PHYSICAL ACTIVITY PREFERENCES OF PATIENTS EXPERIENCING NON-SPECIFIC LOW BACK PAIN.

BY EMEFE UFOMA PEACE

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CERTIFICATION

This project by **Emefe Ufoma Peace** is accepted in its present form as satisfying the project 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 AND DATE

PROF. A. OBINNA EZEUKWU

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EXTERNAL EXAMINAL SIGNATURE AND DATE

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APPROVED BY

_____

REV. SIS. DR. HENRIETTA FAWOLE

HEAD

DEPARTMENT OF PHYSIOTHERAPY

COLLEGE OF MEDICAL SCIENCES

UNIVERSITY OF BENIN

DEDICATION

This Project work is dedicated to God almighty who has stood for me all through this journey , to my late Father, Mr Lawrence Omayuli Emefe and my entire family members.

ABSTRACT

BACKGROUND OF STUDY: The concept of low back pain has attracted interest due to its prevalence and association with quality of life . Despite it recognition, there is still a lack of understanding regarding correlation between physical activity level and their preferences with patients experiencing non- specific low back pain in University of Benin Teaching Hospital and Military Hospital, Benin..

Aim(s): The aim of this study is to ascertain the physical activity of patients with non-specific

LBP and also to determine the correlate of their physical activity preference and identify the

impact of physical activity preference on their level of physical activity.

Methodology: A cross sectional study of 64 patients with non-specific low back pain participated in this study. Instruments such as the Liangjin measuring tape, mechanical weighing scale, and Life Care Centers of America retractable body measuring tape were employed to measure the respondents' height (in meters), weight (in kilograms), and waist and hip circumferences (in meters) respectively. The International Physical Activity Questionnaire–Short Form (IPAQ-SF) and a **q**uestionnaire on the selection of 13 leisure-time sports and physical activity were used to assess physical activity and Physical activity preferences respectively.Visual analog scale (VAS) was use for pain rating. Data analysis involved both descriptive and inferential statistics, with the significance level set at $p<0.05$.

Results: The study's findings revealed that the most preferred physical activity among the respondents was walking (56.3%). Cycling was the most prevalent second of choice (26.6%). Running was the most prevalent third activity of choice (18.8%). The least preferred activity

was korfball. A considerable portion (60.9%) of the respondents exhibited a high degree of physical activity , (18.8%) demonstrated minimal active while (20.3%) were physically inactive. Notably, a significant connection was observed between physical activity preferences and level of physical activity (x 2=9.37, p=0.900), (x2=25.025, p=0.200), (x2=16.936, p=0.767) were the physical activity level and the first, second and third preferred physical activity respectively. The least preferred physical activity (x2=26.613, p=0.087).

CONCLUSION: The result of this study indicated that patient with non-specific low back pain had walking as the most preferred physical activity, cycling and running are the second and third most preferred physical activity receptively, the least preferred activity was korfball. The study also reported that there is no significant association between physical activity preferences and the level of physical activity among patients experiencing non-specific low back pain.

keywords: Non-specific low back pain, Physical activity preferences

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CHAPTER ONE

INTRODUCTION

1.1 Background of study

Non-specific low back pain (LBP) is a common diagnosis in primary health care, 60% to 80% of people will experience non-specific low back pain NSLBP at some point in their lifetime, according to a prevalent diagnosis in basic healthcare (Hoy et al, 2010). Recurrent pain, which occurs repeatedly over the course of a life time, is a defining feature of the syndrome (Eklund et al, 2013). In high-income economies, LBP results in significant productivity loss in addition to the suffering of people affected (Smith et al, 2010). LBP has been blamed for a significant portion of the increased sickness absence rates, especially in high-income economies (Coggon et al, 2013). As the population ages, it is anticipated that the burden of low back pain would rise significantly during the ensuring decades (Smith et al, 2010; Hoy et al, 2012). Therefore, secondary prevention of non-specific LBP, or of the prevention of future episodes, requires interventions.

Low back pain (LBP) is a usual, disabling and costly condition (Hoy et al, 2012; Vos et al, 2017). Most cases of LBP are: classified as non-specific if no specific etiology has being identified (Tulder et al, 2006). The prevalence of low back pain includes individuals, their families, communities and governments around the world (Hoy et al, 2010). Also, the economic burden of LBP is increasing due to absenteeism from work, reduced productivity, and medical cost (Krismer & Tulder, 2007).

Physical activity is widely acknowledged to have many health benefits related to psychological and physiological health (Arseneau et al, 2019; National institute of Health and Clinical Excellence .physical activity exercise referral schemes 2014; Flegal et al, 2007; Sadarangani et al, 2014). Physical activity is defined as ‘any physical movement produced by

skeletal muscles and require energy consumption (Caspersen et al, 1985). Understanding the link between physical activity and her low back pain will inform the future a multicomponent intervention for LBP prevention. Exploring each domain of physical activity separately makes it easier to transfer the knowledge gained from observational studies to actual prevention. Although, its known that physical activity can reduce all-cause mortality and risk factors from a variety of factor of chronic diseases such as cardiovascular diseases, respiratory diseases, diabetes, obesity and musculoskeletal disorders (National institute of Health and Clinical Excellence. physical activity. exercise referral schemes 2014 & O'Donovan et al,2017).

Recreational physical activity of moderate to vigorous intensity is associated with reduced risk of mortality, and inadequate physical activity is associated with increased risk of mortality involving various chronic diseases and excessive medical expenses (Lee et al, 2012; Moore et al, 2012). Patients with LBP are generally considered not as active as healthy individual, but there is no conclusive evidence backing it up (Griffin et al, 2012). LBP is one prevalent disease that 1 in 7 patients visit a physiotherapy clinic in the Netherlands complaining of non-specific LBP (Leemrijse et al, 2016). Counsel and detailed knowledge to patients sustaining non-specific LBP are necessary in all recommendations. One of the important information is that patients should be informed that they do not have a critical illness but to stay active in other to increase their physical activity extent (Heijmanset al, 2003; Wai et al,2008; Middelkoop et al, 2010; Koes et al, 2010; McLean et al, 2010; Hendrick et al, 2010). By encouraging an active lifestyle, the rate and quantity of non-specific low back pain recurrences might be decreased and the duration until a recurrence could be increased (Zandwijk et al, 2013). Advice was given that patient experiencing non-specific low back pain should assume an active lifestyle including physical activity which also has a positive effect on pain and disability outcomes (Wai et al, 2008). Phisical therapist

should encourage frequent physical activity as part of the clinical management of non-specific low back pain in order to obtain these beneficial outcomes.

Patient adherence is necessary for performing the physical exercise that has been prescribed outside of therapeutic setting without a healthcare provider's supervision. According to WHO, adherence is ''the degree to which a person's behaviour-taking medication, adhering to a diet, and/or implementing lifestyle changes correspond with agreed recommendations from a healthcare provider'' (Haynes et al, 2008). However, many patients with non-specific LBP don't appear to follow physiotherapists' recommendations (Kolt et al, 2003; Beinart et al, 2013). The success of treatment is severely hampered by non-adherence, which has been identified as a significant issue (McLean et al, 2010; Sabate, 2003; Medina-Mirapeix et al, 2009; Mannion et al, 2009; Jordan et al, 2010). Several behavioural change statagies to increase physical activity has been published in the literature (Michie et al, 2011; Lara et al, 2014). Motivational interviewing is a common behavioural change technique in the Netherlands (Bartelink et al, 2013; O'Halloran et al, 2014). The goal of motivational interviewing is to increase motivation and commitment to change through cooperative dialogue (Knight et al, 2006; Sjoling et al, 2011; Miller & Rollnick, 2014). Nagative outcomes have muted enthusiasm for motivational interviewing; the effectiveness of this strategy is questionable given the inconsistent nature of its descriptions and intervention design (Christie & Shannon, 2014).

The 'adherence problem' can also be addressed by taking patient preferences into account in an effort to boost motivation to start and continue a physical activity (Jordan et al, 2009; Henchoz & Zufferey, 2013). The biopsychosocial approach to NSLBP and evidence-based management in primary care both place a focus on taking into consideration patient preferences and values in general (Kamper et al, 2015).

Therefore, in the event that patients with NSLBP are recommended to become more physically active, we are interested in learning about their preferences for the sort of exercise. Individual characteristics (such as background, lifestyle, and attitude) have been found to be connected with adherence rates for physical activity recommendations in addition to these exercise-specific features (Scheers et al, 2013). This suggests that individual attitudes toward and motivation to adhere to exercise recommendations are related to individual differences in health decisions and adherence. Additionally, it has been demonstrated that factors such as social support, stages of change, general physical health, and prior adherence to physical exercise are determinants to physical activity participation (Wendel et al, 2007; Koeneman et al, 2011).

A number of different types of physical activity are positively correlated with having a partner to exercise with, the availability of equipment, and efficient travel routes to engage in physical activity, according to observational studies carried out to gain insight into the potential environmental determinants of physical activity (Wendel et al, 2007). Thus, when people are given a choice between two or more options, individual factors, environmental conditions, and rewards may influence how they respond to exercise and what they choose (i.e preferences). However, individual exercise preferences have received minimal research. Understanding individual preferences is crucial because research suggests that providing patients with their preferred treatment option improves significant clinical outcomes including reduced pain and improve back function (i.e preference Collaborative Review, 2008). Individual exercise habits and exercise-related features can have an impact on preferences and adherence rates, which in turn affect results, even though individual preferences might in and of themselves produce the desired health advantages. Individual preferences may be significant when recommending exercise interventions, especially for those with strong preferences, given the numerous aspects that affect what sort of exercise is

best suited to a particular individual (Preferences Collaborative Review, 2008; George & Robinson, 2010).

1.2 Statement of the problem

The musculoskeletal condition that causes the greatest level of impairment worldwide is low back pain (LBP), which is projected to affect 84% of people at some point in their lifetimes (Balague et al, 2012). Approximately 23% of persons have chronic low back pain at some point in time, and 12% of those people will have activity limitations as a result of their LBP. In addition to these amazing numbers, LBP's effect is still expanding (Hartvigsen et al, 2018). The burden of LBP has grown by 60% between 1990 and 2015, according to the most recent study on the world-wide burden of disease (measured using disability-adjusted life years) (Collaborators GBDCoD, 2017). This expansion is thought to be partially caused by the pervasive effects of unhealthy lifestyle decisions, such as sedentary behaviour (Egger et al, 2001; woolf & Pfleger, 2003; Amorim et al, 2017).

There are several factors that affect the engagement in PA prescribed by their physiotherapist, these factors include Frequency,intensity,type and time. However, to the best of the researcher's knowledge, there are only few study that have access preferences for PA in patients with NSLBP and it influence on their performance or engagement in such PA. therefore, this study will aim to access the preference in PA of patients with non specific LBP in UBTH and Benin medical center, NNPC and also to determine the relationship between physical activity preference and level of physical activity among patients with non specific low back pain (George & Robinson, 2010).

1.3 Aim of study

The aim of this study is to ascertain the physical activity of patients with non-specific LBP and also to determine the correlate of their physical activity preference and identify the impact of physical activity preference on their level of physical activity.

1.3.1 Specific objectives

The objectives of this study are to:

i. Determine the most preferred physical activity of patients experiencing non-specific low back pain.
ii. Determine the most dislike physical activity of patient experiencing NSLBP.
iii. Determine the effect of preferred physical activity of patient experiencing NSLBP.
iv. Determine the level of PA of patients experiencing NSLPB.
v. Assess the level of self-determined motivation for PA of patients experiencing NSLBP.
vi. Determine the level of pain among patients experiencing non specific low back pain.

1.4. Research Questions

This study aims to answer the following research questions;

i. What is the most preferred physical activity of patients experiencing non-specific low back pain?
ii. What is the most disliked physical activity of patients experiencing NSLBP?
iii. What is the effect of preferred physical activity on the level of physical activity of patients experiencing NSLBP?

iv. What is the level of physical activity of patient experiencing NSLBP?

v. What is the level of pain of patients experiencing non- specific low back pain.

1.5 Research Hypotheses

1.5.1 Main Hypothesis:

There would d be no significant relationship between preferred physical activity and level of pain among patients experiencing non-specific low back pain.

1.5.2 Sub Hypotheses:

i. There would be no relationship between gender and preferences of physical activity of patient experiencing NSLBP.

ii. There would be no relationship between preferred physical activity and level of physical activity.

iii. There would be no relationship between patient BMI and preferred physical activity

iv. There would be no relationship between age and preferred physical activity.

1.6 Significance of study

i. The physiotherapists' suggestions for activities don't seem to be followed by many back pain sufferers. Patients' preferences for physical exercise may have an impact on their adherences to the recommended physical activity when it is performed outside of a therapeutic setting without a healthcare provider's supervision.

ii. This study will look into the preferences for the different kinds of physical activity that patients with non-specific low back pain who were encouraged to become more active prefer.

iii. This study will identify the types of PA likely to be recommended by Physiotherapists for patients experiencing non specific low back pain.

iv. This study's importance will add to the body of work in this subject, by informing and updating physiotherapist on patient preferences for physical activity experiencing non-specific low back pain.

1.7 Scope of the study

The scope of this study comprises of:

i. **Respondents:** both female and male outward patients of the University of Benin teaching hospital and Military hospital Benin, experiencing non-specific low back pain and would be domiciled within the hospital environment.

ii. **Study location:** This study locations are University of Benin teaching hospital, Benin city and Military hospital Benin, Benin city, Edo state.

1.8 Limitations of study

I. As self-reporting tools was utilized, social desirability bias can have an impact on the results.

ii. Failure of some supposed participants to give consent for participation .

iii. The result may have been limited in statistical power due to the challenge of getting the total number of participants.

iv. Most participants could only participate after their treatment routine and this may have affected their level of pain feedback.

1.9 Definition of terms

Physical activity (PA)- It is any intentional or unintentional movement of the body that involves the usage of skeletal muscles and requires the expenditure of energy.

Preferences- A greater liking for one alternative over another or others.

Patients: A person receiving or registered to receive medical treatment.

Experiencing- Encounter or undergo (an event or occurrence).

Non-specific- Lacking in details or particulars, not caused by a specific or identified agent.

Low back pain- A common, painful condition affecting the lower portion of the spine/ back.

1.10 List of Abbreviations

PA Physical Activity

LBP Low back pain

NSLBP Non-specific low back pain

CLBP Chronic low back pain

CHAPTER TWO

LITERATURE REVIEW

2.1 Low back pain

2.1.1 Definition

LPB is describe as pain, muscle tension or stiffness with or without referred leg discomfort (sciatica) that is localized below the costal margin and above the inferior

gluteal folds of the back. up to 90% of patients are diagnosed with nonspecific LBP of unknown origin and symptoms not attributable to an identifiable well-known specific pathology (such as infection, neoplasm, metastasis, osteoporosis, rheumatoid arthritis, fractures, or radiculopathy). The lower back region extend from the lib cage to the gluteal folds, These vertebrae may exhibit an inward curve known as lordosis because of it roles, the five vertebrae of the lumber spine, number L1-L5, are big and strategically placed. The last two segments of the lumber spine, L4-L5 and L5-S1 support the most weight and body movement and are therefore more vulnerable to damage (Streisfeld et al, 2017). In the absence of anomalies, each nerve root has a close relationship with the medial and inferior portions of the neighbouring vertebral pedicle. The intervertebral foramen has set borders despite the fact that its size varies depending on how spacious each disc space has, The spinal pedicles above and below hold it in place. The doorway-like intervertebral foramen at the end of the passage is equivalent to one, and its vertical height is set to be the height of the corresponding inter vertebral disc gap (Crock et al, 1981).

There are three categories of non-specific LBP are typically distinguished: acute, sub-acute and chronic LBP. Based on how long the pain has lasted, this division. Acute low back pain is a flare-up that lasts less than 6 weeks, sub-acute LBP lasts between 6 and 12 weeks and chronic LBP lasts for 12 weeks or longer (Burton et al, 1995). Non-specific LBP suggest that there is no identified pathoanatomical etiology. Triage aims to rule out cases where the pain is caused by conditions other than lumbar spine issues (such as a leaking aortic aneurysm), conditions affecting the lumbar spine specifically (such as an epidural abscess, compression fracture, spondyloarthropathy, malignancy, or cauda equine syndrome), or by radicular pain, radiculopathy, or spinal canal stenosis. The remaining patients involve generalized low back discomfort. Although the intervertebral

dics and facet joints, among other lumbar structures, are potential sources of pain, clinical tests cannot conclusively link those structures to the pain (Chris et al, 2016).

2.1.2 Prevalence of low back pain

Low back pain (LBP) is a very common, incapacitating, and expensive condition (Hoy et al, 2012; Vos et al, 2017). According to reports, the lifetime prevalence of LBP can reach 84% and the 1-year prevalence is 65% (Walker, 2000). In circumstances, when a specific aetiology has not been established, LBP is typically classified as non-specific (van Tulder, 2006). Low back pain has a negative impact on people, their families, communities, and government worldwide (Hoy et al, 2010). In addition, the expense of treatment, productivity loss, and absenteeism from work all contribute to the growing economic burden of LBP (Krismer et al, 2007). Global years lived with disabilities (YLD) were 42.5 million (95% UI:30.2-57.2 million) in 1990 and climbed to 52.7% to 64.9 million(95% UI:46.5-87.4 million) according to the global burden of disease (GBD) 2017 report (Wu A. et al, 2020), it was recorded that female had higher YLDs than males and was formerly increased with age, 35-39 years was the peak age in 1990 and increased in 2017 with the peak age of 45-49 years. There was 568.4 million cases of LBP prevalent worldwide in 2019 with an age-standardized point prevalence of 6972.5 per 100,000 people and 223.5 million cases of incidence with an age-standardized point prevalence yearly incident of 2748.9 (Wu et al, 2020). Today, low back pain ranks first among all disabilities and reasons for missing work globally, resulting in significant socioeconomic hardship and lost productivity (Hartvigsen et al, 2018). A sizable quantity of productivity is lost each year because of the estimated 149 million workdays lost worldwide due to LBP (Meucci et al, 2015). LBP is the third most common reason for surgical operations, the fifth most common reason for hospital admissions, and doctors' visit among people under the age of 45 (Patrick et al, 2014). Since the cause is vast,

majority (90%) of LBP presentation is unknown, the diagnose is based only on the exclusion of a particular pathology (Amundsen et al, 2018). LBP is grouped into three category; Acute (6 weeks), sub-acute (>6 weeks to 3 months) and chronic (3 months and above). LBP are additional classified as non- specific LBP base on the length of the symptoms (Patrick et al, 2014). Non-specific LBP typically goes away in a few weeks with little or no treatment, but occasionally there will be repeated episodes of pain and disabilities needing specialized, multidisciplinary therapy (Foster et al, 2011). Only 10% to 20% of people with LBP go on to develop CLBP, which causes agonizing pain episodes, substantial physical impairment, and activity limitation (Meucci et al, 2015).

2.1.3 Anatomy of the back

The back, which is the posterior part of the trunk, extends from the neck downwards to the buttocks (Moore et al., 2013). It encompasses various structures, including:

1. Skin and subcutaneous tissue.
2. Muscles: These consist of two layers. The superficial layer primarily facilitates upper limb positioning and movement, while the deeper layers, known as the true muscles of the back, play a role in maintaining body posture.
3. Vertebral column: This includes the vertebral bodies, intervertebral discs, and associated ligaments.
4. Ribs (located in the thoracic region).
5. Spinal cord and the surrounding meninges.
6. Segmental nerves and blood vessels (Moore et al., 2013; Modes & Fahrioglu, 2020).

2.1.4 The vertebral column

1. The vertebral column, also known as the spine, extends from the cranium (skull) to the apex of the coccyx (tailbone). It is composed of 33 vertebrae, with the intervertebral discs accounting for approximately one quarter of its length. In adults, the vertebral column measures around 71 to 75cm. It serves several functions, including:

2. Protection of the spinal cord and spinal nerves.
3. Support of the body's weight and physical structures above the pelvis.
4. Provision of an axis for body movement and a base for the head.
5. Contribution to body posture and locomotion (Valovska, 2011; Moore et al., 2013; DeSai et al., 2020) of the back, which is the posterior part of the trunk, extends from the neck downwards to the buttocks (Moore et al., 2013). It encompasses various structures, including;

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2.1.5 The vertebrae

There are 33 in the vertebral column, composed of vertebrae and intervertebral discs, it is divided into five regions in adults. These regions include:

i. Cervical region: Comprising the first 7 vertebrae.

ii. Thoracic region: Consisting of 12 vertebrae.

iii. Lumbar region: Composed of 5 vertebrae.

iv. Sacral region: Made up of 5 vertebrae.

v. Coccygeal region: Comprising the last 4 inferior vertebrae.

The vertebrae in the cervical to lumbar region (first 25 vertebrae) allow significant movement, while the sacral region fuses to form the sacrum and the coccygeal region fuses to form the coccyx, resulting in rigidity. The junction between the lumbar vertebrae and the sacrum is referred to as the lumbosacral region (Valovska, 2011; Moore et al., 2013).

The size of the vertebrae gradually increases from the cervical to sacral region, reaching its largest size near the superior part of the sacrum. This area experiences increased weight transfer to the pelvic girdle at the sacroiliac joints. The gradual variation in size along the vertebral column is due to the increasing amount of weight borne by each vertebra (Moore et al., 2013). Intervertebral discs separate each vertebra from one another, both superiorly and inferiorly. These discs consist of an outer avascular layer called the annulus fibrosus and a soft inner nucleus pulposus (Valovska, 2011; DeSai et al., 2020). Additionally, there are zygapophyseal joints between the cervical, thoracic, lumbar, and first sacral vertebrae, providing increased flexibility in these regions of the vertebral column (Moore et al., 2013).

Although each vertebra has unique size and characteristics within different regions of the vertebral column, they share a common basic structure. A typical vertebra consists of a vertebral body, a vertebral arch, and seven spinous processes.

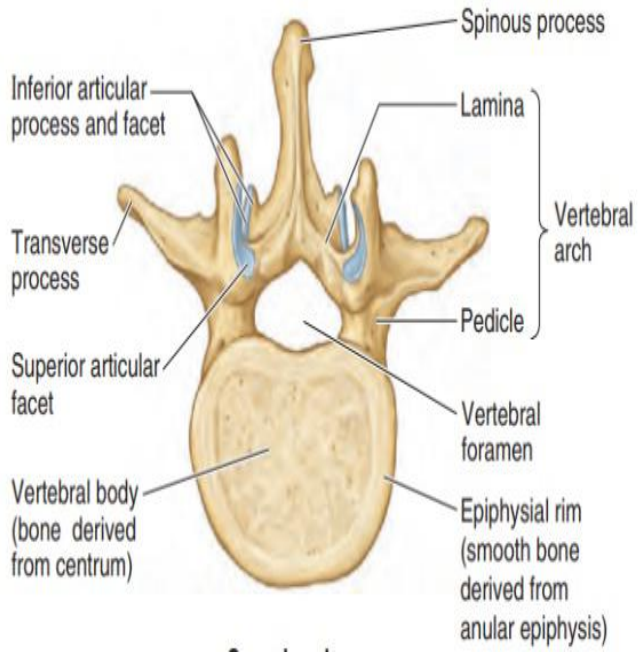

Figure 1:

Image Source; Moore, Clinically Oriented Anatomy, 7th Edition, page 442.

A superior view of the second lumbar vertebra, illustrating a representative example of a typical vertebra.

2.1.6 The vertebral arch

The vertebral arch is situated at the posterior side of the vertebral body. It consists of two pedicles and laminae on both the right and left sides. When combined with the posterior portion of the vertebral body, the vertebral arch forms the vertebral foramen. The vertebral foramina of all vertebrae come together to create a central canal within the vertebral column, known as the vertebral canal. Within the vertebral canal, one can find the spinal cord, its protective coverings (meninges), the roots of spinal nerves, and the associated blood vessels (Moore et al., 2013).

When viewed from the side, above and below each pedicle of the vertebral arch, one can observe the superior and inferior vertebral notches.

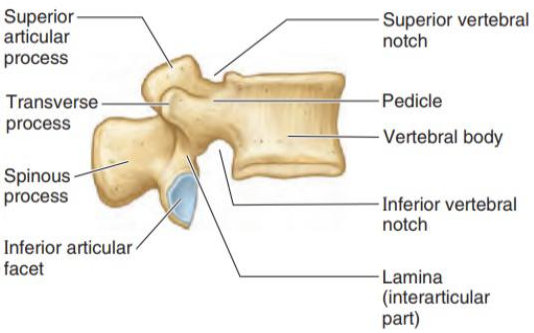

Figure 2:

Image Source: Moore, Clinically Oriented Anatomy, 7th Edition, page 442.

A lateral view of the second lumbar vertebra, illustrating the lateral characteristics of a typical vertebra.

The intervertebral foramina, through which the spinal nerves emerge from the vertebral column, are formed by the superior and inferior vertebral notches of adjacent vertebrae and the connecting intervertebral disc (Valovska, 2011; Moore et al., 2013).

i. A typical vertebra exhibits seven spinal processes that originate from the vertebral arch:

ii. One median spinous process, projecting posteriorly from the junction of the laminae.

iii. Two transverse processes, which extend posterolaterally from the junction of the lamina and the pedicle.

iv. Four articular processes (two superior and two inferior), arising from the junction of the lamina and the pedicle. These articular processes are also referred to as zygapophyses.

The transverse and spinous processes provide attachment sites for the deep muscles of the back, while the articular processes, along with those of adjacent vertebrae, form the zygapophyseal joints. These joints determine the types of movements permitted between each vertebra (Valovska, 2011; Moore et al., 2013). Additionally, the articular processes bear weight during specific transitional periods, such as when transitioning from a flexed position during sit-ups, or when the cervical vertebrae are laterally flexed to their maximum range (Moore et al., 2013).

2.1.7 Joints of the vertebral column

i. The vertebral column is composed of several joints, including:

ii. Joints of the vertebral bodies: These joints are formed by the intervertebral discs located between adjacent vertebral bodies.

iii. Joints of the vertebral arches: These joints are formed between the inferior and superior articular processes of adjacent vertebrae.

iv. Craniovertebral joints: These include the atlanto-occipital joint, which connects the skull (occipital bone) to the first cervical vertebra (atlas), and the atlanto-axial joint, which connects the atlas to the second cervical vertebra (axis).

v. Uncovertebral joints: These joints exist between each cervical vertebral body and the one immediately below it.

vi. Costovertebral joints: These joints are formed between the vertebral column and the ribs.

vii. Sacroiliac joints: These joints connect the sacrum (part of the vertebral column) to the ilium bones of the pelvis.

2.1.8 Movement of the vertebral column

Movement within the vertebral column primarily takes place at the nuclei pulposi of the intervertebral discs and the zygapophyseal joints. The flexibility and elasticity of the intervertebral discs between each vertebra enable a range of motion across the vertebral column. The muscles of the back, along with gravity and the anterior abdominal muscles, contribute to the movement of the vertebral column. However, the range of motion is constrained by several factors:

i. Adjacent ligaments of the vertebral column, such as the ligamentum flavum, the posterior longitudinal ligament, and the anterior longitudinal ligament.

ii. The shape and orientation of the zygapophyseal joints.

iii. Resistance provided by the back muscles and surrounding tissues.

iv. The presence of the rib cage (Moore et al., 2013).

The lumbar and cervical regions of the vertebral column have a wider range of movement compared to the other regions. Potential movements that can occur along the vertebral column include:

i. Flexion (greatest in the cervical region).

ii. Extension (greatest in the lumbar region).

iii. Rotation (Moore et al., 2013)

2.1.9 Curvatures of the vertebral column

When observed from a lateral perspective, the vertebral column of an adult individual exhibits four curvatures in the cervical, thoracic, lumbar, and sacral regions. Kyphosis refers to a curvature where the vertebral column is convex posteriorly and concave anteriorly, and it occurs in the thoracic and sacral regions. On the other hand, lordosis describes a curvature in which the vertebral column is concave posteriorly and convex anteriorly, and it is observed in the cervical and lumbar regions. These curvatures, combined with the flexibility and elasticity of the intervertebral discs, enable a greater range of movement than what would be possible with the discs alone.

While the intervertebral discs provide passive flexibility, the resistance provided by the zygapophyseal joints allows for dynamic flexibility through the involvement of antagonist muscle groups. The movement of the curvatures is regulated by these muscle groups: the long extensors of the back restrict thoracic kyphosis, and the abdominal flexors restrict lumbar lordosis (Valovska, 2011; Moore et al., 2013).

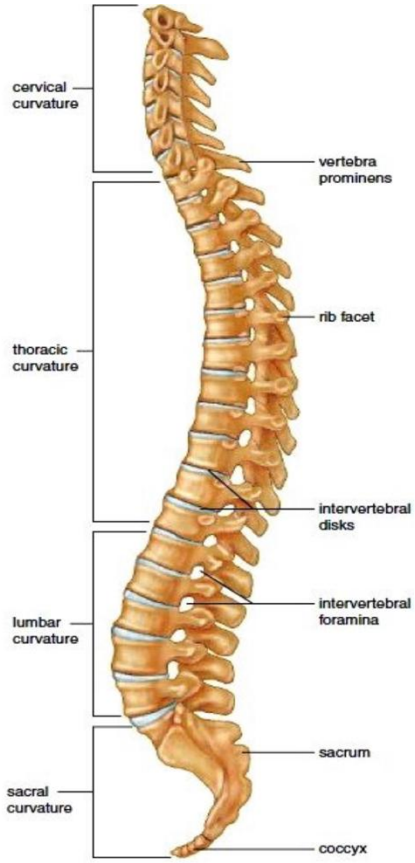

Figure 3:

Image source: www.pinterest.at

A Lateral view of the vertebral column, showing the four spinal curvatures

Carrying additional weights in front of the normal gravitational axis of the body can cause an increase in the spinal curvatures. Prolonged carrying of such weights often leads to muscle discomfort in the muscles that oppose the movement of these curvatures. These discomforts manifest as muscle aches. (Moore et al., 2013).

2.1.10 Vasculature of the vertebral column

The major arterial supply to the vertebral column includes the vertebral and ascending vertebral arteries, as well as the segmental arteries of the trunk. The segmental arteries consist of the posterior intercostal arteries (in the thoracic region), subcostal and lumbar arteries, and the iliocostal, lateral, and medial sacral arteries.

These arteries provide blood supply to different areas of the vertebrae. The anterolateral surfaces of the vertebrae receive blood from periosteal and equatorial branches of these arteries. The spinal branches enter the intervertebral foramina and divide into larger branches called radicular medullary arteries, as well as smaller anterior and posterior vertebral canal branches. The anterior vertebral canal branches supply the vertebral bodies, while the posterior branches supply the vertebral arches. Nutrient arteries, which supply the red marrow of the central vertebral body, arise as branches from the anterior vertebral canal arteries. The radicular medullary arteries supply the posterior and anterior roots of the spinal nerves along with their meninges.

Venous drainage of the vertebral column is facilitated by the internal and external vertebral venous plexuses, which are formed from the spinal veins. These plexuses communicate through the intervertebral foramina. The basivertebral veins drain the vertebral bodies and empty into the anterior internal and external vertebral plexuses. Blood from the vertebral venous plexuses and the spinal cord is drained by the intervertebral veins into the vertebral veins of the neck and the segmental veins of the trunk, including the lumbar, sacral, and intercostal veins(Moore et al., 2013).

2.1.11 Nerve supply to the vertebral column

The major arterial supply to the vertebral column includes the vertebral and ascending vertebral arteries, as well as the segmental arteries of the trunk. The segmental arteries consist of the posterior intercostal arteries (in the thoracic region), subcostal and lumbar arteries, and the iliocostal, lateral, and medial sacral arteries.

These arteries play a crucial role in providing blood supply to different regions of the vertebrae. The anterolateral surfaces of the vertebrae receive blood from periosteal and equatorial branches originating from these arteries. Within the vertebral column, the spinal branches enter the intervertebral foramina and divide into larger branches known as radicular medullary arteries, as well as smaller anterior and posterior vertebral canal branches. The anterior vertebral canal branches supply the vertebral bodies, while the posterior branches supply the vertebral arches. Nutrient arteries, which supply the red marrow of the central vertebral body, arise as branches from the anterior vertebral canal arteries. The radicular medullary arteries supply the posterior and anterior roots of the spinal nerves along with their meninges.

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2.1.12 Muscles of the back

The back muscles can be classified into two major groups: the extrinsic back muscles and the intrinsic back muscles.

The extrinsic back muscles consist of the superficial and intermediate muscle groups. These muscles play a role in initiating and controlling respiratory movements, as well as movements of the limbs (Moore et al., 2013). However, according to Henson et al. (2020), the classification of back muscles involves three groups, with the superficial and intermediate muscle groups being categorized separately from the intrinsic muscle groups.

On the other hand, the intrinsic back muscles are attached to the vertebral column and are primarily involved in controlling the movement of the vertebral column and helping to maintain proper body posture (Moore et al., 2013; Henson et al., 2020).

2.1.13 Extrinsic muscles of the back

The extrinsic muscles of the back can be divided into two groups: the superficial muscles and the intermediate muscles.

The superficial muscle group consists of the trapezius, latissimus dorsi, rhomboids, and levator scapulae. These muscles connect the vertebral column to the upper appendicular skeleton, including the pectoral girdle and the humerus. They play a role in initiating and controlling movements of the upper limbs. The innervation of this muscle group is primarily provided by the anterior rami of the cervical nerves, except for the trapezius, which is innervated by the spinal accessory nerve (cranial nerve XI) (Moore et al., 2013; Modes & Fahrioglu, 2020).

The intermediate extrinsic back muscles are the serratus posterior muscles, which consist of the serratus posterior superior and the serratus posterior inferior. These muscles are involved

in respiratory movements. The serratus posterior superior lies deep to the rhomboids, while the serratus posterior inferior lies deep to the latissimus dorsi. Both muscles are innervated by the intercostal nerves (Moore et al., 2013; Modes & Fahrioglu, 2020).

2.1.14 Intrinsic muscles of the back

The intrinsic muscles of the back play a crucial role in controlling the movement of the vertebral column and maintaining body posture. These muscles span from the pelvis to the cranium and are covered by the deep fascia. They receive innervation from the posterior rami of the spinal nerves (Moore et al., 2013; Modes & Fahrioglu, 2020).

The intrinsic back muscles are organized into three layers:

1) Superficial layer: This layer includes the splenius capitis and splenius cervicis muscles. These muscles cover the deep neck muscles and help maintain the position of the neck.

2) Intermediate layer: The erector spinae muscles, consisting of the iliocostalis, longissimus, and spinalis muscles, make up the intermediate layer. These muscles function to extend the vertebral column.

3) Deep layer: The transversospinalis muscles, comprising the semispinalis, multifidus, and rotatores muscles, form the deep layer. These muscles occupy the groove between the transverse and spinous processes of the vertebrae.

The transversospinalis muscles collectively contribute to back extension. The semispinalis muscle extends the head, cervical, and thoracic regions of the vertebral column. It also acts unilaterally to rotate the contralateral side of these regions. The multifidus muscle stabilizes the vertebrae during movement, while the rotatores muscle also aids in vertebral stabilization and assists with extension and rotational movements (Moore et al., 2013; Modes & Fahrioglu, 2020).

2.1.15 Blood supply and Innervation of the back muscles

The arterial blood supply to the various muscle groups of the back is provided by the deep cervical, posterior intercostal, subcostal, or lumbar vertebral arteries (Henson et al., 2020).

Regarding the nerve supply to the back muscles:

i. The extrinsic muscles are innervated by the anterior rami of the spinal nerves.

ii. The splenius capitis muscle is innervated by the lateral branches of the C2-C3 dorsal rami.

iii. The splenius cervicis muscle is supplied by the lateral branches of the lower cervical dorsal rami.

iv. The erector spinae muscles receive innervation from the dorsal rami of the spinal nerves. The ilocostalis muscle is innervated by the lateral branches of the dorsal rami, while the longissimus muscle is innervated by the intermediate branches.

v. The transversospinalis muscles are supplied by the primary branches of the dorsal rami ranging from C1 to L5 (Moore et al., 2013; Eovaldi & Varacallo, 2019; Henson et al., 2020).

2.1.16 Clinically Relevant Anatomy

The five lumber vertebrae (L1-L5) that can move in a relation to one another make up the lumber spine. They are the largest spinal segment in comparison to the thoracic or cervical regions, they can carry more of the body weight against gravity. A vertebral body, a vertebral arch, a processus spinosus, a process transversi, and facet joints make up each lumber vertebra.

In comparison to the other lumbar vertebrae, the fifth has a somewhat distinct morphology that is more cuneiform, which is consistent with the prominence of the sacro vertebral ariticulation. According to studies, the lumber vertebra's body architecture and structural integrity are complex (Prakash et al, 2007]. Understanding the functional spinal unit (=motion segment, smallest physiological unit of the(lumbar) spine) is vital before developing a search strategy for identifying the problematic non-specific low back pain. This unit consist of two neighbouring vertebrae with an intervertebral disc in between. All surrounding ligaments, connective tissues, facet joints, and muscles are tightly related to this unit as well.

The functional unit is divided into three parts, each of which perform a certain function:

i. The ligamentum longitudinale anterius / posteriores and the vertebral body make up the front lumbar compartment, which serve as a shock absorber and a support for the majority of the body's weight against gravity. When it comes to preventing heavy motions ligament are crucial.

ii. The spinal canal is located in the central lumbar compartment.—purpose: to keep the spinal cord safe. The first lumbar vertebrae mark the termination of the spinal cord, while the cauda equine is formed by the spinal nerve that exit from the second lumbar vertebrae.

iii. The vertebrae arch, the processus spinosus, the processus transversi, and the facet joints make up the back lumbar compartment. – functions: defense against rotation and violent motions and also a place for muscles and connective tissues to attach.

The lumbar spine can move in three different directions: rotation, side bending, and flexion/extension. A lumbar lordosis, which is a byproduct and a crucial element in the development of the erect posture, is present in the lumber spine. This was an adjustment for the newly gained axial loading feature (Prakash et al, 2017).The etiology of low back pain includes the abdominal, gluteal, and leg muscle in addition to the back (lumbar) muscles. According to studies, the multifidus and paraspinal muscles groups are much smaller on the symptomatic side of people with persistent unilateral low back pain compare to the asyptomatic side. (Fortin & Macedo, 2013).

2.1.17 Characteristics/Clinical Presentation:

Some characteristics/clinical presentation:

i. i. An identifiable, well-known specific pathology (such as infection, fracture, cauda equine syndrome,…) cannot explain the origin of the issue (Balague et al, 2012).

ii. ii. Non-specific low back pain cannot affect people of any age, however adolescents experience less of an influence on their quality of life than adult (Balague et al, 2012).

iii. iii. There is little support for the use of sub-grouping in the identification, description, or treatment of non-specific low back pain (Balague et al, 2012).

iv. iv. Frequent relapses mask the effect of acute bouts (Balague et al, 2012).

v. V. Large-scale epideminological studies' findings indicate that recurrence is one of the primary characteristic of low back pain (Balague et al, 2012).

vi. vi. The majority of low back pain are episode are self-limited and unrelated to serious illnesses, but it's crucial for the doctor to identify the small percentage of patients who

do have dangerous underlying illnesses, or ‘’red flags’’! Evidence level 1A (Balague et al, 2012).

vii. vii. Age of onset (20 years or >55 years), major trauma, unexplained weight loss, and extensive neurologic abnormalities are risk factors for red flag (Koes et al, 2010).

viii. viii. Non-specific low back pain is frequently reported in overweight or obese people. The largest correlation between getting treatment for low back pain and persistent low back pain is between being overweight and obese (Shiri et al, 2010).

ix. ix. The development of chronic non-specific low back pain maybe characterized by or predicted by psychosocial factors at the subacute stag, according to studie (Heitz et al, 2009).

x. x. Increase lumbar spine mobility is high-evidence risk factor for non-specific low back pain, according to studies, and it is a common clinical characteristic or presentation or presentation in these conditions (Lakke et al, 2009).

2.1.18 Diagnosing of LBP

LBP can have different forms, which make diagnosis difficult. Acute LBP is new-set, transient LBP that frequently result from a recognizable cause, like an injury. There is no anatomical reason for non-specific LBP which can potentially be acute.

Acute LBP is expected to progress through several days or week of pain that restrict activity as the underlying injury or tissue damage heals.

LBP is frequently explained in terms of time, such as acute LBP, which is pain that last shorter than four weeks, and subacute LBP.

Subacute LBP is described as pain that lasts longer than four weeks but less than twelve weeks. According to a less organized (but potentially more realistic) model for some people, LBP may be episodic, marked by remissions and relapses frequent flare-ups (Croft et al, 1998). One could categorize such LBP as persistent LBP. Persistent LBP will be regarded as a kind of cLBP for the purpose of this narrative review. Central sensitization or windup, an abnormal neurological mechanism is involve in the change of acute LBP to cLBP (Dorner & Crevenna, 2015). A neuropathic component to the pain must be considered as a potential step in the diagnosis of chronic low back pain (Nijs et al, 2015). When a neural system

problem, peripheral or central lesion or both are present and discernible, and when the pain is distributed and reported in a way that makes a neuropathic pain syndrome conceivable, neuropathic central leg pain (cLBP) result. For instance, widespread diffuse pain is typically not thought to be a form of neuropathic pain.

LBP is frequently accompanied by lumbrosacral radiculopathy (LSR), a musculoskeletal disorder (Tawa et al, 2019). However, it is unable to depict the neuropathic component of LBP. The self-Reported leeds assessment of neuropathic symptoms and signs (S-LANSS) is a test for neuropathic pain (Schafer et al, 2009; Capra et al, 2011). The location of neurologic discomfort can also be determined with a clinical neurologic evaluation. Pain assessments, pain description, locating pain spots (which can be done on a drawing of the human body), the patient medical history, and patient interviews are further diagnostic techniques for types of LBP.

2.1.19 Treatment for LBP

Acute LBP patient frequently seek the advice from medical professionals, however there is little evidence to support the superiority of one particular treatment over another in terms of preventing the development to chronic LBP. Manual therapy and low-impact exercise are two possible treatment for an acute bout of LBP. At this point, non pharmacological methods including avoiding surgical treatment are favoured (Kosloff et al, 2013; Chou et al, 2017).

Nonsteroidal anti-inflammatory medications (NSAIDs), for example may be utilized in some situations as a short-term non opioid analgesic. The STarT Back Screening Test (STarT Back) is a risk stratification technique that has been developed to help identify LBP patients who are at risk for developing more enduring LBP symptoms (Hill et al, 2008). The degree to which pain is recognized, mood disturbances, catastrophizing, and fear-avoidance behaviors are all weak factors (Delitto et al, 2019). Physical therapy, behavioural interventions and other treatments may be used to take higher-risk patients to management of some physiological issues that might obstruct recovery.

Physical treatment and cognitive therapy are use in a novel method termed psychologically informed physical therapy (PIPT) to stop LBP chronification (Nicholos et al, 2011). According to the tiered care paradigm, acute LBP is first treated conservatively and with less expensive interventions, moving on as necessary to move sophisticated and expensive therapies.

Patients are generally treated with conservative therapy, patient education, and reassurance unless certain disease represent ‘’red flags’’ and require particular interventions. Physical therapy or other methods are not though to be suitable for all people and may even have negative consequence in some cases. Physical therapy should not be employed too quickly in the treatment of acute LBP because of this. The underlying assumption is that many people with acute LBP will recover with little pain, little effort, and conservative care; those with more severe forms of LBP are likely to experience no negative effect from delaying the start of more aggressive treatment until after a period of conservative intervention (Linton et al,2018).

Stratified care aims to assess acute LBP patients, identifying those who are more likely to need more sophisticated treatment and progress them directly into the right therapy (Linton et al, 2018).There are risk stratification techniques available to assist in identifying individuals with particular biopsychosocial risk variables, and clinical trials testing their usage are currently underway. Rehabilitative measures should be introduced if acute or subacute LBP develops into chronic LBP.

Clinicians must be aware that acute LBP may develop into chronic LBP in this situation, bringing it with reduced function, increasing pain and disability. After experiencing low back pain, rehabilitation can be essential for preventing chronification and averting further discomfort. Exercise, physical training, and educational endeavors are among them (Dorner et al, 2015). Determining people at risk for chronic LBP, diagnosing acute LBP, and starting rehabilitation early-but not too early-are all crucial.

2.2 Physical Activity

2.2.1 Definition of PA

Physical activity can be define as any muscular movement by skeletal muscles and resulting in energy expenditures (Strath et al, 2013). The level of PA can be either moderate or vigorous, both of which help to improve physical health and general well being (WHO, 2020). PA also refer to any type of movement, including actions involving broad skeletal muscles. Even though activities that involve the small skeletal muscles are important, skeletal muscle exercises fall short of providing the health benefits required for wellness and physical fitness.

Physical activity has significant positive effects on a person's social, psychological, and biological health (Das & Horton, 2015; Arem et al, 2015). Regular moderate-intensity physical activity can lower your risk of mortality from all causes and morbidity. In contrast, physical activity is frequently utilized as a prevention strategy for chronic diseases like diabetes, osteoporosis, cardiovascular diseases, depression, and a variety of musculoskeletal ailments, including LBP. Clinical recommendations for LBP frequently encourage physical activity (Garber rt al,2011; Bauman et al,2016; Foster et al,2018). Regarding the precise kinds and levels of physical activity, the recommendations are silent (Excellence NlfHaC, 2016). There is conflicting information regarding whether physical activity is a protective or a risk factor for LBP, despite the fact that research on the topic is expanding (Shiri & Felah-Hassani, 2017). Uncertainties still exist regarding the nature of the relationship and the degree of association (Heneweer et al, 2011). For instance, systematic reviews have shown conflicting findings regarding the link between LBP and participation in sports and leisure-time physical activity (Heneweer et al, 2011; Hoogendoorn et al, 1999).

2.2.2 Types of physical activity

The four (4) major types of physical activity are aerobic exercises, strengthening exercise (including exercise that build muscles and strengthen bones), flexibility exercises, and balance exercises. Other names of aerobics include endurance exercise or cardiorespiratory activities. These are exercises that involve contracting large muscle group repeatedly and continuously, which causes a spike in heart rate and breathing rate. Jogging, swimming, cycling, and aerobic dance are also examples. Strengthening exercise involve both the muscles and bones. Activities that increase muscles mass and strength by putting the muscles under more stress than they have accustomed to are known as muscles-strengthening exercises which include the use of resistant band, weight bearing exercises that include push-ups, squats, and planks. Activities that put pressure on the bones or have an impact on their tension are considered bone-strengthening, These activities are also known as weight-bearing or loading activities and have a significant positive impact on bone health (i.e., muscle and strength). Exercise like jogging, running, and weight lifting are examples. Flexibility exercise help to enhance a joint's capacity to move across its full/complete range of motion. Stretching exercises, weight lifting, yoga, and Tai chi are among activities that can help to increase range of motion, loosen up tight muscles, and promote flexibility. When an older person engages in balance exercises, their risk of falling is reduced because they help keep their body balance whether they are moving or not, Walking heel to toe (also known as a

‘’tandem walk’’), walking backward and sideways, single-leg stance, standing up straight from a sitting position without assistance, and using a wobble board are some of the balance exercises(physical activity guidelines for Americans, 2nd Ed; National Heart, Lung, and Blood Institute [NHLB] n.d.).

2.2.3 Factors Affecting PA

There are internal and external barriers that can be used to categorize some of the variable impacting physical activity (PA). Lack of energy, motivation, and low self-esteem are examples of internal obstacles. Lack of resources, a lack of supplies, a lack of time, and a lack of social amenities are examples of external impediments (Endozo &Oluyinka, 2019).

2.2.4 Health benefits of PA

There are numerous health advantages to increasing physical activity levels. Routine PA has been shown to, for instance, improve body composition (through improved weight control and decrease abdominal adiposity), enhance lipid lipoprotein profiles (e.g., through increased high-density lipoprotein (LDL) cholesterol levels, and enhanced triglyceride levels), improve autonomic tone; Blood coagulation was reduced, coronary blood flow was improved, blood pressure was decreased, and glucose homeostasis and insulin sensitivity were both improved (Warburton et al., 2006).

2.3 Empirical Literature Review

The previously conducted studies that is related to physical activity preferences on Patients experiencing non- specific low back pain will be reviewed in this section. In a study by Zandwijk et al, (2018), The objective of the observational pilot study was to examine the physical activity preferences of patients with non-specific low back pain who were advised to increase their activity levels. Previous research indicates that engaging in moderate to vigorous intensity leisure-time physical activities can help reduce the recurrence rates of low back pain. However, many individuals experiencing back pain do not adhere to the activity recommendations provided by physiotherapists. It is hypothesized that adherence to prescribed physical activity outside the clinical setting, without healthcare provider

supervision, may be influenced by the patients' preferences for specific types of physical activity. a questionnaire was administered to 86 participants who reported experiencing non-specific low back pain. The results indicated that walking and cycling were the most favored physical activities among the participants. Conversely, running was found to be the least preferred activity, followed by football and golf. These findings suggest that when providing activity recommendations to individuals with low back pain in the Dutch population, it is important to consider their preferences, with walking and cycling being the preferred choices.

Table 1: Empirical. Table

Author (s)	Title of the study	Aim of the study	Research design	Sample size	method/ Outcome	Findings/conclusion
Zandeijk et al	Physical activity preferences of patients experiencing non specific low back pain	To investigate the physical activity preferences of patients suffering from non-specific low back pain, who were instructed to increase their level of physical activity .	Observational pilot study	Eighty-six patients	Use of questionnaire	walking and cycling ranked as the most favoured Physical activities, while running was the least preferred, followed by football and golf. Conclusion: walking and running are the most preferred physical activity of patients experiencing non-specific low back pain in Dutch , it should be noted when giving physical activity advice.
Griffin et Al, 2012	Do patients with low back pain have an altered level and/ or pattern of physical activity compared to healthy individuals?	The aim of the study was to acertain , looking on recent studies if patients with chronic low back pain have a lower level and/ or altered pattern of physical activity compared to	Systematic review	seven studies were recruited	Newcastle-Ottawa scale	There is no definitive proof Indicating that individuals with chronic low back pain are less active than healthy individuals. However, there are some indications that daily activity patterns differ

		healthy Individuals.				between individuals with low back pain and control group.
Cuenca et al, 2018	Exercise therapy for acute non-specific low back pain.	To assess the efficiency of exercise therapy for adults experiencing non-specific acute low back pain, characterized as pain lasting less than six weeks.	**A systematic review**	**19 studies**	**A Randomized Controlled trial**	Exercise therapy does not show superior results in providing pain relief or enhancing functional status compared to no treatment, other conservative therapies, or sham treatment, regardless of whether it's for short, intermediate, or long-term periods. Furthermore, there's insufficient robust evidence to suggest that any specific type of exercise therapy is more effective than another. Limited data are available

						regarding recovery, return-to-work, and quality of life. It's important to note that the evaluation is constrained by the limited number of studies available for different outcomes and timeframes, with the exception of comparing exercise therapy to other conservative treatments.
Lunder et al, 2015	**Low back pain and physical activity -A 6.5 years follow-up among young adults in their transition from school to working**	**To examine the course of low back pain and the association between low back pain and leisure time physical activity**	**A prospective cohort study**	**420 participants**	**Linear mixed models analysis**	Throughout the follow-up period, low back pain exhibited a decline when compared to the baseline. While the study revealed trends indicating a decrease in low back pain through

	life.					heightened leisure time physical activity, these trends were not statistically significant. Consequently, the study was unable to substantiate the notion that moderate to high levels of physical activity offer protection against low back pain among young adults entering the workforce. The outcomes, coupled with prior pertinent research, fail to establish a distinct correlation between physical activity and low back pain in young adults. Consequently, there is

						insufficient evidence to provide definitive recommendations regarding the impact of physical activity on reducing low back pain for this demographic.

CHAPTER THREE

MATERIALS AND METHODOLOGY

3.1 Participants

3.1.1 Participants Selection

This study was conducted among out-patients, who are receiving physiotherapy treatment for non-specific low back pain at either the University of Benin Teaching Hospital (UBTH) and Military hospital, Benin .

3.1.2 Inclusion Criteria

i. Outpatients of the physiotherapy department UBTH or Military hospital , Benin
ii. Patients who are currently being managed for non-specific low back pain

3.1.3 Exclusion Criteria

i. Patients who have undergone surgery on the back.
ii. Patients who have other musculoskeletal deformity.
iii. Patients will be excluded if they had a known medical history of cancer, osteoporosis, rheumatoid arthritis, tuberculosis, trauma and fractures in the lumbar spine, and recent infections of the musculoskeletal system.
iv. Patients presenting red flags at intake as referred to in the guideline for low back pain will be excluded

3.2 Materials

3.2.1 Apparatus/Instruments

Data was collected using the following tools:

i. **A Proforma:** This was used to record respondents' socio-demographic data, including their (age, gender, hospital, level of education, having children, body-mass index, work, and marital status).

ii. **Life Care Centers of America Retractable Body Measuring Tape:** The participants' waist and hip circumferences was measured to the nearest meter (m) using a retractable body measuring tape made in the United States of America (USA) by Life care centers of America.

iii. **Mechanical Weighing Scale:** The participants' weights was determined to the nearest 0.5kg (kilogram) using a mechanical scale that was built in Nigeria.

iv. **Liangjin Tape Measure:** The participants' heights was measured to the nearest metre (m) using a Liangjin tape measure made in Mumbai, India.

v. **A Questionnaire on the selection of 13 leisure-time sports and physical activity:.** Which has been used for similar studies . It was explained that respondents had to select their top three picks for their preferred physical activities from a selection of 13 leisure-time sports and physical activities in the questionnaire. The "Compendium of Physical Activities" (Ainsworth et al, 2011) and the "Sport for Life" study published by the

Netherlands Institute for Social Research (Tiessen-Raaphorst et al, 2010) were used to choose the 13 physical activities. Finally, patients were asked to identify the exercise they detested the most.The results of the first through third preference and hate options with regard to physical activities were recorded. Physical activities could be categorized into like and dislikes.

vi. **International Physical Activity Questionnaire Short-form (IPAQ-SF):** This was utilized to gauge the level of exercise among patient with non specific low back pain in university of Benin and. Military hospital, Benin both in Benin City. It takes 5 minutes to complete and asks 7 open-ended questions on a person's most recent seven days of physical activity (walking, jogging, moderate, and vigorous activities), as well as considering the amount of time spent sitting down each week, and it takes 5 minutes to finish (Craig et al., 2003).The amount of physical activity was measured in this study as a variable (MET minutes/week) and was divided into three categories: high-intensity physical activity (HEPA), minimally active level, and inactive level. Walking was calculated as 3.3 METs, moderate PA as 4.0 METs, and vigorous PA as 8.0 METs to produce the continuous variable score from the IPAQ (MET minutes/week). The following classification was then utilized to arrive at the categories.

For high intensity PA, either:

a) a minimum of three days of vigorous activity with a weekly total PA of at least 1500 MET minutes OR

b) a minimum of seven days of any combination of walking, jogging, moderate-intensity, or vigorous-intensity activities with a weekly total PA of at least 3000 MET minutes..

For moderate-intensity exercise, the following requirements must be met:

a) 3 or more days of vigorous exercise and/or walking lasting at least 30 minutes per day .

b) 5 or more days of moderate exercise and/or walking lasting at least 30 minutes per day.

c) 5 or more days of any combination of walking, jogging, moderate-intensity, or vigorous-intensity exercises, lasting at least 600 MET minutes per week.

All individuals who did not meet any of the requirements for moderate or high levels of PA were considered to be engaged in low-intensity/inactive PA. (Forde, 2005).

Reliability and Validity of the Measurement: IPAQ-SF has demonstrated solid basis and instrument for evaluating PA levels in a variety of languages and populations (Craig et al., 2003). Although the IPAQ-SF has a poor construct validity for cardiorespiratory fitness, it has

strong concurrent validity, with Spearman correlation values ranging from 0.78 for intense activity (Min Week-1) to 0.92 for overall PA (Metabolic equivalent of Task [MET]-Min Week-1). Few significant variations were detected in the gender- and socioeconomic status-specific examination of the IPAQ, which shows satisfactory reliability for vigorous and total PA. For vigorous-intensity activity, walking, sitting, and overall physical activity, the IPAQ-SF shows acceptable concurrent validity and test-retest reliability (Oyeyemi et al., 2011).

Vii. **Visual Analogue Scale (VAS):** Will be used for rating participants level of pain.

3.3 Methods

3.3.1 Sample Size and Sampling Technique

Patients was selected via purposive sampling. 59 patients in university of Benin teaching hospital, UBTH , Physiotherapy orthopaedic department and 8 patients in Military hospital, Benin with non specific low back pain. The sample size for this study will be 67 patients.

3.3.2 Research Design

This research is a cross sectional study

3.3.3 Procedure for Data Collection

The data for this study was collected using the self-administered questionnaire. The questionnaire was administered to the patients, who consented to the study, at the clinic where they receive treatment on agreed days within the week. The questionnaire was filled and retrieved on the same day, with the researcher being available to clarify any questions from the participants.

3.3.4 Ethical Consideration

Ethical approval for this study was obtained from the Ethics Research Committee of University of Benin Teaching Hospital, Benin City.

Informed consent was obtained from the prospective participants using informed consent form. Before seeking informed consent, the prospective participants were adequately informed of the aims, methods, any possible conflicts of interest, institutional affiliations of the researcher and the anticipated benefits of the study. Having been fully informed of the aim, methods and benefits, the participants were reserved with the right to refuse to participate without reprisal.

3.3.5 Area/Location

This study was conducted at the Physiotherapy Department ,University Of Benin Teaching Hospital (UBTH) and Military hospital, Benin. The university of Benin Teaching Hospital is a government public owned hospital located in Benin City, Edo State ,Nigeria, It provides both in patient and out patients service.University of Benin Teaching Hospital (UBTH) is a premier and multi- specialty health care service provider in West Africa.The hospital is located in Ugbowo , Benin City and got established on May 12,1973 following the establishment of an edict (number 12) of the Nigeria national health act.The hospital is a tertiary healthcare facility catering for health care needs of generality of people in Benin City,as well as referrals from neighbouring state.It also provides necessary facilities for training of high and middle-level workforce for health ,industry and spearheads research opportunity in the university and other interested parties with economic morbidity and research questions.

3.3.6 Data Analysis

All data was analysed using descriptive statistics of frequency, percentages, mean and standard deviation. Chi square will be used to determine the association between variables.

Data will be analysed using Statistical Package for Social Sciences (IBM SPSS) version 25. The level of significance will be set at $p<0.05$.

CHAPTER FOUR

RESULTS

4.1 Preamble

The main purpose of this study was to ascertain the physical activity preference of patients with non-specific LBP and to determine the relationship between their physical activity preference and their level of physical activity. A total of 64 patients were recruited from University of Benin Teaching Hospital and Military Hospital, Benin city.

4.1.1 Sociodemographic characteristics of the respondents

Shown in table 1. 47 (73.4%) of the respondents were female and 17 (26.6%) were male. 13 (20.3%) of the respondents fell within the age group of 36 – 45 years. 44 (68.8%) were married. 23 (35.9%) of the respondents had a bachelor's degree. The mean number of children was 2.42 (± 2.09).

Table 2: Sociodemographic characteristics of the respondents. N = 64

Variable	Frequency	Percentage (%)
Gender		
Male	17	26.6
Female	47	73.4
Age		
21 – 25	12	18.8
26 – 35	12	18.8
36 – 45	13	20.3
46 – 55	11	17.2
≥ 56	16	25.0
Marital Status		
Single	18	28.1
Married	44	68.8
Divorced	1	1.6
Separated	1	1.6
Educational Level		
None	7	10.9
O level	16	25.0
NCE	2	3.1
OND	6	9.4
HND	4	6.3
BSc	23	35.9
MSc	3	4.7
PhD	3	4.7
Pain Severity		
Mild	6	9.4
Moderate	46	71.9
Severe	12	18.8

Variable	Range	Mean ± SD
Number of children	0 – 7	2.42 ± 2.09
Pain rating	3 – 8	5.42 ± 1.30

4.1.2 Preferred physical activities of the respondents

Shown in table 2. The most preferred physical activity among the respondents was walking (56.3%). Cycling was the most prevalent second activity of choice (26.6%). Running was the most prevalent third activity of choice (18.8%). The least preferred activity was korfball.

Table 3: Preferred physical activities of the respondents **N = 64**

Variable	Frequency	Percentage (%)
Activity 1		
Walking	36	56.3
Cycling	10	15.6
Cycling on a home trainer	4	6.3
Swimming	4	6.3
Tennis/ squash	4	6.3
Football	3	4.7
Golf	1	1.6
Hockey	1	1.6
Running	1	1.6
Activity 2		
Cycling	17	26.6
Walking	12	18.8
Swimming	9	14.1
Cycling on a home trainer	8	12.5
Basketball	3	4.7
Football	3	4.7
Running	3	4.7
Tennis/ squash	3	4.7
Volleyball	3	4.7
Golf	2	3.1
Badminton	1	1.6
Activity 3		
Running	12	18.8
Football	10	15.6
Swimming	10	15.6
Cycling	7	10.9
Cycling on a home trainer	7	10.9
Walking	4	6.3
Basketball	4	6.3
Golf	3	4.7
Tennis/ squash	3	4.7
Korfball	2	3.1
Hockey	1	1.6
Volleyball	1	1.6
Activity x		
Korfball	24	37.5
Running	10	15.6
Hockey	7	10.9
Swimming	6	9.4
Golf	5	7.8

Football	4	6.3
Badminton	3	4.7
Cycling	2	3.1
Tennis/ squash	2	3.1
Cycling on a home trainer	1	1.6

4.1.3 Anthropometric and physical activity characteristics of the respondents

Shown in table 3. The mean height of the respondents was 1.68m (± 0.15). The mean weight was 76.19kg (± 15.47). The mean BMI was 27.59kg/m^2 (± 8.97). The mean waist circumference was 33.96m (±6.17), the mean hip circumference was 40.06 (± 5.43). The mean total MET was 5332.54 (± 5531.55). 39 (60.9%) of the respondents are HEPA active, 13 (20.2%) of the respondents are inactive. 27 (42.2%) of the respondents had a normal BMI.

Table 4: Anthropometric and physical activity characteristics of the respondents N = 64

	Minimum	Maximum	Mean	SD
Height (m)	1.06	1.97	1.68	0.15
Weight (kg)	47	120	76.19	15.47
BMI (kg/m^2)	17.01	79.21	27.59	8.97
Waist circumference (m)	18.0	44.0	33.96	6.17
Hip circumference (m)	24.0	49.0	40.06	5.43
Walking MET	0	5544.00	1795.66	1934.49
Moderate MET	0	6720.00	1487.50	1830.69
Vigorous MET	0	13440.00	2049.38	3525.92
Total MET	0	23784.00	5332.54	5531.55

Variable	Frequency	Percentage (%)
Physical Activity Level		
Inactive	13	20.3
Minimally Active	12	18.8
HEPA Active	39	60.9
BMI Category		
Underweight	1	1.6
Normal weight	27	42.2
Overweight	21	32.8
Obesity Class 1	11	17.2
Obesity Class 3	4	6.3

4.1.4 Relationship between physical activity preference and level of physical activity

Shown in table 4. There was no significant association between physical activity preference and the level of physical activity of the respondents.

Table 5: Chi square association between physical activity preference and level of physical activity N = 64

Activity	Physical Activity Level				
Activity 1	**Inactive (n = 13)**	**Minimally Active (n =12)**	**HEPA Active (n = 39)**	χ^2	**ρ**
Cycling	1	1	8	9.317	0.900
Cycling on a home trainer	0	1	3		
Football	1	1	1		
Golf	0	0	1		
Hockey	0	0	1		
Running	0	0	1		
Swimming	1	0	3		
Tennis/squash	0	1	3		
Walking	10	8	18		
Activity 2					
Badminton	0	1	0	25.025	0.200
Basketball	0	1	2		
Cycling	5	2	10		
Cycling on a home trainer	1	1	6		
Football	0	1	2		
Golf	0	0	2		
Running	2	0	1		
Swimming	3	1	5		
Tennis/squash	0	2	1		
Volleyball	0	2	1		
Walking	2	1	9		
Activity 3					
Basketball	2	0	2	16.936	0.767
Cycling	3	1	3		
Cycling on a home trainer	1	2	4		
Football	2	0	8		
Golf	1	1	1		
Hockey	0	0	1		
Korfball	0	1	1		
Running	2	1	9		
Swimming	1	4	5		
Tennis/squash	0	1	2		
Volleyball	0	0	1		
Walking	1	1	2		
Activity X					
Badminton	1	1	1	26.613	0.087

Cycling	0	0	2
Cycling on a home trainer	1	0	0
Football	1	2	1
Golf	0	3	2
Hockey	3	1	3
Korfball	6	1	17
Running	0	3	7
Swimming	1	0	5
Tennis/squash	0	1	1

4.1.5 Relationship between gender and physical activity preference

Shown in table 5. There was significant association between gender and the first-choice physical activity of the respondents ($\chi^2 = 15.783$, $\rho = 0.046$).

Table 6: Chi square association between gender and physical activity preference N = 64

Activity	Gender			
Activity 1	**Male (n = 17)**	**Female (n = 47)**	χ^2	**ρ**
Cycling	2	8	15.783*	0.046
Cycling on a home trainer	3	1		
Football	2	1		
Golf	0	1		
Hockey	1	0		
Running	1	0		
Swimming	0	4		
Tennis/squash	1	3		
Walking	7	29		
Activity 2				
Badminton	0	1	10.449	0.402
Basketball	1	2		
Cycling	5	12		
Cycling on a home trainer	0	8		
Football	1	2		
Golf	2	0		
Running	1	2		
Swimming	3	6		
Tennis/squash	1	2		
Volleyball	0	3		
Walking	3	9		
Activity 3				
Basketball	2	2	11.943	0.368
Cycling	3	4		
Cycling on a home trainer	1	6		
Football	3	7		
Golf	2	1		
Hockey	1	0		
Korfball	1	1		
Running	2	10		
Swimming	1	9		
Tennis/squash	0	3		
Volleyball	0	1		
Walking	1	3		
Activity X				
Badminton	3	0	14.756	0.098
Cycling	1	1		
Cycling on a home trainer	0	1		
Football	0	4		

Golf	0	5
Hockey	3	4
Korfball	5	19
Running	3	7
Swimming	2	4
Tennis/squash	0	2

4.1.6 Relationship between preferred physical activity and BMI

Shown in table 6. There was no significant association between preferred physical activity and the BMI of the respondents.

Table 7: Chi square association between physical activity preference and BMI N = 64

Activity	BMI						
Activity 1	**Underweight (n = 1)**	**Normal weight (n = 27)**	**Overweight (n = 21)**	**Obesity Class 1 (n = 11)**	**Obesity Class 3 (n = 4)**	χ^2	**ρ**
Walking	1	15	11	6	3	22.247	0.901
Cycling	0	3	4	3	0		
Cycling on a home trainer	0	1	1	1	1		
Swimming	0	2	2	0	0		
Tennis/Squash	0	1	3	0	0		
Running	0	1	0	0	0		
Football	0	3	0	0	0		
Hockey	0	1	0	0	0		
Golf	0	0	0	1	0		
Activity 2							
Walking	0	6	3	2	1	30.705	0.855
Cycling	0	5	7	3	2		
Cycling on a home trainer	0	2	5	1	0		
Swimming	1	6	1	0	1		
Tennis/Squash	0	1	1	1	0		
Badminton	0	0	0	1	0		
Running	0	3	0	0	0		
Football	0	2	1	0	0		
Basketball	0	1	1	1	0		
Volleyball	0	1	1	1	0		
Golf	0	0	1	1	0		
Activity 3							
Walking	0	3	1	0	0	27.010	0.979
Cycling	0	5	1	1	0		
Cycling on a home trainer	0	2	2	2	1		
Swimming	0	3	5	1	1		
Tennis/Squash	0	2	1	0	0		
Running	1	3	4	4	0		
Football	0	5	2	2	1		
Basketball	0	1	2	1	0		
Korfball	0	1	1	0	0		
Hockey	0	0	1	0	0		

Volleyball	0	1	0	0	0		
Golf	0	1	1	0	1		
Activity X							
Cycling	0	2	0	0	0	19.701	0.988
Cycling on a home trainer	0	1	0	0	0		
Swimming	0	3	2	1	0		
Tennis/Squash	0	1	1	0	0		
Badminton	0	1	2	0	0		
Running	0	2	5	1	2		
Football	0	2	1	1	0		
Korfball	1	9	7	5	2		
Hockey	0	3	3	1	0		
Golf	0	3	0	2	0		

4.1.7 Relationship between age and physical activity preference

Shown in table 7. There was no significant association between age and physical activity preference

Table 8: Chi square association between age and physical activity preference N = 64

Activity	BMI						
Activity 1	**21 – 35 (n = 13)**	**26 – 35 (n = 11)**	**36 – 45 (n = 13)**	**46 – 55 (n = 11)**	**≥ 56 (n = 16)**	**χ^2**	**ρ**
Walking	7	6	8	5	10	32.136	0.460
Cycling	1	0	2	3	4		
Cycling on a home trainer	1	0	1	2	0		
Swimming	1	1	1	0	1		
Tennis/Squash	1	2	1	0	0		
Running	0	0	0	1	0		
Football	2	1	0	0	0		
Hockey	0	0	0	0	1		
Golf	0	1	0	0	0		
Activity 2							
Walking	4	1	2	3	2	51.012	0.114
Cycling	1	3	1	3	9		
Cycling on a home trainer	1	2	2	2	1		
Swimming	3	0	4	2	0		
Tennis/Squash	0	0	0	1	2		
Badminton	0	1	0	0	0		
Running	1	2	0	0	0		
Football	1	0	1	0	1		
Basketball	1	2	0	0	0		
Volleyball	1	0	2	0	0		
Golf	0	0	1	0	1		
Activity 3							
Walking	1	0	1	1	1	46.893	0.355
Cycling	1	3	2	1	0		
Cycling on a home trainer	1	0	1	1	4		
Swimming	2	3	4	0	1		
Tennis/Squash	2	0	1	0	0		
Running	1	1	2	2	6		
Football	2	1	1	3	3		
Basketball	1	1	1	0	1		
Korfball	1	1	0	0	0		
Hockey	0	0	0	1	0		

Volleyball	1	0	0	0	0		
Golf	0	1	0	2	0		
Activity X							
Cycling	1	0	0	0	1	32.775	0.623
Cycling on a home trainer	0	1	0	0	0		
Swimming	1	1	0	3	1		
Tennis/Squash	1	1	0	0	0		
Badminton	0	0	0	2	1		
Running	1	2	4	2	1		
Football	2	1	0	0	1		
Korfball	4	3	6	3	8		
Hockey	2	1	1	1	2		
Golf	1	1	2	0	1		

4.1.8 Relationship between preferred physical activity and severity of pain

Table 9: Chi-square association between preferred physical activity and severity of pain

Activity	Physical Activity Level				
Activity 1	**Inactive (n = 13)**	**Minimally Active (n =12)**	**HEPA Active (n = 39)**	χ^2	**ρ**
Cycling	0	8	2	31.682	0.011
Cycling on a home trainer	2	2	0		
Football	1	2	0		
Golf	0	0	1		
Hockey	0	1	0		
Running	1	0	0		
Swimming	0	4	0		
Tennis/squash	1	3	0		
Walking	1	26	9		
Activity 2					
Badminton	0	1	0	18.931	0.526
Basketball	0	2	1		
Cycling	1	13	3		
Cycling on a home trainer	1	7	0		
Football	0	3	0		
Golf	1	0	1		
Running	1	1	1		
Swimming	1	5	3		
Tennis/squash	1	2	0		
Volleyball	0	2	1		
Walking	0	10	2		
Activity 3					
Basketball	2	1	1	25.179	0.289
Cycling	0	4	3		
Cycling on a home trainer	0	7	0		
Football	1	9	0		
Golf	1	2	0		
Hockey	0	1	0		
Korfball	0	2	0		
Running	1	7	4		
Swimming	0	8	2		
Tennis/squash	0	2	1		
Volleyball	0	1	0		
Walking	1	2	1		
Activity X					

Badminton	1	1	1	14.945	0.666
Cycling	0	2	0		
Cycling on a home trainer	0	1	0		
Football	0	2	2		
Golf	0	4	1		
Hockey	2	4	1		
Korfball	1	17	6		
Running	1	9	0		
Swimming	1	4	1		
Tennis/squash	0	2	0		

4.2 Hypotheses Testing

Hypothesis 1: There will be no relationship between preferred physical activity and level of physical activity

Alpha level: 0.05

Test statistic: Chi square

Observed: $p > 0.05$

Since the observed p value was greater than 0.05 Alpha level. The hypothesis was therefore NOT REJECTED

Hypothesis 2: There would be no relationship between gender and preferences of physical activity of patient experiencing NSLBP.

Alpha level: 0.05

Test statistic: Chi square

Observed: $p < 0.05$

Since the observed p value was lesser r than 0.05 Alpha level. The hypothesis was therefore REJECTED

Hypothesis 3: There will be no relationship between preferred physical activity and BMI

Alpha level: 0.05

Test statistic: Chi square

Observed: $p > 0.05$

Since the observed p value was greater than 0.05 Alpha level. The hypothesis was therefore NOT REJECTED

Hypothesis 4: There will be no relationship between age and preferred physical activity

Alpha level: 0.05

Test statistic: Chi square

Observed: $p > 0.05$

Since the observed p value was greater than 0.05 Alpha level. The hypothesis was therefore NOT REJECTED

Hypothesis 5: There will be no significant relationship between preferred physical activity and level of pain among patients experiencing non-specific low back pain

Alpha level: 0.05

Test statistic: Chi square

Observed: $p > 0.05$

Since the observed p value was greater than 0.05 Alpha level. The hypothesis was therefore NOT REJECTED

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 DISCUSSION

The purpose of this study was to acertain the physical activity preferences of patients with non-specific low back pain and to determine the relationship between their physical activity preferences and their level of physical activity in university of Benin and military hospital Benin.

This study assessed the level of physical activity preferences of patients with non-specific low back pain and reported that HAPA Active physical activity had the highest percentage of 60.9%, with inactive and minimally active scoring 20.3% and 18.8% receptively. This shows that a good number of participants did not meet the physical activity guideline criteria and as such were categorized as inactive, few of them were moderately active and most of them were highly active. In all category of physical activity, the activities include heavy lifting, digging, aerobics, fast bicycling, carry light loads, bicycling at a regular pace, walking e.t.c. From the report of this research, patients who engage in various PA have the highest percentage of being physically active and has reduced their level of pain and impairment which implies that non-specific PA will reduce pain and improve psychological health. This report was consistent with the results showed on the study by Hurwitz et al, (2005) on the effect of recreational physical activity and back exercises on low back pain and psychological distress whose result suggest that people experiencing low back pain should avoid certain type of exercise and concentrate on general physical activity. Another study carried out by Alsufiany et al (2020) on non-specific chronic low back pain and physical

activity report that there was no significant divergence in postural control between active individual with or without non-specific chronic low back pain . However, inactive individuals dealing with NSCLBP demonstrated reduced postural control, both postural control and hip strength were linked independently to physical activity levels. In simpler terms, a sedentary lifestyle might contribute to weakened muscle strength and postural control, consequently affecting the functional performance of individuals low back pain.

Nevertheless, the notion of staying physically active lacks a specific definition tied to any particular physical activity or activities. In this study, adherence to physical activity in the clinic and outside the clinic may be influenced by giving and advising patients to engage in preferred physical activity. In UBTH and Military hospital Benin, walking emerged as the most preferred PA among patients experiencing non-specific low back pain, cycling and running were identified as the second and third preferred physical activity respectively. Conversely, korfball was marked as the least preferred PA, the study assessed 17 male patients with NSLBP and 47 were females which implies that female are more prone to low back pain than male. In comparison with the report carried out by Zandwijk et al (2018) on the physical activity preferences of patients with non-specific low back pain, It was stated that walking and cycling were the most preferred activities , while jogging and football was stated to be the least preferred physical activity. The study also report that there is a relationship between gender and preferences for physical activity which is consistent with a study carried out by Wilson et al, (2005) on gender preferences and motivational factor for physical activity and gave a brief report that male itemized their preferred physical activities as playing soccer, basketball ball, football and base ball while girls chose their preferred physical activity as swimming, roller skating and basketball. Although, the study also reported that there is no relationship between age and preferred physical activity but it should be worthy to note that ,well established benefits of physical activity is for disease prevention

and control, wellbeing enhancement and rehabilitation support, it's evident that various factors such as age, population characteristics, health of the individual and other settings must be considered when developing intervention to promote physical activity King et Al (1992). There was also no relationship between preferences for physical activity and and BMI.

However, addressing weight management, motivation deficit and pain is crucial in designing future interventions aimed at promoting physical activity initiation and maintenance among individuals with obesity . These factors serves as both motivation and obstacles and warrants attention for effective engagement in physical activity.

5.2 CONCLUSION

The result of this study indicated that patient with non-specific low back pain had walking as the most preferred physical activity, cycling and running are the second and third most preferred physical activity receptively, the least preferred activity was korfball. The study also reported that there is no significant association between physical activity preferences and the level of physical activity among patients experiencing non-specific low back pain.

5.3 RECOMMENDATIONS.

The results from this study have significant importance of promoting awareness about the preferred physical activity of patients experiencing non- specific low back pain. This recommendation is to improve the level of physical activity of patients and also to enhance the in dependability and general performance of patients with low back pain by:

i. Physiotherapists should suggestion the preferred physical activities to patients experiencing NSLBP to enable them have an impact on their adherence both in the clinic and outside the clinic.

ii. Encouraging patients to adhere to physical activity for their overall physical well-being.

iii. Raising awareness on the factors that may hinder the physical activity level which include frequency, intensity, type and time.

iv. Further research should be done on physical activity preferences of non-specific low-back pain obese patient

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APPENDICES

APPENDIX 1

INFORMED CONSENT FORM

I am Emefe Ufoma Peace, currently a 500 Level student in the Department of Physiotherapy within the School of Basic Medical Sciences, College of Medical Sciences, at the University of Benin, located in Benin City. I am presently engaged in conducting a research project titled “PHYSICAL ACTIVITY PREFERENCES OF PATIENTS EXPERIENCING NON-SPECIFIC LOW BACK PAIN." I am humbly seeking your voluntary participation in this survey, as your valuable responses will aid us in comprehending how Physical activity preferences will improve adherence to physical activity of patients experiencing non-specific low back pain thereby improving quality of life of the individuals. The insights gleaned will contribute to a better understanding of most preferred physical activities and least preferred physical activity at the University of Benin Teaching hospital and Military hospital, Benin.

Within this study, the term "physical activity preferences " encompasses various pursuits such as b1. Walking, Cycling , Cycling on a home trainer , Swimming, Tennis/Squash, Badminton, Running, Football, Basketball, Korfball, Hockey, Volleyball and Golf. The survey comprises of four sections: Section A focuses on your personal information and anthropometric measurements, Section B contains questions regarding your level of physical activity, Section C inquires about physical activity preferences, and finally, Section D, the last section, consists of a scale of 0-10 to describe the perception of severity of pain (Visual analogue scale).

The completion of the survey is anticipated to require around 8-13 minutes of your time. Your involvement in this survey is entirely voluntary, and all information you provide will be treated as confidential. Your cooperation is greatly appreciated.

By indicating your consent, you confirm that you have reviewed the details of this survey and understand the objectives of this research project. Your willingness to participate is acknowledged and greatly valued.

Date:…….

Signature:…….

APPENDIX 2

SECTION A

Socio-Demographic Data

Kindly provide accurate information for the following fields:

1. Age: [ ] 21-25 [ ] 26-35 [ ] 36-45 [ ] 46-55 [ ] 56 and above

2. Gender: [ ] Male [ ] Female

3. Marital Status: [ ] Single [ ] Married [ ] Divorced/Separated

4. Level of Education: _____

5. Hospital: _____

6. Having Children: _____

7. Occupation: _____

Anthropometric Measurement

Height (m): _____

Weight (kg): _____

BMI (kg/m²): _____

Waist and Hip Circumference (m): _____

APPENDIX 3

SECTION B

THE INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE-SHORT FORM (IPAQ-SF)

The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities you did for at least 10 minutes at a time.

During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____**Days per week**

☐ No vigorous physical activities → **Skip to question 3**

How much time did you usually spend doing **vigorous a**ctivities on one of those days?

_____**hours per day** _____**minutes per day**

☐ Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? **Do not include walking**.

_____**days per week**

☐ No moderate physical activities → **skip to question 5**

How much time do you usually spend doing **moderate physical** activities on one of those days?

_____**hours per day** _____**minutes per day**

☐ Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise or leisure.

During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____**days per week**

☐ No walking → **Skip to question 7**

How much time do you usually spend **walking** on one of those days?

_____**hours per day** _____**minutes per day**

☐ Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

During the **last 7 days**, how much time did you spend sitting on a **weekday**?

_____**hours per day** _____**minutes per day**

☐

APPENDIX 4

SECTION C

Questionnaire: Physical Activity Preferences

Suppose an activity advice were to be given to you. You have to perform a physical activity for at least five days a week for at least half an hour daily, making a moderate effort. Which three physical activities would you choose in order of preference? Write '1' in the box before your favourite activity, '2' in the box before your second-favourite activity and '3' in the box before your third-favourite activity. Then write 'X' in the box before the activity you most dislike.1, 2, 3 and X to be filled in by the patient:

1. Walking ( )

2. Cycling ( )

3. Cycling on a home trainer ( )

4. Swimming ( )

5. Tennis/Squash ( )

6. Badminton ( )

7. Running ( )

8. Football ( )

9. Basketball ( )

10. Korfball ( )

11. Hockey ( )

12. Volleyball ( )

13. Golf ( )

APPENDIX 5

SECTION D

THE VISUAL ANALOGUE SCALE (VAS)

The Visual Analogue Scale (VAS) is a method used to measure pain intensity quantitatively. Typically, participants evaluate their pain level by marking a point on a 10 cm horizontal line. The scale ranges from 0 (indicating no pain) to 10 (representing the most intense pain).