide insight into how socio-economic status affects the financial burden of healthcare, helping healthcare

iv. providers and government agencies design targeted interventions that focus on vulnerable populations most affected by high healthcare costs.

v. **Better Resource Allocation:** The study will help tertiary healthcare facilities understand the primary components of out-of-pocket costs associated with physiotherapy management for low back pain. This knowledge will help in better resource allocation and in offering cost-effective treatments.

1.8 Definition of terms

Out-of-Pocket (OOP) Expenditure: Out-of-pocket (OOP) expenditure refers to direct payments made by individuals or households at the time of receiving healthcare services that are not covered by insurance, government programs, or other third-party payers (Wagstaff et al., 2020). These expenses include payments for medical consultations, treatments, medications, diagnostic tests, and physiotherapy services (Mohanty et al., 2014).

Physiotherapy management: is a form of healthcare that focuses on the prevention, management, and treatment of physical impairments, disabilities, and

injuries (Haskin et al., 2012). Physiotherapy management involves a range of non-invasive interventions designed to alleviate pain, restore function, and improve mobility (Gracey et al., 2012). In the context of low back pain (LBP), physiotherapy commonly includes exercise therapy, where tailored exercises are prescribed to strengthen muscles and improve flexibility; manual therapy, which includes hands-on

techniques such as joint mobilization and manipulation; and electrotherapy, which involves the use of electrical currents to reduce pain and inflammation (Fidvi & May 2010).

Low back pain: Low back pain (LBP) describes pain between the lower edge of the ribs and the buttock (WHO, 2019). It is further defined as pain or discomfort localized to the lumbar region of the spine, which may be accompanied by stiffness or muscle tension (Koes et al., 2006).

Tertiary Healthcare Facilities: Tertiary healthcare facilities are advanced medical centers that provide specialized and complex care, often involving cutting-edge technology and highly trained specialists (Akande,2004). These facilities typically offer services beyond what is available in primary and secondary healthcare settings, including specialized diagnostic tests, surgeries, and intensive rehabilitation programs such as those required for the management of chronic conditions like low back pain (Ademiluyi and Aluko-Arowolo, 2009).

Benin city, Nigeria: Benin City is the capital and largest city of Edo State, southern Nigeria. It is the fourth-largest city in Nigeria according to the 2006 census.

1.9 Abbreviations:

OOP: Out of pocket expenditure

LBP: Low back pain

CHAPTER 2

LITERETURE REVIEW

2.1 Theoretical framework

These theories provide a lens to understand how financial burdens, socio-economic factors, and healthcare systems influence access to and utilization of physiotherapy services for managing low back pain (LBP).

Andersen's Behavioral Model of Health Services Use serves as a foundational theory for understanding healthcare utilization. The model posits that health service use is influenced by three key factors: predisposing factors (such as socio-economic status, age, and education), enabling factors (such as income and access to healthcare), and need factors (such as severity of illness) (Andersen, 1995). This model is highly relevant to the study as it explains how socio-economic conditions influence the ability of LBP patients to access and continue physiotherapy services. In Benin City, where health financing often relies on OOP payments, patients' socio-economic status may be a crucial determinant of their physiotherapy utilization.

The **Catastrophic Health Expenditure Theory** is central to exploring the financial burden imposed by OOP payments. Catastrophic health expenditures occur when healthcare costs exceed a household's ability to pay, leading to significant financial hardship or poverty (Xu et al., 2007). In Nigeria, where a large percentage of healthcare expenses are paid out-of-pocket, patients with chronic conditions such as LBP are particularly vulnerable to catastrophic expenditures. This theory will guide the exploration of how the financial burden of physiotherapy impacts patients' healthcare decisions, treatment adherence, and financial stability.

The **Equity in Health Financing Theory** emphasizes that access to healthcare should be based on healthcare needs rather than the ability to pay. Inequities arise when lower-income households bear a disproportionate financial burden in accessing healthcare services, resulting in unequal access to necessary treatments (Wagstaff, 2002). In this study, the theory helps to examine whether patients from lower socio-

economic groups in Benin City experience greater barriers to accessing physiotherapy services due to high OOP payments. This theory supports the investigation of disparities in access to physiotherapy among patients of different socio-economic backgrounds.

Willingness to Pay (WTP) Theory further complements the study by explaining how individuals make decisions about healthcare expenditures. The WTP model suggests that patients' decisions to pay for healthcare services are influenced by their perception of the service's value and their financial capability (Drummond et al., 2015). In the context of physiotherapy for LBP, patients may weigh the perceived benefits of continued treatment against the financial strain imposed by OOP payments. This theory will guide the exploration of how patients' financial capacity influences their willingness to seek or continue physiotherapy.

Social Determinants of Health Theory highlights how socio-economic factors, such as income, education, and occupation, influence health outcomes and healthcare access (Marmot et al., 2008). In the Nigerian healthcare context, patients with lower socio-economic status may face greater barriers to accessing and affording physiotherapy services. This theory helps frame the study's examination of how socio-economic disparities affect the ability of patients with LBP to seek timely and adequate physiotherapy care.

Together, these theories provide a comprehensive framework for examining how OOP payments for physiotherapy services affect healthcare access and equity among LBP patients in Benin City. By integrating health service utilization, financial burden, and socio-economic inequities, the study will provide a nuanced understanding of the challenges faced by patients in managing LBP through physiotherapy.

2.2 Overview of low back Pain

Low back pain (LBP) is one of the most common musculoskeletal disorders globally and a leading cause of disability and reduced quality of life (Hoy et al., 2010). It is typically defined as pain or discomfort localized in the region between the lower rib margins and the buttock creases, with or without referred leg pain (Hoy et al., 2010). LBP can be classified based on duration into acute (less than 6 weeks), sub-acute (6 to 12 weeks), and chronic (lasting more than 12 weeks) (Delitto et al., 2012). The condition affects a wide demographic, and its prevalence is high among both developed and developing countries, placing significant physical, economic, and social burdens on individuals and healthcare systems (Krismer & van tulder 2007).

2.2.1 Global prevalence of Low back pain

Low back pain affects approximately 577 million people globally at any given time (Vos et al., 2016). The point prevalence of LBP globally was estimated to be 7.5% in 2017, meaning about 7.5% of the global population experiences LBP at any given moment (Global Burden of Disease Study, 2017). The annual prevalence of LBP, which refers to the proportion of individuals who experience LBP at any point over a year, is much higher, with estimates ranging from 38% to 58% (Hoy et al., 2014). The lifetime prevalence of LBP is often reported to be 60-85% across different regions, indicating that a large proportion of the population will experience LBP at least once in their lifetime (Rubin, 2007). The high lifetime prevalence underscores the fact that LBP is a near-universal experience, affecting people of all ages, but particularly adults during their most productive years (Hoy et al., 2014).

2.2.2 Age and Gender Variations in Global Prevalence

Low back pain tends to peak during adulthood, particularly between the ages of 30 and 50, and then gradually declines with older age (Borenstein, 2013). A 2014 global

systematic review by Hoy et al. found that the peak prevalence of LBP occurs in individuals aged 40-69 years, with the highest rates (Bento et al., 2020).

2.2.3 Regional Variations in Low Back Pain

The global distribution of LBP prevalence shows significant regional variation due to differences in socio-economic conditions, occupational risks, healthcare access, and cultural factors.

High-Income Countries: The prevalence of LBP is often higher in high-income countries, where sedentary lifestyles, obesity, and aging populations are significant contributors. For example, in Europe, the point prevalence of LBP ranges from 15% to 30% depending on the country (Balagué et al., 2012). In the United States, LBP is the most common type of musculoskeletal disorder, with an estimated 26.6% of adults experiencing LBP in a given year (Shmagel et al., 2016).

Low- and Middle-Income Countries (LMICs): In LMICs, LBP prevalence is also high, often driven by physically demanding occupations, manual labor, and limited access to healthcare. In Africa, for instance, the point prevalence of LBP is reported to range from 23% to 36%, with higher rates among people engaged in heavy physical labor (Louw et al., 2007). In Southeast Asia, the prevalence of LBP varies, but studies in countries like India have reported LBP prevalence of up to 42% (Sharma et al., 2013).

Sub-Saharan Africa: In this region, LBP prevalence is on the rise, particularly in urban centers where industrialization has increased physical labor demands. A study conducted in Nigeria found an LBP prevalence rate of **33.3%** among adults (Adegoke et al., 2009), while Mbada et al. (2019) reported an annual prevalence of **60.3%** in

urban areas of Ibadan, Nigeria. These figures highlight that LBP is not only a problem in high-income nations but also in developing regions with limited healthcare resources.

2.2.4 Disability and Economic Impact of LBP Globally

Low back pain is the leading cause of disability globally in terms of YLDs. According to the Global Burden of Disease Study, LBP was responsible for 57.6 million YLDs in 2017, a figure that has risen significantly over the past three decades (Vos et al., 2017). This increase in YLDs is attributed to the aging global population, increased sedentary behavior, and rising obesity rates.

In economic terms, LBP places a considerable burden on healthcare systems, employers, and society as a whole. The direct costs associated with LBP include healthcare expenses for medical consultations, physiotherapy, diagnostic tests, medications, and surgeries. Indirect costs, which often exceed direct costs, include lost productivity, absenteeism, disability payments, and early retirement. In the United States, the economic burden of LBP is estimated to be between $50 billion and $100 billion annually, including both direct medical costs and indirect productivity losses (Dagenais et al., 2008).

In Europe, the economic impact is similarly significant, with LBP accounting for about 60-80% of musculoskeletal healthcare costs (Balagué et al., 2012). In the UK, LBP alone contributes to nearly 12.5% of all absenteeism, leading to millions of lost workdays every year (Health and Safety Executive, 2019).

2.3 Relevant Anatomy of Low back pain

2.3.1 Bones of the Lumbar Spine

The lumbar spine consists of five large vertebrae (L1-L5), which are responsible for bearing most of the body's weight. The vertebral bodies are large and kidney-shaped, designed for stability and load-bearing. These vertebrae have a thick vertebral body to support the axial skeleton, along with transverse and spinous processes for muscle and ligament attachment (Moore, Dalley, and Agur, 2013). The facet joints between these vertebrae allow for flexion and extension, contributing to the mobility of the lumbar spine while limiting rotational movements (Gray, 2008).

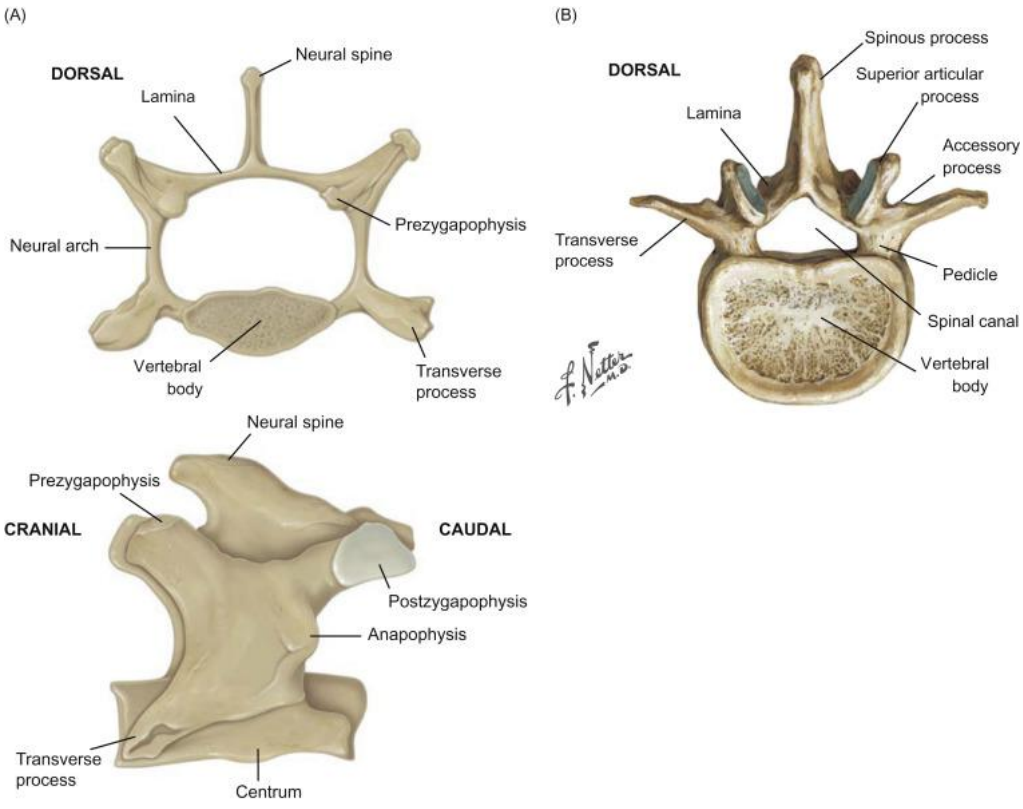

Figure 1: Showing the lumber vertebrae

https://ars.els-cdn.com/content/image/3-s2.0-B9780128029008000051-f05-13-9780128029008.jpg

2.3.2 Intervertebral Discs

The intervertebral discs are fibrocartilaginous structures positioned between adjacent vertebrae. They consist of the annulus fibrosus, which surrounds the gel-like nucleus pulposus. These discs function as shock absorbers and allow for flexibility in the spine. Degeneration of these discs, especially in the lumbar spine, can lead to conditions such as herniation, causing nerve compression and pain (Moore et al., 2013). Vishram Singh (2014) highlights that disc degeneration, particularly in the lower lumbar levels, is one of the most common causes of LBP.

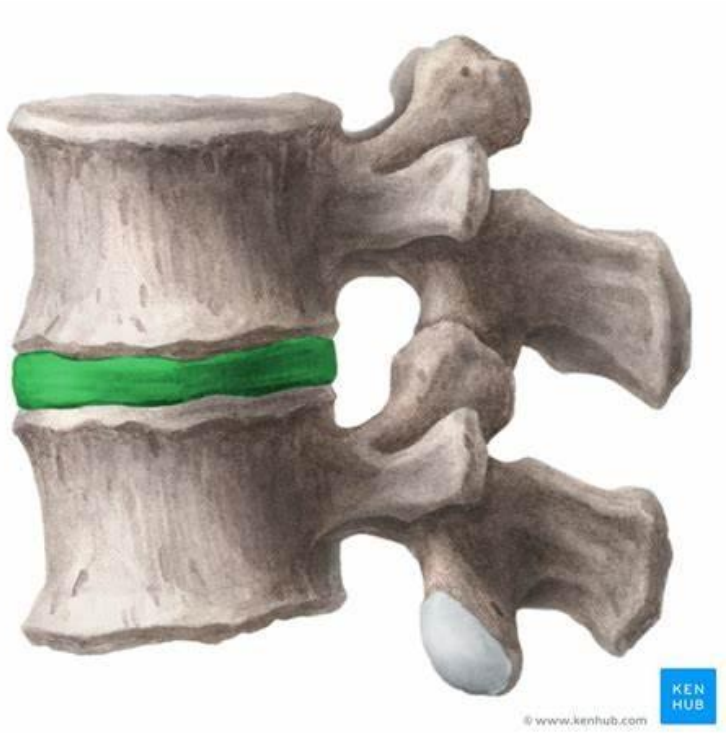

Figure 2: Shpwing the intervetebrae disc

intervetebrae disc - Search (bing.com)

2.3.3 Ligaments of the Lumbar Spine

The ligaments of the lumbar spine provide stability by connecting vertebrae and limiting excessive movements. The anterior and posterior longitudinal ligaments run along the front and back of the vertebral bodies, preventing hyperextension and hyperflexion, respectively (Moore et al., 2013). Other ligaments, such as the ligamentum flavum, interspinous, and supraspinous ligaments, also contribute to spinal stability by restricting certain movements and maintaining the integrity of the vertebral column (Gray, 2008).

2.3.4 Muscles of the Lumbar Region

The muscles surrounding the lumbar spine play a crucial role in supporting the vertebral column and facilitating movement. The erector spinae muscle group, composed of the iliocostalis, longissimus, and spinalis muscles, is responsible for extending the spine (Gray, 2008). The multifidus muscles, which run the length of the spine, provide important segmental stability, particularly in the lumbar region. Weakness or atrophy of these muscles is often linked to chronic LBP (Moore et al., 2013).

2.3.5 Nerves of the Lumbar Spine

The lumbar spine contains nerve roots that exit through the intervertebral foramina. These nerve roots form the lumbar and sacral plexuses, which innervate the lower extremities. Compression of these nerve roots, particularly by herniated discs, can cause conditions such as sciatica, leading to pain radiating down the leg (Singh, 2014). The lumbar plexus arises from the L1-L4 nerve roots, while the sacral plexus (L4-S4) contributes to the innervation of the lower limbs (Gray, 2008).

2.3.6 Spinal Cord and Spinal Canal

The spinal cord ends at the level of L1 or L2, continuing as the cauda equina, a bundle of nerve roots that supplies the lower extremities (Moore et al., 2013). The spinal canal, which houses the spinal cord and cauda equina, can become narrowed due to conditions such as spinal stenosis, which compresses the nerve roots and results in back and leg pain (Singh, 2014).

2.3.7 Sacroiliac Joint

The sacroiliac (SI) joint connects the sacrum to the ilium and plays a significant role in load transfer between the spine and the lower extremities. Dysfunction in this joint can lead to LBP, with pain often radiating to the buttocks or legs (Moore et al., 2013).

2.3.8 Fascia

The thoracolumbar fascia is a thick, multilayered connective tissue that supports the lower back. It plays an essential role in stabilizing the spine, particularly during dynamic movements. Dysfunction in the thoracolumbar fascia has been implicated in chronic LBP (Gray, 2008).

2.3.9 Blood Supply of the Lumbar Spine

The blood supply to the lumbar spine primarily comes from the lumbar arteries, which are branches of the abdominal aorta. These arteries run horizontally and give off segmental branches that supply the vertebral bodies, intervertebral discs, and spinal muscles (Moore et al., 2013). The venous drainage of the lumbar spine occurs through the lumbar veins, which drain into the inferior vena cava (Singh, 2014). Additionally,

smaller vessels like the radicular arteries provide blood to the spinal cord and nerve roots (Gray, 2008).

The lumbar vertebrae receive segmental arterial supply via four or five pairs of lumbar arteries, with additional contributions from the iliolumbar artery and the median sacral artery (Moore et al., 2013). The venous plexus within the vertebral column, called the Batson venous plexus, provides a pathway for venous return without valves, which can explain how infections or cancer metastases spread through the vertebral column (Gray, 2008).

2.4 Physiotherapy in the Management of Low Back Pain (LBP)

Low back pain (LBP) is a leading cause of disability worldwide, and physiotherapy plays a crucial role in its non-invasive management. Physiotherapy aims to reduce pain, improve function, and prevent recurrence, employing various treatment modalities such as exercise therapy, manual therapy, electrotherapy, and education (Airaksinen et al., 2006). Research consistently supports physiotherapy as an effective approach for treating both acute and chronic LBP.

2.4.1 Exercise Therapy

Exercise therapy is one of the most widely used physiotherapy interventions for LBP. It includes strengthening, stretching, and aerobic conditioning exercises that target the muscles supporting the spine, particularly the core stabilizers. The primary goal of exercise therapy is to improve spinal function, reduce pain, and enhance the patient's overall fitness (Hayden et al., 2005). Core stabilization exercises, which focus on

strengthening the deep trunk muscles like the multifidus and transversus abdominis, have shown positive effects in reducing pain and preventing recurrence (Richardson et al., 2004).

Specific exercise programs, such as McKenzie exercises (which focus on spinal extension) and motor control exercises, are often recommended for LBP. McKenzie exercises are designed to centralize pain, particularly in cases of disc-related LBP, while motor control exercises aim to restore the coordinated use of deep and superficial muscles (Ferreira et al., 2006). Evidence shows that a structured exercise program can significantly reduce pain and improve function in individuals with chronic LBP (Hayden et al., 2005).

2.4.2 Manual Therapy

Manual therapy involves hands-on techniques such as spinal mobilization and manipulation, soft tissue massage, and joint mobilization to alleviate pain and improve mobility. Spinal manipulation, often used in cases of mechanical LBP, involves high-velocity, low-amplitude thrusts applied to the lumbar vertebrae to restore joint motion. Several randomized controlled trials have demonstrated that spinal manipulation is effective in reducing pain and improving functional outcomes, especially in acute and subacute LBP (Bronfort et al., 2010). Spinal mobilization, a gentler technique, is also used to relieve stiffness in the lumbar region. A Cochrane review (2011) found moderate evidence that spinal manipulation and mobilization provide clinically significant short-term improvements in pain and function in patients with LBP (Rubinstein et al., 2011). Soft tissue techniques like myofascial release and trigger point therapy help in reducing muscle tightness, which can contribute to mechanical LBP (Henschke et al., 2011).

2.4.3 Electrotherapy

Electrotherapy is another common physiotherapy treatment modality used to manage pain in LBP. Techniques such as Transcutaneous Electrical Nerve Stimulation (TENS), interferential therapy (IFT), and ultrasound therapy are employed to reduce pain and inflammation.

TENS works by sending low-voltage electrical currents through the skin to interfere with pain signals, often resulting in temporary relief (Johnson, 2001). Although there is mixed evidence regarding its long-term effectiveness, TENS is still widely used in the clinical setting for immediate pain relief (Khadilkar et al., 2008).

Interferential Therapy (IFT) uses medium-frequency electrical currents to penetrate deeper tissues and is thought to reduce muscle spasm, promote healing, and relieve pain. While some studies support its use, the overall evidence for IFT in managing LBP is inconsistent (Fuentes et al., 2010).

Ultrasound therapy uses sound waves to promote tissue healing and reduce inflammation. However, recent reviews suggest that ultrasound therapy may offer limited benefits for LBP compared to other treatment modalities (Ebadi et al., 2014).

2.4.4 Patient Education and Self-Management

A critical component of physiotherapy in LBP management is patient education and self-management strategies. Education on posture, ergonomics, and proper body mechanics during daily activities can help prevent exacerbation of symptoms. Physiotherapists often guide patients in developing self-management skills, including home exercise programs that promote long-term spine health and prevent recurrence (Airaksinen et al., 2006).

Evidence suggests that patient education, when combined with active treatment modalities like exercise therapy, improves outcomes in individuals with chronic LBP. A randomized controlled trial by Ferreira et al. (2006) showed that educational interventions, particularly those promoting activity and discouraging bed rest, are crucial in preventing the chronicity of LBP.

Multimodal Approaches

The combination of these physiotherapy modalities often yields better outcomes for LBP patients. For example, combining manual therapy with exercise therapy has been shown to improve pain relief and functional status more effectively than either treatment alone (Furlan et al., 2015). Similarly, combining electrotherapy (e.g., TENS) with an active exercise regimen can provide immediate pain relief, allowing patients to engage more effectively in their exercise program (Khadilkar et al., 2008).

Effectiveness of Physiotherapy in LBP Management

The effectiveness of physiotherapy in managing LBP has been extensively studied. A systematic review by Hayden et al. (2005) found that exercise therapy reduces pain and improves function in patients with chronic LBP. Similarly, manual therapy, including spinal manipulation, has demonstrated positive effects in reducing pain and disability in both acute and chronic LBP patients (Rubinstein et al., 2011).

Research also supports the long-term benefits of physiotherapy in preventing recurrences of LBP. A study by Richardson et al. (2004) showed that patients who adhered to a prescribed exercise regimen experienced fewer recurrences of LBP compared to those who did not.

Physiotherapy remains a cornerstone in the management of LBP, offering a range of non-invasive treatments that are backed by evidence. Exercise therapy, manual therapy, electrotherapy, and patient education are the key components of a physiotherapy program for LBP. The combination of these modalities, tailored to the individual's needs, has proven effective in reducing pain, improving function, and preventing recurrence, making physiotherapy an essential component in the conservative treatment of LBP.

Effectiveness of Physiotherapy for Low Back Pain

Physiotherapy has long been recognized as an effective, non-invasive treatment for managing low back pain (LBP), particularly in terms of pain reduction, functional improvement, and recurrence prevention

Pain Reduction

Physiotherapy interventions significantly reduce pain in patients with both acute and chronic LBP. One of the key approaches in this regard is exercise therapy, which includes core stabilization exercises, stretching, and aerobic conditioning. A meta-analysis by Hayden et al. (2005) found that exercise therapy is effective for reducing

pain in patients with chronic LBP, especially when combined with other treatments like manual therapy and education. Strengthening exercises, in particular, help alleviate pain by improving the stability of the spine and enhancing the function of the muscles that support it (van Middelkoop et al., 2010).

Manual therapy has also been associated with pain reduction. This includes spinal manipulation and mobilization, which help restore movement in the spine and reduce muscular tension. A systematic review by Rubinstein et al. (2011) concluded that spinal manipulation provides moderate pain relief in patients with acute LBP and can be a valuable addition to a multimodal treatment plan. Another form of manual therapy, myofascial release, targets tightness in the fascia and has been shown to reduce pain in patients with musculoskeletal disorders, including LBP (Barnes, 1997).

Electrotherapy modalities such as Transcutaneous Electrical Nerve Stimulation (TENS) have also been used in the treatment of LBP. Though TENS offers short-term relief, especially for acute pain, its long-term benefits remain controversial. However, it remains a useful adjunct to other physiotherapy techniques for immediate pain relief (Khadilkar et al., 2008).

Functional Improvement

In addition to reducing pain, physiotherapy plays a crucial role in improving the functional capacity of individuals with LBP. **Exercise therapy** is particularly effective in restoring functional movement patterns and enhancing the patient's ability to perform daily activities. Functional improvement often occurs through the

strengthening of core muscles (like the multifidus and transversus abdominis) and the enhancement of flexibility in the lumbar spine and surrounding structures (Richardson et al., 2004).

A randomized controlled trial by Ferreira et al. (2006) demonstrated that patients undergoing motor control exercises (designed to retrain proper use of deep trunk muscles) had better functional outcomes compared to those receiving general exercise therapy. Motor control exercises improve the coordination between deep and superficial muscles, which is often impaired in people with LBP. Furthermore, manual therapy techniques, including joint mobilization, improve joint range of motion and enhance the overall function of the spine (Bronfort et al., 2010). These techniques work by reducing joint stiffness and improving the movement of synovial fluid within the joints, leading to better functional outcomes.

Functional improvement is also supported by patient education, which forms a vital part of physiotherapy. Educating patients on proper body mechanics, ergonomics, and activity modification has been shown to facilitate quicker recovery and help patients return to work or daily activities more efficiently (Airaksinen et al., 2006).

Recurrence Prevention

One of the most significant long-term benefits of physiotherapy is its role in preventing the recurrence of LBP. Recurrence is a common issue for individuals with LBP, particularly for those who have experienced previous episodes. Core stabilization exercises have been widely shown to prevent the recurrence of LBP by improving spinal stability and reducing the likelihood of future injury (Richardson et al., 2004). In a study by Hides et al. (2001), patients who participated in a core

stabilization program had fewer recurrences of LBP compared to those who did not. The study highlighted the importance of strengthening the multifidus and transversus abdominis muscles in preventing future episodes of LBP. Moreover, the combination of exercise therapy and education has been demonstrated to significantly reduce the risk of recurrence. According to a review by van Middelkoop et al. (2010), patients who are educated about maintaining an active lifestyle and avoiding prolonged periods of rest are less likely to experience recurrent LBP. Education about self-management, posture, and ergonomics empowers patients to manage their condition more effectively and minimize the chances of a relapse. Another approach that helps in recurrence prevention is manual therapy. Research has shown that patients who undergo regular spinal manipulation or mobilization are less likely to experience recurrent pain episodes, particularly when this is combined with an active exercise program (Bronfort et al., 2010).

Long-Term Effectiveness

The long-term effectiveness of physiotherapy in managing LBP is well-documented, especially when active interventions are included. A systematic review by Hayden et al. (2005) showed that patients who adhered to structured physiotherapy programs had better long-term outcomes, both in terms of pain relief and functional improvement, compared to those who received minimal or no intervention. Importantly, the review highlighted that exercise therapy, when continued beyond the supervised treatment phase, leads to sustained benefits.

One of the reasons physiotherapy is effective in the long term is that it equips patients with the skills needed to manage their condition independently. Programs that focus on self-management strategies and ongoing home exercise empower patients to

continue their recovery after formal treatment ends, thus preventing future episodes of pain (Airaksinen et al., 2006).

Healthcare Systems and Financing in Nigeria

The Nigerian healthcare system is complex, consisting of three tiers: primary, secondary, and tertiary care. Tertiary healthcare facilities are at the top of this hierarchy, providing specialized services for patients with complex conditions requiring advanced medical care. These facilities, typically located in urban centers, serve as referral centers for primary and secondary healthcare providers. However, the healthcare system in Nigeria is characterized by underfunding, inefficiencies, and limited access, particularly in rural areas (Federal Ministry of Health, 2016).

2.5 Structure of the Nigerian Healthcare System

The healthcare system in Nigeria is structured into three levels:

- **Primary healthcare (PHC)** is the first point of contact for individuals seeking healthcare services. It is community-based and focuses on basic health services, preventive care, and health education.
- **Secondary healthcare** offers more specialized care, including diagnostic and treatment services, and is typically delivered through general hospitals.
- **Tertiary healthcare** provides highly specialized medical care, including surgery, complex diagnostics, and specialized treatments for conditions such as cancer, cardiovascular diseases, and neurological disorders. These services are delivered through teaching hospitals, specialist hospitals, and federal medical centers (FMOH, 2016).

The tertiary healthcare system in Nigeria plays a crucial role in the management of complex health conditions, but it is heavily concentrated in urban areas, leaving a significant gap in access for those in rural settings (Onyejekwe, 2020). This uneven distribution of services has exacerbated the healthcare challenges in Nigeria, where the population is largely rural, and access to quality healthcare remains a persistent issue (Onyejekwe, 2020).

2.6 Public and Private Healthcare Providers

Nigeria's healthcare services are delivered by both public and private healthcare providers. The public healthcare sector is government-funded and operates through the Federal Ministry of Health (FMOH) at the national level, with state and local governments managing secondary and primary care, respectively. Public hospitals are the primary providers of healthcare services, particularly for lower-income individuals who cannot afford private care. However, they are often plagued by issues such as inadequate funding, staff shortages, and poor infrastructure, which limit their ability to provide high-quality care (Eze et al., 2020).

On the other hand, the private healthcare sector has grown significantly over the past few decades and now plays a substantial role in healthcare delivery in Nigeria. Private healthcare providers offer a wide range of services, often at a higher quality and cost than public facilities. According to Akinyemi et al. (2019), private facilities cater mainly to the middle- and upper-income populations, providing better facilities, shorter waiting times, and access to a broader range of specialized care. However, the reliance on out-of-pocket (OOP) payments means that access to these services is

limited to those who can afford them, leaving a large segment of the population reliant on the public healthcare system.

Healthcare Funding Models in Nigeria

The healthcare system in Nigeria is funded through a combination of public, private, and donor funding. Public funding for healthcare comes primarily from the federal, state, and local governments. However, the allocation of funds to the healthcare sector remains inadequate. According to the World Health Organization (WHO, 2020), Nigeria allocates only about 4-5% of its national budget to healthcare, which is far below the 15% benchmark set by the Abuja Declaration of 2001. This chronic underfunding has led to poor infrastructure, insufficient medical equipment, and a shortage of healthcare professionals in public healthcare facilities (FMOH, 2016).

Private healthcare funding is largely supported by out-of-pocket (OOP) expenditures, which account for a significant portion of healthcare financing in Nigeria. According to the National Health Accounts report (2017), OOP payments constitute over 70% of total healthcare expenditure in Nigeria. This heavy reliance on OOP payments places a considerable financial burden on households, particularly for chronic conditions such as low back pain (LBP), where patients may require long-term physiotherapy (World Bank, 2018).

In response to these challenges, the Nigerian government introduced the National Health Insurance Scheme (NHIS) in 2005 to reduce the financial barriers to accessing healthcare. The NHIS aims to provide affordable healthcare by pooling funds from enrollees and the government, offering coverage for a range of services, including inpatient and outpatient care. However, the scheme's reach remains limited, covering

only about 10% of the population (NHIS, 2018). The scheme primarily benefits formal sector employees, while those in the informal sector and rural areas continue to rely on OOP payments (Onoka et al., 2013).

The Role of Donor Funding

Donor funding also plays a role in healthcare financing in Nigeria, particularly in areas such as maternal and child health, infectious disease control, and vaccination programs. Organizations such as the World Bank, Global Fund, and USAID provide financial and technical support to the Nigerian government to address key health challenges. However, donor funding is often targeted at specific programs and is not a sustainable source of healthcare financing in the long term. Furthermore, donor dependence can undermine the development of a self-sufficient healthcare system (Asante et al., 2016).

Challenges in Healthcare Financing

One of the primary challenges in healthcare financing in Nigeria is the over-reliance on OOP payments. According to Aregbeshola and Khan (2018), OOP payments push a significant portion of the population into poverty, as individuals and households are forced to bear the full cost of medical care. This is particularly true for chronic diseases that require long-term treatment, such as low back pain, where physiotherapy sessions can accumulate substantial costs over time.

Additionally, public healthcare funding remains insufficient, and the National Health Insurance Scheme (NHIS) has not been able to provide comprehensive coverage for the population. Infrastructural inadequacies and shortages of medical personnel

further exacerbate the situation, particularly in tertiary healthcare facilities where specialized services are in high demand (FMOH, 2016).

The healthcare system in Nigeria is characterized by a mix of public and private providers, with significant gaps in access and quality between the two sectors. While tertiary healthcare facilities provide advanced care, they are often concentrated in urban areas and inaccessible to rural populations. The system is heavily reliant on OOP payments, and public funding remains inadequate. The NHIS, although a step in the right direction, has limited reach and is unable to provide comprehensive healthcare coverage. Addressing these challenges requires increased government

investment in healthcare, expanded insurance coverage, and improved access to quality healthcare services across all regions.

2.7 Out-of-Pocket Healthcare Expenditure

Out-of-Pocket (OOP) healthcare expenditure refers to the direct payments made by individuals to healthcare providers at the time of service, which are not reimbursed by any form of health insurance. These payments include the costs of medical consultations, diagnostic tests, treatments, hospital stays, medications, and other healthcare services. OOP expenditure becomes a financial burden when individuals or households must pay for healthcare services without any financial protection or risk pooling mechanisms like health insurance (World Health Organization, 2010).

Definition and Implications for Healthcare Access

In countries with underdeveloped or insufficient health insurance systems, OOP payments can pose significant barriers to accessing healthcare services. When individuals must bear the full cost of healthcare services, they may delay or forgo necessary treatments, particularly for chronic conditions like low back pain, which require long-term care such as physiotherapy. Xu et al. (2007) state that high OOP payments can lead to catastrophic health expenditures, where healthcare costs exceed a certain percentage of a household's income, potentially pushing families into poverty. In countries with high OOP expenditure, this effect is especially prevalent among low-income populations, who are already vulnerable to financial shocks (Xu et al., 2007).

OOP payments are a critical component of healthcare financing in many low- and middle-income countries (LMICs). According to the World Health Organization (WHO), OOP expenditures can lead to inequitable access to healthcare because individuals from poorer households may struggle to afford essential services. Consequently, high OOP costs result in a situation where access to quality healthcare becomes disproportionately available to wealthier segments of the population (WHO, 2010).

Global Context of OOP Healthcare Expenditure

Globally, the reliance on OOP expenditure is widespread, particularly in LMICs. In some regions, OOP payments account for more than 50% of total health expenditure. According to Xu et al. (2007), approximately 150 million people suffer financial hardship annually due to high OOP healthcare payments, and 100 million are pushed into extreme poverty as a result. This issue is most acute in countries where formal

health insurance coverage is limited, and government health spending is insufficient to meet the population's needs.

For instance, in Sub-Saharan Africa and parts of Asia, where public healthcare funding is often inadequate, OOP payments are a major source of healthcare financing (Xu et al., 2007). This reliance on OOP payments not only limits healthcare access but also leads to poorer health outcomes, as people may delay seeking treatment until their conditions become critical. The absence of financial protection mechanisms leaves many households vulnerable to catastrophic health expenditures, leading to long-term financial distress and worsening health conditions.

In contrast, countries with well-developed health insurance systems, such as in Europe or North America, typically have lower levels of OOP expenditure, as healthcare costs are covered by insurance schemes. In these countries, universal health coverage (UHC) provides a safety net that shields individuals from the financial burden of healthcare services, ensuring more equitable access to care and better health outcomes (WHO, 2010).

Implications for Healthcare Outcomes

High OOP expenditure has significant implications for healthcare outcomes. When people are unable to afford the healthcare they need, conditions can worsen, leading to increased morbidity and mortality. This is particularly problematic for chronic diseases such as cardiovascular disease, diabetes, and musculoskeletal conditions like low back pain, which require continuous management. For instance, people with chronic low back pain may require repeated physiotherapy sessions over an extended period. The costs of these sessions, if paid out-of-pocket, can accumulate, leading

individuals to reduce the frequency of visits or stop treatment entirely, potentially worsening their condition (Xu et al., 2007).

Moreover, inequitable access to healthcare due to high OOP payments can deepen health disparities within a country. Wealthier individuals can afford to seek timely and high-quality care, while poorer populations may suffer from untreated conditions or rely on lower-quality services. This gap not only affects individual health outcomes but also has broader societal implications, as poorer health outcomes among disadvantaged populations can strain public health systems and slow economic productivity (Xu et al., 2007). OOP healthcare expenditure is a significant barrier to achieving universal health coverage, particularly in LMICs. High OOP payments exacerbate inequalities in healthcare access and outcomes, with poorer populations bearing the brunt of financial hardships. Addressing the reliance on OOP payments through improved health insurance coverage and increased government healthcare funding is essential to reducing financial burdens and improving healthcare access and outcomes globally.

2.8 Out-of-Pocket Expenditure and Socio-Economic Impact in Nigeria

Economic Burden on Households

Out-of-pocket (OOP) healthcare expenditure represents a significant financial burden on households in Nigeria, particularly for chronic conditions that require long-term care, such as low back pain (LBP). With limited health insurance coverage and an underfunded public healthcare system, many Nigerians are forced to pay directly for healthcare services. This financial strain is especially severe for chronic conditions

that necessitate repeated treatments, such as physiotherapy for LBP, which can accumulate over time and create economic hardship for affected households.

The Economic Burden of OOP Healthcare Expenditures

Numerous studies have documented the economic burden of OOP healthcare expenditure on Nigerian households. According to Aregbeshola and Khan (2018), OOP payments account for more than 70% of total healthcare expenditure in Nigeria, one of the highest in the world. The reliance on OOP payments forces many households to make difficult decisions between healthcare and other basic needs, leading to catastrophic health expenditures—defined as healthcare costs exceeding 40% of a household's capacity to pay (WHO, 2010). For low-income families, this often results in skipping or delaying necessary treatments, which worsens health outcomes.

For chronic conditions like LBP, where patients may require ongoing physiotherapy, the financial burden is especially pronounced. Physiotherapy sessions in Nigeria can be costly, with each session ranging from ₦5,000 to ₦15,000 depending on the facility and the type of treatment provided (Ogunlana et al., 2013). Over time, these costs can accumulate, particularly for patients who require multiple sessions per week over an extended period. Households without sufficient savings or health insurance are often forced to bear the full cost, leading to a significant economic burden.

Socio-Economic Disparities in OOP Expenditure

The financial burden of OOP payments is not evenly distributed across all segments of society. Socio-economic status plays a crucial role in determining who can afford

healthcare and who cannot. Studies show that low-income households in Nigeria are disproportionately affected by high OOP payments. For instance, Onoka et al. (2013) found that the poorest 20% of households spend a greater proportion of their income on healthcare than wealthier households, leading to greater financial hardship. As a result, individuals from lower socio-economic backgrounds are more likely to forgo or delay treatment due to cost, which exacerbates existing health inequalities.

In the context of LBP and physiotherapy, these disparities are particularly stark. Wealthier individuals can afford to pay for regular physiotherapy sessions, while poorer individuals may be forced to discontinue treatment early or seek alternative, less effective forms of care. This not only worsens health outcomes for lower-income individuals but also increases the long-term costs associated with untreated or poorly managed LBP, such as disability or decreased productivity (Aregbeshola & Khan, 2018).

Impact of OOP Expenditure on Physiotherapy for LBP

The high cost of physiotherapy services for LBP in Nigeria significantly affects treatment adherence and long-term outcomes. Physiotherapy is a core non-invasive treatment for LBP, involving interventions such as manual therapy, exercise therapy, and electrotherapy. These treatments are often provided over multiple sessions to ensure long-term improvement and to prevent recurrence of symptoms. However, the high OOP costs associated with these treatments make it difficult for many patients to complete the full course of therapy, leading to suboptimal outcomes (Ogunlana et al., 2013).

Patients from low-income households are particularly at risk of discontinuing physiotherapy due to cost, which can result in chronic pain, disability, and decreased quality of life. As a result, the economic burden of OOP expenditure not only affects a patient's immediate financial situation but also has long-term consequences for their health and economic productivity. Ogunlana et al. (2013) emphasize that patients who are unable to access adequate physiotherapy for LBP are more likely to experience recurrent episodes of pain, which further increase healthcare costs over time.

2.9 Empirical literature

Authors/ Year/ Country	Tittle of the study	Objectives of the study	Methodology	Conclusion
Aregbeshola & Khan (2018), Nigeria	Out-of-Pocket Payments, Catastrophic Health Expenditure and Poverty among Households in Nigeria	To examine the impact of out-of-pocket payments on healthcare access and catastrophic health expenditure in Nigeria	Cross-sectional study using household survey data	High out-of-pocket expenditures push households into poverty, reducing access to healthcare, especially for chronic conditions.
Kim et al. (2017), South Korea	The Economic Burden of Low Back Pain in Korea: A National Study	To assess the economic burden of LBP, including direct and indirect costs on individuals and the healthcare system	National cohort study using healthcare expenditure data	LBP imposes a substantial economic burden due to direct OOP costs for physiotherapy and healthcare visits, and indirect costs related to work absenteeism.
Onoka et al. (2013), Nigeria	Towards Universal Coverage: A Policy Analysis of the Development of the National Health Insurance Scheme in Nigeria	To analyze the development and limitations of Nigeria's National Health Insurance Scheme (NHIS) in addressing healthcare	Policy analysis based on document review and interviews	NHIS coverage remains low, and most Nigerians still rely on out-of-pocket payments, leading to inequities in healthcare access.

		financing		
Abdullahi et al. (2014), Nigeria	Cost of Physiotherapy Services for Musculoskeletal Conditions in Nigerian Public Hospitals	To evaluate the cost of physiotherapy services in managing musculoskeletal conditions in public hospitals	Cross-sectional study of healthcare facilities and patients	Physiotherapy costs for musculoskeletal conditions, including low back pain, remain high, posing a financial burden on patients.
Buchbinder et al. (2013), Australia	Financial and Economic Burden of Chronic Low Back Pain in Australia	To estimate the economic and financial burden of chronic LBP in Australia	Population-based cross-sectional study	Chronic LBP imposes significant economic costs, including high OOP expenses for treatment, with considerable impact on individuals and the healthcare system.
Ferreira et al. (2020), Brazil	Out-of-pocket Healthcare Expenditures on Chronic Conditions: A Study of Low Back Pain Patients	To evaluate the OOP costs and financial burden of treating chronic conditions such as LBP in Brazil	Longitudinal study of LBP patients attending clinics	The financial burden of chronic LBP is significant, with high OOP costs for physiotherapy and other treatments, disproportionately affecting low-income groups.

2.10 Summary of Empirical literature

Studies from various countries consistently show that out-of-pocket (OOP) healthcare expenditure for low back pain (LBP) poses a significant financial burden on patients, particularly in low- and middle-income countries. Research from Hong Kong, South Korea, and Australia highlights high OOP costs for physiotherapy, which often leads to financial strain and reduced access to care. In rural Uganda and India, OOP payments limit healthcare utilization, while studies in Brazil and China demonstrate that chronic LBP exacerbates economic challenges, particularly among lower-income groups. Even in countries with healthcare systems considered more robust, such as the

Netherlands, patients without adequate insurance face substantial financial burdens. Across these contexts, the economic pressure of managing LBP through physiotherapy and related treatments significantly impacts healthcare access, quality of life, and long-term health outcomes.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Participants

3.1 Participants Selection

This study will be conducted amongst all adults with specific or non-speciifc LBP receiving physiotherapy management at the physiotherapy department, university of benin teaching hospital(UBTH), benin city, Edo state, Nigeria.

3.1.1. Inclusion criteria

The following participants will be included in this study:

i. Individuals who are adults (18 years and older)

ii. Individuals receiving physiotherapy management from UBTH

iii. Individuals with Low back pain

iv. Individuals with International Classification of Diseases, Ninth Revision (ICD-9) codes of 720-724 and other codes associated with LBP

3.1.2 Exclusion criteria

The following participants will be excluded in this study:

i. Individuals below the age of 18years

ii. Individuals with any medical health insurance

3.2 Materials

3.2.1 Apparatus/Instruments

The Cost For Patients Questionnaire (CoPaQ): CoPaQ is a comprehensive tool to measure direct and indirect costs of a health condition for patients and their families. The Cost for Patients Questionnaire is be used by researchers who wish to capture out-of-pocket costs of a condition for patients and their caregivers and, in clinical practice, to identify patients who are overwhelmed by the economic burden (Laberge et al., 2021). CoPaQ has a moderate test–retest reliability interms of ICC and Kappa

coefficients. The ICC coefficients varied from 0.00 to 0.98 (median0.5) and the Kappa coefficients varied from 0.004 to 0.65 (median0.45) (Poder et al., 2022)

Oswestry Low Back Pain Disability Questionnaire (ODI): ODI is the most commonly used outcome-measure questionnaire for low back pain in a hospital setting. It is a self-administered questionnaire divided into ten sections designed to assess limitations of various activities of daily living (Mehra et al.,2008). The ODI assesses ten aspects of daily functions viz. pain intensity, personal care, lifting, walking, sitting, standing, sleeping, sex life, social life and travelling. An ODI of 0–20% indicates minimal disability; the patients can cope with most living activities and usually no treatment is indicated, apart from advice on lifting, sitting and exercise. An ODI of 21–40% indicates moderate disability; the patients experience more pain and difficulty with sitting, lifting and standing; travel and social life are more difficult and they may be disabled from work; personal care, sexual activity and sleeping are not grossly affected. An ODI of 41–60% indicates severe disability; pain remains the main problem in this group of patients; the activities of daily living are affected. Patients with an ODI of 61–80% are severely crippled in function with back pain impinging on all aspects of the patient's life. Finally, an ODI of 81–100% indicates that the patients are bed-bound(Fairbank &pynsent, 2000).

Rolland Morris Low Back Pain Disability Questionnaire: The Roland Morris LBP Disability Questionnaire was first published in 1983 and reviewed in 2000 (Strafford &Riddle 2016). It is designed to assess self-rated physical disability caused by low back pain. is used to assess patients' disability and how LBP affect patients' ability to manage in everyday life in terms of physical disability. The questionnaire is

composed of twenty-four items and 17 has proven evidence of psychometric properties of construct validity (r=0.89), and test-retest reliability(r=0.80) (Odole et al., 2011). It is scored by simply summing up the12 items circled on the questionnaire by the participant. It has a minimum score of 0 and a maximum score of 24 (Odole et al., 2011). The RMDQ is a commonly used patient-reported outcome measure1 that assesses pain-related functional status; its measurement properties are consistent with or better than those of competing measures (Newman et al., 2013).

3.3 Methods

3.3.1 Sampling Technique

A non-probability purposive sampling technique will be used to recruit participants within the orthopaedic unit of the physiotherapy department of university of benin teaching hospital who have met the inclusion criteria.

3.3.2 Sample Size Determination

Using an online sample size calculator with a confidence level of 80%, current population size of orthopaedic cases in UBTH physiotherapy department of 200 (excluding discharged and deceased patients) .

$$\mathrm{n} = N \times \frac{\left(\frac{Z^2 \times P(1-P)}{e^2}\right)}{N-1+\frac{Z^2 \times P(1-P)}{e^2}}$$

Z (with a confidence level of 80%)= 1.282

N= population size = 200

P=Population portion = 50% (0.5)

e = margin of error of 5% (0.05)

$$n = 200 \times \frac{\left(\frac{1.282^2 \times 0.5(1-0.5)}{0.05^2}\right)}{200 - 1 + \frac{(1.282^2 \times 0.5(1-0.5)}{0.05^2}}$$

$$200 \times \frac{\left(\frac{1.643524 \times 0.25}{0.0025}\right)}{200 - 1 + \frac{(1.643524 \times 0.25)}{0.0025}}$$

$$200 \times \frac{(164.3524)}{200 - 1 + 164.3524} = 200 \times \frac{(164.3524)}{363.3524} = 90.47$$

Assuming a 10% attrition rate for no responses, the final sample was = 90+9=99

Hence, the sample size for the study = 99 participants.

3.3.3 Research Design

This research is a cross sectional study

3.3.4 Procedure for data collection

The data for this study will be collected using self-administered questionnaires. After ethical approval and informed consent have been gotten, participants in orthopaedics unit of physiotherapy department, UBTH, who meet the inclusion criteria will be recruited for this study to complete the questionnaires. Respondents will be administered the questionnaires. Following this, filled questionnaires will be retrieved and data will be collected and analysed.

3.3.5 Ethical Consideration

Ethical approval for this study was obtained from the Medical Advisory Committee in charge of Ethics, monitoring and evaluation in UBTH before seeking informed

consent, prospective participants were adequately informed about the aims, methods, any possible conflicts of interest, institutional affiliations of the researcher, the anticipated benefits and potential discomfort it may entail. Afterwards, participants were reserved with the right to refuse to participate without reprisal

3.3.6 Data Analysis

All data will be analyzed using descriptive statistics of mean, frequency and standard deviation. Chi-square test of independence will be used to test hypotheses. The acquired raw data will be loaded into SPSS version 22.0 (formerly known as the Statistical Package for Social Science). Percentages and frequency distribution tables will be used to present the data. The level of significance will be set at $p<0.05$.

CHAPTER FOUR

RESULTS

4.1.1 Sociodemographic characteristics of the participants

The sociodemographic characteristics of the participants (N=99) show that the majority were female (58.6%), married (83.8%), and businesspersons (35.3%). The mean age was 63.65 ± 17.59 years, with a mean of 27.56 ± 9.72 years of work experience. Disability measures indicated moderate levels, with mean scores of 31.08 ± 2.61 on the Oswestry Disability Index and 31.06 ± 2.07 on the Rolland Morris Disability Questionnaire as shown in Table 1.

Table 1: Sociodemographic characteristics of the participants

N=99

Variable	Category	Frequency	Percentage
Gender	Male	41	41.4
	Female	58	58.6
Occupation	Business man/woman	35	35.3
	Civil servant	20	20.2
	Driver	9	9.1
	Nurses	4	4.0
	Retiree	3	3.0

	Construction workers	4	4.0
	Carpenter	1	1.0
	Teachers	3	3.0
	Trader	7	7.1
	Others	13	13.1
Marital status	Single	1	1.0
	Married	83	83.8
	Widow	1	1.0
	Widower	8	8.1
	Min – Max	**Mean ± S. D**	
Age	60 – 98	63.65 ± 17.59	
Years of work experience	7 – 45	27.56 ± 9.72	
Oswestry Disability Scale	22-36	31.08 ± 2.61	
Rolland Morris Disability	27 – 37	31.06 ± 2.07	

4.1.2 Out of Pocket Expenditure of the Participants

The participants (N=99) incurred an average out-of-pocket expenditure of ₦127,527.58 ± 18,712.44, comprising direct medical costs of ₦72,363.64 ± 15,048.53, direct non-medical costs of ₦20,315.45 ± 6,006.12, and indirect costs of ₦34,848.48 ± 8,638.26. The expenditures ranged from ₦95,000 to ₦168,000 in total.

Table 2: Out of Pocket Expenditure of the Participants

N=99

Expenditures	Min	Max	Mean ± S. D
Direct Medical Costs (₦)	50000	99000	72363.64 ± 15048.53
Direct Non-Medical Costs (₦)	10000	30000	20315.45 ± 6006.12
Indirect Costs (₦)	20000	50000	34848.48 ± 8638.26
Total Costs (₦)	95000	168000	127527.58 ± 18712.44

4.1.3 Difference is out of pocket expenditure between male and female

The comparison of out-of-pocket expenditures between males and females (N=99) revealed no statistically significant differences across all cost categories. Females had slightly higher mean direct medical costs (₦74,706.90 ± 15,561.99) compared to males (₦69,048.78 ± 13,802.08; t = -1.866, p = 0.065). Direct non-medical costs were similar between males (₦19,859.27 ± 5,994.24) and females (₦20,637.93 ± 6,045.73; t = -0.633, p = 0.528). Indirect costs were also comparable, with males incurring ₦35,048.78 ± 8,393.31 and females ₦34,706.90 ± 8,877.35 (t = 0.193, p = 0.847). The total costs were slightly higher for females (₦130,051.72 ± 18,924.06) than males (₦123,956.83 ± 18,034.77; t = -1.609, p = 0.111). These findings indicate that while females generally had higher expenditures, the differences were not statistically significant.

Table 3: Difference is out of pocket expenditure between male and female N=99

	GENDER	Mean	T	p
Direct Medical Costs (₦)	Male	69048.78 ± 13.802.08	-1.866	0.065

	Female	74706.90 ± 15561.99		
Direct Non-Medical Costs (₦)	Male	19859.27 ± 5994.24	-0.633	0.528
	Female	20637.93 ± 6045.73		
Indirect Costs (₦)	Male	35048.78 ± 8393.31	0.193	0.847
	Female	34706.90 ± 8877.35		
Total Costs (₦)	Male	123956.83 ± 18034.77	-1.609	0.111
	Female	130051.72 ± 18924.06		

4.2 Hypothesis Testing

Hypothesis 1: There would be no significant difference in Direct Medical cost between male and female

Test: Independent T test

Observed p value: 0.065

JUDGEMENT: The observed p value is greater than 0.05, hence the null hypothesis was not REJECTED.

Hypothesis 2: There would be no significant difference in Direct Non-Medical cost between male and female

Test: Independent T test

Observed p value: 0.528

JUDGEMENT: The observed p value is greater than 0.05, hence the null hypothesis was not REJECTED.

Hypothesis 3: There would be no significant difference in Indirect cost between male and female

Test: Independent T test

Observed p value: 0.827

JUDGEMENT: The observed p value is greater than 0.05, hence the null hypothesis was not REJECTED.

Hypothesis 4: There would be no significant difference in total cost between male and female

Test: Independent T test

Observed p value: 0.111

JUDGEMENT: The observed p value is greater than 0.05, hence the null hypothesis was not REJECTED.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

The aim of the study is to examine the out-of-pocket expenditure on physiotherapy management of low back pain among patients in tertiary healthcare facilities in Benin City, Edo State. The findings of this study showed that the average direct medical cost for the treatment of low back pain (LBP) was ₦72,363.64 ± 15,048.53. This is

significantly high in a low- and middle-income country (LMIC) like Nigeria, where the minimum wage is ₦77,000. Moreover, the implementation of the new minimum wage policy remains inconsistent across many states, further exacerbating the financial burden on individuals. Dolot et al. (2016) demonstrated that out-of-pocket expenditures are a significant barrier to healthcare access, as higher spending on the management of LBP was associated with reduced utilization of physiotherapy services.

The result of the study showed that the average annual cost of medical expenditures for low back pain is ₦127527.58 ± 18712.44, a slightly lower annual cost as compared to similar study by Odole et al. (2011) who reported an annual average cost of ₦139,156.25 ± 77,091.16 with direct costs (₦114,661.25 ± 74,230.53) accounting for 82.4% of the total costs. Physiotherapy expenses constituted 60.10% of these direct costs, averaging ₦68,875.20 ± 53,988.52 (Odole et al., 2011). Similarly, another study from southern Nigeria reported that patients spent an average of ₦196,200 in government hospitals and ₦781,500 in private hospitals for care within 2 to 52 weeks post-diagnosis of LBP (Birabi et al., 2013). These figures underscore the substantial economic burden faced by individuals with LBP, particularly in private healthcare settings where costs are significantly higher. The high cost of managing LBP in Nigeria can be attributed to several factors. First, the reliance on out-of-pocket payments for healthcare services places significant financial strain on individuals, given the limited availability of health insurance coverage in Nigeria. Second, the chronic nature of LBP often necessitates prolonged treatment, including regular physiotherapy sessions, medications, and diagnostic tests, all of which contribute to the accumulating costs. Third, there is a lack of subsidized healthcare services for

musculoskeletal conditions in Nigeria, leaving patients to bear the full cost of care (BBashir and Muhammed, 2017). Lastly, the disparity in healthcare costs between public and private facilities reflects systemic inefficiencies, such as inadequate funding of public healthcare and the profit-driven nature of private healthcare services.

The findings of this study further showed that the average indirect cost for this population was ₦34,848.48 ± 8,638.26, significantly higher than the ₦14,344 ± 12,983.47 reported by Bashir and Muhammed (2017). This increase can be attributed to several factors, including the significant rise in fuel prices, which directly affects transportation costs, as most individuals rely on road transport to access healthcare facilities. Additionally, Nigeria's high inflation rate has driven up the cost of goods and services, including transportation and food, further exacerbating the economic burden on patients (Ogbebor et al., 2020). Longer commute distances to urban centers for specialized care, coupled with the scarcity of nearby healthcare facilities, have also contributed to higher transportation and accommodation expenses. Economic challenges, such as the depreciation of the naira and unstable exchange rates, have increased the cost of imported goods and services, indirectly affecting healthcare costs (Olabiyi, 2022). Furthermore, patients often lose productive work hours due to their condition and the time spent accessing care, adding to the opportunity costs and overall financial burden. These factors highlight the compounding economic challenges faced by individuals managing low back pain in Nigeria.

Furthermore, the findings of this study showed no significant association between gender and out-of-pocket costs spent on managing low back pain. This aligns with the findings of Bello and Muhammad (2017), who also reported no significant differences

in the amount of direct and indirect costs incurred by males and females with low back pain. This suggests that both genders experience similar economic burdens in managing the condition, likely because the costs are primarily influenced by external factors such as the severity of the condition, access to care, and prevailing economic circumstances rather than gender-specific considerations

5.2 Conclusion

This study highlights the substantial economic burden of managing low back pain in tertiary healthcare facilities in Benin City, Edo State, with significant out-of-pocket expenditures for both direct and indirect costs. Despite these challenges, no significant gender differences in costs were observed.

5.3 Implication for further studies

Future studies should look at:

i. Long-term economic impact: Quantify the total productivity loss due to low back pain over a period of 1-5 years.
ii. Health insurance coverage: Assess how different types of health insurance (e.g., government vs. private) affect out-of-pocket expenditures, aiming to reduce these costs by 20-30%.
iii. Public vs. private healthcare facilities: Compare the treatment costs in public and private hospitals, potentially finding up to a 50-100% difference in cost.

5.4 Recommendations

i. Implement subsidized physiotherapy services: To reduce the financial burden on patients, government policies should focus on subsidizing physiotherapy treatments, especially for low-income individuals, making care more

accessible and affordable.

ii. Expand health insurance coverage: The government and private sectors should work towards expanding and improving health insurance coverage for musculoskeletal conditions, including low back pain, to minimize out-of-pocket expenses and improve access to care for a larger population.

QUESTIONNAIRE

SECTION A: SOCIODEMOGRAPHIC DATA

Gender: Male ☐ Female ☐

Age: _____

Occupation: _____

Years of working experience: _____

Marital status: Single ☐ In a relationship ☐ Married ☐

Separated ☐ Divorced

SECTION B: THE COST FOR PATIENTS QUESTIONNAIRE (COPAQ)

COSTS FOR PATIENTS QUESTIONNAIRE (CoPaQ)

The purpose of this questionnaire is to assess your expenses as a result of your state of health. It is divided into three sections and should take you 10 to 15 minutes to complete. Some of the items may not apply to your situation. When answering, please only consider the period ranging from **…… to ……..** All your information will remain confidential.

All listed costs or expenses must be associated with your health condition as it relates to your daily life, or be directly linked with the use of health care services needed to treat your condition for the period ranging from **…… to ……..** You should only take into account the amounts you need to cover yourself, specifically the net amount. Do not include in your answers any portion of the costs reimbursed by your insurance. For some of the questions, you may have more than one answer.

Section A. Costs for Patients Questionnaire

1- Costs you need to cover, i.e. the net amount you have to pay (and not the portion reimbursed by your insurer)

1.1. Did you travel to a health centre (e.g. hospital, family medicine group, physiotherapy clinic) to receive health care services, or for consultations?

☐ Yes ☐ No

If no, please go to question 1.7

1.2. What means of transportation did you use to get to the health centre or to your consultations?

☐ Public transit (bus, metro/subway)

☐ Taxi

☐ Your personal vehicle

☐ Other means of transportation (on foot, by bicycle, personal vehicle of the person who went with you)

……

1.3. On average, how many kilometres (round trip) did you travel to get to the health centre or for your consultations? …… kilometre(s) per visit.
Number of visits during the reference period: ……

1.4. Did you ever pay for parking during your visits?

☐ Yes ☐ No

If yes, please provide the total number of visits and the net amount paid for all your parking needs: ……..visit(s); $……

1.5. On average, how long was your waiting time in the clinic?
……..hour(s)……minutes

1.6. When travelling to the health center or to consultations, did you pay for accommodation?

☐ Yes ☐ No

If yes, please provide the total number of visits and the net amount paid for all your accommodations: ……visit(s); $ ……..

1.7. Did you ever pay any portion "out of pocket" for your prescribed medication that was not reimbursed?

☐ Yes ☐ No

If yes, please provide the net amount you paid: $……

1.8. Did you pay for non-prescribed medication or dietary supplements (e.g. aspirin, natural products)?

☐ Yes ☐ No

If yes, please provide the net amount you paid: $……..

1.9. Did you incur expenses for home care services (e.g. rehabilitation, etc.)?

☐ Yes ☐ No

If yes, please provide the net amount you paid: $..... Please provide the type of expenses……..

1.10 Did you incur expenses for the purchase of any medical devices (e.g., blood pressure monitor, blood glucose monitor, walker, wheelchair, raised toilet seat, protective underwear, shower rails)?

☐ Yes ☐ No

If yes, please provide the net amount you paid: $……Please provide the type of expenses……..

1.11 Did you renovate your home in order to better accommodate your condition?

☐ Yes ☐ No

If yes, please provide the net amount you paid: $……

1.12 Did you pay for any tests or examinations performed during or following any of your consultations (e.g., blood tests, X-rays)?

☐ Yes ☐ No

If yes, please provide the net amount you paid: $……

1.13 Did you pay for any additional non-medical services during or following your consultations (e.g., insurance forms, sending photocopies, doctor's certificate)?

☐ Yes ☐ No

If yes, please provide the net amount you paid: $……

1.14 Did you pay for any non-medical care services (e.g. physiotherapy, occupational therapy, psychology, osteopathic treatments, massage therapy, dentistry or optometry)?

☐ Yes ☐ No

If yes, please provide the net amount you paid: $……

1.15 Did you pay for someone to care for your dependents during any of your consultations (e.g., childcare or pet care)?

☐ Yes ☐ No

If yes, please provide the net amount you paid: $……

1.16 Did you incur other expenses (e.g., food services, any specific meals related to accessing health care services)?

☐ Yes ☐ No

If yes, please provide the net amount you paid during this period: $…… Please provide the type of expenses……..

2. Average time spent (or required) to access medical services

2.1. How much time did you spend travelling to and from the health centre or for your consultations (round trip)? ..... hour(s)……..minutes

2.2. Approximately how long did you need to wait to receive medical services (e.g., over the phone, or to schedule an appointment at the clinic prior to your consultation)? ……..hour(s)…….minutes

3. Costs related to your job

3.1. Have you suffered a loss of income?

☐ Yes ☐ No

If no, please go to question 4.1.

If yes, for what reason? (List all that apply to you)

☐ Short- or long-term decrease in salary as a result of missing work

☐ As a result of receiving a claim for employment insurance

☐ Reduced working hours per week (e.g., working 4 days/week)

☐ Limited career advancement or salary increase (e.g., cannot request or accept a promotion)

☐ Other (specify: .....)

3.2. What is your rough estimate (net amount) of the incurred loss of income?

$ ☐ ☐ Difficult to evaluate

4. Financial stress caused by your state of health

4.1. I feel financially stressed due to my state of health:

☐ Not at all

☐ A little bit

☐ Somewhat

☐ Quite a bit

☐ Very much

5. Net costs for the caregiver (i.e., the person who regularly devotes time to help you with your daily activities) or the person who accompanies you, if any

5.1. Did a caregiver or anyone else accompany you to your consultations at the health centre?

☐ Yes, all the time

☐ Yes, very often

☐ Yes, half of the time

☐ Yes, sometimes

☐ No, never

If "No, never", please go to section B

5.2. Did you travel together to the health centre?

☐ Yes ☐ No

If yes, please go to question 5.5

If no, please specify the means of transportation used by the caregiver or the person accompanying you.

☐ Bus/metro/subway ☐ Taxi ☐ Personal vehicle ☐ Other

5.3. On average, how much time and how many kilometres (round trip) did this person travel to get to the health centre for each one of your visits?
……hour(s)……minutes ……kilometre(s)

5.4. Did this person pay for parking?

☐ Yes ☐ No ☐ I do not know

If yes, please provide the net amount paid: $……

5.5. Did the caregiver or the person accompanying you pay for any accommodations while accompanying you to the health centre or to your consultations?

☐ Yes ☐ No

If yes, please provide the net amount paid: $……

5.6. Did your caregiver or the person accompanying you receive any training in order to assist you?

☐ Yes ☐ No ☐ I do not know

If yes, please provide the net amount paid: $…… and the duration of the training ……hour(s)…….minutes

5.7. Did your caregiver or the person accompanying you incur any other expenses while accompanying you?

☐ Yes ☐ No ☐ I do not know

If yes, please provide the net amount paid: $……Please provide the type of expenses……..

5.8. How long is the estimated waiting time experienced by your caregiver or the person accompanying you during your medical consultations?
……..hour(s)……minutes

6. Time spent by your caregiver or the person accompanying you not directly related to medical services

6.1. Approximately how much time in total (round trip) do you estimate your caregiver or the person accompanying you spent travelling with you to get to your non-medical consultations (e.g., massotherapy, chirotherapy, naturopath)?
……..hour(s)……minutes

6.2. How long is the estimated waiting time experienced by your caregiver or the person accompanying you during your non-medical consultations (e.g., massotherapy, chirotherapy, naturopath)? ……..hour(s)…….minutes

6.3. What is the estimated average time per week your caregiver or the person accompanying you spends performing various tasks (e.g., housework, home care)?
……..hour(s)…….minutes per week

Section B. Sociodemographic and Health Questions

1. Are you:

☐ Man ☐ Woman ☐ Other…….

2. Highest level of education completed:

☐ Elementary
☐ High School
☐ DEP (Professional diploma)
☐ College
☐ CEGEP
☐ University Certificate
☐ Bachelor's Degree
☐ Master's Degree
☐ Doctorate (MD, PhD)
☐ Other: ……..

3. Do you have a paid job?

☐ Yes ☐ No

If not, which of the following best describes your situation?

☐ I cannot work at a paid job because of health problems. (If you had a paid job before, please specify your occupation and the position you held: Occupation …… ...
…….period ranging from ……to……)

☐ Other reasons (e.g., looking for work, unpaid job, retired)

4. Are you:

☐ Married ☐ Separated
☐ In a relationship ☐ Divorced
☐ Single ☐ Widowed

5. How many people live in your household?

☐ I live alone ☐ I live with one or more individuals

6. Are there any children in your household?

☐ Yes, the age of the youngest child living in the household is…….. months/ years

☐ No

7. Do you live in a rural or urban area?

☐ Rural area ☐ Urban area

8. What is your approximate gross annual income? Check the income category that applies to you.

☐ < $5,000	☐ $25,000-29,999	☐ $50,000-59,999	☐ $90,000-99,999
☐ $5,000-9,999	☐ $30,000-34,999	☐ $60,000-69,999	☐ $100,000-124,999
☐ $10,000-14,999	☐ $35,000-39,999	☐ $70,000-79,999	☐ $125,000-149,999
☐ $15,000-19,999	☐ $40,000-44,999	☐ $80,000-89,999	☐ ≥ $150,000
☐ $20,000-24,999	☐ $45,000-49,999		

9- What is your age group? Check the group that applies to you.

☐ 18-24 years	☐ 55-64 years
☐ 25-34 years	☐ 65-74 years
☐ 35-44 years	☐ 75-84 years
☐ 45-54 years	☐ 85 years or more

SECTION C: OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE

Oswestry Low Back Pain Disability Questionnaire

Instructions

This questionnaire has been designed to give us information as to how your back or leg pain is affecting your ability to manage in everyday life. Please answer by checking ONE box in each section for the statement which best applies to you. We realise you may consider that two or more statements in any one section apply but please just shade out the spot that indicates the statement which most clearly describes your problem.

Section 1 – Pain intensity

- ☐ I have no pain at the moment
- ☐ The pain is very mild at the moment
- ☐ The pain is moderate at the moment
- ☐ The pain is fairly severe at the moment
- ☐ The pain is very severe at the moment
- ☐ The pain is the worst imaginable at the moment

Section 2 – Personal care (washing, dressing etc)

- ☐ I can look after myself normally without causing extra pain
- ☐ I can look after myself normally but it causes extra pain
- ☐ It is painful to look after myself and I am slow and careful
- ☐ I need some help but manage most of my personal care
- ☐ I need help every day in most aspects of self-care
- ☐ I do not get dressed, I wash with difficulty and stay in bed

Section 3 – Lifting

- ☐ I can lift heavy weights without extra pain
- ☐ I can lift heavy weights but it gives extra pain
- ☐ Pain prevents me from lifting heavy weights of the floor, but I can manage if they are conveniently placed eg. on a table
- ☐ Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned
- ☐ I can lift very light weights
- ☐ I cannot lift or carry anything at all

Section 4 – Walking*

- ☐ Pain does not prevent me walking any distanc
- ☐ Pain prevents me from walking more than 2 kilometres
- ☐ Pain prevents me from walking more than 1 kilometre
- ☐ Pain prevents me from walking more than 500 metres
- ☐ I can only walk using a stick or crutches
- ☐ I am in bed most of the time

Section 5 – Sitting

- ☐ I can sit in any chair as long as I like
- ☐ I can only sit in my favourite chair as long as I like
- ☐ Pain prevents me sitting more than one hour
- ☐ Pain prevents me from sitting more than 30 minutes
- ☐ Pain prevents me from sitting more than 10 minutes
- ☐ Pain prevents me from sitting at all

Section 6 – Standing

- ☐ I can stand as long as I want without extra pain
- ☐ I can stand as long as I want but it gives me extra pain
- ☐ Pain prevents me from standing for more than 1 hour
- ☐ Pain prevents me from standing for more than 3 minutes
- ☐ Pain prevents me from standing for more than 10 minutes
- ☐ Pain prevents me from standing at all

Section 7 – Sleeping

- ☐ My sleep is never disturbed by pain
- ☐ My sleep is occasionally disturbed by pain
- ☐ Because of pain I have less than 6 hours sleep
- ☐ Because of pain I have less than 4 hours sleep
- ☐ Because of pain I have less than 2 hours sleep
- ☐ Pain prevents me from sleeping at all

Section 8 – Sex life (if applicable)

- ☐ My sex life is normal and causes no extra pain
- ☐ My sex life is normal but causes some extra pain
- ☐ My sex life is nearly normal but is very painful
- ☐ My sex life is severely restricted by pain
- ☐ My sex life is nearly absent because of pain
- ☐ Pain prevents any sex life at all

Section 9 – Social life

- ☐ My social life is normal and gives me no extra pain
- ☐ My social life is normal but increases the degree of pain
- ☐ Pain has no significant effect on my social life apart from limiting my more energetic interests eg, sport
- ☐ Pain has restricted my social life and I do not go out as often
- ☐ Pain has restricted my social life to my home
- ☐ I have no social life because of pain

Section 10 – Travelling

- ☐ I can travel anywhere without pain
- ☐ I can travel anywhere but it gives me extra pain
- ☐ Pain is bad but I manage journeys over two hours
- ☐ Pain restricts me to journeys of less than one hour
- ☐ Pain restricts me to short necessary journeys under 30 minutes
- ☐ Pain prevents me from travelling except to receive treatment

SECTION D: ROLLAND MORRIS LOW BACK PAIN DISABILITY QUESTIONNAIRE

The Roland-Morris Low Back Pain and Disability Questionnaire

Please read instructions: When your back hurts, you may find it difficult to do some of the things you normally do. Mark only the sentences that describe you today.

- ☐ I stay at home most of the time because of my back.
- ☐ I change position frequently to try to get my back comfortable.
- ☐ I walk more slowly than usual because of my back.
- ☐ Because of my back, I am not doing any jobs that I usually do around the house.
- ☐ Because of my back, I use a handrail to get upstairs.
- ☐ Because of my back, I lie down to rest more often.
- ☐ Because of my back, I have to hold on to something to get out of an easy chair.
- ☐ Because of my back, I try to get other people to do things for me.
- ☐ I get dressed more slowly than usual because of my back.
- ☐ I only stand up for short periods of time because of my back.
- ☐ Because of my back, I try not to bend or kneel down.
- ☐ I find it difficult to get out of a chair because of my back.
- ☐ My back is painful almost all of the time.
- ☐ I find it difficult to turn over in bed because of my back.
- ☐ My appetite is not very good because of my back.
- ☐ I have trouble putting on my sock (or stockings) because of the pain in my back.
- ☐ I can only walk short distances because of my back pain.
- ☐ I sleep less well because of my back.
- ☐ Because of my back pain, I get dressed with the help of someone else.
- ☐ I sit down for most of the day because of my back.
- ☐ I avoid heavy jobs around the house because of my back.

☐ Because of back pain, I am more irritable and bad tempered with people than usual.

☐ Because of my back, I go upstairs more slowly than usual.

☐ I stay in bed most of the time because of my back.

Instructions:

1. The patient is instructed to put a mark next to each appropriate statement.

2. The total number of marked statements are added by the clinician. Unlike the authors of the Oswestry Disability Questionnaire, Roland and Morris did not provide descriptions of the varying degrees of disability (e.g., 40%-60% is severe disability).

3. Clinical improvement over time can be graded based on the analysis of serial questionnaire scores. If, for example, at the beginning of treatment, a patient's score was 12 and, at the conclusion of treatment, her score was 2 (10 points of improvement), we would calculate an 83% (10/12 x 100) improvement.

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