PEFFECTIVENESS OF PHYSIOTHERAPY TREATMENT IN LUMBER DISC PROLAPS PATIENTS WITH ADVISED SURGERY BY ORTHOPEDIC CONSULTANT OR NEUROLOGY CONSULTANT

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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation

entitled

EFFECTIVENESS OF PHYSIOTHERAPY TREATMENT IN LUMBER DISC PROLAPS PATIENT WITH ADVISED SURGERY BY ORTHOPEDIC CONSULTANT OR NEUROLOGY CONSULTANT

Submitted by **Maria Shikder**, for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT).

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DECLARATION

I declare that the work presented here is my own. All sources used were cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of information of the study. I would be bound to take written consent of my supervisor and head of the physiotherapy department of Bangladesh health professions institute.

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Acronyms

BHPI: Bangladesh Health Professions Institute

BMRC: Bangladesh Medical Research Council

CRP: Centre for the Rehabilitation of the Paralyzed.

IRB: Institutional Review Board

LBP: Low Back Pain

PLID: Prolapse Lumber Intervertebral Disc

MS: Musculoskeletal

VAS: Visual Analogue Scale

WHO: World Health Organization

SPSS: Statistical Package for the Social Sciences

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Abstract

The purpose of the study was explore the effectiveness of physiotherapy treatment in lumber disc prolapse patient with advised surgery by orthopedic consultant or neurology consultant. Objectives: To evaluate the outcome of pain after receiving physiotherapy according to visual analog scale, to identify the improvement of every component of functional ability level. *Methodology*: Single group Pre- test & Post-test design was used for the study design. Total 10 participants with PLID were selected through convenience sampling for this experimental study. The study is conducted at musculoskeletal outdoor Unit of CRP. Visual analog scale was used to measure the intensity of pain in different functional position. Related "t" test was used to compare the result in Pain was analyzed by Calculating mean difference between pretest and posttest. *Results*: By using an related *t* test on the data the result were found to be highly significant in case of resting pain ($p<0.05$), pain in sitting ($p<0.05$), in standing ($p<0.05$), pain during walking ($p<0.05$), pain during heavy weight lifting ($p<0.05$) and pain during stairing ($p<0.05$).*Conclusion:* After observing pre-test and post-test score the study found that lumber disc prolapse is significantly decrease by receiving physiotherapy. The experimental study shows that physiotherapy treatment are effective treatment for reducing pain and disability in lumber disc prolapse patient. Participants in the study showed a greater benefit after receiving treatment than earlier. Which indicate that physiotherapy can be an effective treatment approach for patient with lumber disc prolapse.

Key words: Lumber disc prolapse, Physiotherapy treatment

CHAPTER I INTRODUCTION

1.1 Background

The international prevalence of low back pain vaires, but estimations for lifetime prevalence of this condition have been reported between 70 and 80% (Maniadakis & Gray, 2010). It is estimated that, in all populations, an individual has an 80% probability of having low back pain at some period during their life time, and about 18% of the population experiences low back pain at any given moment. According to US National Center for Health Statistics reports, 14% of new patients that went to a hospital for treatment were patients with low back pain, which represents 13 million people. About 3% of all patients discharged from hospitals have symptomatic low back pain. The expense of treating low back pain is higher than $100 billion each year (Peng, 2013).

Lumbar radicular syndrome (LRS) is based on a lumbar disc prolapse. LRS is characterized by irradiating pain over the area of the buttocks or legs served by 1 or more spinal nerve roots of the lumbar vertebrae or sacrum, combined with neurologic deficits associated with nerve root compression. LRS has a major effect on healthcare utilization and costs. In the Netherlands (16 million inhabitants), the annual cost of direct and indirect medical care for herniated lumbar discs was U.S. $1.6 billion in the mid-1990s; and in the United Kingdom, those 1% of all patients with low back pain who undergo surgery account for approximately 30% of healthcare costs for spinal disorders. Estimates on the incidence of lumbar disc herniation operations range from 25 to 40 operations per 100,000 inhabitants in Europe to 70 in the United States, respectively. In many Western countries, postoperative physiotherapy-based rehabilitation programs are generally recommended aiming to shorten the period of postoperative recovery. Not to offer rehabilitation after disc herniation surgery may be considered unethical by many clinicians. Up to 60% of patients complain from troublesome postoperative symptoms after a first operation for intervertebral disc herniation. Such low postoperative success rates have been related to the selection criteria for operation, to the techniques applied, and to the heterogeneity of postoperative rehabilitation programs offered (Celal et al., 2007)

Discogenic low back pain is a serious medical and social problem, and accounts for 26%-42% of the patients with chronic low back pain. Recent studies found that the pathologic features of discs obtained from the patients with discogenic low back pain were the formation of the zones of vascularized granulation tissue, with extensive innervation in fissures extending from the outer part of the annulus into the nucleus pulposus. Studies suggested that the degeneration of the painful disc might originate from the injury and subsequent repair of annulus fibrosus. Growth factors such as basic fibroblast growth factor, transforming growth factor β1, and connective tissue growth factor, macrophages and mast cells might play a key role in the repair of the injured annulus fibrosus and subsequent disc degeneration (Peng, 2013).

The lumbosacral radicular syndrome (LSRS or LRS; also called sciatica) is typically characterized by radiating pain in the dermatome of a lumbar or sacral spinal nerve root. Occasionally more than one root is involved. Contained in the syndrome pain may be accompanied with lumbar fixation, reflex abnormalities motor and sensory disturbances. In diagnosis includes stenosis of the spinal and/or root canal, infection, multiple sclerosis, autoimmune or metabolic neuropathy, and tumour. This study will be restricted to herniations at the lowest three lumbar disc levels, since these represent the most common sites. In the vast majority of cases LSRS is the result of a herniated disc. In the Netherlands annually between 60,000 and 75,000 new cases of LSRS are diagnosed by the General Practitioner (GP). The presumed direct medical costs of treatment of LSRS are € 133 million each year. Most of these costs are attributable to in-hospital treatment; only a small portion is incurred by GP's or physiotherapists (€ 3.2 million) (Peul et al., 2005).

Low back pain is a prevalent condition that has many direct and indirect costs in terms of pain and disability as well as the economic burden in terms of lost work days, health care interventions, and lost productivity time. Herniated lumbar disk is the most common specific cause of low back pain. Young and middle-aged individuals are the most frequent sufferers of this condition (Sedighi & Haghnegahdar, 2014).

In numerous studies investigators have demonstrated that, during lumbar surgeries performed after administration of a local anesthesia, pressure to the annulus fibrosis results in low-back pain. The application of pressure to lumbar discs generated low-back pain during such operations. Kuslich, et al., were able to generate back pain

similar to the preoperative pain in 70% of the patients in a consecutive series of 193 cases when stimulation was applied to the annulus fibrosis or the posterior longitudinal ligament. This pain response was blocked with the application of a local anesthetic (Baldwin, 2006).

1.2 Rationale

Prolapse lumber intervertebral disc (PLID) is one of the most common health problems all over the world. PLID has become now a major medical, social and economic problem and the costs are comparable to those associated with coronary heart disease, diabetes or depressions. Thus diminishing the cost of PLID is a major health problem issue also. Moreover a large part of population has lack of physical fitness, didn't regular physical exercise, and lack of normal posture and leading of a sedentary life are most common prevalent predisposing characteristics of lumber disc prolapse in Bangladesh. It is the number one factor for activity limitation.

PLID itself is a frequent cause of reduction of the mobility of the lumbar spine that causes impairment of spinal mobility. It is the number one factor of activity limitation in patients less than 45 years old and more common in female than male. Limitation of lumbar mobility interfere with the attainment of important functional skills and activities of daily living such as dressing, picking up objects from the floor etc.

Obesity associated with PLID causes hyperextension during stance phase and also affects daily movements such as standing up, walking, lateral bending and forward flexion. These forms of functional disabilities have profound effects on the quality of life. The other factors contributing to the long-term disability are age, location of symptoms, socioeconomic and psychological factors (distress, depression, beliefs, job dissatisfaction and mental stress at work).

The study is to find out effectiveness of physiotherapy treatment in PLID patient with advised surgery. In PLID the medical treatment is not enough rather than physiotherapy treatment is also needed. Physiotherapy is a vast area. The scope of physiotherapy is broad. Physiotherapy treatment is very useful in PLID. But many of us are not aware about physiotherapy treatment can be applied even in surgery stage. This study will help to determine treatment plan and to make patient's satisfaction about physiotherapy treatment.

1.3Aim

The aim of this study is to find out the effectiveness of physiotherapy treatment in lumbar disc prolapse patient.

1.4 Objectives

1.4.1 General objective

To identify the effectiveness of physiotherapy treatment in PLID patient.

1.4.2 Specific objective

1. To explore socio-demographic (age, gender, occupation, educational status) characteristics of patients with PLID
2. To find out the effectiveness of physiotherapy treatment for reducing pain in different functional position such as sitting, standing, walking, weight lifting and staring
3. To find out the outcome of pain after physiotherapy intervention.

1.5 Hypothesis

Physiotherapy treatment is more effective in prolapse lumbar intervertebral patient.

1.6 Null hypothesis

Physiotherapy treatment is no more effective than other treatment in prolapse intervertebral disc patient.

1.6 Operational definition

PLID

Prolapse lumber intervertebral disc is a medical condition affecting the lumber due to trauma, lifting injuries or idiopathic causes, in which a tear in the outer fibrosus of an intervertebral disc allows the soft central portion to bulge out beyond the damaged outer range.

Heavy weight lifting

Lifting objects at least 20 Kg or more.

Physical Exercise

Exercise for at least 40 minute3 times per week, example- walking 40 minute 3 times per week.

Poor Sitting Posture

Sitting with lordosed or kyphosed or slouched.

CHAPTER II LITERATURE REVIEW

The lumbar spine corresponds to lower back consists of five vertebrae. These vertebraes have heavy thick bodies to support the greater stress and weight as they serves as major load bearing portion of the vertebrae. There are two short stalks project posteriorly from the body and then fuse medially to form the neural arch. The vertebral foramen is located in the center of the neural arch through which the spinal cord passes. A spinous process projects posteriorly from the posterior portion of the neural arch and transverse process projects laterally from each side of the neural arch (Gunstream, 2008).

The spine is a three-joint complex at each level. This complex consists of one intervertebral disc and two facet joints. The two facet joints are plane type of synovial joints and the joint between the vertebral bodies is a symphyseal joint. The surfaces of the vertebral bodies are lined by thin layers of hyaline cartilage and between these layers the intervertebral disc is a thick plate of fibrocartilage that serves as shock absorber (Chaurasia, 2005).

The disc is viscoelastic that have creep and relaxation behavior. It also helps in stress distribution and protects the vertebrae from grinding against each other (Lee, 2006).

During axial compression these joints bear load and allow movement between the vertebrae. Each intervertebral disc consists of the nucleus pulposus which is a central but slightly posterior mucoid substance embedded with reticular, collagenous fibers and surrounded by the annulus fibrosus that is a fibrocartilaginous lamina. The annulus fibrosus has three layers- the outermost, middle and innermost fibers. The anterior longitudinal ligament (ALL) strengthens the anterior fibers. The posterior longitudinal ligament (PLL) is a narrow structure that provides weak midline reinforcement especially at L4-5 and L5-S1. The anterior and middle fibers are most numerous anteriorly and laterally but less posteriorly. These fibers are firmly attached to the vertebral bodies. The symphyseal joints between the vertebral bodies provide mobility of the vertebral column and facet joints allow gliding movements. The movements of the lumbar spine are flexion, extension and lateral flexion with a minor degree of rotation (Kishner, 2012).

The ligaments of the lumbar spine are anterior longitudinal ligament (ALL), posterior longitudinal ligament (PLL), interspinous ligament, intertransverse ligament and ligamentum flavum (LF). The ALL is attached to the anterior annular fibers and covers the ventral surfaces of lumbar vertebral bodies and discs. It maintains joints stability and limit extension. The PLL is situated within the vertebral canal over the posterior surface of the vertebral bodies and discs. It limits vertebral column flexion except at the lower lumbar spine as it is narrow and weak. The interspinous ligament weakly resist flexion of the spine and intertransverse ligament resist lateral bending of the trunk. The LF forms the posterior wall of the vertebral canal by being attached with the interspinous ligament medially and the facet capsule laterally. Normally this ligament is taut. During flexion it becomes stretched and during extension it becomes contracted while maintaining constant disc tension. As a whole ligament protect the spinal cord, allow adequate physiological movements and provide spinal stability. Joints stability is also affected by muscles and tendons. The tendons and muscles help to stabilize the spine by holding the articulating bone ends together and prevent excessive movement (Lee, 2006).

There are four functional groups of muscles- flexors, extensors, lateral flexors and rotators. These muscles control the lumbar spine. During flexion and extension of the lumbar spine both left and right side muscle groups acts as synergist. The flexor muscles are divided into an extrinsic and intrinsic group. The abdominal wall muscles- rectus abdominis, external abdominal oblique, internal abdominal oblique and transversus abdominis are the extrinsic group muscles. Psoas major and iliacus muscles are the intrinsic group muscles.

The extensor muscles are arranged in 3 layers- erector spinae is the primary extensor which is a single muscle but at the upper lumbar area it divides into 3 vertical columns of muscles (iliocostalis, longissimus, and spinalis). The transversospinal muscle is a 3-layered fasciculated muscle includes semispinalis, multifidus and rotatores lumborum. These muscles lie deep to the erector spinae and acts as lumbar spine extensor and rotator. A multitude of small and segmental muscles are the deepest layer of the lumbar extensors. They act as postural stabilizers and increase the efficiency of larger muscle group action. The lateral flexor of lumbar spine is quadratus lumborum. The three function of the spine includes load-bearing, provision of movement and protection of neural elements. The spine support the weight and

resulting bending moments of the head and upper torso and transfer the load to the pelvis. It allows motion between the torso and pelvis and protects the spinal cord and nerve roots from damage (Niosi & Oxland, 2006).

There are various methods and devices for measuring lumbar spine motion. The most common methods are Schober technique, radiologic researches, videofluoroscopic analysis, goniometry and inclinometry (Ulucam & Cigali, 2009). Other methods are spondylometers, fingertip-to-floor methods and plumb lines. All of these techniques have some disadvantages such as cost, exposure to radiation, need for specialized equipment and questionable reliability. There is no fully developed method of measurement of back motion for clinical use (Beattie et al., 2008).

Lumbar intervertebral discopathy is a common clinical problem and a significant cause of low back pain. Usually it is associated with overload and damage to the intervertebral disc, which directly relates to the instability of the motion segment. Renal normal anatomy between tissues within the spinal canal is a cause of the reflex curvature of the spine, the goal is to increase the volume of the spinal channel and reduce the compression of the nerve tissue. Knee-jerk reaction to pain is an non physiological change of the setting of the spine in the frontal plane (Wojcik et al., 2014).

Low back pain secondary to prolapse of lumbar intervertebral discs (PLID) is a major cause of morbidity. Its lifetime prevalence is 60 to 80%, with a true sciatica rate of 5% in men and 4% in women.(Freeman &Maharani, 2008)

Symptomatic PLID is usually treated with nerve root decompression with preservation of bony and ligamentous stabilisers of the spine. (Mathews & Long, 2007)

Low Back Pain (LBP) represents one of the most leading musculoskeletal causes of disability and is the most frequently reported condition for which people receive outpatient physiotherapy. It has been referred to as a 20th century enigma which continues to cause disability and distress in a large proportion of the adult population (Odole et al., 2010)

In worldwide estimates of lifetime prevalence of LBP vary from 50 to 84%. A point prevalence of 15–30% among international surveys of LBP report and a 1-month

prevalence of LBP between 19 and 43%. In a general working population in Sweden, ~5% sought care because of a new LBP episode during a 3-year period. Work-related factors associated with LBP that are physical and psychosocial in origin. The consequences of LBP are far-reaching and associated with increased absence from work, lost productivity and corresponding increase in economic costs (Ghaffari et al., 2006).

United States of America (USA) and Australia that such of developed countries, prevalence of LBP ranges from 26.4% to 79.2%andin developed countries lifetime prevalence of LBP is reported to be up to 85 %(Louw et al, 2007). Cassidy et al. reported thatamong adult Canadians, prevalence of LBP was 28.4% and 84.1% of Saskatchewan adults had experienced LBP at some point during their lifetime (Alkherayf, 2010).

Another study of a Belgian survey found that an almost identical lifetime prevalence of 59%. Reports published that industrialized countries have indicated prevalence rates among the general population ranging from 21% in Hong Kong and 39% in Bradford, UK to 69% in Denmark andless industrialized countries are few but it is generally believed that the prevalence is much lower than the industrialized countries (Omokhodion, 2008). LBP number is more than 20%in Bangladeshand it has a great harmful effect on health, employment and daily activities of living (Rashid et al., 2012).

Pains in lower back are an increasingly common complaint. Until recently, it was thought that they apply only to older people but reports in recent years testify to the fact that this problem affects younger and younger people including children (Furnes et al., 2011).

Damage to the intervertebral disc causes structural abnormalities associated with a reduction of its height, and engraves the annulus outside the edge of the adjacent vertebral bodies. This is the direct cause of the instability of the motion segment. Convexities of intervertebral disc directed into the spinal canal or intervertebral holes disrupt the anatomical conditions there between the posterior vertebral elements and the front part of the dural sac. Lumbar intervertebral disc is a common clinical problem and a significant cause of low back pain. Symptoms of a hernia are usually

characteristic but appear in varying degrees in individual patients (Huang et al., 2012).

Intervertebral disc (IVD) problems, principally excessive migration of the nucleus pulposus (NP) and disruption of the anulus fibrosus (AF), are generally accepted to be one of the main causes of nonspecific back pain (Wetzel & Donaldson., 2013).

Around 40% of people with low back pain are thought to have pain of discogenic origin.The apocryphal “slipped disc,” disc bulging or ultimately prolapse leading to impingement,is a major cause of work absence in industrialized societies (Andersson, 2012).

The assumption that (primarily) extension and flexion cause, predictable and repeatable,anterior and posterior (respectively), migrations of the NP underlies popular conservative therapeutic interventions, such as the McKenzie regimen (McKenzie, 2005).

PLID is normally a benign, self-limiting condition and difficult to treat only using medical interventions (Buselli et al, 2011). Thus treatments of PLID depend on the type and source of pain (Krishna, 2013).

Multidisciplinary treatment approach is effective for patients with LBP (Guzman et al., 2009). The team consists of physicians, physiotherapists, occupational therapists and psychologists (Jacobson et al., 2009). Pharmacological treatments include acetaminophen and non-steroidal anti-inflammatory drugs (NSAIDs). Acetaminophen is first-line drug because of its high safety profile and low cost where as NSAIDs have significant gastrointestinal and renovascular adverse effects (Last & Hulbert, 2009).

The principle of treatment of LBP are to relieve pain in acute case, restore normal movement in chronic cases and recurrence is to be prevented (Ebnezar, 2013).

One of the most common treatments for PLID is physiotherapy. Physical Therapist assess an individual's physical ability to do a specific job or activity and aids in developing a safe return to work program or reduce symptoms. All exercises should be performed slowly and comfortably to avoid injury. When performing strengthening and flexibility exercises, remember to breathe naturally and do NOT hold your breath;

exhale during exertion and inhale during relaxation. A program of strengthening, stretching, and aerobic exercises will improve fitness level. Research has shown that people who are physically fit are more resistant to back injuries and pain and recover quicker when they do have injuries than those who are less physically fit (Magalhaes et al., 2015).

Physiotherapy includes various type of stretching and strengthening exercises, manual therapies such as mobilization, manipulation, McKenzie therapy and electrotherapeutic modalities such as ice, heat, transcutaneous electrical nerve stimulation (TENS), ultrasound (Krishna, 2013). Electrotherapeutic modalities especially hot packs, short wave diathermy, ultrasound, TENS are commonly used to reduce pain (Rashid et al., 2012). Manual therapy is also effective in reducing pain (Moseley, 2006). Massage reduces pain, improves function and relaxation. It become more effective when combined with exercises, stretching and education (Buselli et al., 2011).

Spinal manipulation reduces pain, improves functional activities and return to work (Jacobson et al., 2009). Exercise therapy includes strengthening and core stability exercises that reduce pain and improve functions (Last & Hulbert, 2009). Motor control exercise improves neuromuscular control of trunk segments. If spinal manipulation and motor control exercises are used combinedly, the treatment become more effective (Jacobson et al., 2009). Lumbar extension is also effective (Rittweger et al., 2012). Medium-firm mattress is beneficial for the patients (Chou et al., 2007). Recent study shows that early activity, specific core stabilisation exercises, ergonomic and postural advices are effective for LBP management (Fritz et al., 2007).

For acute cases that are not debilitating, low back pain may be best treated with conservative self-care (Chou et al., 2007) including: application of heat or cold and continued activity within the limits of the pain, Firm mattresses have demonstrated less effectiveness than medium-firm mattresses (Atlas, 2010). Engaging in physical activity within the limits of pain aids recovery. Prolonged bed rest (more than 2 days) is considered counterproductive. Even with cases of severe pain, some activity is preferred to prolonged sitting or lying down - excluding movements that would further strain the back. Structured exercise in acute low back pain has demonstrated neither improvement nor harm (Choi et al., 2010).

Strengthening exercises help increase muscle tone and improve the quality of muscles. Muscle strength and endurance provide energy and a feeling of wellness to help you perform daily, routine activities. Adequate core strength that comes from abdominal and back muscles helps stabilize the spine, allows proper spinal movement, and makes it easier to maintain correct posture. Strong hip and leg muscles are important to perform proper lifting techniques and body mechanics. (Minichiello and Alaxandr, 2005).

Krishna said these are specific exercises to strengthen the abdominal muscles and low back muscles (erector spinae) to provide the aforementioned 'belt of muscle' around the spine. These exercises typically include: specific abdominal strengthening such as sit-ups, crunches, abdominal machines, & leg rises. Flexibility is the ability to move arms and legs through their full range of motion. Stretching will help improve your flexibility. Adequate flexibility of tissues around the spine and pelvis allows full, normal spinal movement, prevents abnormal force on the joints and decreases the possibility of injury (Deutscher et al., 2014).

Stretching also prepares muscles for activity; stretching should be done both before and after each vigorous workout to prevent muscle strain and soreness and to help avoid injuries. When performing flexibility exercises, stretch as far as you can and hold the stretch for 10 seconds and then ease back. Each stretching exercise should be performed slowly in both directions, with no sudden jerking or bouncing. Bouncing is more likely to injure or strain a muscle or joint (Deutscher et al., 2014).

These exercises involve the use of a variety of exercises & many include use of exercise balls, balancing machines or specific stabilizing exercises. The point of dynamic stabilization exercises is to strengthen the secondary muscles of the spine and help support the spine through various ranges of motion (Frankel and Wallen, 2004). A convincing relation exists between low back pain and decreased muscular endurance. Occupational postural disorders, where prolonged maintenance of a particular posture occurs, were a causal factor to low back pain. Patients with low back pain have decreased levels of muscular endurance in the lumbar extensors. Abdominal muscular endurance in patients with low back pain is less than those in the normal health population. The application of endurance exercises that incorporate the back extensors as well as the abdominal muscles (Kravitz & Andrews, 2011).

Along with specific back exercises, aerobic exercise that increases the heart rate for a sustained period is very beneficial for helping back problems. Aerobic exercise increases the flow of blood and nutrients to back structures which supports healing, and can decrease the stiffness in the back and joints that lead to back pain. It is easier to controlweight or lose weight, decreasing the stress placed on the spine structures and joints. An increased production of endorphins after 30 or 40 minutes of exercise can combat pain.These bio-chemicals are the body's natural painkiller (Ostgaard et al., 2011).

It is not known if chiropractic care improves clinical outcomes in those with lower back pain more or less than other possible treatments. A 2004 Cochrane review found that spinal manipulation(SM) was no more or less effective than other commonly used therapies such as pain medication, physical therapy, exercises, back school or the care given by a general practitioner which was supported by a 2006 and 2008 review (Murphy & Volinn, 2005).

A 2010 systematic review found that most studies suggest SM achieves equal or superior improvement in pain and function when compared with other commonly used interventions for short, intermediate, and long-term follow-up. In 2007the American College of Physicians and the American Pain Society jointly recommended that it be considered for people who do not improve with self care options. A 2007 literature synthesis found good evidence supporting SM and mobilization for low back pain.

Ergonomic recommendations for minimizing the risks of back injuries focus on improving working posture and equipment design. These include postural change and use of back support. Alternate between sitting and standing to reduce postural fatigue and maximize postural variety, which helps to reduce static muscle fatigue & LBP. Use Support when sitting or standing, don't lean forwards or stoop in an unsupported posture for prolonged periods.If you are sitting, sit up straight or recline slightly in a chair with good back support, and use a good footrest if necessary. If you are standing for prolonged periods try to find something to help you lean against.

Surgery is indicated only when conservative treatment fails. To remove the source of pain and restore normal loading across the disc is the principle of surgery.

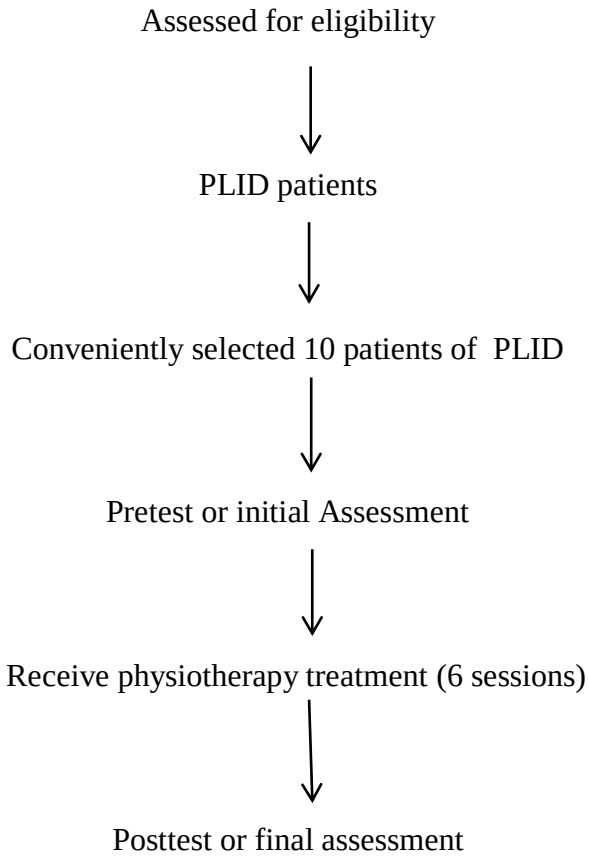
The most common operations are posterior lumbar interbody fusion (PLIF) and anterior lumbar disc replacement (Krishna, 2013).

CHAPTER III METHODOLOGY

3.1 Study design

The aim of the study was to evaluate the effectiveness of physiotherapy treatment in lumber prolapse patient. Pre-post experimental design of quantitative research was selected for this study because the experimental study is the best way to determine effectiveness. The researcher was conducted the study with a single group. The design had no a control group to compare with the experimental group (Bowling, 2006).

Flowchart of phases of experimental design



3.2 Study area

Data was collected from the outpatient, Musculoskeletal Physiotherapy unit of Centre for the Rehabilitation of the Paralyzed (CRP), Savar and CRP Mirpur Dhaka. Besides this in CRP patient come from all sectors of Bangladesh from all economical condition for comprehensive rehabilitation so it reflects the entire population.

3.3 Study population

A population refers to the entire group of people or items that meet the criteria set by the researcher. Patient with PLID with advised surgery were the population.

3.4 Sample Size

The researcher was determined to take a small sample size so that the researcher can analyze the data from the participants deeply and easily that were came. Bailey (2004) claimed that a sample is a subset of the population that has been selected to participate in the project. Researcher was taken only 10 participants as sample. This small number of participants provides a representative picture of the study. Due to time limitation the researcher was choose 10 participants to conduct his study; within the short time it could not be possible to conduct the study with a large number of the population.

3.5 Sampling Technique

Convenience sampling procedure was used for this study. This sampling procedure allowed the researcher to choose a typical case for the study. By using this sample procedure the researcher make a judgment about sample and able to collect in-depth data from participant according to research needs. As the study aim was to find out the effectiveness of physiotherapy treatment in PLID patients.

3.6 Inclusion criteria

1. Lumber disc prolapse patients with advice surgery by orthopaedic consultant or neurology consultant.
2. Complain of back pain for two months
3. Age level 18-55years
4. Both male and female are included
5. Those who are motivated

3.7 Exclusion Criteria

1. Patient suffering from serious pathological disease e.g. tumors, tuberosclerosis
2. Age level below 18years and after 55 years
3. Those who are not motivated
4. Not MRI done
5. Undiagnosed patient

3.8 Data collection procedure

The study procedure was conducted through assessing the patient, initial recording, treatment and final recording. After screening the patient at department, the patients were assessed by qualified physiotherapist. Six sessions of treatment was provided for every subject. Ten subjects were chosen for data collection according to the inclusion criteria. Data was gathered through a pre-test, intervention and post-test and the data was collected by using a written questionnaire form which was formatted by the researcher. Pretest was performed before beginning the treatment and the intensity of pain were noted with VAS score on questionnaire form. The same procedure was performed to take post-test at the end of six session of treatment. Researcher gave the assessment form to each subject before starting treatment and after six session of treatment and instructed to put mark on the line of VAS according to their intensity of pain. At the end of the study, specific test was performed for statistical analysis.

Face to face interviews helped the researcher to determine 10 participants understanding of the questions by observed their facial expressions. Questionnaires used both English and Bengal for easy understanding of the participants.

3.9 Data collection tools

To conduct the study the researcher collected data through using different types of data collection tools. The researcher organized the materials to successfully complete the interview session. The organized material was questionnaires, consent forms, a

tape recorder, paper, pen & a pencil. Some semi-structured questions were designed to conduct the interviews; during the interview instrument was paper, pen & pencil to write field notes.

3.10 Data Measurement tool

In this study researcher used visual analogue scale for measuring the intensity of pain. The VAS is a simple and accurate way of subjectively assessing pain along a continuous visual spectrum. VAS consists of a straight line on which the individual being assessed marks the level of pain. The ends of the straight line are the extreme limits of pain with 0 representing no pain and 10 representing the worst pain ever experienced. According to Myles (2009), the visual analog scale (VAS) is a tool widely used to measure pain and a change in the visual analog scale score represents a relative change in the magnitude of pain sensation.

3.11 Questionnaire

The questionnaire was developed under the advice and permission of the supervisor following certain guidelines. There were ten close ended questions with visual analogue scale (VAS) with some objective questions which were measured by examiner and each question was formulated to identify the change of pain with each activity.

Socio demographic criteria including age, sex, occupation, marital status, living area, educational status. Positional criteria including pain in rest, in sitting, in standing, during walking, during heavy weight, during stairing.

3.12 Ethical consideration:

The whole process of this research project was done by following the Bangladesh Medical Research Council (BMRC) guidelines and World Health Organization (WHO) Research guidelines. The proposal of the dissertation including methodology was approved by Institutional Review Board (IRB) and obtained permission from the concerned authority of ethical committee of Bangladesh Health Professions Institute (BHPI). Again before the beginning of the data collection, the researcher obtained the permission ensuring the safety of the participants from the concerned authorities of the clinical setting and was allotted with a witness from the authority for the

verification of the collected data. The researcher strictly maintained the confidentiality regarding participant's condition and treatments.

Before conducting research with the respondents, it is necessary to gain consent from the subjects (Baily, 2004). For this study researcher will give a consent form and the purpose of the research and consent forms will explain to the subject verbally. Researcher will tell those participants are fully voluntary and they have the right to withdraw at any time. Researcher will also tell them confidentiality would be maintained. Information may be published in any presentations or writing but they will not be identified. The study results may not have any direct effects on them but the members of Physiotherapy population may be benefited from the study in future. They will not be embarrassed by the study. At any time the researcher would be available to answer any additional questions in regard to the study.

3.13 Data analysis

Statistical analysis was performed by using Microsoft Excel 2013 and Scientific Calculator

3.13.1 Statistical Test

The data was analyzed by related t test as the study was a before-and-after observations on the same subjects where the measurements/treatments are applied to the same subjects. According to Hicks (2009), experimental studies with the different subject design where single group is used and each tested in two different conditions and the data is interval or ratio should be analyzed with related t test.

So, $t = \frac{\overline{d}}{SE(d)} = \frac{\overline{d}}{\frac{SD}{\sqrt{n}}}$

Where,

$\overline{d}$= Mean of difference between paired values.

SE= SE of the Mean difference.

SD= standard deviation.

n= Number of value in each pair.

Calculating the degree of freedom from the formula

df = (n−1)

= (10−1)

=9

Resting pain

Reduction of pain scores in before and after physiotherapy treatment for PLID patients

Subjects	Pretest (d1)	Posttest (d2)	Difference (d)	$(d-\bar{d})$	$(d-\bar{d})2$
1	9	5	4	1.5	2.25
2	8	5	3	0.5	0.25
3	6	5	1	-1.5	2.25
4	5	3	2	-0.5	0.25
5	5	3	2	-0.5	0.25
6	5	3	2	-0.5	0.25
7	4	2	2	-0.5	0.25
8	8	4	4	1.5	2.25
9	4	2	2	-0.5	0.25
10	8	5	3	0.5	0.25
			∑d=25		8.5

Table-1: Reduction of resting pain in pretest and posttest group

Calculating the degree of freedom from the formula

df = (n−1)

= (10−1)

=9

So, t = $\frac{\bar{d}}{SE(d)} = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}}$

$$= \frac{2.5}{0.97}$$

$$= 2.57$$

Variables in the study statistically significant or not significant at the following level of significance:

No.	**Name of variable**	**Calculated t Value**	**P value**	**Mean difference**	**Significant or not Significant**
1	Resting pain	2.57	0.030	2.5	Significant at $p < .05$
2	Pain in sitting	7.2	0.00005	3.6	Significant at $p < .05$
3	Pain in standing	11.07	0.00002	3.6	Significant at $p < .05$
4	Pain during walking	11.03	0.00002	3.4	Significant at $p < .05$
5	Pain during heavy weight lifting	10.28	0.000003	3.6	Significant at $p < .05$
6	Pain during staring	5.0	0.000739	3.1	Significant at $p < .05$

Table-2: Variables in this study with level of significance

3.13.2 Level of Significance

The observed t value was 2.57, 5% level of significant, 9 degree of freedom, standard t value is 2.262 that is less than the observed t value so it can calculated 5% of significant.

CHAPTER: IV RESULTS

4.1 Socio-demographic characteristics:

4.1.1 Age range:

Analysis revealed that among the 10 participants of 20-30 years of old 20%,31-40 years of old 40%,and 41-50 years of old participants were 40% and standard deviation is 0.789.

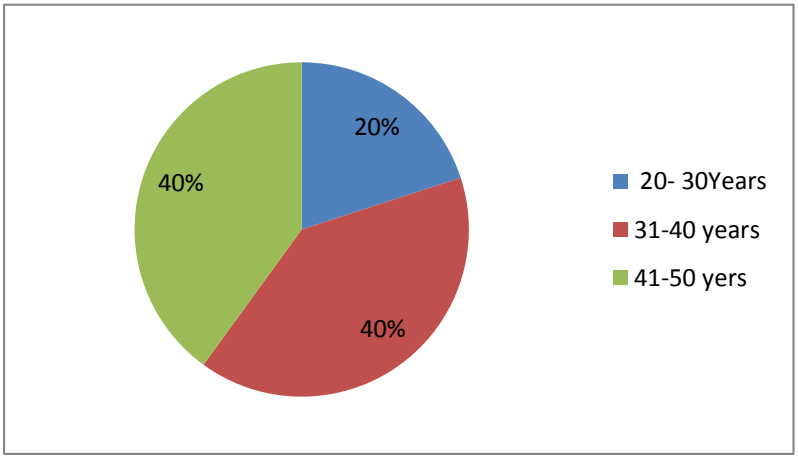


Figure1: Age Range

4.1.2 Sex

Among all the participants approximately 40% (4of 10) were male and 60% (6 of 10) were female. Here result showed that female is more affected than the male.

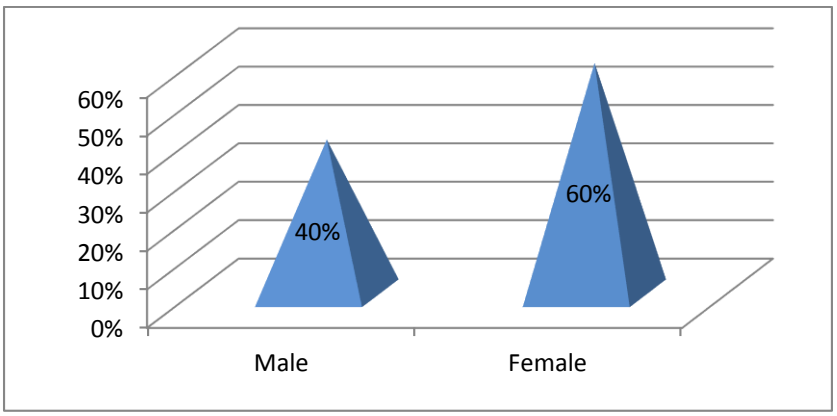


Figure 2: Sex of the participants

4.1.3 Occupation of the participants

In this study 50% participants were housewife, 30% participants were service holder, 10% participants were student, 10% participants were farmer, the study showed that PLID is higher among housewives than other occupations.

Occupation

Occupation	Number	Percent%
Farmer	1	10
Service Holder	3	30
Housewife	5	50
Students	1	10
Total	10	100

Table-3: Occupation of the participants

4.1.4 Marital Status

Among all the participants approximately 50% (5 of 10) was married and approximately 20% (2 of 10) unmarried and 30% (3 of 10) were widow. My study showed that PLID is higher among married then widow then unmarried.

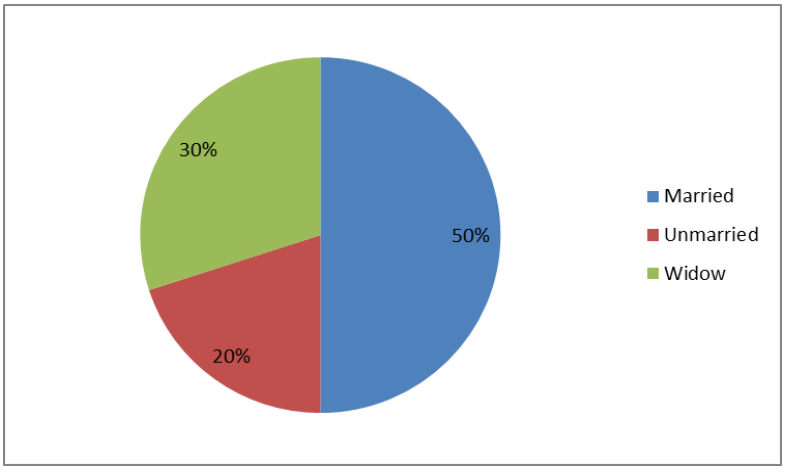


Figure 3: Marital status of participants

4.1.5 Living area

Among all the participant s were 70% (7 of 10) rural and 30% (3 of 10) were urban. My study showed that rural populations were more affected than urban population.

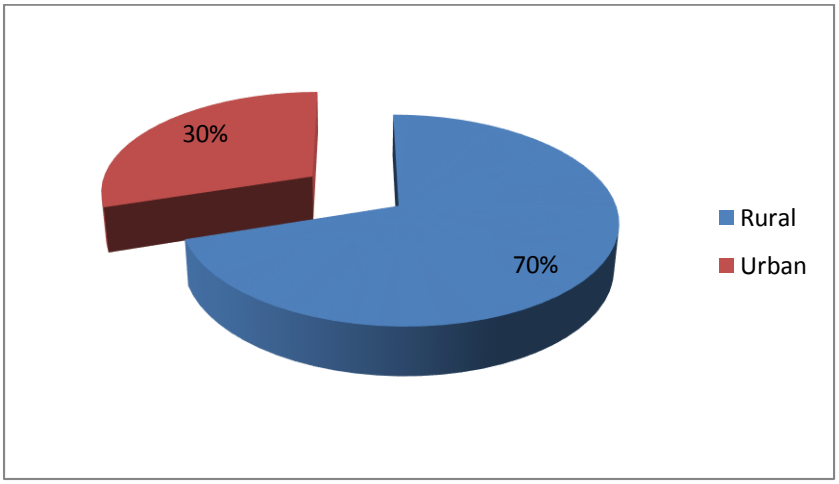


Figure 4: Living area of the participants

4.1.6 Educational status

Among all the participant approximately 10% (1 of 10) participant was able to do signature , 10% (1 of 10) were primary level, 20% (2 of 10) were high school level, 30% (3of 10) were S.S.C pass and 20% (2 of 10) were H.S.C pass , 10% (1 of 10) participant was graduated.

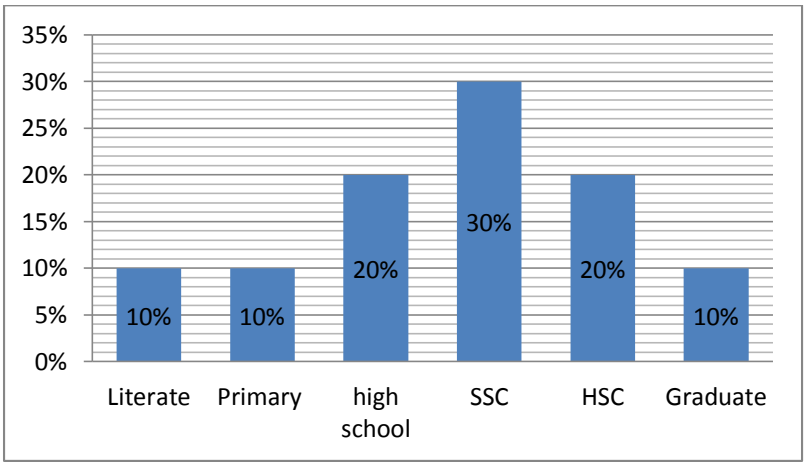


Figure 5: Educational Status of participants

Resting pain

10 patients were enrolled and these patients were pretest and posttest group. And all of these patients were treated by various physiotherapy interventions. Mean difference of reduction of pain intensity between pretest and posttest group was 2.5. Using related "t" test on the data of resting pain (t=2.57, df=9) and p value is .0150, the result was found to be significant for one tailed hypothesis. So this result suggests that following application of treatment to the group showed significant improvement in case of resting pain.

Pain in sitting

10 patients were enrolled and these patients were pretest and posttest group. And all of these patients were treated by various physiotherapy interventions. Mean difference of reduction of pain intensity during sitting between pretest and posttest group was 3.6. Using related "t" test on the data of pain in sitting (t=7.2, df=9) and p value is .000025 the result was found to be highly significant for one tailed hypothesis. So this result suggests that following application of treatment to the group showed significant improvement in case of pain in sitting.

Pain in standing

10 patients were enrolled and these patients were pretest and posttest group. And all of these patients were treated by various physiotherapy interventions. Mean difference of reduction of pain intensity during sitting between pretest and posttest group was 3.6. Using related "t" test on the data of pain in sitting (t=11.07 and df=9) and p value is .00001 the result was found to be highly significant for one tailed hypothesis. So this result suggests that following application of treatment to the group showed significant improvement in case of pain in sitting.

Pain during walking

10 patients were enrolled and these patients were pretest and posttest group. And all of these patients were treated by various physiotherapy interventions. Mean difference of reduction of pain intensity during walking between pretest and posttest group was 3.4. Using related "t" test on the data of pain in sitting (t=11.03and df=9) and p value is .00001 the result was found to be highly significant for one tailed hypothesis. So

this result suggests that following application of treatment to the group showed significant improvement in case of pain during walking.

Pain during heavy weight lifting

10 patients were enrolled and these patients were pretest and posttest group. And all of these patients were treated by various physiotherapy interventions. Mean difference of reduction of pain intensity during heavy weight lifting between pretest and posttest group was 3.6. Using related "t" test on the data of pain during heavy weight (t=12.41 and df=9) and p value is .00001 the result was found to be highly significant for one tailed hypothesis. So this result suggests that following application of treatment to the group showed significant improvement in case of pain in sitting.

Pain during staring

10 patients were enrolled and these patients were pretest and posttest group. And all of these patients were treated by various physiotherapy interventions. Mean difference of reduction of pain intensity during walking between pretest and posttest group was 3.1. Using related "t" test on the data of pain in sitting (t=5.0 and df=9) and p value is .0007 the result was found to be highly significant for one tailed hypothesis. So this result suggests that following application of treatment to the group showed significant improvement in case of pain during walking.

CHAPTER-V DISCUSSION

The purpose of this study was to evaluate the effectiveness of physiotherapy treatment in lumber disc patient with advised surgery by orthopedic consultant or neurology consultant. In this experimental study 10 patients with lumber disc prolapse were randomly assigned to the experimental group. This 10 participants were received physiotherapy treatment. They attended for 6 sessions of treatment within two weeks in the physiotherapy musculoskeletal outdoor department of CRP Savar in order to demonstrate the improvement. The outcome was measured by using visual analogue scale for pain intensity in different functional position.

In this study it was found that the persons who were suffering from PLID there almost n=4, (40%) were male and about n=6 (60%) were female from total participants and the ratio of male female was 1:1.5. A prospective observational study among the 102 CLBP patients found that 60 (58.8%) were female and 42 (41.2%) were male and the male female ratio was 1:1.43 (Shakoor et al., 2007). Biglarian et al., (2012) found that PLID was more frequent among female (37.5%) rather than male (18.3%) in an Iranian population. In Hungarian population the prevalence of LBP among female was 9% higher than male (Horvath et al., 2010). It also was proved that there is a positive relationship between gender and LBP as more women suffer PLID than men (Nia et al., 2011).

Study found that the participants who were suffering from PLID most of them were housewife that is 50%, 30% were service holder, 10% were farmer, 10 % were student. A study 102 cases in Dhaka, Bangladesh found that a majority of the patients were housewives (58.8%) followed by government service holder (19.6%) and businessman (10.8%). Others were labourer (6.9%), private service (2.9%) and retired servicemen (Shakoor et al., 2007). Among the general Afyon population 64.2% housewives suffered from LBP (Tucer et al., 2009). Some studies indicate that housekeeping work and childcare could increase the risk of LBP among women (Nagasu et al., 2007).

The study showed that the persons who suffering from PLID only 10% can do signature, 10% have education level was primary primary education, 20% completed secondary education, 20% have passed SSC, 30% had higher secondary education, 10% had bachelor or above . Alkherayf and Agbi (2009) suggested that individuals who had some postsecondary education in general had less chance to develop LBP. A study in Iran showed that most of the affected group completed their basic educational level that is 33.9%, 20.2% completed moderate educational level and 15% completed higher education. LBP is more likely to be reported by those with lower educational qualification because higher education may provide knowledge that influences on the lack of LBP (Biglarian et al., 2012). Study found that 76% participants lived in rural area and 24% participants lived in urban area. In Iran 32.6% of total population who were lived in rural area suffered from LBP (Biglarian et al., 2012).

The researcher found significant improvement of pain in posttest group. In the participants, mean difference of reduction of pain intensity between pretest and posttest group was 2.3. Also there was significant improvement of pain in sitting in which mean difference between pretest and posttest group was 3.6, in standing Mean difference between pretest and posttest was 3.6, during walking mean difference between pretest and posttest was 3.4, during heavy weight bearing mean difference between pretest and posttest was 3.6 and lastly during stairing mean difference between pretest and posttest was 3.1.

As it was the first research of the researcher, so the researcher might overtake some mistakes. There was no control group. The researcher could not compare the study with other due to lack of studies about present practice of PLID. The researcher was taken small number of sample. The researcher was collected data from the musculoskeletal department at CRP. So the result of this study could not generalize of all PLID patients in Bangladesh.

CHAPTER: VI CONCLUTION &RECOMMENDATION

6.1 CONCLUTION

PLID is a very frequently occurring phenomenon in Bangladesh and all over the world. PLID has great impact causing severe long term physical disability and give rise to huge costs for the society. Literature showed that more than one-third of disability is caused due to low back problems. PLID is higher in rural area which are about 70%, occupation plays an important role PLID more seen in housewives which is about 50% then farmer which is about 30% then others. Age is also a main factor for developing low back pain because after increasing age there may cause some degenerative change. This change cause low back pain. PLID is more seen in age range between 31-50.The researchers found that about 60% of female affected in PLID whereas male was about 40%.

The result of this experimental study have identified that physiotherapy treatment are effective treatment for reducing pain and disability in lumber disc prolapse patient. Participants in the study showed a greater benefit after receiving treatment than earlier. Which indicate that physiotherapy can be an effective treatment approach for patient with lumber disc prolapse.

Physiotherapy technique is used that aims to reduce pain on lumber region, to facilitate rehabilitation program. It is a cost effective treatment alternative for many common injuries & overuse syndrome which is effective for restoring the joint play and for establishing proper structural alignment. So it may become helpful for patients with PLID to determine physiotherapy as intervention for reducing the features of PLID. From this research the researcher wishes to explore the effectiveness of Physiotherapy treatment to reduce the features of patient with PLID, which will be helpful to facilitate their rehabilitation and to enhance functional activities.

6.2 RECOMMENDATION

The aim of the study was to evaluate the effectiveness of physiotherapy treatment in lumber disc prolapse patient. However, the study had some limitations it some further steps were identified that might be taken for the better accomplishment of further study. The main recommendations would be as follow:

The random sampling technique rather than the convenient would be chosen in further in order to enabling the power of generalization the results. The duration of the study was short, so in future wider time would be taken for conducting the study. Investigator use only 10 participants as the sample of this study, in future the sample size would be more. In this study, the investigator took the sample from CRP Musculoskeletal unit, it was small area to take available sample. So for further study investigator strongly recommended to include the person with PLID from the community or all over the Bangladesh to ensure the generalizability of this study.

REFFERENCES

Alkherayf, F. and Agbi, C., (2009). Cigarette smoking and chronic low back pain in the adult population. Clinical and Investigative Medicine, 32(5):360-367.

Alkherayf, F., Wai, E., Tsai, E. and Agbi, C., (2010). Daily smoking and lower back pain in adult Canadians: the Canadian Community Health Survey. Journal of Pain Research, 3:155–160.

Andersson, G.B.J., (2012). Epidemiological features of chronic low back pain. Lancet, 354:581–605.

Atlas,S.J.,(2010). Non pharmacological treatment for low back pain, Journal of Musculoskeletal Medicine, 27(1):20–27.

Bailey D.M., (2004), Research for the Health Professional: A Practical Guide, F. A. Davis Company: Philadelphia.

Baldwin, N. G., (2006). Lumbar Disc Disease: The Natural History. Neurosurgical Focus,[Online]. Available: http://www.medscape.com/viewarticle/442526_2[accessed on 5 August 2015].

Beattie, P., Rothstein, J.M. and Lamb, R.L., (2008). Reliability of the Attraction Method for Measuring Lumbar Spine Backward Bending. Physical Therapy, 67:364-369.

Biglarian, A., Seifi, B., Bakhshi, E., Mohammad, K., Rahgozar, M. and Serahati, S., (2012). Low Back Pain Prevalence and Associated Factors in Iranian Population: Findings from the National Health Survey. Pain Research and Treatment,44(3):75-89.

Bowling, A., (2006). Research Method in Health: Investigating and Health Services, Open University Press: Buckingham.

Buselli, P., Bosoni, R., Busè, G., Fasoli, P., Scala, E..L., Mazzolari, R., Zanetti, F. and Messina, S., (2011). Effectiveness evaluation of an integrated automatic termomechanic massage system in nonspecific sub-acute and chronic low back pain - a randomized double blinded controlled trial, comparing SMATH therapy versus sham therapy: study protocol for a randomized controlled trial. Trials, 12:216.

Celal, E. B., Karl-Ludwig, R., Ronald, S., Horst, M., Martin, N., Andreas, S., Martin, P., Wolf, O., Karl, U. and Gerold, E. R., (2007). Physiotherapy-Based Rehabilitation Following Disc Herniation Operation: Results of a Randomized Clinical Trial. Spine, 32(19):2041-2049.

Chaurasia, B.D., (2005). Human Anatomy. 4th edition. India: CBS Publishers & Distributors.

Choi, B.K., Verbeek, J.H.,Wai-san, W. and Jiang, J.Y., (2010). Exercises for prevention of recurrences of low-back pain. Cochrane Database Systematic Review, 20(1): 1-50.

Choi, H.S., Kyung-Woo Kwak, K.W, Kim, S.W. and Sang, H., (2013). Surgical versus Conservative Treatment for Lumbar Disc Herniation with Motor Weakness. J Korean NeurosurgSoc . 54 :183-188.

Chou, R., Deyo, Bureah. and winkel., (2011).Diagnostic imaging for low back pain: advice for high-value health care from the American College of Physicians. Annals of internal medicine, 154(3): 181–189.

Deutscher, D., Werneke, M.W., Gottlieb, D. and Fritz ,J.M, (2014).Physical therapists' level of McKenzie education, functional outcomes, and utilization in patients with low back pain. Journal of Orthopedic Sports Physical Therapy. 44(12):925-36.

Ebnezer, J.,(2013). Essential of Orthopaedics for physiotherapists. Jaypee brother’s medical publishers Ltd: New Delhi, India.

Frankel, J.R. and Wallen, N., (2004), How to design & Evaluate research in education, 4thed, McGraw Hill: London.

Freeman, B.J., Maharani, P., Williams, N.S., Bulstrode, C.J., and O'Connell, P.R.,(2008). Short practice of surgery. 25th ed. Hodder Arnold: London.

Fritz, J.M., Cleland, J.A. and Childs, J.D., (2007). Subgrouping Patients With Low Back Pain: Evolution of a Classification Approach to Physical Therapy. Journal of Orthopaedic & Sports Physical Therapy, 37(6):290-302.

Furnes, O., Bøe, A. and Sudmann, E., (2011). Lumbar inter vertebral disk prolapse in adolescents. Tidsskr Nor Laegeforen, 116 (25): 2993-5.

Ghaffari, M., Alipour, A., Jensen, I., Farshad, A.A. and Vingard, E., (2006). Low back pain among Iranian industrial workers. Oxford Journals, 56(7):455-460.

Gunstream, S.E., (2008). Anatomy & Physiology. USA: Wm. C. Brown Publishers.

Guzman, J., Esmail, R., Karjalainen, K., Malmivaara, A., Irvin, E. and Bombardier, C., (2009). Multidisciplinary rehabilitation for chronic low back pain: systematic review. British Medical Journal, 322:1511-1516.

Hicks, C.M., (2009). Research Methods for Clinical Therapists: Applied Project Design and Analysis. USA: Elsevier Health Sciences.

Horvath, G., Koroknai, G., Acs, B., Than, P. and Illes, T., (2010). Prevalence of low back pain and lumbar spine degenerative disorders. Questionnaire survey and clinical–radiological analysis of a representative Hungarian population. International Orthopaedics, 34:1245–1249.

Huang, S.R., Shi, Y.Y., and Zhan, H.S., (2012). Diagnostic ideas and programs of lumbar intervertebral disc herniation. Strategies Trauma Limb Reconstr, 25(2): 147-51.

Jacobson, B., Westcott, T., Bohanan, A., and Lopez, A., (2009). Chronic Low Back
Pain,[Online].USA:Physiopedia.Available:http://www.physiopedia.com/Chronic_Low_Back_Pain [accessed on 5 May 2013].

Kishner, S., (2012). Lumbar Spine Anatomy, [Online]. USA: WebMD LLC. Availabale: http://emedicine.medscape.com/article/1899031-overview#showall [accessed on 8th May 2013].

Kravitz, L. and Andrews, R., (2011). Fitness and Low Back Pain, [online]. http://www.unm.edu/~lkravitz/Article%20folder/lowback.html [accessed on 29 March 2013].

Krishna, M., (2013). Chronic Low Back Pain, [online]. UK: Manoj Krishna. Available: http://www.spinalsurgeon.com/conditions/chronic-low-back-pain/ [accessed on 8 May 2013].

Last, A.R. and Hulbert, K., (2009). Chronic Low Back Pain: Evaluation and Management. American Family Physician, 79(12):1067-1074.

Lee, M., (2006). Analysis of Lumbar Spine Kinematics during Trunk Flexion and Extension Motions. Master of Science. Virginia Polytechnic Institute and State University. Available: < http://scholar.lib.vt.edu/theses/available/etd-01202006-144843/> [accessed on 25 september 2015].

Louw, Q., Morris, L. and Grimmer-Somers, K., (2007). The Prevalence of low back pain an in Africa: a systematic review. Bio Med Central Musculoskeletal Disorder, 8:105.

Magalhaes, M.O., Muzi, L.H., Comachio , J., Burke, T.N. and Renovato, F., (2015). The short-term effects of graded activity versus physiotherapy in patients with chronic low back pain: A randomized controlled trial. Bio Medical Central Musculoskeletal Disorder, 8: 75.

Maniadakis, N. and Gray, A., (2010). The economic burden of back pain in the UK. Pain,84(1):95–103.

Mathews, H.H. and Long, B.H., (2007).Minimally invasive techniques for the treatment of intervertebral disc herniation. Journal of American Academy Orthopaedic Surgery,10: 80–105.

McKenzie, R.Z., (2005). The Lumbar Spine: Mechanical Diagnosis and Therapy. Waikanae, Spinal Publications :New Zealand.

Minichiello, E. and Alaxandr, L., (2005), In department interviewing, 2nded, Wesley Longman Australia pity Limited: South Melbourne.

Moseley, L., (2006). Combined physiotherapy and education is efficacious for chronic low back pain. Australian Journal of Physiotherapy, 48:297-302.

Murphy, P.L., and Volinn, E., (2005). Is occupational low back pain on the rise? Spine, 24(7):691-7.

Myles PS, Troedel S, Boquest M and Reeves M, 2009, Regional anesthesia and pain management: linearity of the pain visual analog scale ,Anesthesia and Analgesia, 89:1517-20.

Nagasu, M., Sakai, K., Ito, A., Tomita, S., Temmyo, Y., Ueno, M. and Miyagi, S., (2007). Prevalence and risk factors for low back pain among professional cooks working in school lunch services. Bio Med Central Public Health, 7:171.

Nia, H.S., Haghdoost, A.A.,Beheshti, Z., Soleymani, M.A., Bahrami, N., Hojjati, H. and Hosseine, F.H., (2011). Relationship between backache and psychological and psychosocial job factors among the nurses. International Journal of Nursing and Midwifery, 3(7):86-9.

Niosi, C.A. and Oxland, T.R., (2006). Degenerative mechanics of the lumbar spine. The Spine Journal, 4:202-208.

Odole, A.C., Adegoke, B.O.A., Akinpelu, A.O. and Okafor, A.C., (2010). Low Back Pain At Work: Knowledge and Attitude of Sectional Heads At the University College Hospital, Ibadan. African Journal of Physiotherapy and Rehabilitation Science, 3(1):28-35.

Omokhodion, F.O., (2008). Low back pain among rural and urban populations in Southwest Nigeria. African Newsletter on Occupational Health and Safety, 12(3):58.

Ostgaard, H.C., Andersson, G.B. and Karlsson, K., (2011). Prevalence of back pain in pregnancy, available: http://www.ncbi.nlm.nih.gov/pubmed/1828912, [accessed on 23sept 2015].

Peng, B.G.(2013). Pathophysiology, diagnosis, and treatment of discogenic low back pain. World Journal of Orthopedic , 4(2): 42-52.

Peul,W., Houwelingen, H., Hout, W. and Brand ., (2005). Prolonged conservative treatment or 'early' surgery in sciatica caused by a lumbar disc herniation: rationale and design of a randomized trial. Bio Medical Central Musculoskeletal Disorders, 6(8): 1471-1474.

Rashid, M.R., Rahman, M., Rahman, M.A. and Hoq, M., (2012). Studies on the alternative of medicinal for chronic lower back pain. Journal of Innovation and Development Strategy, 6(1):98-102.

Rittweger, J., Just, K., Kautzsch, K., Reeg, P. and Felsenberg, D., (2012). Treatment of Chronic Lower Back Pain with Lumbar Extension and Whole-Body Vibration Exercise. Spine, 27(17):1829-1834.

Sedighi, M. and Haghnegahdar, A., (2014). Lumbar Disk Herniation Surgery: Outcome and Predictors. Global Spine Journal, 4:233–244.

Shakoor, M.A., Islam, M.A., Ullah, M.A., Ahmed, M.M. and Hassan, S.A., (2007). Clinical profile of the patient with chronic low back pain-a study of 102 cases. Journal of Chittagong Medical College Teachers‟ Association, 18(2):16-20.

Tucer, B., Yalcin, B.M., Ozturk, A., Mazicioglu, M.M., Yilmaz, Y. and Kaya, M., (2009). Risk Factors for Low Back Pain and Its Relation with Pain Related Disability and Depression in a Turkish sample. Turkish Neurosurgery, 19(4):327-332.

Ulucam, E. and Cigali, B.S., (2009). Measurement of Normal Lumbar Spine Range of Motion in the College-Aged Turkish Population Using a 3D Ultrasound-Based Motion Analysis System. Trakya Universitesi Tip Fakultesi Dergisi, 26(1):29-35.

Wetzel, F.T., and Donaldson, R., (2013).The role of repeated end-range/pain response assessment in the management of symptomatic lumbar discs. Spine,3: 146–54.

Wojcik, G., Piskorz, J., Ilzecka,J. and Bulikowski,W., (2014) **.** Effect of intervertebral disc disease on scoliosis in the lumbar spine. Spine, (27): 155-15.

APPENDIX I

সম্মতিপত্র

(অংশ গ্রহণকারীকে পড়ে শোনাতে হবে)

আসসালামুআলাইকুম,

আমার নাম মারিয়া শিকদার,আমি এই গবেষণা প্রকল্পটি বাংলাদেশ হেলথ প্রফেশনস ইন্সিটিউট (বি এইচ পি আই) এ পরিচালনা করছি যা আমার ৪র্থ বর্ষ বি এস সি কোর্সের অধিভুক্ত। আমার গবেষনার শিরোনাম ,লাম্বার ডিস্ক প্রলাপ্স রোগীদের মধ্যে যাদের অপারেশনের উপদেশ দেওয়া হয়েছে তাদের ক্ষেত্রে ফিজিওথেরাপী চিকিৎসার কার্যকারিতা। ”।আমি এ ক্ষেত্রে আপনাকে কিছু ব্যাক্তিগত এবং আনুসঙ্গিক প্রশ্ন করতে চাচ্ছি।এতে আনুমানিক ১০ মিনিট সময় নিবো।

আমি আপনাকে অনুগত করছি যে,এটা আমার অধ্যয়নের অংশ এবং এটা অন্ন কোন উদ্দেশ্যে ব্যাবহ্রিত হবে না। গবেষক সরাসরি এই অধ্যয়নের সাথে অন্তর্ভুক্ত নয়। তাই এই গবেষণায় আপনার অংশগ্রহন বর্তমান এবং ভবিষ্যৎ চিকিৎসায় কোন প্রভাব ফেলবে না। আপনি যে সব তথ্য দিবেন তার গোপনীয়তা বজায় রাখা হবে এবং আপনার প্রতিবেদনের ঘটনা প্রবাহে এটা নিশ্চিত করা হবে যে এই তথ্যের উৎস অপ্রকাশিত থাকবে।

এই অধ্যয়নে আপনার অংশগ্রহন স্বেচ্ছাপ্রণদিত এবং আপনি যে কোন সময় এই অধ্যয়ন থেকে কোন নেতিবাচক ফলাফল ছারাই নিজেকে প্রত্যাহার করতে পারবেন। এছাড়াও কোন নির্দিষ্ট প্রশ্ন অপছন্দ হলে উত্তর না দেওয়ার এবং সাক্ষাতকারের সময় কোন উত্তর না দেওয়ার অধিকারও আপনার আছে।

এই অধ্যয়দ্ধয়নে অংসগ্রহণকারী হিসেবে যদি আপনার কোন প্রশ্ন থাকে তাহলে আপনি আমাকে অথবা মোঃ আনোয়ার হোসেন ,সহযোগী অধ্যাপক ,ফিজিওথেরাপি বিভাগ, সিআরপি ,সাভার ,ঢাকা-১৩৪৩ তে যোগাযোগ করতে পারেন।

সাক্ষাৎকার শুরু করার আগে আপনার কি কোন প্রশ্ন আছে?

আমি আপনার অনুমুতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি।

☐ হ্যাঁ

☐ না

১। অংশগ্রহণকারীর স্বাক্ষর .....

২। সাক্ষাতগ্রহণকারীর স্বাক্ষর .....

৩। প্রত্যক্ষদর্শীর স্বাক্ষর .....

CONSENT FORM

(Please read out to the participants)

Assalamualaikum, my name is Maria Shikder, I am conducting this study for a Bsc in Physiotherapy project, my study dissertation titled is **"**Effectiveness of physiotherapy treatment in lumber disc prolapse patients with advised surgery by orthopaedic consultant or neurology consultant" or Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related information regarding LBP.You will perform some tasks which are mention in this form. This will take approximately 10 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. The researcher is not directly related with this musculoskeletal area, so your participation in the research will have no impact on your present or future treatment in this area (musculoskeletal unit). All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous and also all information will be destroyed after completion of the study. Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview.

If you have any query about the study or your right as a participant, you may contact with me and/or Md Anowar hossain , Associate professor, department of physiotherapy, CRP, Savar, Dhaka.

Do you have any questions before I start?

So, may I have your consent to proceed with the interview or work?

Yes ☐

No ☐

Signature of the Participant _____

Signature of the Interviewer _____

Signature of the witness _____

প্রশ্নপত্র(বাংলা)

লাম্বার ডিস্ক প্রলাপ্স রোগীদের মধ্যে যাদের অপারেশনের উপদেশ দেওয়া হয়েছে তাদের ক্ষেত্রে ফিজিওথেরাপী চিকিৎসার কার্যকারিতা।

ব্যাক্তিগত বিবরণ: কোড নং:

অংশগ্রহণকারীর নামঃ

ঠিকানা:

গ্রাম / বাড়ী নং .....

ডাক ঘর.....

থানা .....

জেলা .....

মোবাইল নম্বর:

সাক্ষাৎকার গ্রহনের তারিখ: দিন /মাস /বছর .....

লাম্বার ডিস্ক প্রলাপ্স রোগীদের মধ্যে যাদের অপারেশনের উপদেশ দেওয়া হয়েছে তাদের ক্ষেত্রে ফিজিওথেরাপী চিকিৎসার কার্যকারিতা।

১। আর্থ সামাজিক তথ্য: কোড নং:

বয়স ....বছর

লিঙ্গ:

১= পুরুষ ২ = মহিলা

পেশা:

১= কৃষক ২ = দিনমজুর ৩ = পরিষেবা ধারক

৪ = কারখানার শ্রমিক ৫ = ড্রাইভার ৬ = রিকশাচালক

৭ = ব্যবসায়ী ৮ = বেকার ৯ = গৃহিনী

১০ = শিক্ষক ১১ = ছাত্র

১২ = অন্যান্য (উল্লেখ করুন) ....

বৈবাহিক অবস্থা:

১= বিবাহিত ২ = অবিবাহিত ৩= বিধবা

৪ = বিবাহবিচ্ছেদ ৫= একা

পরিবার প্রকার:

১ = একক পরিবার ২ =যৌথ পরিবার

বসবাসরত এলাকা:

১ = পল্লী 2 = শহর

শিক্ষাগত যোগ্যতা

১ = নিরক্ষর ২ = স্বাক্ষর করতে পারে ৩= প্রাথমিক

৪= মাধ্যমিক ৫= এসএসসি ৬= এইচএসসি.

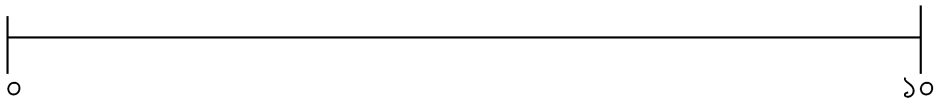
৭ = স্নাতক ৮ = স্নাতকত্তর

পরিবারের মাসিক আয়: ....টাকা.....।

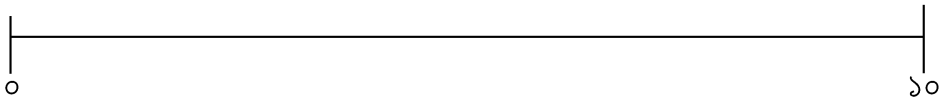
এই প্রশ্নপত্র লাম্বারডিস্ক প্রলাপ্স রোগীদের জন্য প্রনয়ন করাহয়েছ।. প্রতিটি প্রশ্নের সঙ্গে একটি দীর্ঘ লাইন আছে।. লাইন ব্যথা পরিস্থিতি উপস্থাপন করে,বাম প্রান্ত কোন ব্যথা নেই এবং ডানপ্রান্ত তীব্র ব্যথা প্রতিনিধিত্ব করে।আপনার কাছে যেখানে সবচেয়ে বেশি ব্যাথা অনুভূত হয় সেখানে চিহ্নিত করুন।

১। বিশ্রামরত অবস্থায় আপনার ব্যাথার তীব্রতা কত?

প্রাক পরীক্ষা

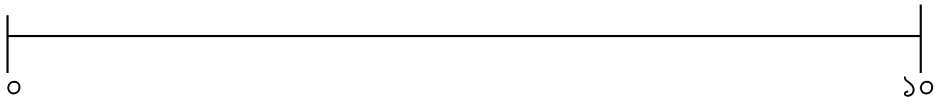


পরবর্তী পরীক্ষা

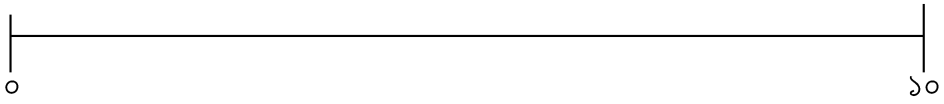


২।বসা অবস্থায় আপনার কোমর ব্যাথার তীব্রতা কত?

প্রাক পরীক্ষা

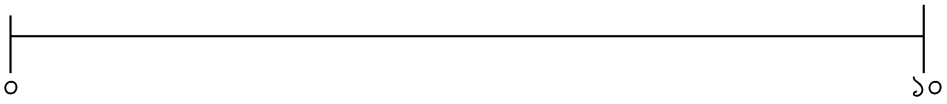


পরবর্তী পরীক্ষা

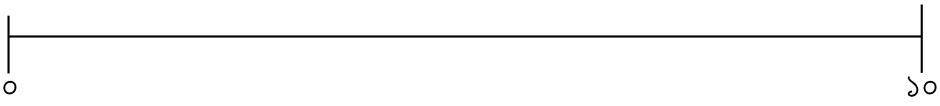


৩।দাড়ানো অবস্থায় আপনার কোমর বেথার তীব্রতা কত?

প্রাক পরীক্ষা

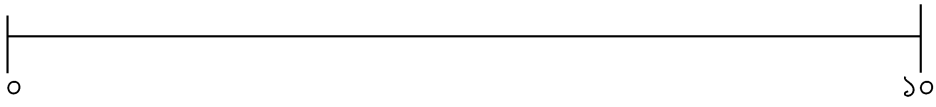


পরবর্তী পরীক্ষা

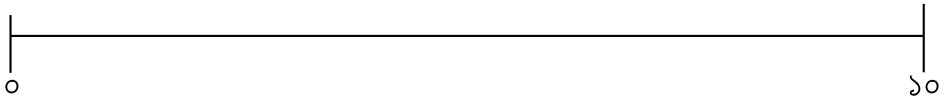


৪। হাঁটা অবস্থায় আপনার কোমর ব্যাথার তীব্রতা কত

প্রাক পরীক্ষা

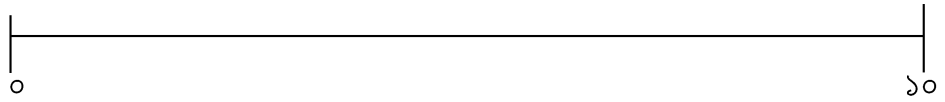


পরবর্তী পরীক্ষা

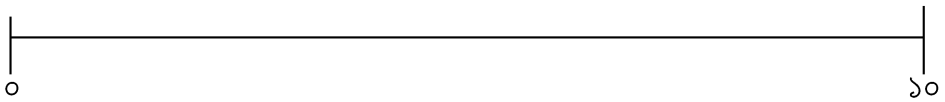


৫। দৌড়ানো অবস্থায় আপনার কোমর ব্যাথার তীব্রতা কত?

প্রাক পরীক্ষা

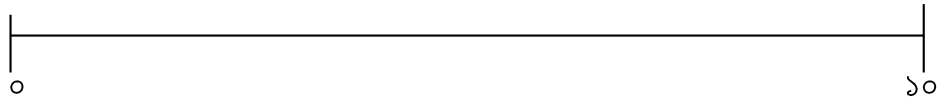


পরবর্তী পরীক্ষা

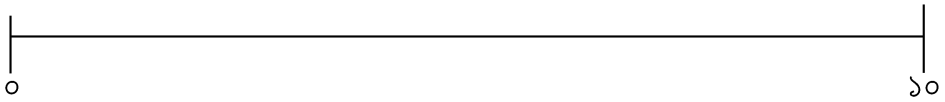


৬।ভাঁজ অবস্থায় আপনার কোমর ব্যাথার তীব্রতা কত?

প্রাক পরীক্ষা

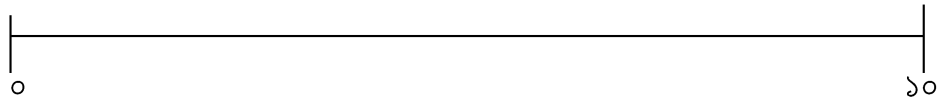


পরবর্তী পরীক্ষা

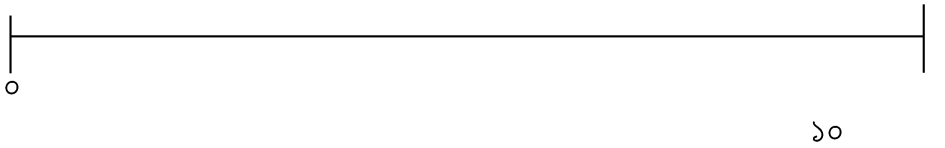


৭।ভারী জিনিষ উত্তলন অবস্থায় আপনার কোমর ব্যাথার তীব্রতা কত?

প্রাক পরীক্ষা

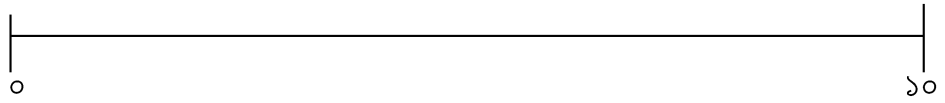


পরবর্তী পরীক্ষা

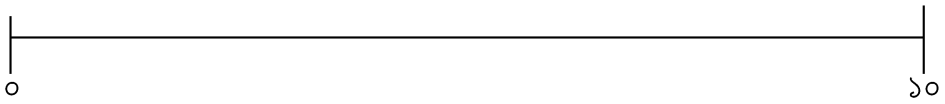


৮।গোসল করা অবস্থায় আপনার কোমর ব্যাথার তীব্রতা কত?

প্রাক পরীক্ষা

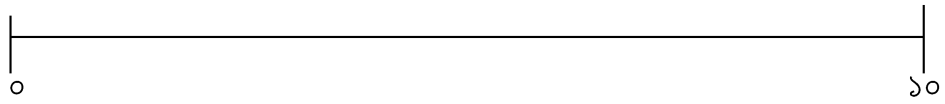


পরবর্তী পরীক্ষা

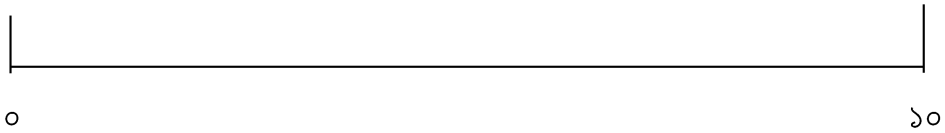


৯।সিঁড়ি দিয়ে উঠার সময় আপনার কোমর ব্যাথার তীব্রতা কত?

প্রাক পরীক্ষা

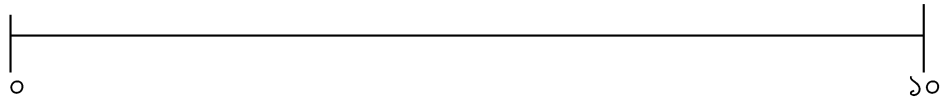


পরবর্তী পরীক্ষা

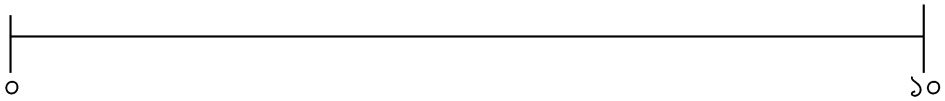


১০। ভ্রমন অবস্থায় আপনার কোমর ব্যাথার তীব্রতা কত?

প্রাক পরীক্ষা



পরবর্তী পরীক্ষা



Questionnaire (English)

"Effectiveness of physiotherapy treatment in lumber disc prolapse patients with advised surgery by Orthopaedic consultant or neurology consultant"

Personal details: Code no :

Name of participant

Address:

Village/house no……..

Post office……

Thana……

District…….

Contact number /Mobile number:

Date of interview: DD/MM/YY……

"Effectiveness of physiotherapy treatment in lumber disc prolapse patients with advised surgery by Orthopaedic consultant or neurology consultant"

1.Socio demographic information: Code no:

Age……..years

Sex:

1= male 2= female

Occupation:

1= Farmer 2= Day laborer 3= Service holder

4= Garments/ Factory worker 5= Driver 6= Rickshaw puller

7= Businessman 8= Unemployed 9= Housewife

10= Teacher 11= Student 12= Other

(Specify)……..

Marital status:

1= Married 2= Unmarried 3 = Widow

4 = Divorce 5= Single

Family type:

1= Nuclear family 2= Extended family

Living area:

1= Rural 2= Urban

Educational level:

1 = Illiterate 2=literate 3= Primary 4=Secondary

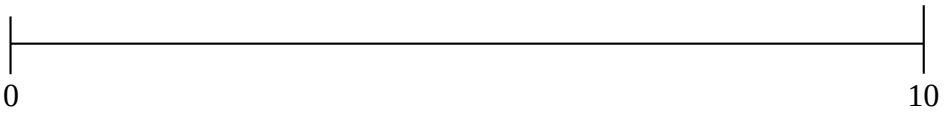
5 = S.S.C 6=H.S.C. 7= Graduate 8= Post Graduate

Monthly family income:……..taka

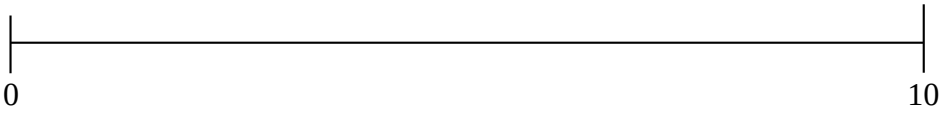
This questionnaire is designed for lumber disc prolaps patients. With each question there is a long line. The line represents pain situation. The left hand end represents no pain and right hand end represents severe pain. Please a mark on the line where you feel it shows how much pain you have

1. How severe your pain is at resting position?

Pre test

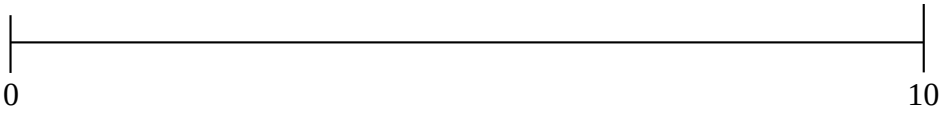


Post test

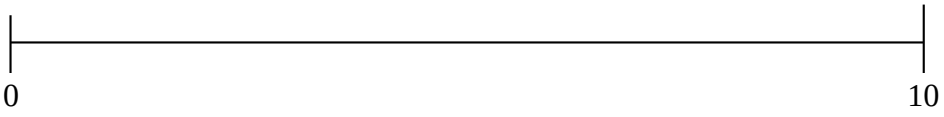


2.How severe is your Pain at back during sitting?

Pre test

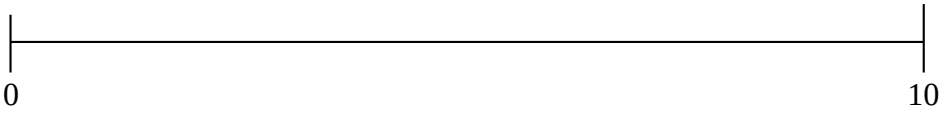


Post test

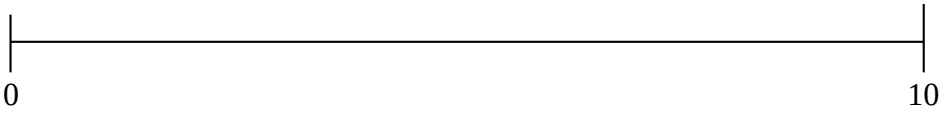


3.How severe is your Pain at back during standing?

Pre test

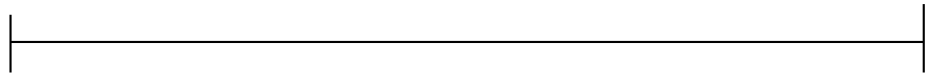


Post test

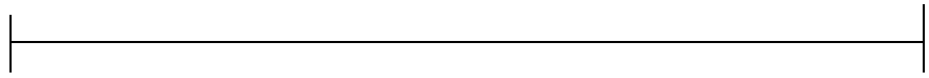


4. How severe is your Pain at back during walking?

Pre test

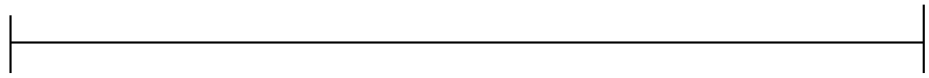


Pre test

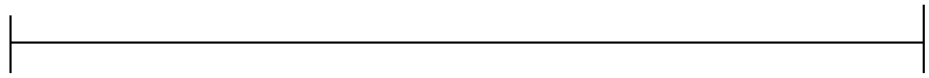


5.How severe is your pain during running?

Pre test

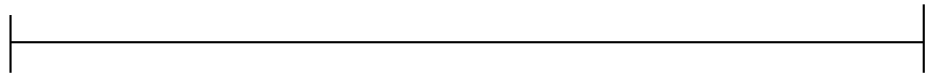


Post test

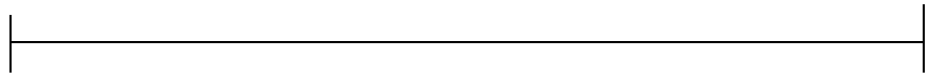


6.How severe is your pain during bending?

Pre test

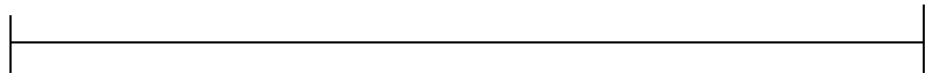


Post test



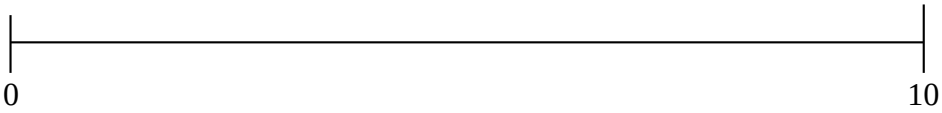
7.How severe is your pain during lifting heavy weight?

Pre test



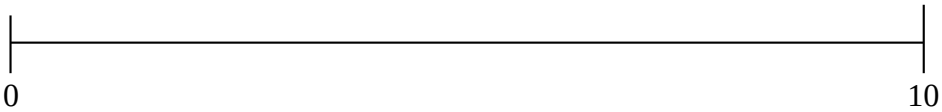
10

Pre test

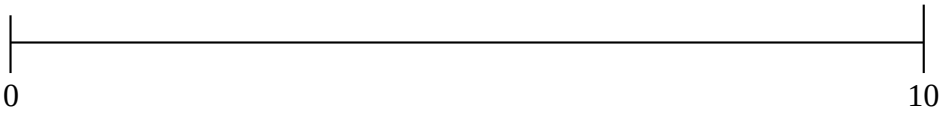


8. How severe is your pain during bathing or washing yourself?

Pre test

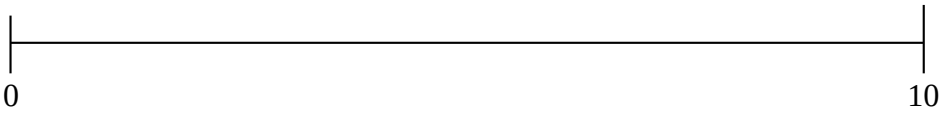


Post test

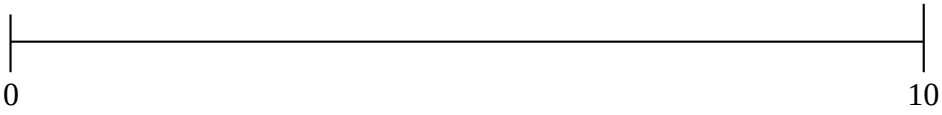


9. How severe is your pain during several flights of stairs?

Pre test

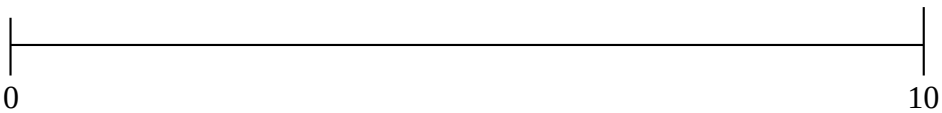


Pre test

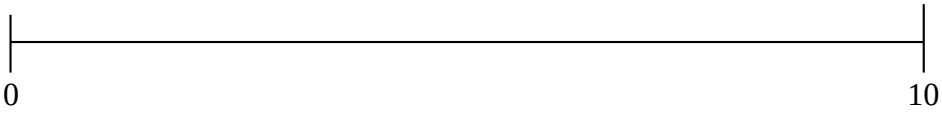


10. How severe is your pain during travelling?

Pre test



Post test



APPENDIX II

Pain in sitting

Reduction of pain scores in before and after physiotherapy treatment for PLID patients

Subjects	Pretest (d1)	Posttest (d2)	Difference (d)	$(d-\bar{d})$	$(d-\bar{d})2$
1	9	4	5	1.4	1.96
2	9	4	5	1.4	1.96
3	8	3	5	1.4	1.96
4	2	1	1	-2.6	6.76
5	4	2	2	-1.6	2.56
6	6	3	3	-0.6	0.36
7	9	4	5	1.4	1.96
8	9	5	4	0.4	0.16
9	3	1	2	-1.6	2.56
10	9	5	4	0.4	0.16
			$\sum d=36$		20.4

Table-1: Reduction of pain during sitting in pretest and posttest group

Calculating the degree of freedom from the formula

$df = (n-1)$

$= (10-1)$

$= 9$

So, $t = \frac{\bar{d}}{SE(d)} = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}}$

$= \frac{3.6}{0.5}$

= 7.2

Pain in standing

Reduction of pain scores in before and after physiotherapy treatment for PLID patients

Subjects	Pretest (d1)	Posttest (d2)	Difference (d)	$(d-\bar{d})$	$(d-\bar{d})2$
1	8	3	5	1.4	1.96
2	7	4	3	-0.6	0.36
3	9	4	5	1.4	1.96
4	8	7	1	-2.6	6.67
5	5	2	3	-0.6	0.36
6	7	3	4	0.4	0.16
7	9	5	4	-0.4	0.16
8	9	5	4	-0.4	0.16
9	7	3	4	-0.4	0.16
10	9	6	3	-0.6	0.36
			∑d=36		12.31

Table-2: Reduction of pain during standing in pretest and posttest group

Calculating the degree of freedom from the formula

df = (n−1)

= (10−1)

= 9

So, t = $\frac{\bar{d}}{SE(d)} = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}}$

$= \frac{3.6}{0.325}$

=11.07

Pain in walking

Reduction of pain scores in before and after physiotherapy treatment for PLID patients

Subjects	Pretest (d1)	Posttest (d2)	Difference (d)	$(d-\bar{d})$	$(d-\bar{d})2$
1	7	3	4	0.6	0.36
2	8	4	4	0.6	0.36
3	3	1	2	-1.4	1.96
4	8	5	3	-0.4	0.16
5	4	1	3	-0.4	0.16
6	7	3	4	-0.4	0.16
7	5	2	3	-0.4	0.16
8	9	4	5	1.6	2.56
9	7	3	4	0.6	0.36
10	6	4	2	1.6	2.56
			∑d=34		9.24

Table-3: Reduction of pain during walking pretest and posttest group

Calculating the degree of freedom from the formula

df = (n−1)

= (10−1)

= 9

So, t = $\frac{\bar{d}}{SE(d)} = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}}$

$= \frac{3.4}{0.30}$

= 11.03

Pain in heavy weight lifting

Reduction of pain scores in before and after physiotherapy treatment for PLID patients

Subjects	Pretest (d1)	Posttest (d2)	Difference (d)	$(d-\bar{d})$	$(d-\bar{d})2$
1	8	4	4	0.4	0.16
2	9	3	6	2.4	5.76
3	9	6	3	-0.6	0.36
4	6	4	2	-1.6	2.56
5	7	3	4	0.4	0.16
6	7	4	3	-0.6	0.36
7	8	4	4	0.4	0.16
8	9	5	4	0.4	0.16
9	7	3	4	0.4	0.16
10	8	6	4	0.4	0.16
			∑d=36		10

Table-4: Reduction of pain during heavy weight lifting in pretest and posttest group

Calculating the degree of freedom from the formula

df = (n−1)

= (10−1)

= 9

So, t = $\frac{\bar{d}}{SE(d)} = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}}$

$= \frac{3.6}{0.35}$

= 10.28

Pain in staring

Reduction of pain scores in before and after physiotherapy treatment for PLID patients

Subjects	Pretest (d1)	Posttest (d2)	Difference (d)	$(d-\bar{d})$	$(d-\bar{d})2$
1	9	3	6	2.9	8.41
2	9	3	6	2.9	8.41
3	2	1	1	-2.1	4.41
4	6	4	2	-1.4	1.21
5	7	6	1	-2.1	4.41
6	6	4	2	1.1	1.21
7	8	4	4	0.9	0.81
8	9	4	5	1.9	3.61
9	4	2	2	1.1	1.21
10	9	7	2	1.1	1.21
			∑d=31		34.9

Table-5: Reduction of resting pain in pretest and posttest group

Calculating the degree of freedom from the formula

df = (n−1)

= (10−1)

= 9

So, t = $\frac{\bar{d}}{SE(d)} = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}}$

$= \frac{3.1}{0.62}$

= 2.57

Permission letter

September 2, 2015

Head of The Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain ,Savar , Dhaka-1343.

Through: Head, Department of Physiotherapy, BHPI.

Subject: Seeking permission of data collection to conduct my research project.

Dear Sir,

With due respect and humble submission to state that I am Maria Shikder, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project entitled on**"Effectiveness of physiotherapy treatment in lumber disc prolapse patients with advised surgery by orthopaedic consultant or neurology consultant"**under the supervision of MuhmmadAnowarHossain, Assistant professior, Department of Physiotherapy,CRP. Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. I want to collect data for my research project from the patients of CRP. So, I need permission for data collection from the Musculoskeletal outpatient unit of Physiotherapy department of CRP-Savar&Mirpur campus. I would like to assure that anything of my study will not be harmful for the participants.

I, therefore, pray & hope that you would be kind enough to grant my application & give me permission for data collection and obligue thereby.

Sincerely Yours

Maria Shikder

Maria Shikder

4th Professional B.Sc. in Physiotherapy

Roll-28, Session: 2010-2011

Bangladesh Health Professions Institute (BHPI)

(An academic Institute of CRP)

CRP, Chapain, Savar, Dhaka-1343.

10.09.15

Cancelled 02/09/15

She may be allowed for data collection

02/09/15

Md. Obaidul Haque
Associate Professor & Head of the Department
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

Permission is given to contact with Ms. Shamima Islam (N.ipg) as a counter part of the data collection process.

Mohammad Anwar Hossain
Associate Professor &
Head of Physiotherapy Dept.
CRP, Chapain, Savar, Dhaka-1343