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EFFECTIVENESS OF MUSCLE ENERGY TECHNIQUE AMONG NON-SPECIFIC LOW BACK PAIN PATIENTS ATTENDED AT CRP

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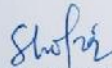
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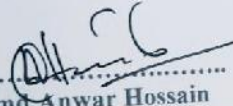
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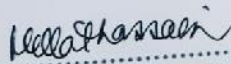
Submitted by **Redwanul Tasmerin Masuda** for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc PT).



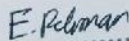
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DECLARATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also decline that for any publication, presentation or dissemination of information of the study. I would bound to take written consent from the department of Physiotherapy of Bangladesh Health Professions Institute (BHPI).

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CONTENTS

| Topic | Page No |
|---------------------------------------|----------------|
| Acknowledgment | I |
| Acronyms | II |
| List of figure | III |
| List of table | IV |
| Abstract | V |
| CHAPTER- I: INTRODUCTION | 1-9 |
| 1.1 Background | 1-5 |
| 1.2 Rationale | 6 |
| 1.3 Operational definition | 7 |
| 1.4 Conceptual framework | 8 |
| 1.5 Aim of the study | 9 |
| 1.6 Objectives | 9 |
| 1.6.1 General objectives | 9 |
| 1.6.2 Specific objectives | 9 |
| 1.7 Hypothesis | 9 |
| 1.8 Null hypothesis | 9 |
| CHAPTER- II: LITERATURE REVIEW | 10-18 |
| CHAPTER- III: METHODOLOGY | 19-29 |
| 3.1 Study design | 19 |
| 3.2 Study area | 19 |
| 3.3 Study period | 19 |
| 3.4 Study population | 19 |
| 3.5 Sample size | 20 |
| 3.6 Sampling technique | 21-22 |
| 3.7 Inclusion criteria | 23 |
| 3.8 Exclusion criteria | 23 |
| 3.9 Data Processing | 23 |

| | |
|---|--------------|
| 3.9.1 Data collection tools | 23 |
| 3.9.2 Data measurement tools | 24 |
| 3.9.3 Ethical issues | 24 |
| 3.9.4 Data collection procedure | 25 |
| 3.9.5. Data analysis | 25 |
| 3.9.6 Statistical Test | 25 |
| 3.9.7. Level of Significance | 25 |
| 3.9.8 Treatment protocol | 26-29 |
| CHAPTER -IV: RESULTS | 30-50 |
| CHAPTER- V: DISCUSSION | 51-55 |
| CHAPTER- VI: LIMITATIONS | 56 |
| CHAPTER -VII: CONCLUSION AND RECOMENDATION | 57-58 |

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Acronyms

| | |
|---------|---|
| ADL | Activity of Daily Living |
| BHPI | Bangladesh Health Professions Institute. |
| CLBP | Chronic Low back pain |
| CRP | Centre for the Rehabilitation of the Paralysed. |
| LBP | Low back pain |
| MET | Muscle Energy Technique |
| NPRS | Numeric Pain Rating Scale |
| NSAID's | Non-Steroidal Anti-inflammatory Drugs |
| ODI | Oswestry Disability Index |
| PLID | Prolapsed Lumbar Intervertebral Disc |
| ROM | Range of motion |
| SPSS | Statistical Package of Social Science |
| UK | United Kingdom |
| USA | United States of America |
| VAS | Visual Analogue Scale |
| WHO | World Health Organization |

List of Figures

| Figure No | | Page No. |
|------------------|--|-----------------|
| Figure 1 | CONSORT Flow-chart | 22 |
| Figure 2 | MET in supine position | 29 |
| Figure 3 | Age range of the participants between groups | 31 |
| Figure 4 | Gender (Male) distribution of the participants | 32 |
| Figure 5 | Gender (Female) distribution of the participants | 32 |
| Figure 6 | Occupation of the participants | 33 |
| Figure 7 | Mechanical stress position among experimental group | 34 |
| Figure 8 | Mechanical stress position among control group | 34 |
| Figure 9 | Marital status of the participants | 37 |
| Figure 10 | Living area of the participants (Experimental group) | 38 |
| Figure 11 | Living area of the participants (Control group) | 38 |
| Figure 12 | Back pain duration of the participants | 40 |
| Figure 13 | Smoking history of the participants | 41 |
| Figure 14 | Hypertension history of the participants | 43 |
| Figure 15 | Asthma history of the participants | 44 |
| Figure 16 | Major accident or surgery | 45 |

List of Tables

| Table No | | Page No |
|-------------------|---------------------------------------|----------------|
| Table I | Experimental Group Treatment Protocol | 26 |
| Table II | Control Group Treatment Protocol | 26 |
| Table III | Daily working hour | 35 |
| Table IV | Educational qualifications | 36 |
| Table V | Sleeping posture | 39 |
| Table VI | Diabetes History | 42 |
| Table VII | Pain severity on NPRS | 48 |
| Table VIII | Disability score on ODI | 49 |
| Table IX | Disability score on ODI | 50 |

ABSTRACT

Background: Low back pain is the pain in the lumbosacral area of the vertebral column encircling the distance from the 1st lumbar vertebra to the 1st sacral vertebra. From this domain lordotic curvature is formed. Approximately 50% of the general population suffers from back pain in a year and up to 80% of individuals account LBP over the course of their lifetimes. Low back pain is a common cause of pain and disability among the sufferers. Muscle energy technique (MET) is a form of manual therapy frequently used to correct lumbar pain, reduce disability, here in the patient voluntarily contracts specific muscles against the resistance of the clinician. Studies on MET regarding magnitude and duration of effectiveness are limited. **Objectives:** To identify the therapeutic effectiveness of Muscle Energy Technique for the treatment of Non-specific Low Back Pain. **Methodology:** Quasi experimental study design was used in this study. 54 patients with LBP were assigned into two groups from outdoor musculo-skeletal unit, CRP. Among them 27 patients were assigned into control group received MET with conventional care and another 27 into control group received only conventional care. Total treatment sessions were ten (10). MET of the hamstrings and ilio-psoas consisted of four 5-second hold/relax periods, while the control group received a conventional treatment. **Measurement tools:** Numerical pain rating scale (NPRS) was used to measure pain and ODI to measure lower back disability. **Analysis of data:** Paired t test was done using SPSS version 20. **Results:** Subjects receiving MET demonstrated greater improvement in NPRS and ODI. Thereby suggesting that MET may is useful for low back pain patients to reduce pain and disability.

Key words: *Non-specific low back pain, Muscle energy technique, conventional therapy.*

1.1 Background

People usually solicit the musculoskeletal system as well as particularly the spine that is the fundamental framework of body movements when acting a variety of daily tasks. This complicated presents attributable to its formation, the criteria of a sagittal balance that is presented because of its curvatures. Further than or lower than standard physiological values any variation is taken into account pathological and will result to musculoskeletal injury (William et al., 2019).

Back pain could be an extensive and worldwide symptom that severely affects the quality of the individual's life and even leads to activity restriction (Wang et al., 2018) and a major physical condition that is the leading cause of years survived with disability (Arnold et al., 2019) and it is also proved by Global Burden of Disease Study where they declared that in most countries the peak reason for disability was low back pain of years (Wang et al., 2018).

Hoy et al. (2012) stated that low back pain is that the global reason for personal, community and economical burden because it is one among the foremost common health issues. According to one low back pain study (Werneke et al., 2010) globally chronic low back pain is the elevated momentous economic trouble which is greater than 10 billion (US dollars) in every year and according to Arnold et al. (2019) in the United States, it is estimated that the direct expenditure of low back pain is between \$12.2 and \$90.6 billion, without the indirect costs coupled with diminished work output or unemployment. Furthermore, the treatment cost of LBP has increased drastically between 1997 and 2005, devoid of concurrent progress in health status.

LBP is familiar throughout the adult's years in men and women, 1st episodes most often occur among individuals in their 20s and 30s (Kelsey, 2010). Approximately 50% of the general population suffers from back pain in a year and up to 80% of individuals account LBP over the course of their lifetimes (Franke et al., 2015).

Among the geriatric group, LBP is the third most prevailing chronic illness. 36-70% of geriatric citizen with musculoskeletal ailments are affected by LBP (Michal et al., 2019). One study (Freburger et al., 2009) found that low back pain occurs greater than 80% of the populace in several times in their life and related figures also are found in United Kingdom (UK), United State of America (USA), Australia, Canada and also other developed countries. The National Health and Nutrition Education Survey reported that over a 6-month period, 59 million people had acute or chronic back pain among patients aged 17-44 years in the United States (Bindra et al., 2015). In USA, around 70-85% population experiences LBP at some points of their lives (Buselli et al., 2011).

The life time prevalence of low back pain in European country is greater than 70% (Tomita et al., 2010). European review article revealed that the life time prevalence of LBP was between 51% and 84% where point prevalence ranged between 14% and 42% (Horvath et al., 2010). In Western Europe, back pain has been reportable to have an effect on up to 40% of adult population, with inferior rates in Japan 19.1% (Bindra et al., 2015). A European study also proved that, 66% patient suffered by moderate pain, 34% suffered by severe pain (Breivik et al, 2006). Thirty-one studies have reportable the prevalence of back pain in Indian population among the multiple occupations that has been found to fluctuate from 6.2% (in general population) to 92% (in construction workers) (Bindra et al., 2015).

Among twothirds of the adults' Low back pain is a serious health issue (Janwantanakul et al, 2011). Chronic low back pain is experienced by 70%–80% of adults in different times in their lives. In general citizens LBP could be quite familiar drawback that has at some aspects of their life (Hoy et al., 2010). There is an extensive monetary expenditure of low

back pain to the healthcare system and employers because of declined production and lost days from work (Wynne-Jones et al., 2014).

Low back pain could be a vital health condition having a serious impact on the life style as well as on the health care cost. Low back pain is the most typical everyday grievance. About 20% of the adult population suffers from LBP in Australia at any given time (Alsaadi et al., 2011). In Africa, within one year, LBP prevalence is 33% among adolescents where the adult prevalence is 50%. LBP is as common a condition as in early age and teenage years that are seen in adults. A cross sectional study among 18-year-old females and 20-year-old males demonstrated that the lifetime incidence exceeded 50% in Denmark (Sato et al., 2011).

In developing countries, LBP is present in more than 70% of individuals. Close to 90% of back pain is non-specific, representing that the pathophysiological origin of the back pain cannot be precise in majority number of people. Besides, it is tough to specify and treating the issues that are responsible for back pain as a result of many co-related factors are concerned, such as psychological, work-related and different individual factors. Back pain is cured spontaneously, but 5-20% of acute back pain patients experienced chronic or constant lower back pain (Horvath et al., 2010). Later on 2019, Traeger stated that LBP is second only to the common cold as aetiology for consulting a general practitioner.

International review emphasized a worldwide emergency in the mismanagement of low back pain recently, with elevated rates of guideline-discordant care equally in high- and low-middle income countries. In their call to action, the Lancet Low Back Pain Series Working Group authors advocated that researchers and policy makers: “Develop and implement strategies to ensure early identification and adequate education of patients with low back pain at risk for persistence of pain and disability” (Traeger et al., 2019).

Non-specific low back pain (LBP) is one of the crucial public health concerns that seriously interfere on productivity, working capacity and quality of life (Fan & Straube, 2016). Close to 15% of LBP has a recognizable etiology while the residual 85% is non-specific LBP (Patel et al., 2018). In industrialized countries the lifetime prevalence of non-specific LBP is 60-70% with an early adult incidence of 5% (Duthey, 2013).

In nature, once 80-90% of the adult low back pain conditions are identified as non-specific, in adolescent athletes just 67% of back pain is of non-specific source (Cox, 2011).

According to literature, the non-specific LBP prevalence is greater in females. Some authors revealed that the women are more vulnerable than male due to the anatomical and the functional specialty which in together may stimulate the origin of low back pain. Women have lower height, less muscle mass and bone density, higher joint fragility, and lower adjustment power to physical effort. Additionally, the summation of the burden attributed by housekeeping raises the chance. Consequently, most people have the history of non-specific LBP and every one age teams are thought-about in danger (Lizier et al., 2012).

One issue that has been offered as significant in the origin and perseverance of non-specific low back pain is constancy and control of the spine. Studies of individuals with LBP have recognized the steadiness of the spine is not maintained when the deep trunk muscles (eg. Transversus abdominis and multifidus) are impaired. Moreover, there is confirmation of remitted cross-sectional area and magnified fatigability and a proposal of enlarged intramuscular fat in the para-spinal muscles of the individuals with low back pain (LBP). In theory, associate degree intervention that intend to correct the revolutions occurring within the deep trunk muscles which aims the restitution of control and coordination of those muscles ought to be helpful in the management of chronic low back pain (Macedo et al., 2009).

There are several therapies claimed to be helpful for the treatment of LBP. The majority of these treatments hasn't been well investigated or has been found to have unassuming outcome in terms of pain relief and improving disability. For a lot of low back pain patients, conversely, even modestly effectual treatments can facilitate in adjusting with clinical features and returning to normal living. It is therefore need to investigate the effectiveness of treatments that will help low back pain patients, notably those treatments which are non-invasive and are likely to be safe and sound and inexpensive like muscle energy technique (Franke et al., 2015).

According to clinical studies counsel, pain and discomfort are decreased once Muscle Energy Technique and related post isometric techniques are applied to the spine (Franke et al., 2012). In manual field, Muscle Energy Technique has shown itself to be one of the most valuablecares(Chaitow, 2013).

Fifty years past, Fred Mitchell Sr developed Muscle Energy Technique (MET) and was then refined and partly modified by his son Fred Mitchell Jr (Franke, 2015).MET is one among the foremost ordinarily used technique provided by American osteopaths. In the same way, MET is often applied by osteopaths in Australia and therefore the United Kingdom (Fryer, 2011).

To reveal the effectuality of utilizing MET in providing pain respite there is some study in individuals with non-specific lumbopelvic pain when considered at 24 hour following intervention (Ceprnja & Gupta, 2018).“Muscle energy technique” is a term that portrays the application of moderate, static muscle contraction by the patient in opposition to the manual resistance of the expert, with the aim to to possess a hypoalgesic and/or mechanical outcome (Franke et al., 2015).

It is recommended that Muscle Energy Techniques (MET) are used to:

- Lengthen a shortened muscle;
- Mobilize a restricted joint.
- Strengthen a physiologically weakened muscle;
- Reduce localized edema and passive congestion (Fryer, 2011).

1.2 Rationale

Low back pain (LBP) is the common problem in both developed & developing countries (Miranda et al., 2010). Low back pain (LBP) is one of the main causes of disability, and despite its high prevalence, the source of pain is not established in the majority of cases and the term “nonspecific low back pain” is used (Macedo et al., 2009).

Several study mentioned in different types of treatment is effective but not concluded effectively. So researcher is tried to find out the effective treatment for non-specific low back pain patients (Nambi et al., 2013).

There were abundant published articles on the subject of physiotherapy interventions for patients with low back pain but muscle energy technique was not combined with conventional physiotherapy for back pain patients earlier by any author. The aim of this study is to know the efficacy of Muscle Energy Technique (MET) along with usual interventions in reducing pain severity and their impact on function.

Actually, this desertation would form a foundation to use muscle energy technique along with conventional physiotherapy considering special dose and repetitions. However, research is crucial to advance the knowledge of health professionals and to develop the profession. The results of this study would guide the physiotherapists to apply evidence-based treatment to patients with non-specific low back pain which would be advantageous for patients and develop physiotherapy profession as well.

1.3.Operational Definition

Low back pain:

Low back pain defined as pain and discomfort, localized below the costal margin and above the inferior gluteal folds, with or without referred leg pain.

Acute low back pain:

Acute low back pain is defined as a pain or discomfort that persists for less than 3 months, within expected healing period.

Chronic low back pain:

Chronic low back pain (CLBP) is defined as a pain that persists for more than 3 months, or longer than the expected healing period.

Muscle Energy Techniques (MET):

Muscle Energy Techniques (MET) are a form of soft tissue or joint, manipulations or mobilization, deriving from osteopathic medicine, employed in the treatment of musculoskeletal dysfunction (Chaitow, 2013).

Conventional Physiotherapy:

The group of treatments set by the physiotherapist to treat a patient for a certain condition which has been widely used in a certain clinical setting may be denoted as conventional physiotherapy. So treatment techniques that are generally preferred by physiotherapist in a particular setting termed as conventional physiotherapy.

Semi-urban area:

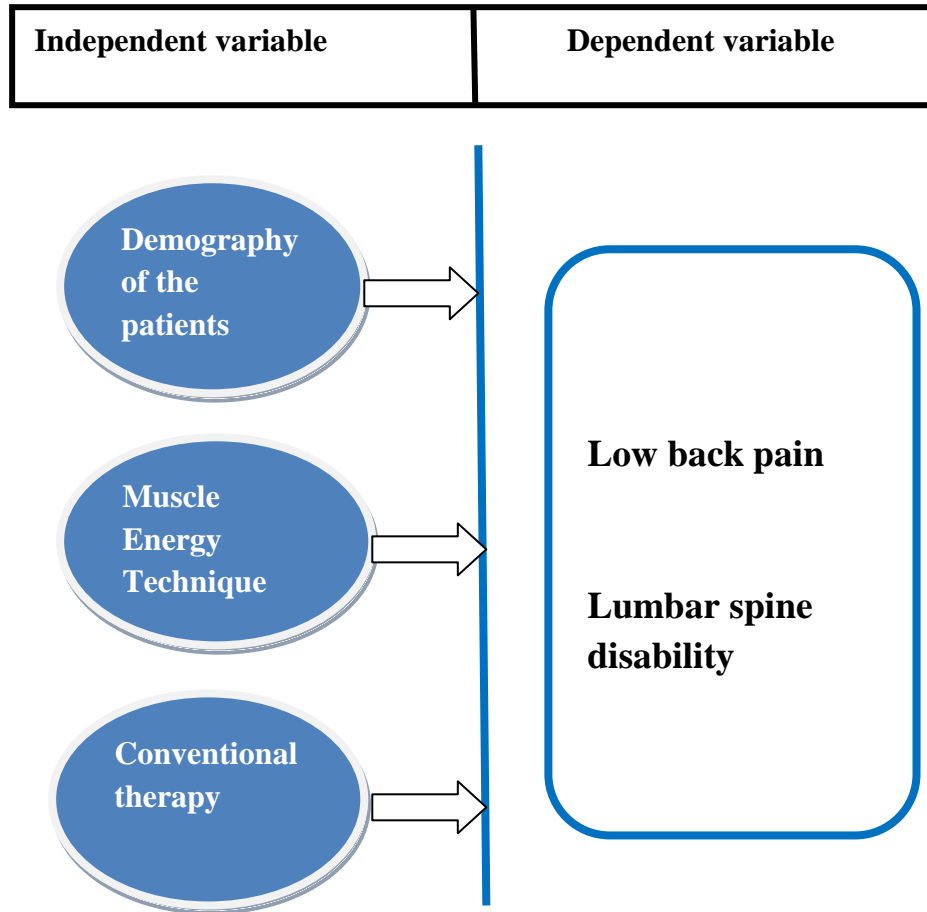
Partly urban; between urban and rural; somewhat but not wholly characteristic of urban areas.

Mechanical stress position:

A stress position or submission position, places the human body in such a way that a great amount of weight is placed on a specific structure like bone, muscle, cartilage, ligaments or other structures.

1.4. Conceptual Framework

List of variables



1.5. Aim of the study

The aim of the study is to find out the effectiveness of Muscle Energy Technique (MET) along with conventional physiotherapy for the management of patient with Non-specific Low Back Pain (LBP).

1.6. Objectives

1.6.1. General Objective

To identify the therapeutic effectiveness of Muscle Energy Technique for the treatment of Non-specific Low Back Pain.

1.6.2. Specific objectives

- To determine the socio-demography of low back pain.
- To find out the different working posture affecting of the low back pain.
- To measure of pain intensity in different functional position after receiving treatment.
- To identify the effectiveness of Muscle Energy Technique in reducing disability and improving functional ability of the patient with low back pain
- To formulate a recommendation on treatment guideline for LBP patients evaluating the result of the study.

1.7. Hypothesis (H1)

Muscle energy technique combined with conventional physiotherapy is more effective than only conventional physiotherapy for the treatment of patients with Non-specific Low Back Pain.

1.8. Null hypothesis (H0)

Muscle energy technique combined with conventional physiotherapy is no more effective than only conventional physiotherapy for the treatment of patients with Non-specific Low Back Pain.

Manual therapist addressed that low back pain is one in every of the foremost common complaints (Slater et al., 2012), and there is a wide number of literatures concerning reason, categorization, strategies of diagnosis and useful treatments for low back pain(Wynne-Jones et al., 2014).In regarding to the anatomical view, LBP is the pain in the lumbosacral area of the vertebral column encircling the distance from the 1st lumbar vertebra to the 1st sacral vertebra. From this domain lordotic curvature is formed (Kravitz & Andrews, 2014).

Adolescent's low back pain has been accelerated with accrued absence from school, inferior quality of life and a multiple use of pain alleviating drugs. In adolescents the responsible factors for low back pain is found to be associated with low and extremely high levels of physical activity(Fritz & Clifford, 2010).Although the adults and adolescents lifetime low back pain prevalence is nearly parallel, but there is a considerable distinction in anatomy and biomechanics of the adult and also the adolescent spinal column (Cox, 2011).

Chronic pain is a growing health concern worldwide because between 60% and 90% of people will experience an episode of chronic pain during their lifetimes. Overall, chronic low back pain (CLBP) generates one of the highest costs in healthcare spending worldwide (Salas et al., 2019).

According to Patel et al. (2018) Muscle Energy Technique is a versatile technique traditionally applied to address muscular strain, pain, localoedema and joint dysfunction and to improve joint range of motion, to relieve muscle tension and improve the strength of the muscle. It is a direct technique in that the patient, instead of the care provider, supplies the corrective force. Cox (2011) stated in his study MET that refers to reduced muscle tension inducedtemporarily following its isometric contraction. Globally 37% of LBP was guessed to account as work related with a two fold variation across different geographical area.

In one study (Patel et al., 2018) it is found that disability outcome measures after the second day of post-treatment in two groups in their study (the MET and the MET-SCS group) were statistically significant difference ($p < 0:001$) within the groups. In both the groups, when analysis was done within the group, a statistically significant difference ($p < 0:05$) was seen in VAS and lumbar ROM after the second day post-treatment.

Specific low back pain is usually recommended to be more common in adolescents than in adults, with spondylolysis and spondylolisthesis being the common reason behind low back pain in adolescents. In nature, once 80-90% of the adult low back pain conditions are identified as non-specific, in adolescent athletes just 67% of back pain is of non-specific source (Cox, 2011). If the pain is not properly treated and successfully managed, CLBP patients have been shown to exhibit greater levels of emotional stress and disability when compared to patients suffering from equally severe and long-term chronic neck pain (Altug et al., 2015).

Mechanical deformations of soft tissues containing nociceptors are responsible for all spinal mechanical pain. It is important to ensure muscle balance in both muscle length and tension for normal function; thus muscle imbalances whenever the strength or length of an agonist and antagonist muscle are changed generally leads to altered movement patterns and sometimes pain syndromes (Page et al., 2010). The presence of increased cartilage to bone ratio, secondary ossification centers, hyper-elasticity of soft tissues, the continual development of the spinal curvature and also the current development of the adolescent body, mark the difference between the adult and therefore the adolescent spine. These differences dispose the adult spine to lesser possibility of acute and overuse injuries than the adolescent spine (Cox, 2011).

The SI was thought of the foremost vital cause of LBP in 20th century and the reported SI dysfunction prevalence rate among general people is 13.8 to 47.9%. Radicular pain will point toward a spinal nerve or a nerve root involvement whereas referred pain indicates involvement of tissues away from the spine; so differentiation between referred pain and radicular pain is crucial (Magee, 2008). MET is a gentle manual therapy intervention targeting the soft tissues primarily, although it also makes a major contribution toward the joint mobilization (Salas et al., 2019).

Sailor et al. (2018) randomly assigned 24 participants into two groups, MET and PRT groups. They found significant group-by-time interactions for all outcomes, indicating that ROM improved differently between groups (greater increase in MET groups than in the PRT). However, the improvement in MET was better than that of PRT evident from higher mean difference between pre- and post-treatment data. According to the comparison of mean difference values of pre- and post-test between MET and PRT, the difference was significantly higher in MET compared to PRT. According to Salas et al. (2019) study the sequence of muscle and joint mechanoreceptor activation evokes firing of local somatic efferents. This in turn leads to sympathoexcitation and activation of the periaqueductal gray matter, which plays a role in the descending modulation of pain.

Referred pain won't follow a selected pattern of dermatome. Pain in flexion and sitting may refer that problem are located in disc but pain at extension may indicate facet joint involvement or spondylosis. Through objective diagnostic assessment and medical imaging to confirm, if the pathoanatomical cause can be recognized, based upon this the causes of LBP is usually categorized as specific or non-specific (Abbotto, 2016).

It is needed to differentiate whether it is vascular claudication or neurogenic claudication. When the problem is commonly disc related, pain may occur in uphill walking but while pain with downhill walking is often associated with lumbar canal stenosis (neurogenic claudication). In vascular claudication, symptoms become worse in cycling or walking while neurogenic claudication most of the time gets reduced in a flexed position on the bike. Pain may arise at night because of disc or SI joint problem (Daniels et al, 2011).

In most of the cases, the reason of back pain is not identified and accordingly it is considered as "non-specific back pain" and when the etiology is known is taken into account as "specific" (Andrea et al., 2012). Daniels et al., (2011) stated that history of previous physiotherapy plays a vital role to find out the response of the patient to any previous treatment. Previous physiotherapy treatment accentuating on instant pain relief with little attention to correcting the biomechanical abnormalities may result in reappearance of pain. Unsuccessful physical therapy sessions may be possible yellow flags which may delay the rehabilitation process.

Recent research (Chou et al., 2016) further demonstrates that, in males, the combination of obesity and the presence of an emotional disorder may interact and influence the likelihood of having back pain.

Palpation of the lumbar spinous processes and the SI joint is helpful to detect inflammation or fracture to the lumbar spine. The therapist ought to be aware about the findings of AS like evidence of HLA-B27, presence of pain at rest and getting worse with activity, morning stiffness; more and more declining ROM. Expert should pay attention for cysts, abnormal growth as they might be indicative of innate malformation (Daniels et al., 2011).

The overwhelming greater parts of individuals have acute pain and get well at intervals a couple of weeks, with or while not interventions. Sometimes, there is an extremely short hyper acute period which sustains for 24-48 hours. Throughout this era there's pain and severe spasm during which sufferers are put out of action and motion is prohibited. Luckily, only a few patients suffer from this period and recover among 24-48 hours (Kuritzky & Samraj, 2012). The lifetime prevalence of acute low back pain between 60% to 90% and 30% may extend to a chronic state (Ladeira, 2011).

Chronic- stage pain research in CLBP sufferers has provided proof for changes within the structure and activity in the spinal musculature. LBP is a complex condition which might be related to risk factors, such as, age, sex, lifestyle, and mental status, occupation, social support, and pain sensitivity. It may initiate with an injury which can be accelerated by factors like de-conditioning, psychological factors, different chronic health conditions, biological and cultural factors (Patel et al., 2018).

Pain may originate from the intervertebral discs, bones, ligaments and muscles of the spine and it is typically transient. Genetic, environmental, psychological and biomechanical issues act as risk factors for LBP. However, although there is no exact reason for 85% LBP cases but 97% may be responsible for musculoskeletal ailments (Castillo & Lieberman, 2015).

The carriage of intense pressure is mostly recognized to be a threat in a nearby or remote future for spinal trauma. As management of associated to other vital physical demands like unstable postures, vertical displacement, etc. it is frequently the case so this link is more marked. These might be the resource of acute or chronic injuries. These disorders are thought of as a collection of painful lesions in the spine (William et al., 2019). Etiologies of LBP include mechanical injury, arthritis, sciatica, spinal fracture, malignancy, connective tissue disorder, infection, cauda equina syndrome, metabolic etiology, abdominal or retroperitoneal visceral or vascular processes, psychogenic pain, and malingering. To diagnose the etiology of back pain, careful history-taking and physical examination play a vital role (Prentice, 2015).

Osteopaths established a manual therapy Muscle Energy Technique which is currently employed in numerous different manual physical therapists. MET is that the method of contracting a specific muscle through and followed by relaxing the muscle. MET is a conservative management use to treat limited ROM and altered muscle tonicity of the spine and other extremities and it exploits neuromuscular excitation and inhibition to reinstate pain free movement (Fryer, 2011).

It has been supported to be efficient for lengthening a shortened muscle, strengthening muscles, and increasing the range of motion of a restricted joint. To explain MET there are a diversity of other terms. MET was described as “active muscle relaxation technique” by Chiropractor Craig Leibenson few years ago (Chaitow, 2013).

Intervertebral discs act as a shock absorber and a cushioning between vertebral bodies. Once this bulging happens it will protrude into the spinal canal and produces radicular pain into the back, buttocks and leg. There is typically sharp, centrally positioned pain close to the spinal cord that radiates down a dermatomal pattern. Sufferers will usually complain symptoms- numbness, tingling, or weakness down into their legs, since a herniated disc has an effect on the nervous system (Prentice, 2015).

Simon et al. (2014) stated that the lower back, particularly, these discs are found between the lumbar vertebrae. L4-L5 is most frequently affected discs and also the L5-S1.

The explanations for a slipped disc is sometimes forward bending with twisting that places an oversized quantity of force on the lumbar vertebrae (Prentice, 2015). MET could be a mild manual therapy treatment first and foremost target to the muscles, although it conjointly plays a significant role in the direction of joint mobilization (Hariharasudhan & Balamurugan, 2019). Currently Ch.C, Liebenson applies the further comprehensive descriptor, manual resistance techniques. Pioneer practitioners such as T.J. Ruddy evolved MET out of osteopathic processes and named his approach 'resistive duction'. F.L. Mitchell Jnr son of F.L. Mitchell Snr and many others have developed in 1958 the accepted definition of MET, a vastly sophisticated system of manipulative manner within which the patient 'uses muscles, on request, from a specifically controlled position in a definite direction, against a distinctly executed counterforce' (Chaitow, 2013).

MET is applied by professionals from various professions and has been advocated for the treatment of shortened muscles, weakened muscles, lymphatic drainage and restricted joints. MET is taken into account by some to be a biomechanics-based analytic diagnostic system that brings into play a precise physical diagnosis evaluation processes to recognize and qualify articular range of motion restriction additionally to use muscle effort to mobilize joints and tissues (Gendy et al., 2017).

The reduction in pain in MET is as a result of painful inhibition, through both the ascending and descending neurological passageway, after the activation of muscle and joint mechano-receptors over the course of the isometric contractions. It is noteworthy to know that throughout the contractions, endogenous pain-inhibiting chemicals are released, including endocannabinoids, enkephalins, and endorphins. The outcome of this study revealed improvement in sleep disturbance in the MET group (Zibiri et al., 2019).

Mahajan et al. (2012) concluded in their study that both the treatment techniques, MET and static stretching were effective in alleviating the mechanical pain in terms of decreasing pain intensity and increasing AROM as there was no significant difference between the two groups, however MET was superior than static stretching in decreasing pain intensity and increasing AROM.

Shah & Kage in 2016 mentioned that non-specific low back pain is pain not attributed to a recognisable pathology. Low back pain is non-specific in 85% of population. Fear of movement and reinjures lead to inactivity and disability.

A Muscle Energy Technique (MET) helps to inhibit muscle tonus experienced in a concise period following its isometric contraction. Muscle energy technique (MET) is often utilized technique before stretching for achieving tonus release (inhibition) in an exceedingly muscle. This technique involves the introduction of an isometric contraction to the affected muscle and subsequently produces post-isometric relaxation by the influence of the Golgi tendon organs (autogenic inhibition). It should even be practiced to the antagonistic muscle group by producing reciprocal inhibition within the offensive agonistic muscle(s) (Gendy et al., 2017). It is useful when the tightness of the muscle is a major causal factor to somatic dysfunction. This study revealed that MET, NSE, and NCE provided considerable benefit to NSCNP patients when was administered to them. There was a noticeable improvement in outcome measure parameters of pain and disability in the MET group, NSE group as well as the control group post-intervention (Zibiri et al., 2019).

There is a larger amount of evidence that MET is helpful in chronic pain. The mode of action of MET was featured to either post-isometric relaxation, which has an effect on the tissues that were isometrically contracted, or reciprocal inhibition, which has an influence on the antagonists to the tissues that have undergone contraction. Those are comparatively pain free soft tissue and joint movement following gentle isometric contraction (Kisner et al., 2017).

LBP is often associated with reduced spinal motion. Lumbar extension is frequently more restricted than flexion. Pain and stiffness can result in reduced spinal extension. The conservative treatment of LBP includes electrotherapy, exercise therapy and manual therapy. Manual therapy includes Maitland's spinal mobilisation, Mulligan's MWM, STT like MET, Positional Release therapy, myofascial release, PNF (Shah & Kage, 2016). Patient education, a treatment that authors of Cochrane (2008) review recognize

effective for acute LBP when applied in an intensive format and that every major clinical guideline recommends.

Selkow (2009) stated that decrease awareness of spinal motion and position and cutaneous touch perception is the consequence of proprioception and motor control disturbance by spinal pain. Collection of interstitial tissue fluid and lymphatic flow are incremented by the consequence of muscle contraction and lymph flow increases distally in the collecting ducts, centrally in the thoracic duct, and in the muscle during concentric and isometric muscle contraction as a result of physical activity by MET for enhancement of hypoalgesia, alter intramuscular pressure and the passive tone of the tissue.

MET is a versatile technique and in the strain, pain, local edema and joint muscle energy technique is accustomed as a conventional technique. MET is a one and only treatment in reducing lumbo-pelvic pain and in acute LBP minimize disability when combined with neuromuscular re-education and resistance training (Embaby et al., 2017). A growing number of researches proved positive alteration following MET. Although study involving clinical outcomes is limited but studies show a raise in the extensibility of muscles and spinal ROM support the justification of treating clients with decreased mobility. One case study series and one RCT express that LBP with the intention of examined MET as the sole treatment exploiting clinical outcomes (Kisner et al., 2017).

Pain mechanism may be influenced by Muscle Energy Technique and may raise hypoalgesia. Although the mechanisms are unknown, it is guessed that central and peripheral modulatory mechanisms, like activation of muscle and joint mechanoreceptors which involve centrally mediated pathways, like the periaqueductal grey (PAG) in the midbrain, or non-opioid serotonergic and noradrenergic descending inhibitory pathways (Selkow, 2009).

Therapeutic action could engage diversity a neurological and biomechanical mechanisms, as well as hypoalgesia, altered proprioception, motor programming and management, and alters in tissue fluid. MET may additionally have physiological effects irrespective of presence or absence of dysfunction. Reflex muscle relaxation is often cited as a

mechanism for length; vary ROM, and tissue texture changes following MET (Fryer, 2011).

Hypothetically, in lumbopelvic region muscle energy technique is used with the intention to correct a muscle asymmetry by targeting the hamstring or hip flexor muscles on the painful aspect of the low back in patients with chronic LBP. Study for the foremost useful course of contraction to extend flexibility in healthy muscle will exist (Kisner et al., 2017).

Appropriate treatment should be addressed this relaxes them, before any effort is formed to strengthen weak muscles, any hypertonicity in their antagonists. When Physiotherapist applied MET, the patient's muscle voluntarily contracts in an exactly controlled direction in opposition to an externally applied counter-force. Shortened and hypertonic muscles are often known as the key element of limited motion of a joint (Gendy et al., 2017).

Contract-relax agonist-contract and agonist-contract are variants of PNF, where the client actively pushes further into the resistance or where isometric contractions far from as well as into the resistance are changed. To improve flexibility these methods have been thoroughly efficient however applicable wherever soft tissue is doesn't seem to be painful. It's not counseled for painful muscles or joints as a result of pushing into the painful range would probably turn out protecting muscle guarding and apprehension(Kisner et al., 2017).

Proprioception and motor control is perturbed by spinal pain and consequently reduced awareness of spinal motion and position and cutaneous touch perception. Motor programming which is affected by spinal pain alongside lessen the stabilization of paraspinal musculature causing superficial spinal muscles to over react to stimuli. Single intervention of MET is effective to alleviate pain in individuals in acute episode of lumbo-pelvic pain which is mentioned by Selkow in 2009.

This desertation was designed to evaluate the effectiveness of Muscle energy technique combined with conventional physiotherapy among patients with non-specific low back pain. To identify the efficiency of this treatment regime, Numeric Pain Rating Scale (NPRS) and Oswestry DisabilityIndex (ODI) were used as measurement tools for measuring pain and disability.

3.1. Study Design

The study was a quantitative evaluation of quasiexperimental research design. In fact, the study was an experiment between different subject designs. Muscle energy technique combined with conventional physiotherapy techniques applied to the experimental group and only conventional physiotherapy techniques applied to the control group. A pre-test (before intervention) and post-test (after intervention) was administered with each subject of both groups to compare the effects on pain and disability.

3.2. Study Area

Musculoskeletal Unit, Department of Physiotherapy, Centre for the Rehabilitation of the Paralysed (CRP), Savar, Dhaka.

3.3. Study Period

August 2018 to July 2019.

3.4. Study Population

The study population was the patients diagnosed as low back pain attended in the musculoskeletal unit of physiotherapy department at CRP, Savar, Dhaka.

3.5. Sample Size

The equation of the sample size calculation are given below-

$$n = \left\{ \frac{z \left(1 - \frac{\alpha}{2} \right)}{d} \right\}^2 \times pq$$

Here,

$$z \left(1 - \frac{\alpha}{2} \right) = 1.96$$

$P = 0.80$ (Here p = prevalence and p = 80%)

$$\begin{aligned} q &= 1-p \\ &= 1- 0.80 \\ &= 0.20 \\ d &= 0.05 \end{aligned}$$

Now,

$$\begin{aligned} n &= \left\{ \frac{1.96}{0.05} \right\}^2 \times (0.80 \times 0.20) \\ &= 246 \end{aligned}$$

The actual sample size for this study was calculated as 246, but as the study was performed as a part of academic research project and there were some limitations. So that researcher has taken 54 participants as sample conveniently according to inclusion and exclusion criteria for this study. 27 participants were in experimental group and 27 participants in control group. Obviously this is a small sample but still we believe they will be provided a representative picture of the study.

3.6. Sampling Technique

54 patients with low back pain who met the inclusion criteria selected conveniently from the musculoskeletal unit of physiotherapy department of CRP, Savar, Dhaka. All the participants had an equal probability of assigning to any of two groups and then 27 patients were non-randomly assigned to experimental group comprising of treatment approaches of Muscle Energy Technique combined with conventional physiotherapy techniques and 27 patients to the control group treated by conventional physiotherapy techniques for this study. Completion of sampling technique, the researcher non-randomly assigned the participants into experimental group and control group, the samples was given numerical number C1, C2, C3 etc. for the control group and E1, E2, E3 etc. for experimental group. Finally, the sample size was 54 in number consisting of 27 participants in the control group and 27 in the experimental group as there was no dropped out before completion of 10 sessions of treatment.

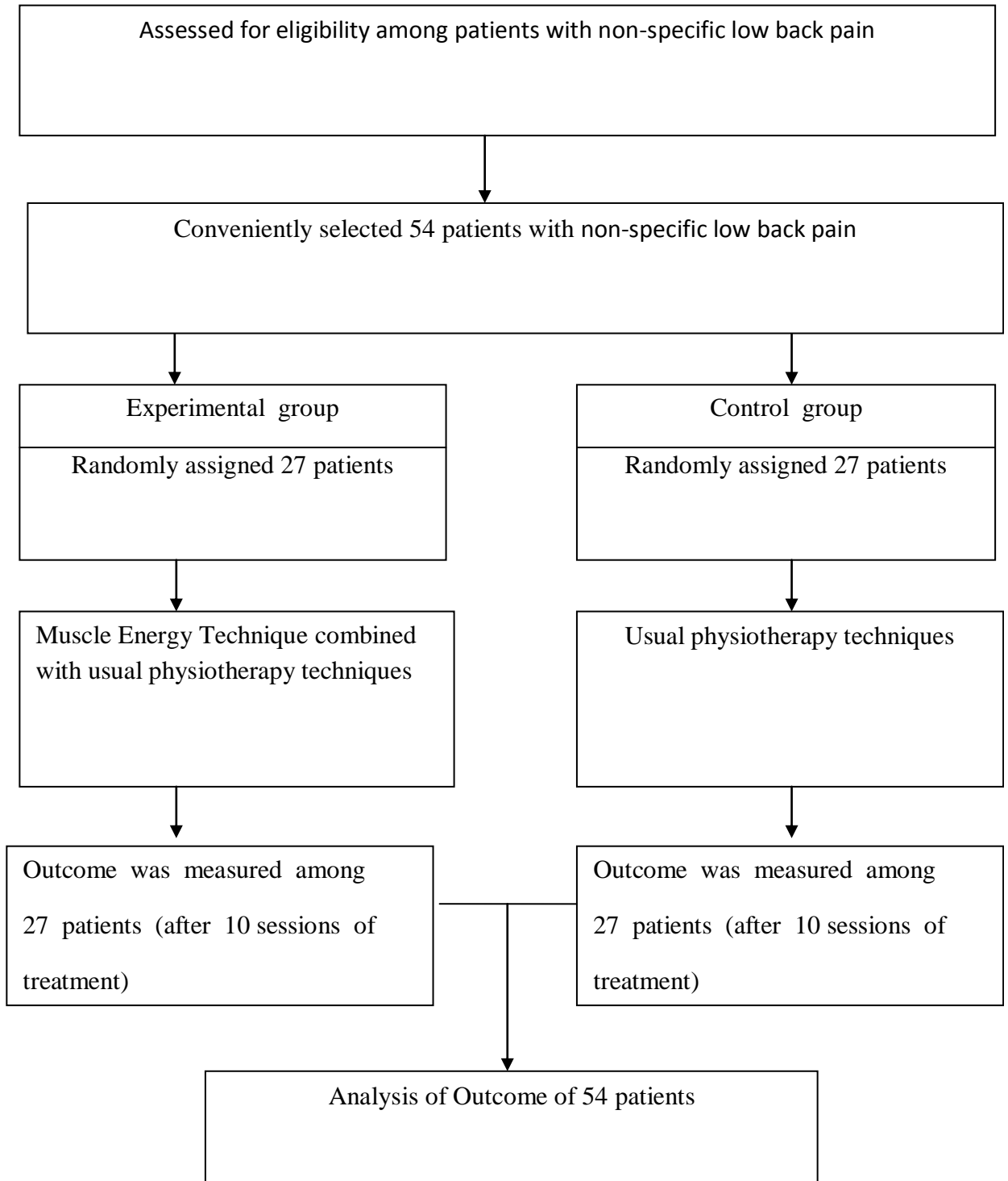


Figure 1: CONSORT flowchart of the phases of quasi experimental research

3.7 Inclusion criteria

- Age group:18-60 year (McKenzie, 1990)
- Both sexes.
- Low back pain not of specific Origin diagnosed by a clinician (Fracture, tumours, malignancy, ankyloses, Infections and pregnant women).

3.8 Exclusion Criteria

- Patients with clinical disorder where Muscle energy technique is contraindicated.
- Acute disc prolapse patient.
- Patient less than 18 years and above 60 years.
- Diagnosis of secondary complications such as tumour, TB spine, fracture, dislocation and severe osteoporosis, Paget's disease.
- All sorts of infection, Rheumatoid Arthritis, Ankylosing Spondylitis.
- Cauda-equina lesions, Cord signs & Syndrome, Transverse myelitis.
- Pregnant women.
- Mentally retarded patient.
- Patients those are taking pain killer.
- Patients who are not interested to be a participant of this study.

3.9. Data Processing

3.9.1. Data Collection Tools

- Record or Data collection form
- Consent Form
- Structured questionnaire. (Both open ended and close ended questionnaire)
- Numeric Pain Rating Scale – for measuring pain.
- Oswestry Disability Index (ODI)
- Pen, Papers.

3.9.2. Data measurement Tools

Numeric Pain Rating Scale (NPRS):

McCaffery et al. (1999) used a numeric scale to rate the pain status experienced by patients. It is known as Numeric Pain Rating Scale. The scale is a 10cm long scale ranging from 0-10. Here a zero (0) means no pain, 1-3 indicates mild pain, 3-5 indicates that pain is in moderate state and 6-10 is worst possible pain feeling experienced by patients.

Oswestry Disability Index (ODI):

This is a set of questionnaire that has been designed to provide information regarding how the patient's back pain affects his/her ability to manage in everyday life.

3.9.3. Ethical Issues

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 presented to the Institutional Review Board (IRB) of Bangladesh Health Professions Institute (BHPI). Again before starting data collection, researcher obtained permission from the head of physiotherapy department to access patient data based management and allow full involvement of physiotherapist who have been working in musculoskeletal physiotherapy department, CRP, Savar. The researcher strictly maintained the confidentiality regarding participant's condition and treatments. The researcher obtained consent from each participant to take part in this study. A signed informed consent form was received from each participant. Every subject had the opportunity to discuss their problems with the senior authority or administration of CRP and had any questioned answer to their satisfaction.

3.9.4. Data Collection Procedure

The data collection procedure was conducted through assessing the patient, initial recording, treatment and final recording. 10 sessions of treatment was provided for each participant. Data was gathered through a pre-test, intervention and post-test. Pre-test was performed before beginning the treatment and the intensity of pain was noted with NPRS and disability by ODI. The same procedure was performed to take post-test. The data collector collected the data of both groups in front of the Physiotherapist in order to minimize the bias.

3.10. Data Analysis

Statistical analysis was performed by using statistical package for social science (SPSS) version 20.

3.10.1 Statistical Test

For the significance, a statistical test was carried out. Statistical analysis refers to the well-defined organization and interpretations of the data by systemic and mathematical procedure and rules (DePoy & Gitlin, 2015). The investigator did paired t-test.

Paired t-test

A paired t-test is used to compare two population means where you have two samples in which observations in one sample can be paired with observations in the other sample.

Formula of paired t-test

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

Where,

\bar{d} = mean of difference (d) between paired values,

$SE(\bar{d})$ = Standard Error of the mean difference,

SD = standard deviation of the differences d, and

n = number of paired observations.

3.10.2. Level of Significance

In order to find out the significance of the study, the “p” value was calculated. The p values refer to the probability of the results for experimental study. The word probability refers to the accuracy of the findings. A p value is called level of significance for an experiment and a p value of <0.05 was accepted as significant result for health service research. If the p value is equal or smaller than the significant level, the results are said to be significant (DePoy and Gitlin, 2015).

3.11. Treatment Protocol

Muscle energy technique was applied by a graduate qualified physiotherapist who is expertized in Muscle energy technique to the patients of experimental group.

Table -I: Experimental Group Treatment Protocol

| Treatment option | Duration/ Repetition |
|--------------------------------|---|
| McKenzie Approach | 10 repetition in each session |
| Lumbar mobilization | 60 repetition in each set in each session |
| Stretching to back muscle | 15 second hold, 3-5 repetition (1 set) |
| Soft tissue technique | 3 minutes |
| Muscle Energy Technique | 3–5 times repetition then relaxation of 2-3 s |
| IRR | 10 minutes |

Table – II: Control Group Treatment Protocol

| Treatment option | Duration/ Repetition |
|---------------------------|---|
| McKenzie Approach | 10 repetition in each session |
| Lumbar mobilization | 60 repetition in each set in each session |
| Stretching to back muscle | 15 second hold, 3-5 repetition (1 set) |
| Soft tissue technique | 3 minutes |
| IRR | 10 minutes |

McKenzie Approach (Directional Preference)

According to McKenzie (1995) the treatment options are:

1. Flexion principle

A. Standing position

- Repeated flexion in standing
- Repeated flexion in standing with over pressure

B. Sitting position

- Repeated flexion in sitting
- Repeated flexion in sitting with over pressure.

C. Lying position

- Repeated flexion in lying
- Repeated flexion in lying with over pressure.
- Rotation mobilization in flexion

2. Extension principle

A. Standing position

- Repeated extension in standing
- Repeated extension in standing with over pressure

B. Lying position

- Lying prone
- Sustain extension
- Repeated extension in lying
- Repeated extension in lying with over pressure.
- Mobilization in extension.
- Rotation mobilization in extension

3. Lateral principle

A. Standing position

- Manual shift correction
- Wall support side gliding
- Side gliding with extension

- Step standing

B. Lying position

- Banana shaped lying
- Side lying with with pillow support
- Extension from banana shape
- Rotation mobilization in flexion.

According to the directional preference these approaches were given to the patients. The patients who were given positive feedback in extension were given extension principle and the patient given positive feedback in flexion was given flexion principle.

Spinal Mobilization was given according to the Maitland Mobilization Grade in between Grade I-IV.

Soft tissue technique was given by Deep Transverse Friction Massage (DTFM), Stroking and Effleurage techniques.

MET in lateral recumbent position

The patient was in the lateral recumbent position on the side opposite to his/her side-bending dysfunction while the physiotherapist stood facing the subject. The physiotherapist monitored the lumbar area with his one hand while with the other hand flexed the subject's knees and hips until the barrier was engaged at the vertebral segment being treated. For flexion dysfunction, the physiotherapist induced an extension of the spine by pushing hips and knees posteriorly. The patient was then asked to straighten his/her bottom leg, and the foot of the leg positioned above was placed in the bottom leg's popliteal space. The physiotherapist then palpated the dysfunctional vertebra and then the patient was pulled anteriorly and superiorly from the arm positioned below to introduce a rotation and side-bending of the lumbar spine until the barrier was engaged at the vertebral segment being treated. Then the physiotherapist's other hand was placed over the upper shoulder of the patient and the patient was asked to push anteriorly with his/ her shoulder using approximately 30% of their effort against the physiotherapist's unyielding

counterforce and to hold there for 3 s to 5 s. The physiotherapist then re-engaged the barrier by pulling the patient anteriorly and superiorly from the arm positioned below. The maneuver was repeated for 3–5 times with a relaxation of 2 s to 3 s duration in between.



Figure 2: MET in lateral recumbent position

MET in side-bending component position

The physiotherapist flexed both of the patient's hips and knees and lifted the ankles toward the ceiling until the barrier was reached. The patient then asked to push his/her ankles toward the floor using approximately 30% of their effort against the physiotherapist's unyielding counterforce. The barrier was re-engaged by lifting the patient's ankle further and the maneuver was repeated 3–5 times with a relaxation of 2 s to 3 s duration in between.

For this study 54 patients with Non-specific Low Back Pain were taken as sample from Musculo-skeletal unit of Center for Rehabilitation of Paralyzed (CRP), Savar to explore the effectiveness of Muscle Energy Technique (MET) for the treatment of Low Back Pain (LBP). The results which were found have been shown in different bar diagrams, pie charts and tables.

4.1. Socio-demographic Information

4.1.1 Age Range

In this study Figure 1 shows that there were 54 participants participated were the minimum age of a participant was 21 and maximum age of a participant was 60 and mean age was 38.61 (\pm 11.6) years. Most of the participants were included in the age group 31-40 years that was 18 (33%). In depth analysis, it was clearly observed that about 61% participants lied in the age group 21-40 years.

Among the participants, ages in between 21-30, 33% participants were in experimental and 22% in control group, in 31-40years group 37% in experimental and 30% in control group, 26% in experimental and 18% participants in control group were included in the age range 41-50 years and lastly in between 51-60 years age group there were 4% in experimental and 30% participants in control group.

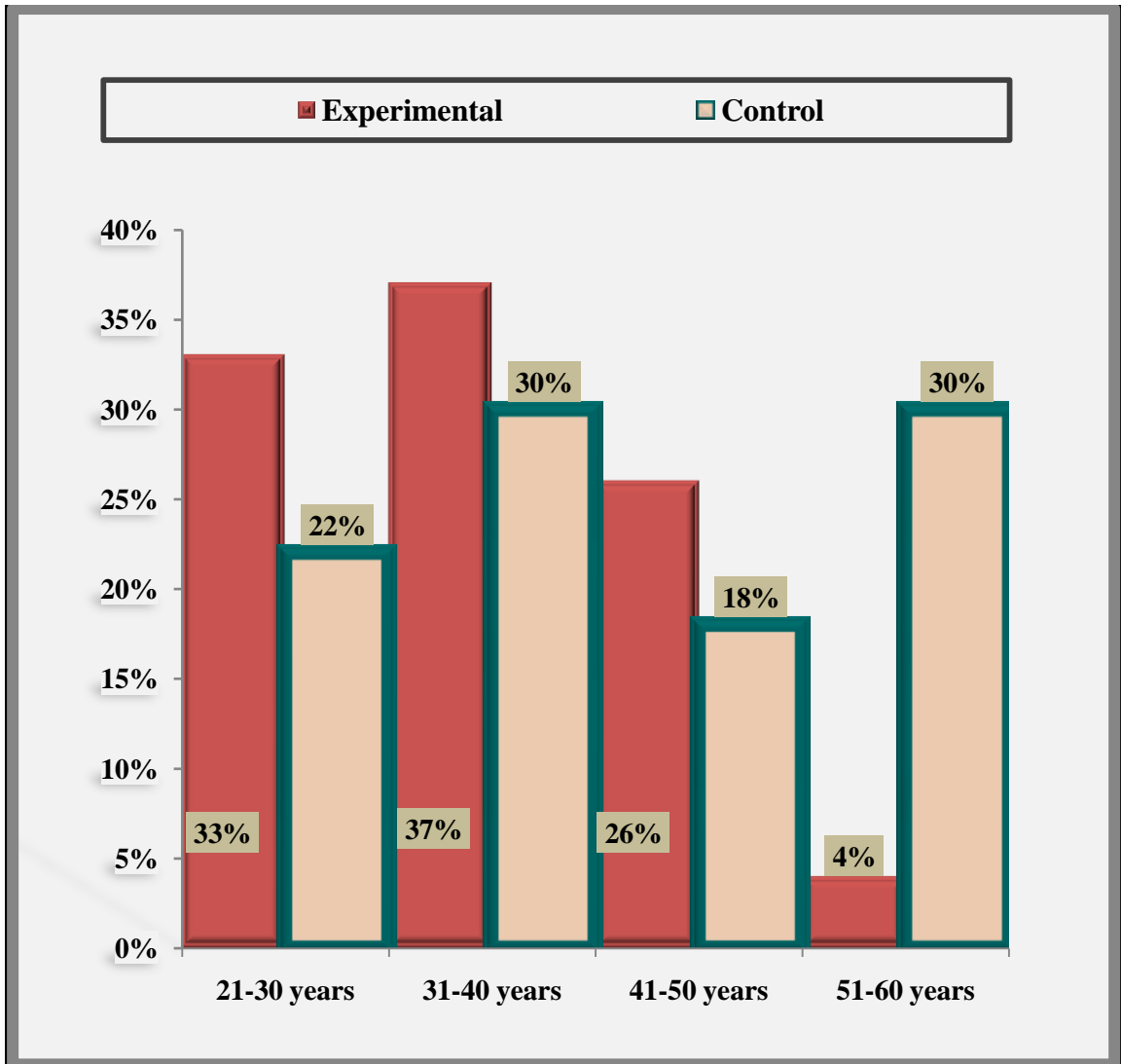


Figure 3: Age range of the participants between groups

4.1.2 Gender of the Participants

In this study, there were 54 participants where 78% (n=42) were Male (85% in experimental and 70% in control group) and 22 % (n=12) were female (15% in experimental and 30% in controlgroup).

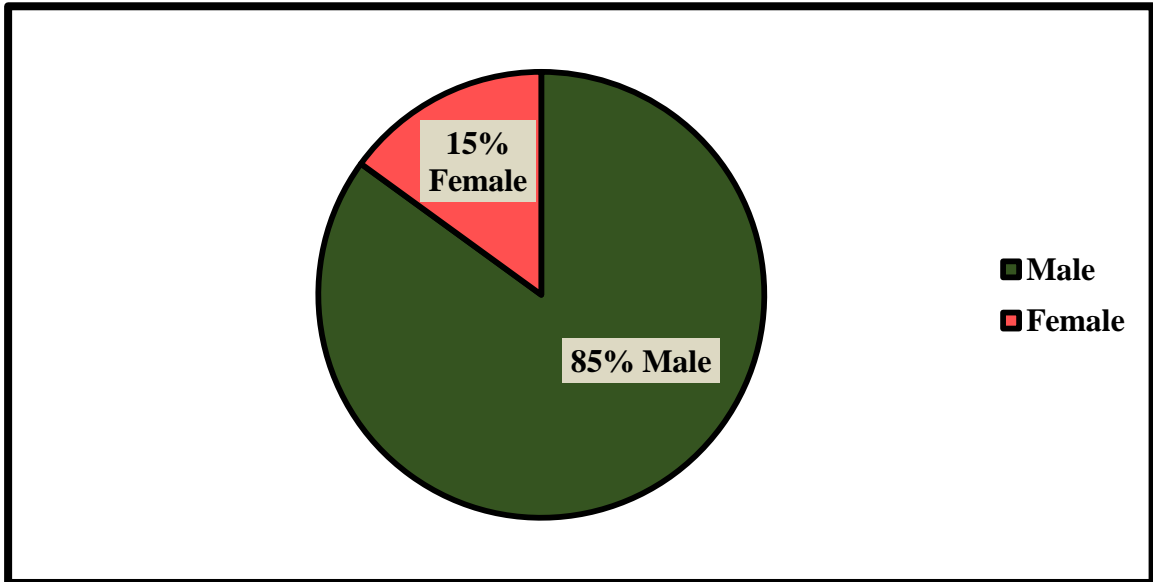


Figure 4: Gender distribution of the participants in experimental group

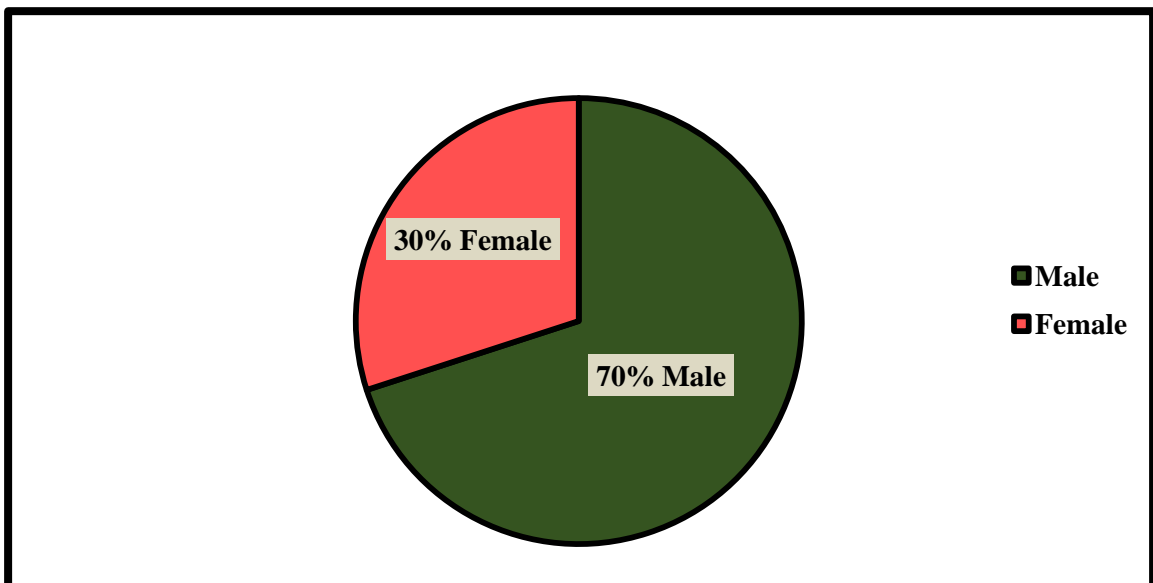


Figure 5: Gender distribution of the participants in control group

4.1.3 Occupation of the participants

Figure 4 showed, among the 54 participants, 26% (n=14) were service holder (22% in experimental group and 30% in control group), 18% (n=10) were businessman (22% in experimental group and 30% in control group), 6% (n=3) were labour (all are in experimental group), 19% (n=10) were housewives (15% in experimental group and 22% in control group), 11% (n=6) were student (15% in experimental group and 7% in control group), and 20% (n=11) came from others professions (15% in experimental group and 26% in control group). So, most of the participants are service holder.

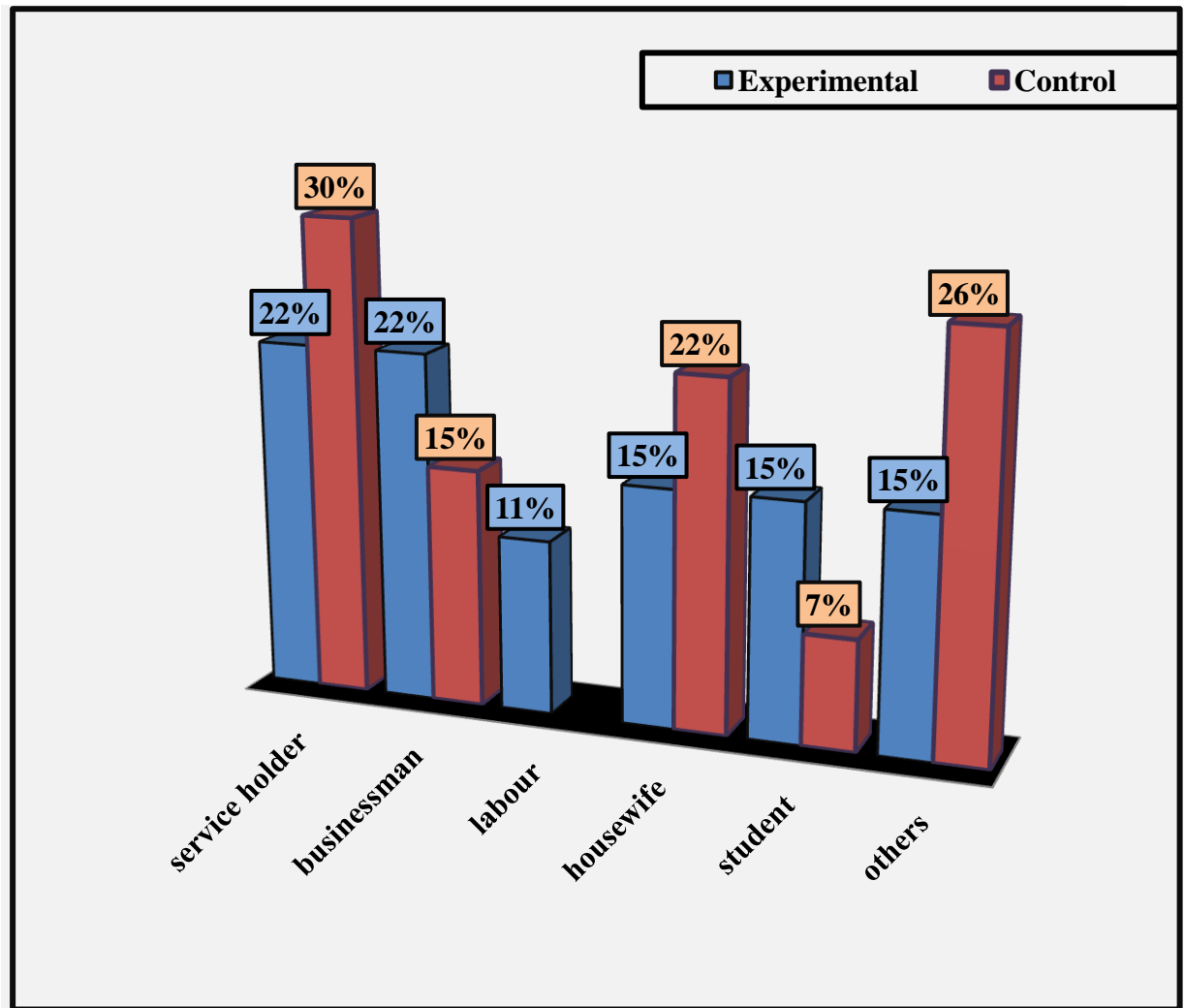


Figure 6: Occupation of the participants

4.1.4 Mechanical stress position of the participants

From the pie chart- most the participants (65%, n=35) suffering from low back pain whose mechanical stress position were sitting (70% were in experimental and 59% were in control group), 22% (n=12) participants mechanical stress position was standing (19% were in experimental and 26% were in control group) and 13% (n=7) participants mechanical stress position was walking (11% were in experimental and 15% were in control group).

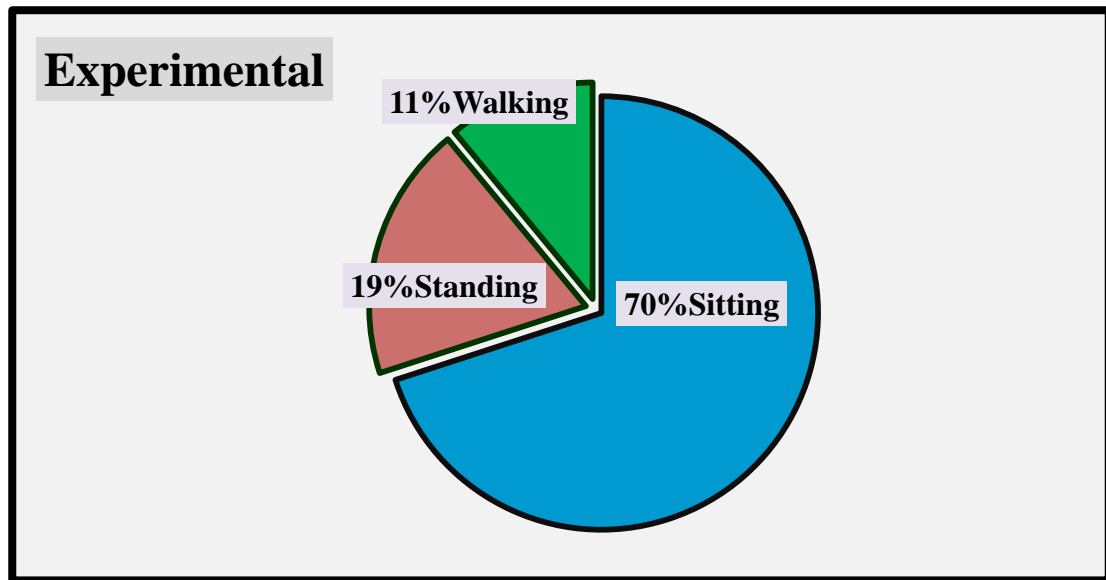


Figure 7: Mechanical stress position of the participants

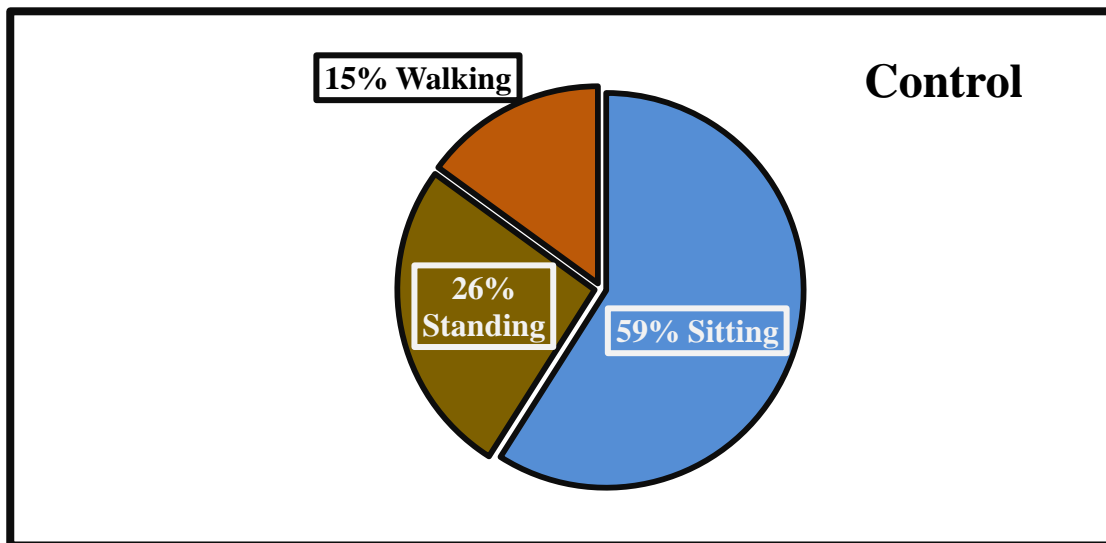


Figure 8: Mechanical stress position of the participants

4.1.5. Daily working hour

From this table it can be explained that among 54 participants 35% work 1-4 hours, 41% work 5-8 hours, 22% work 9-12 hours and 2% patients work 13-16 hours in average per day. From this table it also showed that most of the participants work 5-8 hours daily.

Table IV: Daily working hour

| Daily working hour | Experimental group | | Control group | |
|--------------------|--------------------|-------------|---------------|-------------|
| | Number (N) | Percent (%) | Number (N) | Percent (%) |
| 1-4 Hours | 7 | 26 | 12 | 44 |
| 5-8 Hours | 11 | 41 | 11 | 41 |
| 9-12 Hours | 9 | 33 | 4 | 15 |
| Total | 27 | 100 | 27 | 100 |

4.1.6 Education level of both groups participants with frequencies and percent:

Table IV showed that among 54 participants, no participant was illiterate in the experimental group and 1(3.7%) was in control group, 5(18.5%) participants of experimental group was in primary and 9 (33.3%) was in control group, 8 (29.6%) participant passed S. S. C examination both in experimental and control group. There were 2 (7.4%) participants who passed H. S. C. level in experimental group and 3 (11.1%) was in control group. At graduate level, there were 6 (22.2%) in experimental and 4 (14.8%) in control group and in post graduate level 6 (22.2%) was from experimental and 2 (7.4%) participants from control group.

Table V: Educational qualifications

| Educational level | Experimental group | | Control | |
|-------------------|------------------------|---------|------------------------|---------|
| | Number of participants | percent | Number of participants | percent |
| Illiterate | - | - | 1 | 3.7% |
| Primary | 5 | 18.5% | 9 | 33.3% |
| Secondary | 8 | 29.6% | 8 | 29.6% |
| Higher secondary | 2 | 7.4% | 3 | 11.1% |
| Graduate | 6 | 22.2% | 4 | 14.8% |
| Post graduate | 6 | 22.2% | 2 | 7.4% |

4.1.7 Marital status

Among 54 (100%) participants, 18% (n=10) participants were unmarried, where 26% were in experimental group and 11% were in control group. 80% (n=43) participants were married, where 74% were in experimental group and 85% were in control group, 2% (n=1) participants were divorced and were in control group and there was no widow in both group.

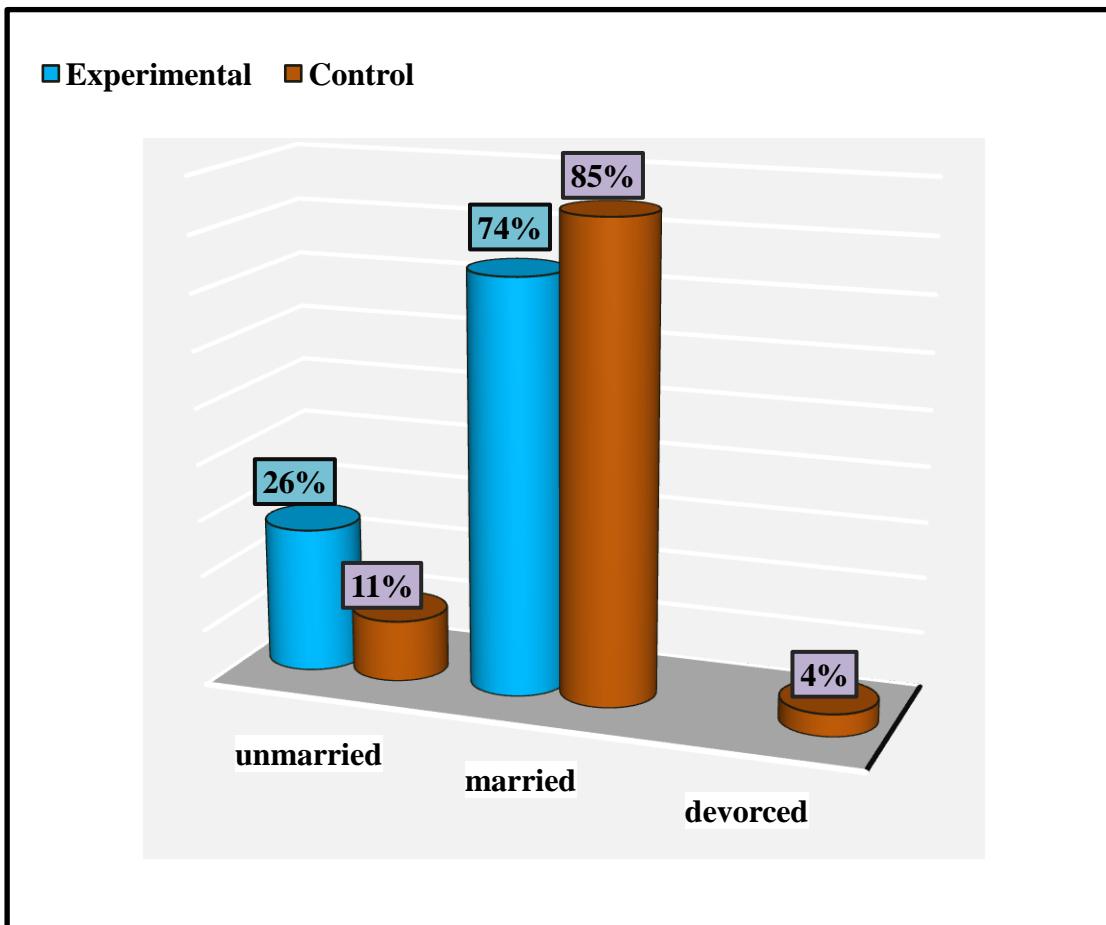


Figure 9: Marital status of the participants

4.1.8 Living area of the participants

The pie chart showed that among the 54 (100%) participants it was found that 44% (n=24) were live in urban area, 24% (n=13) came from semi-urban and 32% (n=17) from rural area.

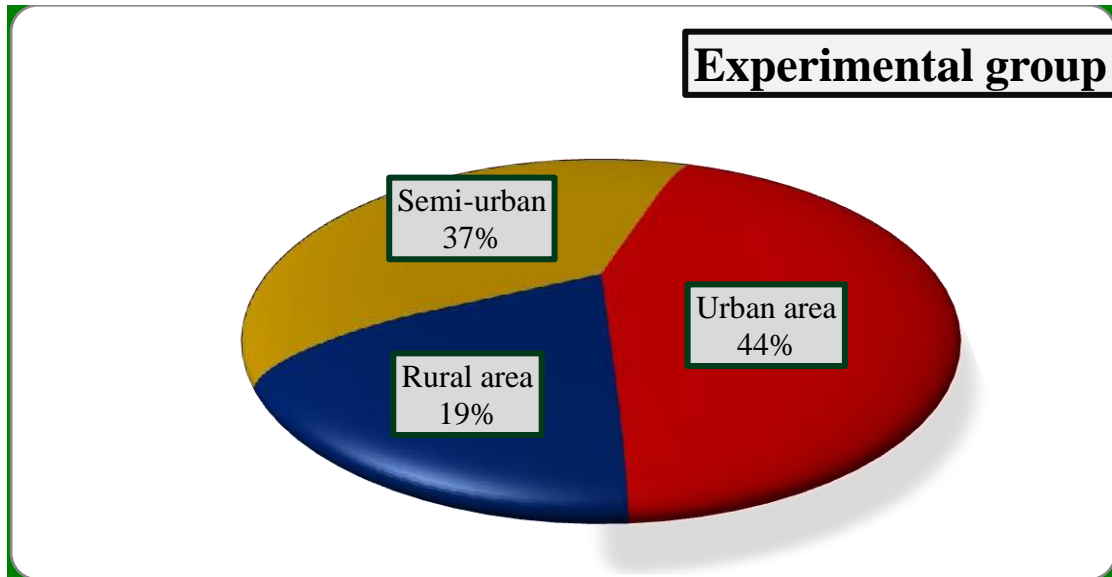


Figure 10: Living area of the particip

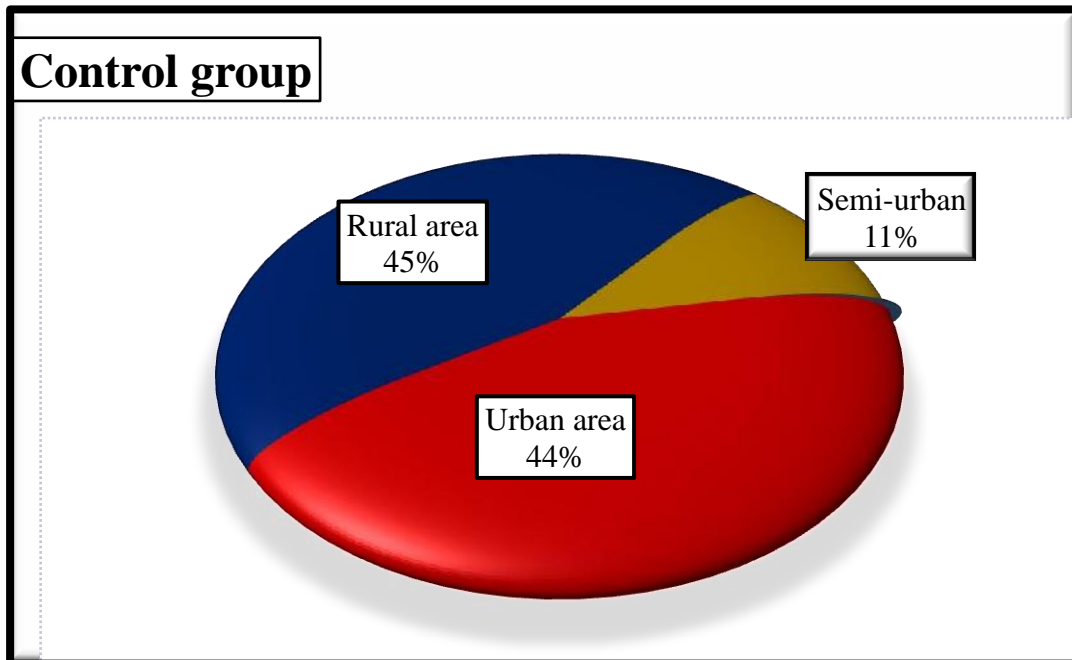


Figure 11: Living area of the participant

4.1.9 Sleeping posture of both groups' participants with frequencies and percentage:

Table V showed that among 27 patients of experimental group, 40.7% (n=11) preferred to sleep in supine lying, 7.4% (n=2) in prone lying, 48.1% (n=13) in side lying (right) and 3.7% (n=1) in side lying (left). In contrast, among 27 patients of control group, 40.7% (n=11) to sleep in supine lying, 7.4% (n=2) in prone lying, 40.7% (n=11) in side lying (right) and 11.1% (n=3) in side lying (left).

Table VI: Sleeping posture

| Sleeping posture | Experimental group | | Control | |
|------------------|------------------------|---------|------------------------|---------|
| | Number of participants | Percent | Number of participants | Percent |
| Supine lying | 11 | 40.7% | 11 | 40.7% |
| Prone lying | 2 | 7.4% | 2 | 7.4% |
| Side lying-right | 13 | 48.1% | 11 | 40.7% |
| Side lying-left | 1 | 3.7% | 3 | 11.1% |

4.1.10 Back pain duration

This above column showed that among 54 participants, experimental group participants suffering duration of low back pain was more than control group as there was no participant from control group in the 5th group of back pain duration but in experimental group 4% participants who's suffered from low back pain from 37-45 months.

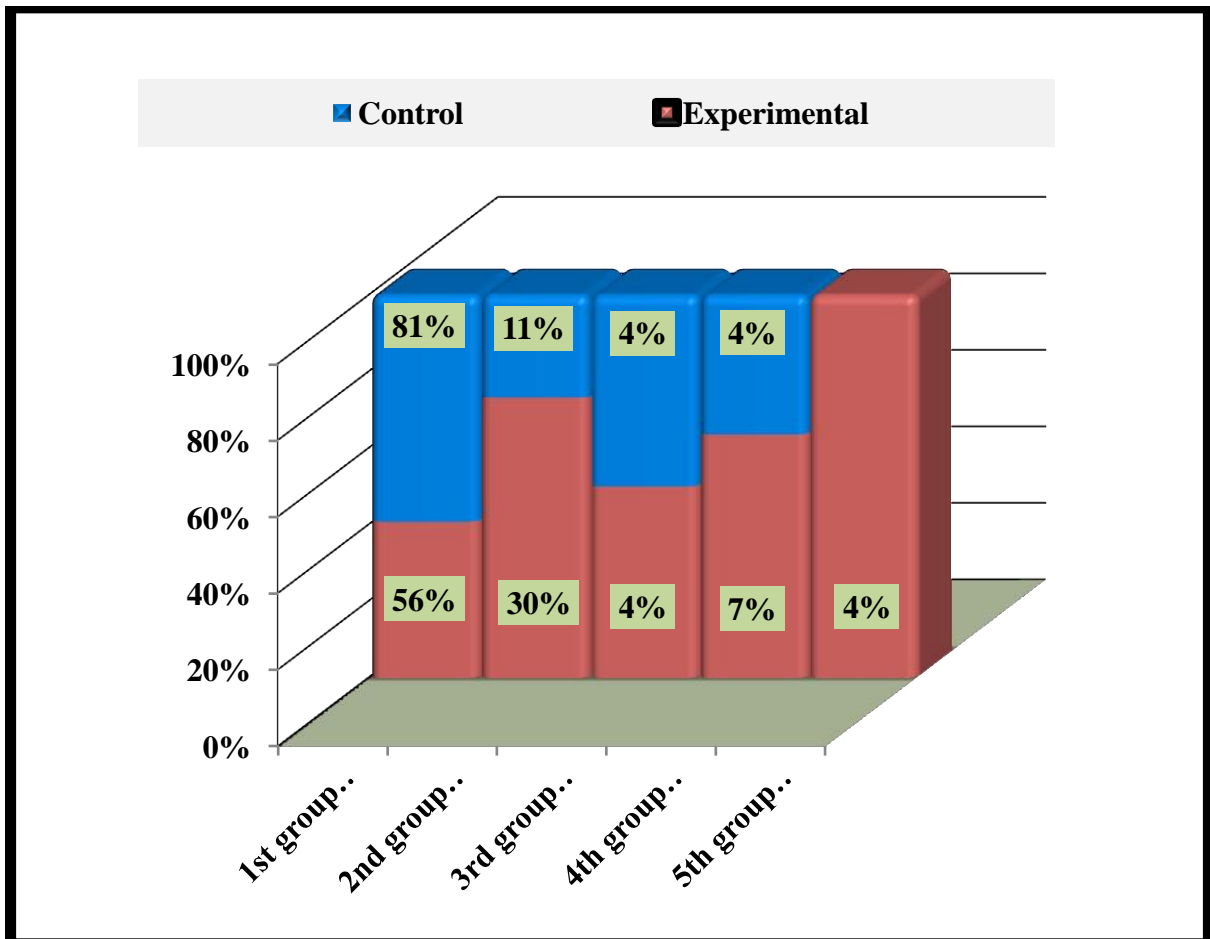


Figure 12: Back pain duration of the participants

4.1.11 Smoking history among the participants

The column showed that among the 54 participants, 13% (n=7) were smoker (11% in experimental group and 15% in control group) and 87% (n=47) were non-smoker (89% in experimental group and 85% in control group). So, most of the participants of this study were non-smoker.

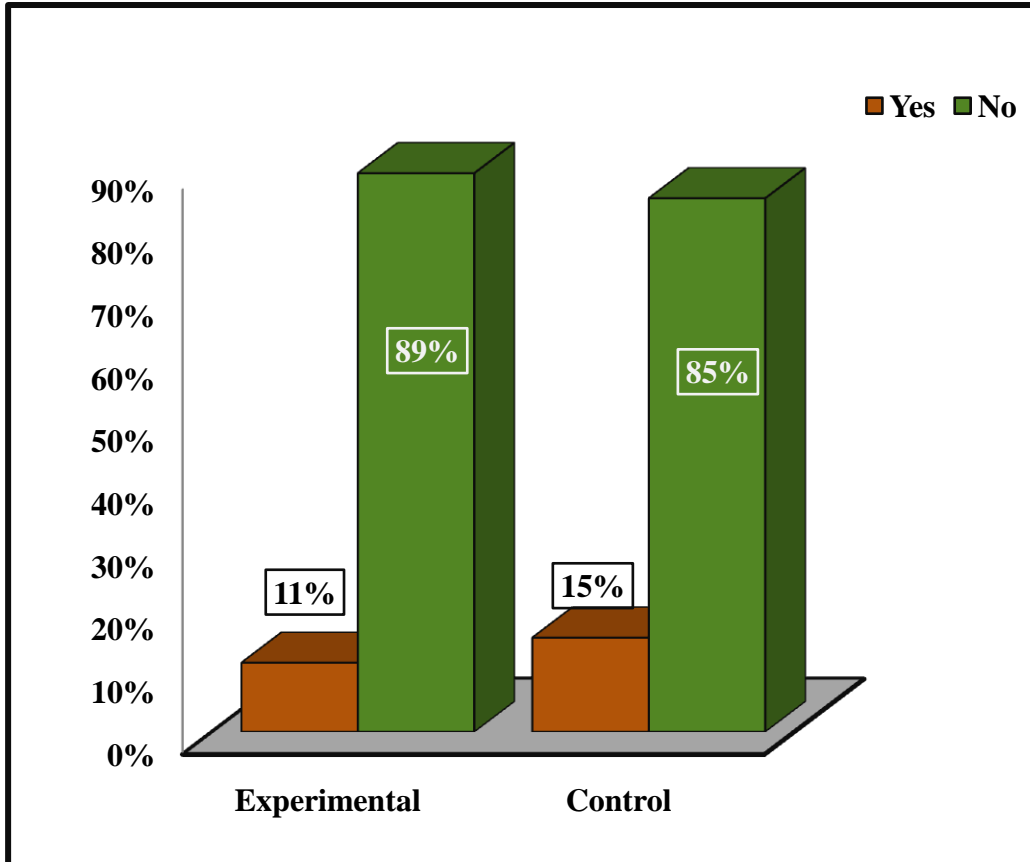


Figure 13: Smoking history of the participants

4.1.12 Diabetic History among the participants

This table showed that, among total (54) participants, most of the participants (83%, n=45) were non-diabetic, 13% (n=7) were diabetic and remaining 4% (n=2) were not confirmed about diabetes mellitus.

Table also showed that 82% participants (n=22) were non-diabetic, 11% (n=3) were diabetic and 7% (n=2) were not confirmed about diabetes in experimental group and 85% (n=23) were non-diabetic, 15% (n=4) participants were diabetic in control group.

Table VII: Diabetes History

| Diabetes mellitus | Experimental | | Control | |
|--------------------------|---------------------|-----------------------|-------------------|-----------------------|
| | Number (N) | Percentage (%) | Number (N) | Percentage (%) |
| Yes | 3 | 11 | 4 | 15 |
| No | 22 | 82 | 23 | 85 |
| Don't know | 2 | 7 | 0 | 0 |
| Total | 27 | 100 | 27 | 100 |

4.1.13 Hypertention history among the participants

This study showed that among 54 participants 78% (n=42) were non-hypertensive (78%, n=21 were both in experimental and control group) 20% (n=11) were hypertensive (18%, n=5 were in experimental group and 22%, n=6 were in control group) and only 2% (n=1) don't know that he/she has hypertension which (4%, n=1) were in experimental group.

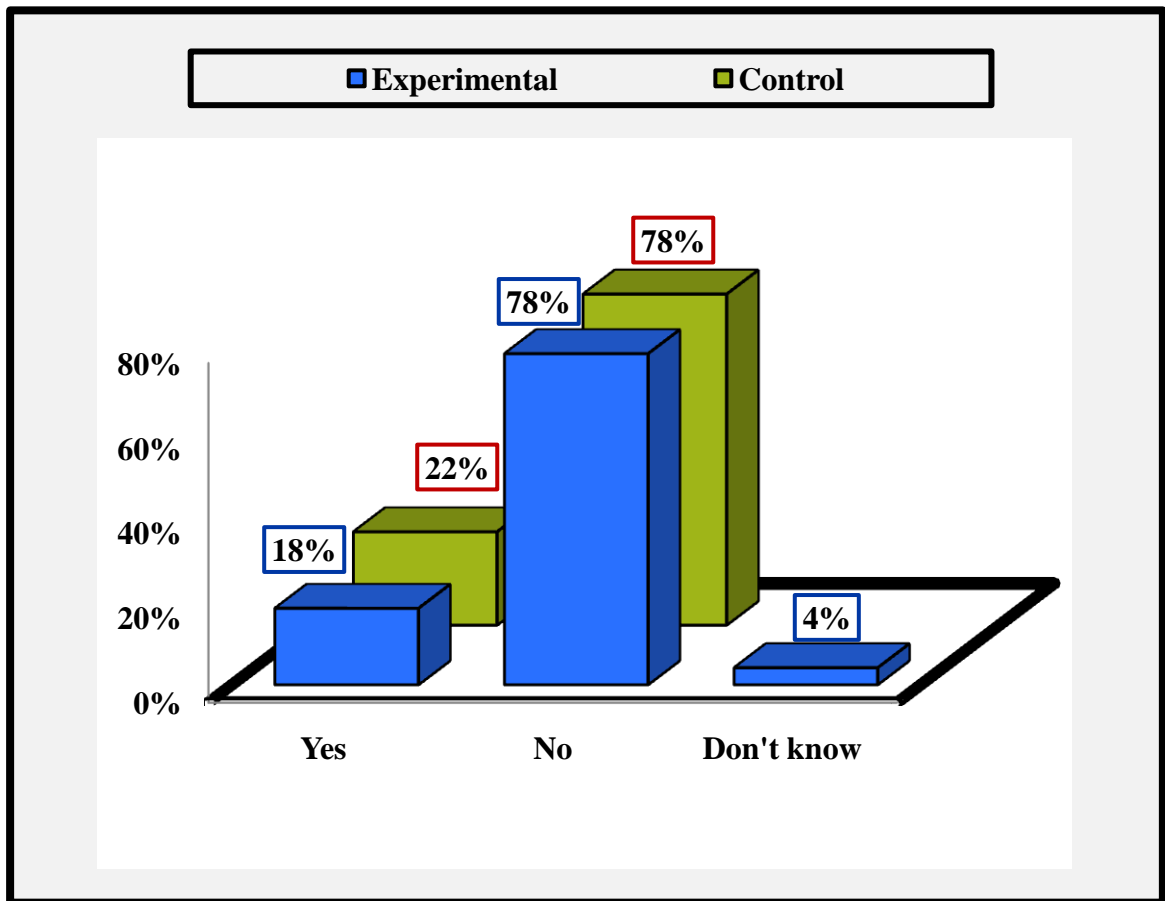


Figure 14: Hypertention history of the participants

4.1.14 Asthma history among the participants

In this study there were 54 (100%) participants, among this participants 87% (n=47) didn't have asthma where 89% were in experimental group and 85% were in control group and the remaining 13% (n=7) were with the history of asthma and among this 13% participants, 11% were in experimental and 15% were in control group.

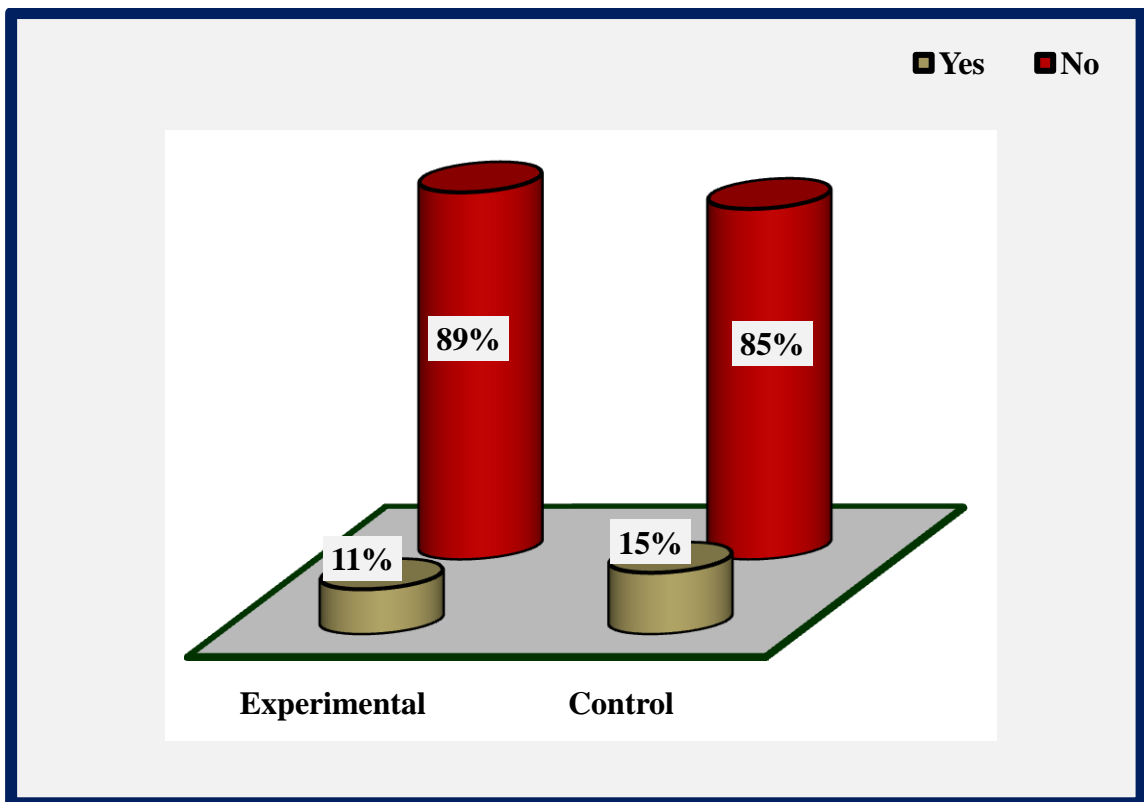


Figure 15: Asthma history of the participants

4.1.15 Major accident or surgery hisyory of the participants

In this study, among 54 participants 67% (n=36) has no history of major accident or surgery, were 74% (n=20) in experimental group and 59% (n=16) were in control group and 33% (n=18) has the history of major accident or surgery, were 26% (n=12) in experimental group and 41% (n=11) were in control group.

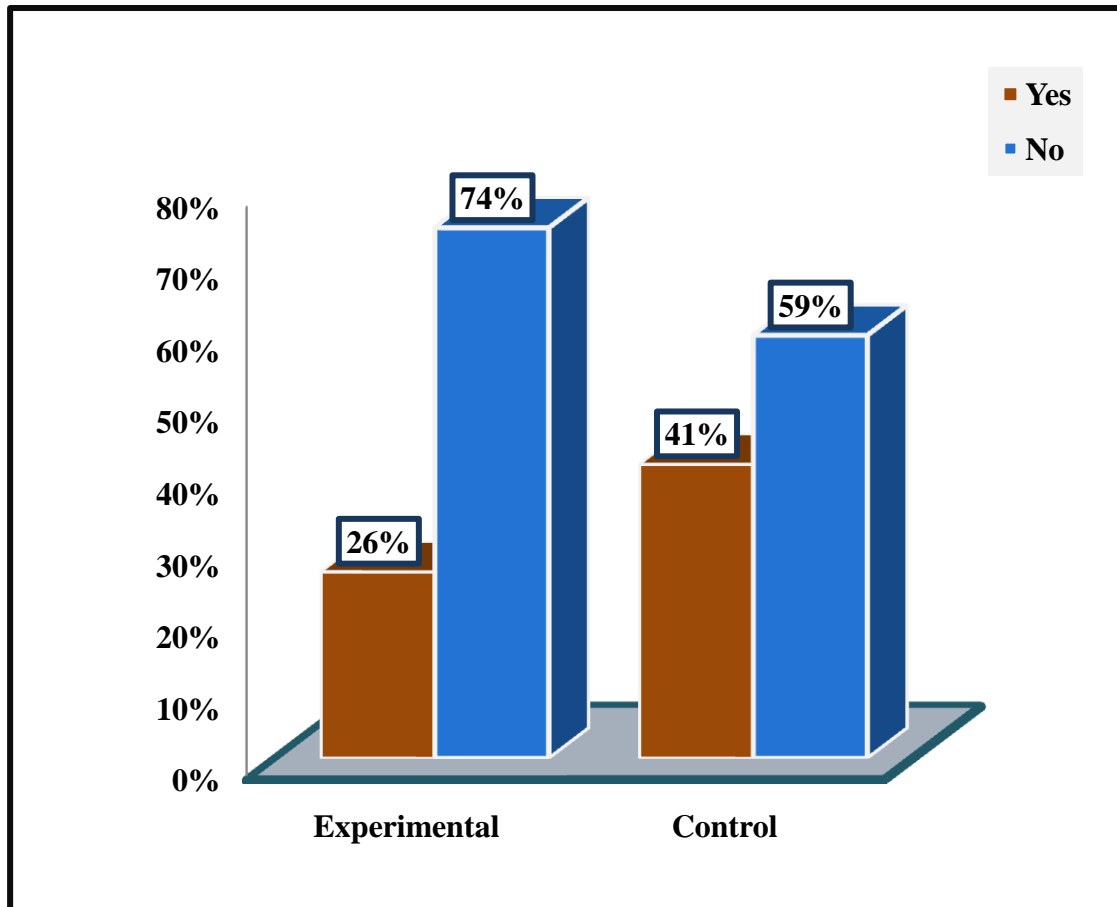


Figure 16: Major accident or surgery

4.2 Pain and Disability

In order to find out the significance of the study, the “p” value was calculated. The p values refer to the probability of the results for experimental study. The word probability refers to the accuracy of the findings. A p value is called level of significance for an experiment and a p value of <0.05 was accepted as significant result for health service research. If the p value is equal or smaller than the significant level, the results are said to be significant.

The researcher had calculated paired t-value and significant level and have presented in the following tables-

4.2.1a Numeric Pain Rating Scale (paired t-test)

In Numeric Pain Rating Scale (NPRS) the investigator did paired t-test. In the NPRS (initial-final) the outcomes of both experimental and control group were significant ($P \leq 0.05$) for each item, which indicate that Muscle Energy Technique is effective to reduce pain in low back pain patients and the degree of freedom were 26 in every item in the both groups. In the item of **pain in general** the t value was 9.73 in experimental group; and 9.73 in control group. In **pain during sitting** the t value was 9.08 in experimental group; and 9.08 in control group. In **pain at bending position** the t value was 8.13 in experimental group; and 8.13 in control group. In the item of **pain during sit to stand** the t value was 8.00 in experimental group; and 8.00 in control group. In the item of **pain in standing position** the t value was 7.09 in experimental group; and 7.09 in control group. **Pain during walking** the t value was 8.18 in experimental group; and 8.18 in control group. In the item of **pain during activities of daily livings** the t value was 10.07 in experimental group; and 10.07 in control group. In the item of **pain during working** the t value was 9.20 in experimental group; and 9.20 in control group. In **pain while traveling** the t value was 6.355 in experimental group; and the t value was 6.04 in control group. In the item of **pain while sleeping** the value was 4.05 in experimental group; and 3.79 in control group.

Table VIII: Pain severity on NPRS

| Variables | Test | Experimental | | | Control | | |
|---|-------------|--------------|---------------|----|---------|---------------|----|
| | | t | Sig. level | df | t | Sig. level | Df |
| How severe is your pain in general? | Pre Post | 9.73 | 0.00 | 26 | 9.73 | 0.00 | 26 |
| How severe is your pain in during sitting? | Pre Post | 9.08 | 0.00 | 26 | 9.08 | 0.00 | 26 |
| How severe is your pain at bending position? | Pre Post | 8.13 | 0.00 | 26 | 8.13 | 0.00 | 26 |
| How severe is your pain during sit to stand? | Pre Post | 8.00 | 0.00 | 26 | 8.00 | 0.00 | 26 |
| How severe is your pain in standing position? | Pre Post | 7.09 | 0.00 | 26 | 7.09 | 0.00 | 26 |
| How severe is your pain during walking? | Pre Post | 8.18 | 0.00 | 26 | 8.18 | 0.00 | 26 |
| How severe is your pain during activities of daily livings? | Pre Post | 10.07 | 0.00 | 26 | 10.07 | 0.00 | 26 |
| How severe is your pain during working? | Pre Post | 9.20 | 0.00 | 26 | 9.20 | 0.00 | 26 |
| How severe is your pain while traveling? | Pre Post | 6.355 | 0.00 | 26 | 6.04 | 0.00 | 26 |
| How severe is your pain while sleeping? | Pre Post | 4.052 | 0.00 | 26 | 3.79 | 0.00 | 26 |

4.2.1b Oswestry Disability Index (paired t-test):

In Oswestry Disability Index (ODI) the investigator did paired t-test. In the ODI percentage (initial-final) the outcomes of both experimental and control group were significant ($P \leq 0.05$), where t value was 8.73 and degree of freedom was 26 in experimental group; and the t value was 6.04 and degree of freedom was 26 in control group. So, Muscle Energy Technique is effective to reduce disability.

Table IX: Disability score on ODI

| Variables | Experimental | | | Control | | |
|----------------------------------|---------------------|-----------------------|-----------|----------------|-----------------------|-----------|
| | t | Sig. level | df | t | Sig. level | df |
| ODI (%) Initial-final | 8.73 | 0.00 | 26 | 6.04 | 0.00 | 26 |

4.2.1b Oswestry Disability Index (paired t-test):

In Oswestry Disability Index (ODI) the investigator did paired t-test. In the ODI group (initial-final) the outcomes of both experimental and control group were significant ($P \leq 0.05$), where t value was 7.33 and degree of freedom was 26 in experimental group; and the t value was 6.32 and degree of freedom was 26 in control group. So Muscle Energy Technique is effective to reduce disability.

Table X: Disability score on ODI

| | Experimental | | | Control | | |
|-------------------------------|---------------------|-----------------------|-----------|----------------|-----------------------|-----------|
| Variables | T | Sig. level | df | t | Sig. level | df |
| ODI in group Initial-final | 7.33 | 0.00 | 26 | 6.32 | 0.00 | 26 |

The purpose of this study was to evaluate the effectiveness of muscle energy technique to reduce pain and disability among non-specific lower back pain patients. So pain intensity and functional status/disability were the outcomes. Chief complaints of non-specific low back pain are pain and functional disability. Therefore, I selected pain intensity and functional status/disability as outcomes.

These outcomes were also widely used in several of the previous systematic reviews on various interventions for lower back pain. Pain intensity was evaluated using the visual analogue scale (VAS) or the numerical rating scale (NRS). Functional status/disability was evaluated using validated measurement tools such as the Roland Morris Disability Questionnaire (RMDQ) or the Oswestry Disability Scale (Leem, et al., 2017).

In the study, a total of 54 patients were recruited and they were assigned into 2 groups. Both groups were assessed to determine the intensity of pain, back pain related functional disability using the outcome measurement tools. In the experimental group, patients were applied muscle energy technique along with conventional physiotherapy and for the patients in the control group, conventional physiotherapy alone was given. My study population was between 18-60 years (mean age: 38.61 (± 11.6) years for both experimental and control group). Among the 54 participants, most of the participants were [26%, (n=14)] were service holder (22% in experimental group and 30% in control group) and the participants whose mechanical stress position were sitting suffering from low back pain more (70% were in experimental and 59% were in control group). In this study muscle energy technique has significant ($P \leq 0.05$) effect in NPRS and ODI values after 10 session of treatment.

Hariharasudhan & Balamurugan (2019) took in their study a total of 30 (100%) individuals randomly divided into groups A (MWM technique) and B (MET). Mean age with a standard deviation of group A and B was 41.73 ± 8.319 and 40.20 ± 6.19 . A total of 13 (43.3%) female and 17 (56.7%) males participated in this study. They examined the

outcomes of MET in patients with LBP and they concluded that mean \pm SD of MET group at baseline, 2, 4, and 6 weeks was 5.20 ± 0.77 , 4.8 ± 0.77 , 4.53 ± 0.64 . VAS had a significance of $P = 0.32$ at 2 weeks, 1.00 at 4 weeks, and 0.001 at 6 weeks in MET group, which is suggestive of gradual reduction of pain through the course of training. There was a statistically significant difference in the MET group and it showed greater improvement in Oswestry disability index. But subjects who received mobilization with movement showed a significant improvement in both VAS and EFA than the other group which received MET.

In Sailor et al., (2019) Twenty-four participants were randomly assigned into MET ($n = 12$) and PRT ($n = 12$) groups. Mean age was 20.4 ± 1.3 years old; mean SLR angle right: $56.8^\circ \pm 8.8^\circ$, mean SLR angle left: $56.3^\circ \pm 9.3^\circ$; and females: $n = 21$, males: $n = 03$). While data obtained after 2 weeks' stretching program shows a significant difference ($P < 0.05$) between groups. From paired sample t-test the repeated-measure ANOVA analyses indicated significant group-by-time interactions for all outcomes, indicating that ROM improved differently between groups. According to the comparison of mean difference values of pre- and post-test between MET and PRT, the difference was significantly higher in MET compared to PRT.

The exercise program was carried out for 10 sessions in both groups for current study. The study demonstrated that muscle energy technique (MET) combined with conventional physiotherapy showed significant ($P \leq 0.05$) of both experimental and control group to reduce pain and to reduce the disability in patients with non-specific low back pain. So null hypothesis is rejected and alternative hypothesis is accepted for this study.

Nambi et al., (2019) have done a study, where gender distribution in Group A (ischemic compression) have nine males (60%) and six females (40%). Group B (muscle energy technique) have seven males (46.66%) and eight females (53.33%). Age distribution Group A mean age is 46.20 and an SD ± 5.88 and Group B mean age is 45.46 and SD ± 5.44 . They found statistically, no significant ($P > 0.05$) changes in the scores in the Groups A and B for VAS, and statistically significant ($P < 0.05$) changes in the scores in

the Groups A and B for Range of Motion (ROM) with greater change scores in the Group B compared with Group A.

According to Zibiri et al., (2019) there was a significant difference at the end of the 4th and 8th week post-intervention for pain severity ($P = 0.01, 0.004$), neck disability ($P = 0.01, 0.001$), and sleep disturbance ($P = 0.02, 0.002$) with the MET and NCS technique. The analysis showed that there were significant differences between MET and NCE groups and NSE & NCE for pain, neck disability, and sleep disturbance. Paired t-test showed that there was a significant difference ($P < 0.05$) between pre- and post-treatment interventions for pain in all the groups.

MET plus any intervention versus other therapies plus that intervention for chronic non-specific LBP seven studies with 232 participants were found for this comparison. The studies provided low quality evidence of no difference regarding pain and functional status Franke, et al., (2015).

Selkow, et al. (2013) had done a study with the subjects consisted of 16 males and 4 females [Age 24.1 ± 7.1 (MET), 29.7 ± 11.9 (control)]. There were no significant differences ($p > 0.05$) between any of the subject group demographics or baseline VAS values. The main finding of their study was that the MET group demonstrated a decrease ($4.3 \text{ mm} \pm 1.5 \text{ mm}$) in VAS pain while pain for the control group increased ($17.1 \text{ mm} \pm 13.7 \text{ mm}$). All subjects together showed decreased pain ($8.1 \text{ mm} \pm 1.6 \text{ mm}$), which were statistically significant from baseline. When MET and control were compared, pain increased for the control group from baseline ($18.1 \text{ mm} \pm 14.3 \text{ mm}$) to ($35.2 \pm 28.0 \text{ mm}$) 24 hours after treatment, whereas for MET, pain decreased from baseline ($29.3 \text{ mm} \pm 19.1 \text{ mm}$) to ($25.0 \text{ mm} \pm 20.6 \text{ mm}$) 24 hours after treatment.

In this study the researcher found among the participants, ages in between 21-30, 33% participants were in experimental and 22% in control group, in 31-40 years group 37% in experimental and 30% in control group, 26% in experimental and 18% participants in

control group were included in the age range 41-50 years and lastly in between 51-60 years age group there were 4% in experimental and 30% participants in control group.

Gender distribution in both the group was statistically insignificant ($p > 0.05$) with male in MET 18 (72%) and MET-SCS 17 (68%), while female in MET 7 (28%) and MET-SCS 8 (32%). The mean age of participants in MET (38.32 ± 14.92 years) and MET-SCS (44.72 ± 12.82 years) was statistically insignificant ($p > 0.05$). Disability outcome measures also showed a statistically significant difference ($p < 0.001$) within the groups in both group. In both the groups, when analysis was done within the group, a statistically significant difference ($p < 0.05$) was seen in VAS and lumbar ROM. The results showed a significant improvement in both groups in VAS, lumbar ROM and ODI at the end of the treatment (Patel, et al., 2018).

El Gendy, et al., (2017) express in their study MET have significant short term effect on somatic dysfunction in mechanical LBP patients, where pain decreased significantly post-treatment. In his study sample consisted of 40 males patients divided equally into two groups. Group (A) received HVLA thrust manipulation; their mean age and BMI were (24 ± 3.69) years. While group (B) received MET, their mean age and BMI were (24.3 ± 3.57) years. Unpaired t-test proved that there was no significant difference between the two groups in their age.

Mailloux et al. (2006) demonstrated that a spine rehabilitation program contributed to a 13% decrease in disability level measured with ODI. For Valenza, results showed significant regarding scores in disability; Roland-Morris Disability Questionnaire between groups means a difference of 3.2 ± 4.12 , $P = 0.003$ and the Oswestry scale improved too ($P < 0.001$). Patel, et al., (2018) stated in their study between the groups, analysis showed no statistically significant difference ($p > 0.05$) after the first or second session. The improvement after second treatment sessions was noted in pain, and disability in both the groups. The results showed a significant improvement in both experimental and control groups in VAS, lumbar ROM, ODI and RMDQ at the end of the treatment.

MET plus any intervention versus that same intervention alone for acute non-specific LBP with 40 participants and chronic non-specific LBP with 30 participants, there was

low-quality evidence of no clinically relevant difference between MET plus any intervention versus that same intervention for non-specific LBP regarding pain and functional status. The analysis involved post-treatment comparisons and there was no evidence regarding the long term effectiveness of the interventions. The quality of research related to testing the effectiveness of MET is poor. Studies conducted to date generally provide low-quality evidence that MET is not effective for patients with non-specific LBP (Franke, et al., 2015).

Despite of the effectiveness of Muscle Energy Techique combined with conventional care on dependent variables in this study, there were some limitations.

The main limitation was unable to develop a sampling frame to which the study lacks external validity. As samples were collected only from CRP- Savar, it could not represent the wider low back pain population and the study lacks in generalizability of results to wider population. In addition, the study was conducted with 54 patients of non-specific low back pain, which was a very small size of samples in compare with the real world prevalence.

There was an absence of randomization in sampling method. The researcher did not diagnose specifically individual patient and it was non-specific low back pain, so there was difference among the conventional therapy and its doses. It lacks the absolute minimization of physiotherapist's bias during delivering treatment. Age, gender, educational status, occupation, mechanical stress position and overall life style were differents among the participants that may give data error. Some patients were with co-morbids and poor health status like diabetes malitus, hypertension, asthma, major accident or surgery that may be influencing the result.

Data were collected only two times during study and it created study limitation as it lacks follow up daily or weekly basis changes in dependent variables. The study did not offer any follow up for participants which was essential component to find out effectiveness of treatment for longer period of time.

Sometimes treatment sessions were interrupted due to public holiday and recruit physiotherapists taken leave in the data collection which took longer time to complete session that may interrupt the result. It is limited by the fact daily activities of the subject were not monitored which could have influenced. There was no available research done in this area in Bangladesh. So, relevant information about Low Back Pain with specific intervention for Bangladesh was very limited in this study.

CHAPTER-VII CONCLUSION AND RECOMMENDATION

Non-specific low back pain regarded as the source of impairments within the structure of lumbar spine. Low back pain not only affects the bodily system but also the entire personnel daily activities. Therefore, appropriate measurement tools were selected to find out the status of lumbar pain and disability. The result of the study have identified that the effectiveness of conventional physiotherapy with muscle energy technique was less for Low Back Pain patients which was a Quantitative experimental study.

The aim of the study was to find out the efficacy of muscle energy technique among the patients with low back pain. However, the study had some limitations. Some steps were identified that might be taken for the better accomplishment for further study. The main recommendations would be as follow:

Despite the limitations of the study particularly small sample size, the results of the study give further motivation to conduct another research with sufficient time and sample size. Population can be taken occupation or gender specific in future study. Further study can be done on effects of muscle energy technique on a specific low back pain.

A comparative study can be done between muscle energy technique and other single manual therapy technique. In future studies should use more homogenous study designs, populations and pathologies. Only efficacy of MET will be done in future. Treatment session number would be altered to see effectiveness of MET in different ways. Further clinical researches are necessary to support and explain the relationship between muscle energy technique and improvement in low back pain and disability.

Sample can be taken from different clinical site of the Bangladesh. A longer time frame and long-term follow-up examination may provide long-term effect of the treatment. More specific criteria in the inclusion avoiding sacroiliac dysfunction would ensure consistency of participants. Collection of further data on mechanics of injury, level of chronicity and specific grade of injury.

Future study should include a multiple blinding procedure of data collection to maintain intra-rater reliability. The narrowing of variables such as age, gender, occupation, mechanical stress position in order to increase validity.

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ANNEXURE

1. Consent Form (Bengali Version)
2. Questionnaire (Bengali Version)
3. Consent Form (English Version)
4. Questionnaire (English Version)
5. Anatomy of Lumbar Spine
8. Permission Letter
9. IRB form

সম্মতিপত্র

আসসালামুআলাইকুম, আমি রিদওয়ানুল তাছমেরিন মাসুদা, ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধীনে বাংলাদেশ হেলথ প্রফেশনস ইন্সটিটিউট (বিএইচপিআই) এর ফিজিওথেরাপি বিভাগের ৪র্থ বর্ষের ছাত্রী। আমার ব্যাচেলর ডিগ্রী সম্পন্ন করার জন্য আমাকে একটি গবেষণা সম্পাদন করতে হবে এবং এটা আমার অধ্যয়নের একটি অংশ। আমার গবেষণার শিরোনাম, "সিআরপিতে আগত নির্দিষ্ট নয় এমন কোমড় ব্যাথার রোগীর ক্ষেত্রে মাসেল এনার্জি টেকনিক এর কার্যকারিতা"। আমার গবেষণা প্রকল্প বাস্তবায়ন করার জন্য, রোগীদের কিছু তথ্য সংগ্রহ করা প্রয়োজন। আপনাকে আমার গবেষণার একজন অংশগ্রহণকারী হওয়ার জন্য অনুরোধ করছি। এক্ষেত্রে আমি আপনার কিছু ব্যক্তিগত এবং আনুষঙ্গিক তথ্য জানতে চাচ্ছি। এতে প্রায় ১৫-২০ মিনিট সময় লাগবে একবারের জন্য যেটা আমি দুইবার পূরণ করব। ইহা সম্পূর্ণরূপে একটি প্রাতিষ্ঠানিক গবেষণা এবং অন্যকোন উদ্দেশ্যে ব্যবহৃত হবেনা। গবেষণায় আপনার অংশগ্রহণ আপনার চিকিৎসায় কোন প্রভাব ফেলবে না। অংশগ্রহণকারীরা সরাসরি কোন উপকারিতা পাবে না কিন্তু আমরা আশা করছি যে, এই গবেষণার মাধ্যমে আমরা কোমড়ব্যাথার রোগীদের ক্ষেত্রে ফিজিওথেরাপি চিকিৎসার গুরুত্ব বের করতে পারব। আমি নিশ্চিত করছি সকল উপাত্তসমূহ গোপনীয় রাখা হবে। আপনি যেকোন সময় নিজেকে গবেষণা থেকে প্রত্যাহার করতে পারেন।

একজন অংশগ্রহণকারী হিসেবে, অধ্যয়ন সম্পর্কে যদি কোন প্রশ্ন থাকে তাহলে আমাকে বা আমার সুপারভাইজার মো. শফিকুর ইসলাম, সহকারী অধ্যাপক, ফিজিওথেরাপি বিভাগ, বি এইচ পি আই, সি আর পি, সাভার, ঢাকা, ১৩৪৩ এর সাথে যোগাযোগ করতে পারেন।

আমি শুরু করার আগে আপনার কোন প্রশ্ন আছে?

হ্যাঁ না

আমি সোচ্ছায় এ গবেষণা প্রকল্পে অংশগ্রহণ করতে রাজি আছি

অংশগ্রহণকারীর স্বাক্ষর

তারিখ

উপাত্তসংগ্রহকারীর স্বাক্ষর

তারিখ

স্বাক্ষীর স্বাক্ষর তারিখ

প্রশ্নাবলী

এই প্রশ্নপত্রটি কোমর ব্যাথার রোগীদের ব্যাথা পরিমাপ করার জন্য তৈরি করা হয়েছে এবং এই অংশটি তথ্য সংগ্রহকারী কালো কলম দ্বারা পূরণ করবেন।

রোগীর কোড নং:

তারিখ:

অংশগ্রহনকারীর নাম:

ঠিকানা:

মোবাইল নাম্বার:

প্রশ্নাবলী:

অধ্যায়-১: ব্যক্তিগত তথ্যাবলী

১. রোগীর বয়স:বছর

২. লিঙ্গ:

- পুরুষ
- মহিলা

৩. পেশা:

- চাকুরীজীবী
- ব্যবসায়ী
- দিনমজুর
- গৃহিনী

- শিক্ষার্থী
- অন্যান্য

৪. কোন অবস্থায় কাজের চাপ বেশি?

- বসে
- দাঁড়িয়ে
- হাঁটাহাঁটি

৫. দৈনিক কাজের সময়:

.....ঘন্টা

৬. উচ্চতা:(ফিট)

৭. ওজন: (কেজি)

৮. শিক্ষাগত যোগ্যতা:

- নিরক্ষর
- প্রাথমিক
- মাধ্যমিক
- উচ্চ মাধ্যমিক
- স্নাতক
- স্নাতকোত্তর

৯. বৈবাহিক অবস্থা:

- অবিবাহিত
- বিবাহিত
- বিপত্নীক/বিধবা
- তালাক প্রাপ্ত

১০. আবাসিক এলাকা:

- গ্রাম এলাকা
- শহর এলাকা
- মফস্বল এলাকা
- পাহাড়ি এলাকা

১১. আপনি রাতে কিভাবে ঘুমান?

- চিৎ হয়ে
- উপুড় হয়ে
- কাত হয়ে (ডানে)
- কাত হয়ে (বামে)

১২. আপনি কতদিন যাবত ব্যাথায় ভুগছেন?

.....মাস

১৩. আপনি কি ধূমপান করেন?

- হ্যাঁ
- না

অধ্যায়-২: মেডিকেল তথ্যাবলী:

১. আপনার কি ডায়বেটিস আছে?

- হ্যাঁ
- না
- জানিনা

২. আপনার কি উচ্চ রক্তচাপ আছে?

- হ্যাঁ
- না
- জানিনা

৩. আপনার কি শ্বাসকষ্ট আছে?

- হ্যাঁ
- না

৪. আপনার কি বড় কোন দুর্ঘটনা বা অপারেশন হয়েছে?

- হ্যাঁ
- না

চিকিৎসার পূর্ববর্তী তথ্যাবলী

রোগীর স্বাক্ষর ও তারিখ:

অধ্যায়-৩: ব্যাথা বিষয়ক তথ্যাবলী (নিউমেরিক পেইন রেটিং স্কেল):

এখানে,

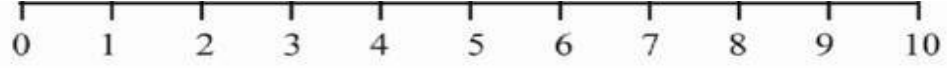
০ = কোন ব্যাথা নাই

১- ৩ = হালকা ব্যাথা

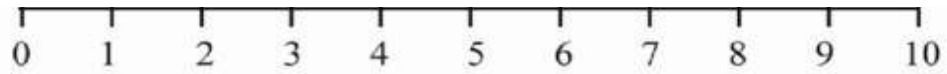
৪- ৬ = সহনীয় ব্যাথা

৭- ১০ = তীব্র ব্যাথা।

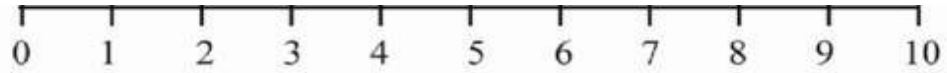
১. সচরাচর আপনার ব্যাথার তীব্রতা কত?



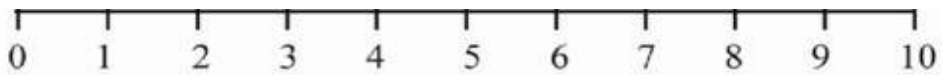
২. বসার সময় আপনার ব্যাথার তীব্রতা কত?



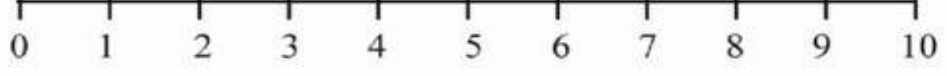
৩. সামনে ঝুকলে আপনার ব্যাথার তীব্রতা কত?



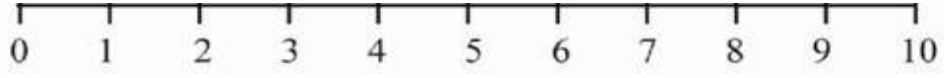
৪. বসা থেকে দাঁড়ালে আপনার ব্যাথার তীব্রতা কত?



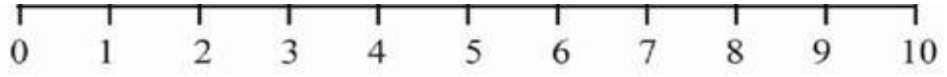
৫. দাঁড়ানো অবস্থায় আপনার ব্যাখার তীব্রতা কত?



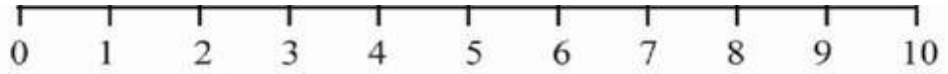
৬. হাঁটার সময় আপনার ব্যাখার তীব্রতা কত?



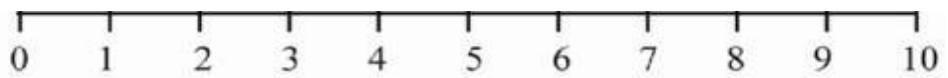
৭. দৈনন্দিন কার্যকর্মে আপনার ব্যাখার তীব্রতা কত?



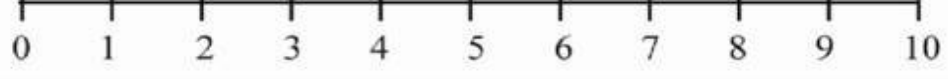
৮. কাজের সময় আপনার ব্যাখার তীব্রতা কত?



৯. ভ্রমণে আপনার ব্যাখার তীব্রতা কত?



১০. ঘুমের সময় আপনার ব্যাথার তীব্রতা কত?



অধ্যায়:৪- অস-ওয়সট্রি কোমড় ব্যাথ্যার অক্ষমতা সংক্রান্ত প্রশ্নাবলী

এই প্রশ্নপত্রটি আপনার কোমড় ব্যাথা আপনার দৈনন্দিন জীবনকে কতখানি প্রভাবিত করে তার সম্বন্ধে আমাদের ধারণা দিবে। দয়া করে প্রতিটি প্রশ্নের উত্তর দিবেন এবং প্রতিটি বিভাগ থেকে শুধুমাত্র একটি উত্তর চিহ্নিত করবেন যেটি আপনার ক্ষেত্রে প্রযোজ্য। কোন বিভাগ থেকে দুই বা তার অধিক উত্তর আপনার সাথে সম্পর্কিত মনে হতে পারে, কিন্তু দয়া করে শুধুমাত্র একটি উত্তর চিহ্নিত করবেন যেটি আপনার সমস্যাকে সবচেয়ে ভালোভাবে ব্যাখ্যা করে।

৪.১ ব্যাথার তীব্রতা

- আমার এই মুহূর্তে কোন ব্যাথা নেই।
- এই মুহূর্তে ব্যাথা খুব হালকা।
- এই মুহূর্তে ব্যাথা মধ্যমস্হী।
- এই মুহূর্তে ব্যাথা মোটামুটি তীব্র।
- এই মুহূর্তে ব্যাথা খুব গুরুতর।
- এই মুহূর্তে ব্যাথা অচিন্তনীয়।

৪.২ ব্যক্তিগত যত্ন (ওয়াশিং, ড্রেসিং ইত্যাদি)

- আমি সাধারণত নিজেকে দেখাশুনা করতে পারি।
- আমি সাধারণত নিজেকে দেখাশুনা করতে পারি, কিন্তু এটা কিছুটা ব্যাথাদায়ক।
- আমি সাধারণত নিজেকে দেখাশুনা করতে পারি, কিন্তু আমি কিছুটা সতর্কতা অবলম্বন করি।
- আমার কিছু সাহায্য প্রয়োজন হয়, কিন্তু অধিকাংশ কাজ আমি নিজে করতে পারি।

- আমার নিজের কাজকর্মের জন্য সারাদিন ব্যাপি অন্যের সাহায্য প্রয়োজন হয় ।
- আমি কষ্ট করেও কাপড় পরিস্কার করতে পারি না এবং বিশ্রামে থাকি ।

8.৩ উত্তোলন

- আমি অতিরিক্ত ব্যাথা ছাড়া ভারী ওজন উত্তোলন করতে পারি ।
- আমি ভারী ওজন উত্তোলন করতে পারি, কিন্তু এটা কিছুটা ব্যাথা তৈরী করে ।
- আমি ব্যাথার জন্য ভারী ওজন উত্তোলন করতে পারি না, কিন্তু আমি সুবিধামত স্থান থেকে ওজন উত্তোলন করতে পারি, যেমন: টেবিল হতে ।
- আমি ব্যাথার জন্য ভারী ওজন উত্তোলন করতে পারি না, কিন্তু আমি সুবিধামত স্থান থেকে অল্প অথবা মোটামুটি ওজন উত্তোলন করতে পারি ।
- আমি খুবই অল্প ওজন উত্তোলন করতে পারি ।
- আমি কোন ওজনই উত্তোলন অথবা বহন করতে পারি না ।

8.8 হাঁটা

- ব্যাথা আমাকে যে কোন দুরত্বে হাঁটার ক্ষেত্রে বাঁধার সৃষ্টি করে না
- ব্যাথা আমাকে এক মাইলের বেশি হাঁটতে বাঁধার সৃষ্টি করে ।
- ব্যাথা আমাকে আধা মাইলের বেশি হাঁটতে বাঁধার সৃষ্টি করে ।
- ব্যাথা আমাকে ১০০ গজের বেশি হাঁটতে বাঁধার সৃষ্টি করে ।
- আমি শুধু লাঠি অথবা ক্রাচ ব্যবহার করে হাঁটতে পারি ।
- আমি বেশিরভাগ সময়ই বিছানায় তাকি এবং হামাগুড়ি দিয়ে টয়লেটে যাই ।

8.৫ বসা

- আমি যেকোন চেয়ারে আমার নিজের ইচ্ছেমত বসতে পারি।
- আমি শুধুমাত্র আমার পছন্দেও চেয়ারে নিজের ইচ্ছেমত বসতে পারি।
- আমি ব্যাথার জন্য এক ঘন্টার বেশি বসতে পারি না।
- আমি ব্যাথার জন্য আধা ঘন্টার বেশি বসতে পারি না।
- আমি ব্যাথার জন্য দশ মিনিটের বেশি বসতে পারি না।
- আমি ব্যাথার জন্য কিছুক্ষণের জন্যও বসতে পারি না।

8.৬ দাঁড়ানো

- আমি ব্যাথা ছাড়া আমার ইচ্ছেমত দাঁড়িয়ে থাকতে পারি।
- আমি আমার ইচ্ছেমত অনেকক্ষণ দাঁড়িয়ে থাকতে পারি, কিন্তু এটা কিছুটা ব্যাথার সৃষ্টি করে।
- আমি ব্যাথার জন্য এক ঘন্টার বেশি দাঁড়িয়ে থাকতে পারি না।
- আমি ব্যাথার জন্য আধা ঘন্টার বেশি দাঁড়িয়ে থাকতে পারি না।
- আমি ব্যাথার জন্য দশ মিনিটের বেশি দাঁড়িয়ে থাকতে পারি না।
- আমি ব্যাথার জন্য কিছুক্ষণের জন্যও দাঁড়িয়ে থাকতে পারি না।

8.৭ ঘুমানো

- ব্যাথা আমার ঘুমের কোন সমস্যা তৈরি করে না।
- ব্যাথা আমার ঘুমের মাঝেমাঝে সমস্যা তৈরি করে।
- আমি ব্যাথার জন্য ছয় ঘন্টার কম ঘুমাতে পারি।
- আমি ব্যাথার জন্য চার ঘন্টার কম ঘুমাতে পারি।
- আমি ব্যাথার জন্য দুই ঘন্টার কম ঘুমাতে পারি।
- আমি ব্যাথার জন্য কিছুক্ষণের জন্যও ঘুমাতে পারি না।

8.৮ যৌন জীবন

- আমার যৌন জীবন স্বাভাবিক এবং কোন ব্যাথা তৈরি করে না।
- আমার যৌন জীবন স্বাভাবিক এবং কিছুটা ব্যাথা তৈরি করে।
- আমার যৌন জীবন স্বাভাবিক কিন্তু এতে অনেক ব্যাথা তৈরি করে।
- আমার যৌন জীবন ব্যাথার জন্য গুরুতরভাবে সীমাবদ্ধ।
- আমার যৌন জীবন ব্যাথার জন্য অনেকটাই সীমাবদ্ধ উপক্রম।
- আমার যৌন জীবন ব্যাথার জন্য পুরোটাই সীমাবদ্ধ।

8.৯ সামাজিক জীবন

- আমার সামাজিক জীবন স্বাভাবিক এবং এটা কোন ব্যাথা তৈরি করে না।
- আমার সামাজিক জীবন স্বাভাবিক এবং এটা কিছুটা ব্যাথা তৈরি করে।
- ব্যাথা আমার সামাজিক জীবনের উপর কোন প্রভাব ফেলে না, কিন্তু উদ্দিপনামূলক কাজকর্ম হতে বিরত রাখে।
- ব্যাথা আমার সামাজিক জীবনকে বাধাগ্রস্ত করে এবং বাহিরে যেতে পারি না।
- ব্যাথা আমার সামাজিক জীবনকে চার দেয়ালের মধ্যে সীমাবদ্ধ করেছে।
- ব্যাথার জন্য আমার কোন সামাজিক জীবন নেই।

8.১০ ভ্রমন

- আমি ব্যাথা ছাড়াই যে কোন জায়গায় ভ্রমন করতে পারি।
- আমি যে কোন জায়গায় ভ্রমন করতে পারি, কিন্তু এটা কিছুটা ব্যাথার সৃষ্টি করে।
- আমি অতিরিক্ত ব্যাথা নিয়ে দুই ঘন্টার বেশি ভ্রমন করতে পারি।
- আমি অতিরিক্ত ব্যাথা নিয়ে এক ঘন্টার বেশি ভ্রমন করতে পারি।
- ব্যাথার জন্য আমি ত্রিশ মিনিটের বেশি ভ্রমন করতে পারি না।
- ব্যাথার জন্য আমি চিকিৎসার প্রয়োজন ব্যতীত ভ্রমন করি না।

চিকিৎসার পরবর্তী তথ্যাবলী

রোগীর স্বাক্ষর ও তারিখ:

অধ্যায়-৩: ব্যাথা বিষয়ক তথ্যাবলী (নিউমেরিক পেইন রেটিং স্কেল):

এখানে,

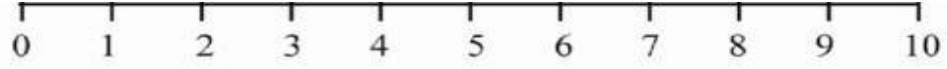
০ = কোন ব্যাথা নাই

১- ৩ = হালকা ব্যাথা

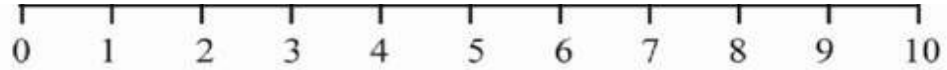
৪- ৬ = সহনীয় ব্যাথা

৭- ১০ = তীব্র ব্যাথা।

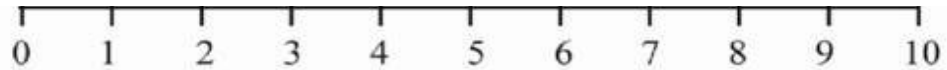
১. সচরাচর আপনার ব্যাথার তীব্রতা কত?



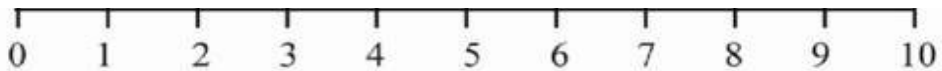
২. বসার সময় আপনার ব্যাথার তীব্রতা কত?



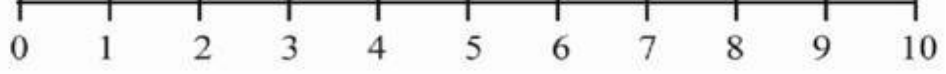
৩. সামনে ঝুকলে আপনার ব্যাথার তীব্রতা কত?



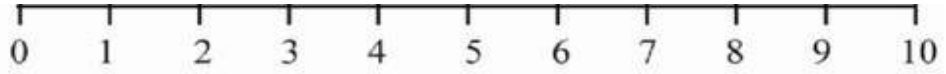
৪. বসা থেকে দাঁড়ালে আপনার ব্যাথার তীব্রতা কত?



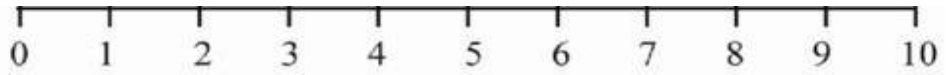
১১. দাঁড়ানো অবস্থায় আপনার ব্যাখার তীব্রতা কত?



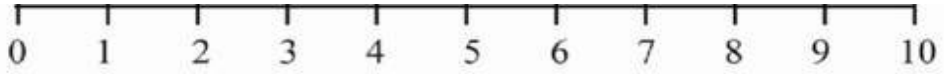
১২. হাঁটার সময় আপনার ব্যাখার তীব্রতা কত?



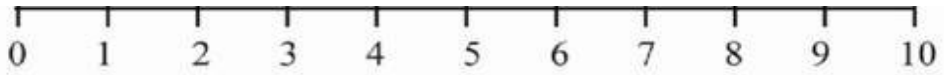
১৩. দৈনন্দিন কাযকর্মে আপনার ব্যাখার তীব্রতা কত?



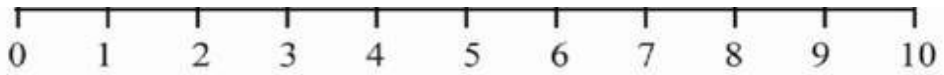
১৪. কাজের সময় আপনার ব্যাখার তীব্রতা কত?



১৫. ভ্রমনে আপনার ব্যাখার তীব্রতা কত?



১৬. ঘুমের সময় আপনার ব্যাখার তীব্রতা কত?



অধ্যায়:৪- অস-ওয়সট্রি কোমড় ব্যাথ্যার অক্ষমতা সংক্রান্ত প্রশ্নাবলী

এই প্রশ্নপত্রটি আপনার কোমড় ব্যাথা আপনার দৈনন্দিন জীবনকে কতখানি প্রভাবিত করে তার সম্বন্ধে আমাদের ধারণা দিবে। দয়া করে প্রতিটি প্রশ্নের উত্তর দিবেন এবং প্রতিটি বিভাগ থেকে শুধুমাত্র একটি উত্তর চিহ্নিত করবেন যেটি আপনার ক্ষেত্রে প্রযোজ্য। কোন বিভাগ থেকে দুই বা তার অধিক উত্তর আপনার সাথে সম্পর্কিত মনে হতে পারে, কিন্তু দয়া করে শুধুমাত্র একটি উত্তর চিহ্নিত করবেন যেটি আপনার সমস্যাকে সবচেয়ে ভালোভাবে ব্যাখ্যা করে।

৪.১ ব্যাথার তীব্রতা

- আমার এই মুহূর্তে কোন ব্যাথা নেই।
- এই মুহূর্তে ব্যাথা খুব হালকা।
- এই মুহূর্তে ব্যাথা মধ্যমস্থি।
- এই মুহূর্তে ব্যাথা মোটামুটি তীব্র।
- এই মুহূর্তে ব্যাথা খুব গুরুতর।
- এই মুহূর্তে ব্যাথা অচিন্তনীয়।

৪.২ ব্যক্তিগত যত্ন (ওয়াশিং, ড্রেসিং ইত্যাদি)

- আমি সাধারণত নিজেকে দেখাশুনা করতে পারি।
- আমি সাধারণত নিজেকে দেখাশুনা করতে পারি, কিন্তু এটা কিছুটা ব্যাথাদায়ক।
- আমি সাধারণত নিজেকে দেখাশুনা করতে পারি, কিন্তু আমি কিছুটা সতর্কতা অবলম্বন করি।
- আমার কিছু সাহায্য প্রয়োজন হয়, কিন্তু অধিকাংশ কাজ আমি নিজে করতে পারি।

- আমার নিজের কাজকর্মের জন্য সারাদিন ব্যাপি অন্যের সাহায্য প্রয়োজন হয় ।
- আমি কষ্ট করেও কাপড় পরিস্কার করতে পারি না এবং বিশ্রামে থাকি ।

8.৩ উত্তোলন

- আমি অতিরিক্ত ব্যাথা ছাড়া ভারী ওজন উত্তোলন করতে পারি ।
- আমি ভারী ওজন উত্তোলন করতে পারি, কিন্তু এটা কিছুটা ব্যাথা তৈরী করে ।
- আমি ব্যাথার জন্য ভারী ওজন উত্তোলন করতে পারি না, কিন্তু আমি সুবিধামত স্থান থেকে ওজন উত্তোলন করতে পারি, যেমন: টেবিল হতে ।
- আমি ব্যাথার জন্য ভারী ওজন উত্তোলন করতে পারি না, কিন্তু আমি সুবিধামত স্থান থেকে অল্প অথবা মোটামুটি ওজন উত্তোলন করতে পারি ।
- আমি খুবই অল্প ওজন উত্তোলন করতে পারি ।
- আমি কোন ওজনই উত্তোলন অথবা বহন করতে পারি না ।

8.8 হাঁটা

- ব্যাথা আমাকে যে কোন দুরত্বে হাঁটার ক্ষেত্রে বাঁধার সৃষ্টি করে না
- ব্যাথা আমাকে এক মাইলের বেশি হাঁটতে বাঁধার সৃষ্টি করে ।
- ব্যাথা আমাকে আধা মাইলের বেশি হাঁটতে বাঁধার সৃষ্টি করে ।
- ব্যাথা আমাকে ১০০ গজের বেশি হাঁটতে বাঁধার সৃষ্টি করে ।
- আমি শুধু লাঠি অথবা ক্রাচ ব্যবহার করে হাঁটতে পারি ।
- আমি বেশিরভাগ সময়ই বিছানায় তাকি এবং হামাগুড়ি দিয়ে টয়লেটে যাই ।

8.৫ বসা

- আমি যেকোন চেয়ারে আমার নিজের ইচ্ছেমত বসতে পারি ।
- আমি শুধুমাত্র আমার পছন্দেও চেয়ারে নিজের ইচ্ছেমত বসতে পারি ।
- আমি ব্যাথার জন্য এক ঘন্টার বেশি বসতে পারি না ।
- আমি ব্যাথার জন্য আধা ঘন্টার বেশি বসতে পারি না ।
- আমি ব্যাথার জন্য দশ মিনিটের বেশি বসতে পারি না ।
- আমি ব্যাথার জন্য কিছুক্ষণের জন্যও বসতে পারি না ।

8.৬ দাঁড়ানো

- আমি ব্যাথা ছাড়া আমার ইচ্ছেমত দাঁড়িয়ে থাকতে পারি ।
- আমি আমার ইচ্ছেমত অনেকক্ষণ দাঁড়িয়ে থাকতে পারি, কিন্তু এটা কিছুটা ব্যাথার সৃষ্টি করে ।
- আমি ব্যাথার জন্য এক ঘন্টার বেশি দাঁড়িয়ে থাকতে পারি না ।
- আমি ব্যাথার জন্য আধা ঘন্টার বেশি দাঁড়িয়ে থাকতে পারি না ।
- আমি ব্যাথার জন্য দশ মিনিটের বেশি দাঁড়িয়ে থাকতে পারি না ।
- আমি ব্যাথার জন্য কিছুক্ষণের জন্যও দাঁড়িয়ে থাকতে পারি না ।

8.৭ ঘুমানো

- ব্যাথা আমার ঘুমের কোন সমস্যা তৈরি করে না ।
- ব্যাথা আমার ঘুমের মাঝেমাঝে সমস্যা তৈরি করে ।
- আমি ব্যাথার জন্য ছয় ঘন্টার কম ঘুমাতে পারি ।
- আমি ব্যাথার জন্য চার ঘন্টার কম ঘুমাতে পারি ।
- আমি ব্যাথার জন্য দুই ঘন্টার কম ঘুমাতে পারি ।
- আমি ব্যাথার জন্য কিছুক্ষণের জন্যও ঘুমাতে পারি না ।

8.৮ যৌন জীবন

- আমার যৌন জীবন স্বাভাবিক এবং কোন ব্যাথা তৈরি করে না।
- আমার যৌন জীবন স্বাভাবিক এবং কিছুটা ব্যাথা তৈরি করে।
- আমার যৌন জীবন স্বাভাবিক কিন্তু এতে অনেক ব্যাথা তৈরি করে।
- আমার যৌন জীবন ব্যাথার জন্য গুরুতরভাবে সীমাবদ্ধ।
- আমার যৌন জীবন ব্যাথার জন্য অনেকটাই সীমাবদ্ধ উপক্রম।
- আমার যৌন জীবন ব্যাথার জন্য পুরোটাই সীমাবদ্ধ।

8.৯ সামাজিক জীবন

- আমার সামাজিক জীবন স্বাভাবিক এবং এটা কোন ব্যাথা তৈরি করে না।
- আমার সামাজিক জীবন স্বাভাবিক এবং এটা কিছুটা ব্যাথা তৈরি করে।
- ব্যাথা আমার সামাজিক জীবনের উপর কোন প্রভাব ফেলে না, কিন্তু উদ্দিপনামূলক কাজকর্ম হতে বিরত রাখে।
- ব্যাথা আমার সামাজিক জীবনকে বাধাগ্রস্ত করে এবং বাহিরে যেতে পারি না।
- ব্যাথা আমার সামাজিক জীবনকে চার দেয়ালের মধ্যে সীমাবদ্ধ করেছে।
- ব্যাথার জন্য আমার কোন সামাজিক জীবন নেই।

8.১০ ভ্রমন

- আমি ব্যাথা ছাড়াই যে কোন জায়গায় ভ্রমন করতে পারি।
- আমি যে কোন জায়গায় ভ্রমন করতে পারি, কিন্তু এটা কিছুটা ব্যাথার সৃষ্টি করে।
- আমি অতিরিক্ত ব্যাথা নিয়ে দুই ঘন্টার বেশি ভ্রমন করতে পারি।
- আমি অতিরিক্ত ব্যাথা নিয়ে এক ঘন্টার বেশি ভ্রমন করতে পারি।
- ব্যাথার জন্য আমি ত্রিশ মিনিটের বেশি ভ্রমন করতে পারি না।
- ব্যাথার জন্য আমি চিকিৎসার প্রয়োজন ব্যতীত ভ্রমন করি না।

Score: / 50 **Transform to percentage score x 100 = % points**

Core: 50.

10 questions related to function. Maximum of 5 points per question.

Score is reported as a percentage: (Score X 2) % points.

Scoring: For each section the total possible score is 5, if the first statement is marked the section score = 0, if the last statement is marked it = 5. If all ten sections are completed the score is calculated as follows:

Example: 16 (total scored) 50 (total possible score) x 100 = 32%

If one section is missed or not applicable the score is calculated: 16 (total scored) 45

(total possible score) x 100 = 35.5%

Here,

0-20% = Mild

20-40% = moderately impaired

40-75% = severely impaired

>75% likely non-movement component if not hospitalized.

<12% can safely return to work and normal activities.

Informed consent

(Please read out to the participant)

Assalamualaikum, I am **Redwanul Tasmerin Masuda**, 4th year student of B. Sc in Physiotherapy at Bangladesh Health Professions Institute (BHPI) under the Faculty of Medicine in University of Dhaka. To complete my Bachelor degree, I have to conduct a thesis and it is a part of my study.

My thesis title is, “**Effectiveness of Muscle Energy Technique (MET) among non-specific Low Back Pain patients attended at CRP**”. To fulfill my research project, I need to collect data. So, you can be a respected participant of my research and I would like to request you as a subject of my study. I would like to know about some personal and other related information. This will take approximately 15-20 minutes one time which I will fill up two times.

I would like to inform you that this is a purely academic study and will not be used for any other purposes. Your participation in the research will have no impact on your present or future treatment. The participants do not get direct benefit from the study but we hope we will identify the effectiveness of physiotherapy treatment for Low Back Pain patients. I assure that all data will be kept confidential. You have the right to withdraw consent and discontinue participation at any time of the experiment.

If you have any query about the study or your right as a participant, you may contact with me or my supervisor Md. Shofiqul Islam, Assistant Professor of Physiotherapy Department, BHPI, CRP, Savar, Dhaka-1343.

Do you have any questions before I start?

Yes

No

I agree to participate in the research project voluntarily.

Participant’s Signature.....Date.....

Data collector’s Signature..... Date.....

Witness’s Signature Date.....

Questionnaire

This questionnaire is developed to measure the pain of the patient with Non-Specific Low Back Pain and this portion will be filled by data collector using a black pen.

Patient ID No:

Date:

Patient name:

Address:

Mobile No:

Questions:

Part - I: Socio – demographic Information:

1. Patient's age:

2. Sex

Male

Female

3. Occupation:

Service holder

Businessman

Labour

Housewife

Student

Others

4. Mechanical stress:

Sitting

Standing

Walking

5. Daily working hour: (hour)

6. Height:..... (feet)

7. Weight: (kg)

8. Educational qualification:

Illiterate

Primary

Secondary

Higher secondary

Graduate

Post graduate

9. Marital status:

- Unmarried
- Married
- Widow
- Divorced

11. Living area:

- Urban area
- Rural area
- Semi-urban area
- Hill tracks.

12. In which posture do you prefer to sleep at night?

- Supine lying
- Prone lying
- Side lying right
- Side lying left

13. How long have you been suffering from back pain?

..... (month)

Part- II: Medical Information:

1. Do you have Diabetes Mellitus?

- Yes
- No
- Don't Know

2. Do you have Hypertension?

- Yes
- No
- Don't Know

3. Do you have asthma?

- Yes
- No

4. Do you have any major accident or surgery?

- Yes
- No

Before treatment

Patient's sign and date:

Part- III: Pain status related questions (NPRS Scale):

Here,

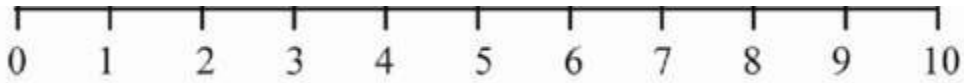
0 = No pain

1-3 =Mild Pain

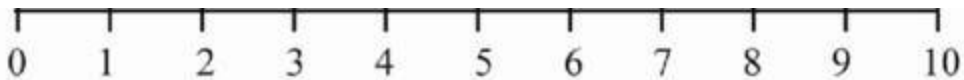
4-6 =Moderate Pain

7-10 =Severe Pain.

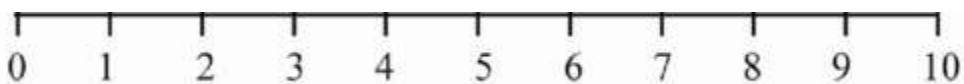
1) How severe is your pain in general?



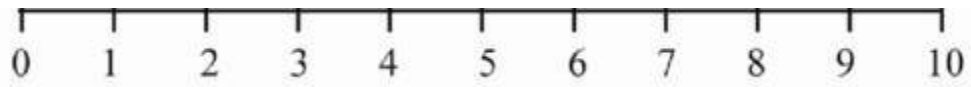
2) How severe is your pain during sitting?



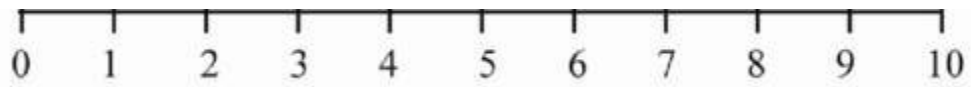
3) How severe is your pain at bending position?



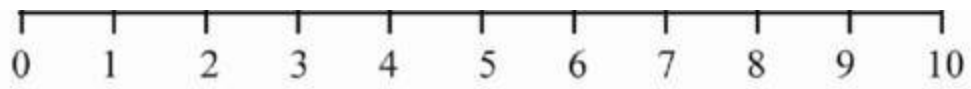
4) How severe is your pain during sit to stand?



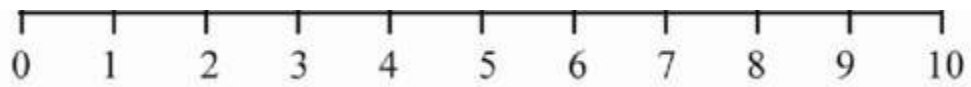
5) How severe is your pain in standing position?



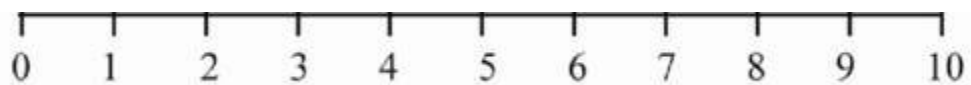
6) How severe is your pain during walking?



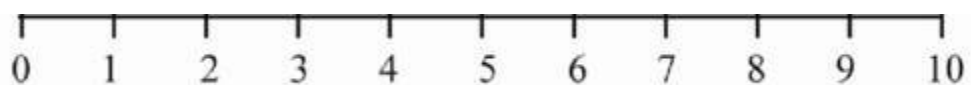
7) How severe is your pain during activities of daily livings?



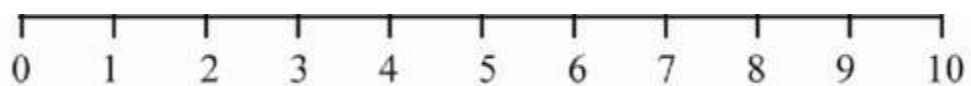
8) How severe is your pain during working?



9) How severe is your pain while traveling?



10) How severe is your pain while sleeping



Before treatment

Patient's sign and date:

Oswestry Low Back Disability Questionnaire

This questionnaire has been designed to give us information as to how your back pain has affected your ability to manage in everyday life. Please answer every question and mark in each section only the one answer that applies to you. It is realized that you may consider two or more statements in any section related to you, but please just mark the point that most closely describes your problem.

Section 1 – Pain Intensity

0. I have no pain at the moment.
1. The pain is very mild at the moment.
2. The pain is moderate at the moment.
3. The pain is fairly severe at the moment.
4. The pain is very severe at the moment.
5. The pain is the worst imaginable at the moment.

Section 2 – Personal Care (washing, dressing, etc.)

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

Section 3 – Lifting

0. I can lift heavy weights without extra pain.
1. I can lift heavy weights but it gives extra pain.
2. Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned (i.e. on a table).
3. Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.
4. I can lift only very light weights.
5. I cannot lift or carry anything at all.

Section 4 – Walking

0. Pain does not prevent me walking any distance.
1. Pain prevents me walking more than 1 mile.
2. Pain prevents me walking more than of a mile.
3. Pain prevents me walking more than 100 yards.
4. I can only walk using a stick or crutches.
5. I am in bed most of the time and have to crawl to the toilet.

Section 5 – Sitting

0. I can sit in any chair as long as I like.
1. I can sit in my favourite chair as long as I like.
2. Pain prevents me from sitting for more than 1 hour.
3. Pain prevents me from sitting for more than hour.
4. Pain prevents me from sitting for more than 10 minutes.
5. Pain prevents me from sitting at all.

Section 6 – Standing

0. I can stand as long as I want without extra pain.
1. I can stand as long as I want but it gives me extra pain.
2. Pain prevents me from standing more than 1 hour.
3. Pain prevents me from standing for more than an hour.
4. Pain prevents me from standing for more than 10 minutes.
5. Pain prevents me from standing at all.

Section 7 – Sleeping

0. My sleep is never disturbed by pain.
1. My sleep is occasionally disturbed by pain.
2. Because of pain, I have less than 6 hours sleep.
3. Because of pain, I have less than 4 hours sleep.
4. Because of pain, I have less than 2 hours sleep.
5. Pain prevents me from sleeping at all.

Section 8 – Sex life (if applicable)

0. My sex life is normal and causes no extra pain.
1. My sex life is normal but causes some extra pain.
2. My sex life is nearly normal but is very painful.
3. My sex life is severely restricted by pain.
4. My sex life is nearly absent because of pain.
5. Pain prevents any sex life at all.

Section 9 – Social Life

0. My social life is normal and causes me no extra pain.
1. My social life is normal but increases the degree of pain.
2. Pain has no significant effect on my social life apart from limiting my more energetic interests, i.e. sports.
3. Pain has restricted my social life and I do not go out as often.
4. Pain has restricted social life to my home.
5. I have no social life because of pain.

Section 10 – Traveling

0. I can travel anywhere without pain.
1. I can travel anywhere but it gives extra pain.
2. Pain is bad but I manage journeys of over two hours.
3. Pain restricts me to journeys of less than one hour.
4. Pain restricts me to short necessary journeys under 30 minutes.
5. Pain prevents me from traveling except to receive treatment.

Score: / 50 Transform to percentage score x 100 = % points

Core: 50.

10 questions related to function. Maximum of 5 points per question.

Score is reported as a percentage: (Score X 2) % points.

Scoring: For each section the total possible score is 5, if the first statement is marked the section score = 0, if the last statement is marked it = 5. If all ten sections are completed the score is calculated as follows:

Example: 16 (total scored) 50 (total possible score) x 100 = 32%

If one section is missed or not applicable the score is calculated: 16 (total scored) 45 (total possible score) x 100 = 35.5%

Here,

0-20% = Mild

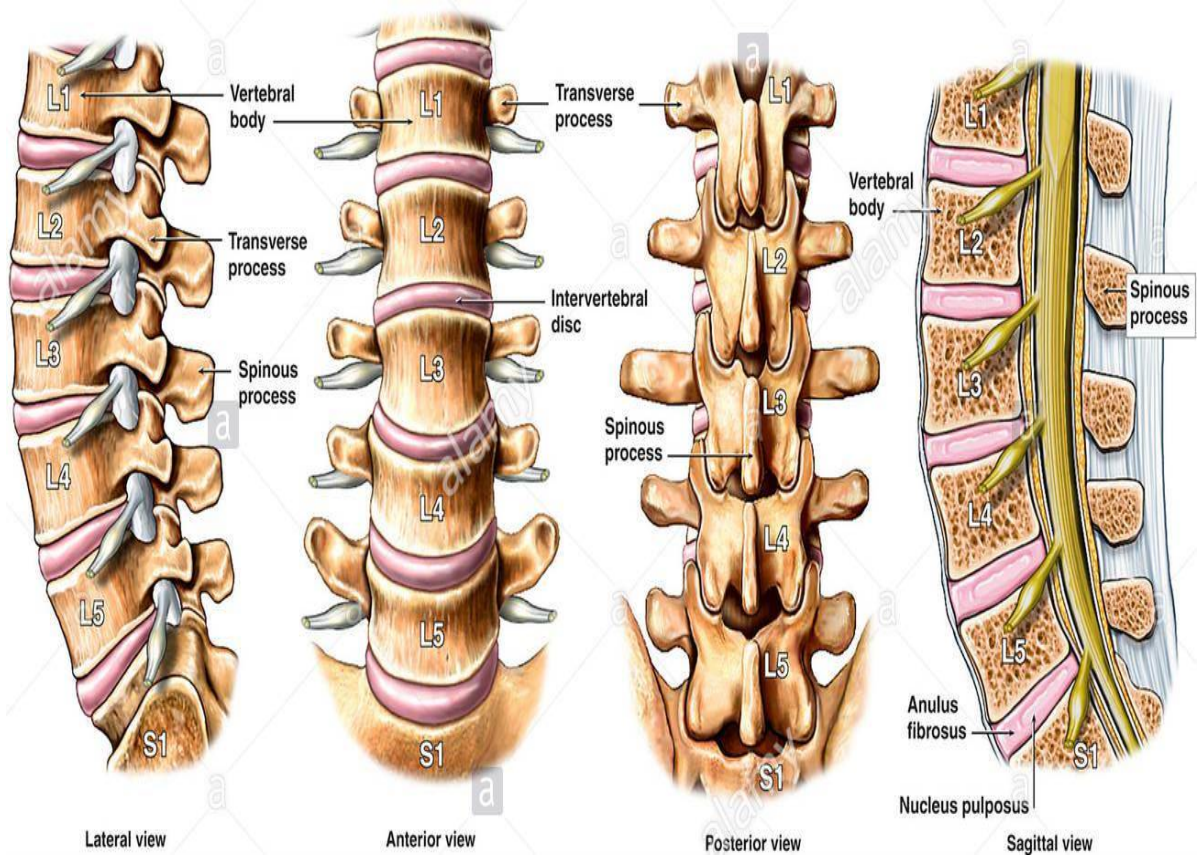
20-40% = moderately impaired

40-75% = severely impaired

>75% likely non-movement component if not hospitalized.

<12% can safely return to work and normal activities.

Anatomy of Lumbar spine





বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)
(The Academic Institute of CRP)

Ref.

CRP-BHPI/IRB/09/19/1327

Date: 12/07/2019

To
Redwanul Tasmerin Masuda
B.Sc. in Physiotherapy
Session: 2014-2015 Student ID: 112140269
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of thesis proposal, "Effectiveness of Muscle Energy Technique among non-specific Low Back Pain patients attended at CRP" by ethics committee.

Dear Redwanul Tasmerin Masuda,

Congratulations.

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above mentioned dissertation, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

| Sr. No. | Name of the Documents |
|---------|--|
| 1 | Dissertation Proposal |
| 2 | Questionnaire (English & Bangla version) |
| 3 | Information sheet & consent form. |

The purpose of the study is to see the effectiveness of Muscle Energy Technique among non-specific Low Back Pain patients. The study involves use of a questionnaire that includes Numeric Pain Rating Scale (NPRS), Oswestry Disability Index (ODI). It may take approximately 15-20 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 10.00 AM on 11th August, 2018 at BHPI.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

সিআরপি-চাপাইন, সাক্কার, ঢাকা-১৩৪৩, বাংলাদেশ, ফোন : ৭৭৪৫৪৬৪-৫, ৭৭৪১৪০৪ ফ্যাক্স : ৭৭৪৫০৬৯

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404, Fax : 7745069, E-mail : contact@crp-bangladesh.org, www.crp-bangladesh.org

Permission letter

07th May, 2019

The Head

Department of Physiotherapy,

CRP, Chapain, Savar, Dhaka-1343.

Subject: Seeking permission to collect data to conduct 4th year physiotherapy research project.

Dear Sir,

With due respect and humble submission to state that I am Redwanul Tasmerin Masuda, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved the research project entitled on "Effectiveness of Muscle Energy Technique (MET) among non-specific Low back pain patients attended at CRP" under the supervision of Md. Shofiqul Islam, Assistant Professor, Physiotherapy Department, CRP, Savar, Dhaka-1343, Bangladesh. Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc. in physiotherapy. I want to collect necessary data for the research project from the patients attending at Musculoskeletal unit, department of Physiotherapy, CRP, Savar. Therefore I need to obtain your kind written permission to initiate data collection from the targeted patients. I would like to assure ethical principle would be followed as per guidelines of my institution/department.

May I, therefore pray and hope that you would be kind enough to grant my application & permit me to collect required data to accomplish the research objectives.

Yours obediently,

Redwanul Tasmerin Masuda
Redwanul Tasmerin Masuda

4th professional B.Sc. in Physiotherapy

Roll No.: 36, Session: 2014-15

Bangladesh Health Professions Institute (BHPI)

(An academic Institute of CRP)

CRP, Chapain, Savar, Dhaka-1343.

*Forwarded for kind permission.
Shofiq
07.05.2019*

11.05.19
Prof. Md. Obaidul Haque
Head, Department of Physiotherapy
BHPI, CRP, Savar, Dhaka-1343

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