EFFICACY OF TILT MANIPULATION IN SACRO-ILIAC JOINT AMONG LOW BACK PAIN PATIENTS ATTENDING AT CRP

S.M. Joynul Abedin

Bachelor of Science in Physiotherapy (B. Sc. PT)

Roll no. - 1618

Reg. no. - 1930

Session: 2010-2011

BHPI, CRP, Savar, Dhaka

Bangladesh Health Professions Institute (BHPI)

Department of Physiotherapy

CRP, Savar, Dhaka-1343

Bangladesh

August’ 2015

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

EFFICACY OF TILT MANIPULATION IN SACRO-ILIAC JOINT AMONG LOW BACK PAIN PATIENTS ATTENDING AT CRP

Submitted by **S.M. Joynul Abedin**, for the partial fulfillment of the requirement for the degree of Bachelor of Science in Physiotherapy (B.Sc.PT).

……

Mohammad Habibur Rahman
Assistant Professor
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka
Supervisor

……

Mohammad Anwar Hossain
Associate Professor of Physiotherapy, BHPI &
Head, Department of Physiotherapy
CRP, Savar, Dhaka

……..

Ehsanur Rahman
Assistant Professor
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

……

Md. Shofiqul Islam
Assistant Professor
Department ofPhysiotherapy
BHPI, CRP, Savar, Dhaka

……

Md. Obaidul Haque
Associate Professor & Head
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

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 declare that for any publication, presentation or dissemination of information of the study. I would be bound to take written consent of my supervisor & Head of Physiotherapy Department, Bangladesh Health Professions Institute (BHPI).

Signature: **Date:**

S.M. Joynul Abedin

Bachelor of Science in Physiotherapy (B. Sc. PT)

Roll no- 1618

Reg. no- 1930

Session: 2010-2011

BHPI, CRP, Savar, Dhaka

Contents

Acknowledgement

First of all, I would like to pay my gratitude to ALLAH who has given me the ability to complete this project in time with success. The second acknowledgement must go to my family members who have always inspired me for preparing the project properly.

I am extremely grateful to my honorable and praiseworthy supervisor **Mohammad Habibur Rahman**, Assistant Professor of Physiotherapy, BHPI, CRP, Savar, Dhaka for giving me his valuable time, his supervision and excellent guidance without which I could not able to complete this project.

I would like to express my gratitude to **Mohammad Anwar Hossain**, Associate Professor and Head of the Physiotherapy Department, CRP, Chapain, Savar, Dhaka for giving me permission for data collection.

I would like to express gratitude to **Md. Obaidul Haque**, Associate Professor & Head, Department of Physiotherapy, Bangladesh Health Professions Institute (BHPI); **Ehsanur Rahman**, Assistant Professor of Physiotherapy, BHPI; **Muhammad Millat Hossain**, Senior Lecturer of Physiotherapy, BHPI and all of my teachers for helping me in this study. I would also like to give my special appreciation to my respected teacher **Md. Shofiqul Islam**, Assistant Professor of Physiotherapy, BHPI for his proficient guidance to carry out this study. My special thanks to all the staffs of Musculoskeletal Outdoor Unit of Physiotherapy Department. I am grateful to **Muhammad Shohidul Islam**, Senior Physiotherapist & OPD Incharge, Department of Physiotherapy, CRP, Savar, Dhaka and **Md. Delowar Hossain,** Clinical Physiotherapist; **Nidi Orin Maybee**, Intern Physiotherapist, Department of Physiotherapy, CRP, Savar, Dhaka.

My special thanks to my friends for their continuous suggestions and supports to take challenges which have inspired me throughout the project. I would like to thank the Librarian of Bangladesh Health Professions Institute (BHPI) and her associates for their kind support to find out related books,journals and also access to internet. Finally I would like to thank to all participants of the study for their enormous co-operation.

Acronyms

BHPI	:	Bangladesh Health Professions Institute
CRP	:	Bangladesh Medical Research Council
BMRC	:	Center for the Rehabilitation of the Paralysed
WHO	:	World Health Organization
IRB	:	Institutional Review Board
LBP	:	Low Back Pain
SIJ	:	Sacro Iliac Joint
SIJD	:	Sacro Iliac Joint Dysfunction
PT	:	Physiotherapy

List of Tables

List of Figures

Abstract

Purpose: The purpose of this study was, to assess the therapeutic effectiveness of Tilt Manipulation in Sacro-Iliac Joint with conventional physiotherapy treatments among patients with low back pain. *Objectives:* To assess the effect on pain after introducing Tilt Manipulation Sacro iliac Joint Dysfunction, to measure the severity of pain by using Numeric Pain Rating Scale, to find out the effect of pain at rest after introducing tilt manipulation, to identify the severity of pain during standing after introducing tilt manipulation, to identify the severity of pain during long time standing (more than 10 minute) after introducing tilt manipulation, to find out the effect of pain at 6 minute walking test after introducing tilt manipulation. *Methodology*: The study was an experimental design. Total 10 samples were selected conveniently then randomly assigned to two different groups for this study from outpatient of Musculoskeletal Unit, Physiotherapy Department, and Centre for the Rehabilitation of the Paralysed (CRP), Savar, Dhaka. Numeric pain rating scale was used to assess pain intensity of the patients. Experimental Group received combination therapy of Tilt Manipulation with conventional physiotherapy while control group received conventional physiotherapy only. *Result*: The finding of the study was carried out by using non-parametric Mann-Whitney *U* test to compare the experimental and control group and analysed by interpreting the probability level of significance of *U* value. The results were found to be significant for *U* value at probability level 0.05. There were four variables in this study. Pain at resting position have beneficial effect where $U=2.5$, and observed *p*value ($p<.05$); pain at standing position $U=1.5$, and observed *p* value($p<.05$); pain at long time standing position $U=7$, and observed *p* value ($p<.05$); pain at six minute walking test $U=3$, and observed *p* value ($p<.05$). *Conclusion*: The study concluded as the Tilt Manipulation is significantly capable of producing beneficial effects on pain reduction, pain related symptoms minimization in patients with Sacro-iliac Joint Dysfunction.

Keywords: Low Back Pain, Sacro-iliac Joint Dysfunction, Tilt Manipulation, Conventional Physiotherapy.

CHAPTER-I: INTRODUCTION

1.1 Background Information

Low back pain (LBP) is the common problem in both developed and developing countries. LBP is more common in all of population. Severity is gradually increased with the work in a long time or inappropriate way or poor posture. LBP is common health problem throughout the world and major cause of disability (Choobineh et al., 2007). Low back pain is defined as pain of more than three months duration. It occurs in 2-8% of those who experience low back pain. Pain in the lowerback sometimes refers into the hip, buttock or one leg. The cause may be muscle strains or trigger points, instability due to weak postural muscles, hypomobile spinal facet joints, or degeneration or herniation of spinal disks. LBP is common throughout the adults years in men and women, first episodes most frequently occur among people in their 20s and 30s (Kelsey, 2010). Pain in the lower back area that can relate to problems with the lumbar spine, the discs between the vertebrae, the ligaments around the spine and discs, the spinal cord and nerves, muscles of the low back, internal organs of the pelvis and abdomen, or the skin covering the lumbar area (Ostgaard et al., 2008). The typical postures and activities make one of the most vulnerable groups of being LBP. Most of the cases of LBP the posture is too poor, Growing evidence showed that low back pain starts early in life between 8-10 years (Croft et al, 2014). Low back pain affects men and women in their best productive years, with the peak frequency of symptoms occurring in the age range of 35-55 (Wai et al., 2010). LBP prevalence is significant as early as age 12- 14 in both sexes (Ghaffari et al., 2006). Low back pain will affect 75-85% of all people at some point during their lifetime. Approximately 50% of them will have a recurrence within a year. Approximately 90% improve without surgery. Approximately 7.4% of patients with low back pain account for 75% of the money spent on low back pain. The vast majority of acute low back pain is the result of injury such as sprain or strain, while the cause of low back pain is multi-factorial (Marius, 2013). In general people LBP is a very common problem that experience at some point in their life (Hoy et al., 2010). Approximately 70-85% population suffers LBP at some point of their lives in USA (Buselli et al., 2011). Tomita et al. (2010) mentioned that in European country the lifetime prevalence of LBP is more than 70%. Lifetime prevalence of LBP was between 51% and 84%

where point prevalence ranged between 14% and 42% according to a European review article (Horvath et al., 2010). LBP is become the thorn in the side of modern medicine. The lifetime prevalence of LBP is 58% in UK and 70% in USA (Peterson et al., 2005). In Canadian study it was reported that 84% adults experienced LBP during their lifetime. Average prevalence of LBP in UK is 59%, in Denmark 70%, in Finland 75% and in Iran 29.3% respondents reported LBP (Biglarian et al., 2012). However the prevalence rate was greatly higher in developing countries especially in South West Nigeria that is 72% and 64% in China (Fabunmi et al., 2005). Sacroiliac joint dysfunction is a known cause of low back pain. We think that a diagnostic score scale may be performed to assess diagnostic utility of clinical signs of sacroiliac joint dysfunction. The primary aim of the present study was to conduct the pilot study of our new diagnostic score scale, for sacroiliac joint syndrome (Gonzalez & Oliveros, 2015). Sacroiliac joint dysfunction (SIJD) is a condition affecting 15-30% of patients with low back pain seen in outpatient clinics. Currently there is no well-defined standard of care. The purpose of this case report is to discuss the multidisciplinary management between an athletic trainer and an optometrist for an athlete with bilateral SIJ dysfunction and a visual midline shift syndrome (Robey & Boyle, 2013). Pain from the sacroiliac joint (SIJ) is an under-recognized cause of low back pain. The degree to which SIJ pain decreases quality of life has not been directly compared to other more familiar conditions of the lumbar spine (Cher & Recking, 2015). Low back pain is an exceedingly common and important worldwide health problem. Back pain rates are higher than cancer and chronic obstructive pulmonary disease as a cause of poor health, and lower back pain is the sixth most common cause of loss of global disability-adjusted life years (Salomon et al., 2012).

1.2 Justification of the study

Low back pain is a very common health problem worldwide and a major cause of disability - affecting performance at work and general well-being. Low back pain can be acute, sub-acute, or chronic. Low back pain affects people of all ages, from children to the elderly, and is a very frequent reason for medical consultations. Global Burden of Disease Study (2010) estimated that low back pain is among the top 10 diseases and injuries that account for the highest number of DAILYs worldwide. It is difficult to estimate the incidence of low back pain as the incidence of first-ever episodes of low back pain is already high by early adulthood and symptoms tend to recur over time. The sacroiliac joints are often considered a source of low back pain. Debate has continued over the existence of sacroiliac joint dysfunction. Some view the sacroiliac joint as an insignificant contribution to low back pain, and whereas others believe the sacroiliac joint plays a major role in low back pain. So, it is believed that the sacroiliac joint contributes to low back pain. The sacroiliac joint accounts for approximately 16% to 30% of cases of chronic mechanical low back pain. Pain originating in the sacroiliac joint is predominantly perceived in the gluteal region, although pain is often referred into the lower and upper lumbar region, groin, abdomen or lower limb. Low back pain is a costly illness for which tilt manipulative therapy is commonly recommended. Previous systematic reviews and practice guidelines have reached discordant results on the effectiveness of this therapy for low back pain.

1.3 Operational Definition

Sacro-Iliac joint Dysfunction

Dysfunction in the sacroiliac joint, or SI joint, is thought to causelow back and/or leg pain.

Low Back pain

Low Back pain is also known as lower back pain or lumbago, is a common disorder involving the muscle and bones of the back. Low back pain may be classified by duration as acute (pain lasting less than 6 weeks), sub-chornic (6 to 12 weeks), or chronic (more than 12 weeks). The condition may be further classified by the underlying cause as mechanical, non-mechanical, or referred pain.

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.

Manipulation

A passive, high-velocity, low amplitude thrust towards joint complex within its anatomical limit with the intent to restore optimal motion, function, and/or to reduce pain.

1.4 List of variable

Independent variable

Conventional physiotherapy, Tilt manipulation.

Dependent variable

Pain.

1.5 Aim

The aim of the study was to assess the efficacy of Tilt Manipulation in Sacro-Iliac Joint with conventional physiotherapy treatments among patients with low back pain.

1.6 Objectives

General objective

To identify the efficacy of tilt manipulation in the sacroiliac joint among low back pain patient.

Specific objective

1. To find out the effect of pain after introducing tilt manipulation at rest (lying position).
2. To identify the severity of pain during standing after introducing tilt manipulation.
3. To identify the severity of pain during long time standing (more than 10 minute) after introducing tilt manipulation.
4. To find out the effect of pain at 6 minute walking test after introducing tilt manipulation.

1.7 Hypothesis

Tilt manipulation along with conventional physiotherapy is more effective than only conventional physiotherapy for the treatment of patient with low back pain.

1.8 Null hypothesis

Tilt manipulation along with conventional physiotherapy is no more effective than only conventional physiotherapy for the treatment of patient with low back pain.

CHAPTER-II : LITERATURE REVIEW

Low back pain is the most prevalent musculoskeletal condition and the most common cause of disability in developed nations (Woolf & Pfleger, 2008). According to the anatomical view, the term LBP refers to pain in the lumbosacral area of the spine encompassing the distance from the 1st lumbar vertebrae to the 1st sacral vertebra. This is the area of the spine where the lordotic curve forms (Kravitz & Andrews, 2014). Among adult population LBP is the most common everyday complaint. In Australia about 20% of the adult population experiences LBP at any gave time (Alsaadi et al., 2011). Louw et al. (2007) stated that in Africa the prevalence of LBP is 33% among adolescents and 50% among adults in one year. LBP is as common complaint as in childhood and adolescence that are seen in adults. A cross-sectional study among 18-year-old females and 20-year-old males showed that the lifetime incidence surpassed 50% in Denmark (Sato et al., 2011). Conditions involving one or both sacroiliac joints are often referred to as sacroiliac joint pain. Sacroiliac joint pain is defined as pain arising from intra-articular structures such as the anterior sacroiliac ligament, posterior sacroiliac ligament, interosseous ligaments, and articular cartilage in the Sacroiliac joint. Sacroiliac joint dysfunction is a state of altered mechanics, either an increase or decrease from the expected normal or the presence of an aberrant motion (Paris, 2010). Low back pain is pain and stiffness in the lower back. It is one of the most common reason people miss work (Shiel, 2007). It includes pain arising from extra-articular structures that surround the Sacroiliac joints. Such as the sacrotuberous, sacrospinous, and/or iliolumbar ligaments (Vleeming et al., 2008). Pain in the lower back is called low back pain. It also affects muscles, tendons, ligaments and nerves. This can develop when the same muscles are used over and over again or for a long time without taking time to rest. The chance of getting this type of injury increases if the force exerted is high and or the job requires an awkward posture. Low back pain may be postural dysfunctional or derangement syndrome (Mckenzie, 1995). Low back pain (LBP) is an important occupational health problem in Canada and in most industrialized countries. In 2002, estimates of the cost of back pain in Quebec ranged from $1.9 to $3.9 billion (Tissot et al, 2009). Systematic reviews ofepidemiologic studies have not been able to support a relationship of LBP withprolonged standing or walking or with prolonged sitting (Chen et al, 2009). LBP

is a multi-factorial disorder which involves most active individuals of the society and leads to many social and economic problems. Many risk factors effect incidence and durability of LBP, some of which can be changeable and reversible (Sadigi et al, 2008). Low back pain can occur if any job involves lifting and carrying heavy objects, or if anyone spends a lot of time sitting or standing in one position or bending over. It canbe caused by a fall or unusually strenuous exercise (Paris, 2010). Back pain can bebrought on by the tension and stress in some people. It can even be brought on byviolent sneezing or coughing (Sadigi et al., 2008). SI joint dysfunction may cause low back pain, the prevalence of this condition has not been well studied. Prevalence studies are further compromised by the fact that most have used either physical examination findings and/or radiological imaging techniques to make the diagnosis of SI joint pain (Amit et al., 2006). Worldwide Low back pain is a very common health problem and a major cause of disability that affecting performance at work and general well-being. Low back pain can be acute, sub-acute, or chronic. Though several risk factors have been identified, the causes of the onset of low back pain remain obscure and diagnosis is difficult to make. Low back pain is not a disease but a constellation of symptoms. In most cases, the origins remain unknown (Rubin, 2007). Low back pain is the leading cause of activity limitation and work absence throughout much of the world and it causes an enormous economic burden on individuals, families, communities, industry and governments (Steenstra et al., 2005). Another study has attempted to identify and evaluate the contribution of different demographic, physical, socioeconomic, psychological, and occupational factors to the development of spinal pain. It is interesting that 37% of LBP worldwide are attributable to occupational risk factors, which represent many potentially preventable sources of pain (Asdrubal et al, 2011). The lifetime prevalence of LBP (at least one episode of LBP in a lifetime) in developed countries is reported to be up to 85% (Walker, 2005). LBP results in significant levels of disability, producing significant restrictions on usual activity and participation, such as an inability to work. Furthermore, the economic, social and public health effects of LBP appear to be increasing (Katz, 2006). LBP affects 80% of adults during their lifetime and is a major-medical condition that causes disability and expenditure of healthcare dollars (Amit et al, 2006). LBP is also the major cause of suffering and the second most common reason for patients to visit primary health care providers. It is estimated that 5.4 million Americans are disabled by LBP each year and that it is the second most

common cause of sick leave (Angela et al., 2007). Low back pain (LBP) continues to be a significant healthcare problem in developed societies (Bishop & Foster, 2005). Sacroiliac joint pain is a challenging condition affecting 15% to 25% of patients with axial low back pain, for which there is no standard long-term treatment. Recent studies have demonstrated that historical and physical examination findings and radiological imaging are insufficient to diagnose SI joint pain. The most commonly used method to diagnose the SI joint as a pain generator is with small-volume local anesthetic blocks, although the validity of this practice remains unproven. In the present review provide a comprehensive review of the anatomy, function, and mechanisms of injury of the SI joint, along with a systematic assessment of its diagnosis and treatment (Laslett et al., 2008).

Anatomy of sacroiliac joint

The sacroiliac (SI) joint is the largest axial joint in the body, with an average surface area of 17.5 cm^2 (Bernard & Cassidy, 2005). There is wide variability in the adult SI joint, encompassing size, shape, and surface contour. Large disparities may even exist within the same individual (Ruch, 2007). The SI joint is most often characterized as a large, auricular-shaped, diarthrodial synovial joint. In reality, only the anterior third of the interface between the sacrum and ilium is a true synovial joint; the rest of the junction is comprised of an intricate set of ligamentous connections. Because of an absent or rudimentary posterior capsule, the SI ligamentous structure is more extensive dorsally, functioning as a connecting band between the sacrum and iliac (Bowen & Cassidy, 2007). The main function of this ligamentous system is to limit motion in all planes of movement. In women the ligaments are weaker, allowing the mobility necessary for parturition. The SI joint is also supported by a network of muscles that help to deliver regional muscular forces to the pelvic bones. Some of these muscles, such as the gluteus maximus, piriformis and biceps femoris, are functionally connected to SI joint ligaments, so their actions can affect joint mobility. The potential for vertical shearing is present in approximately 30% of SI joints, owing to the more acute angulation of the short, horizontal articular component (Mitchell, 2008).

Sacroiliac (SI) Joint Dysfunction

SI joint dysfunction or incompetence generally refers to pain in the sacroiliac joint region that is caused by abnormal motion in the sacroiliac joint, either too much motion or too little motion. It typically results inflammation of the SI joint, and can be debilitating (Lee, 2011). Bergmann & Peterson, (2011) defines sacroiliac joint dysfunction as a state of relative hypomobility associated with possible altered positional relationships between the sacrum and the ilium.

Causes of sacroiliac joint pain

The causes of LBP are multifactorial, including physical, environmental, pathological factors. Back injuries in the work place are rarely caused by direct trauma; typically they are the result of overexertion of individual factors. Age is the most important whereas sex, height (greater than 72 inch tall), weight and smoking >20 cigarettes per day probable risk factors (Hestbaek, 2008). Occupational factors associated with an increased risk of LBP are : heavy physical work, static work posture, frequent bending & twisting & lifting, pushing & pulling, repetitive work, psychological & psychosocial (Cox, 2011). Over two third of back strains are caused by lifting & other exertions likepushing & pulling. The common causes of LBP are muscle strain, vertebral compression fractures, spinal stenosis, intervertebral disc lesion, spondylolysis or spondylolisthesis, & exercise programme (Painting et al, 2005).

Common symptoms of sacroiliac joint dysfunction

Pain that may be sharp, stabbing or dull, localized to one side of the pelvis/low back, groin, or tail bone, Pain that may radiate down to the knee, Pain with movements, such as standing up from a sitting position, turning in bed, or bending/twisting, Muscle tightness and tenderness in the hip/buttock region, Pain with walking, standing, and prolonged sitting, Pain that is worse when standing and walking, and eases when sitting or lying down (Eck et al., 2015).

Diagnosis of SI Joint Dysfunction

Results of studies examining radiologic findings in patients with SI joint pain have been similarly disappointing (Slipman et al., 2006). The investigators found sensitivities of 46% and 13%, respectively, for the use of radionuclide bone scanning in the identification of SI joint pain (Maigne et al., 2011). Non-invasive clinical testing for SIJ pain rests on pain provocation tests that stress the SIJ structures and provoke the usual or familiar pain of which the patient complains. The key tests are distraction, compression, FABER test, thigh thrust, Gaenslen's, and sacral thrust (Robinson et al., 2007; Laslett, 2008).

Conservative Management

The non-interventional management of SI joint pain should ideally address the underlining pathology. In patients with true or apparent leg length discrepancy, this might include the use of shoe inserts to more equitably distribute the load borne by the SI joints. Because leg length discrepancies are frequently found in asymptomatic individuals (Schuit et al., 2006), and many patients already compensate for their lower extremity length difference by altering their gait or posture, most experts recommend starting out cautiously with inserts that correct only half the incongruity. For SI joint pain resulting from altered gait mechanics and spine malalignment, physical therapy and osteopathic or manipulation have been reported to reduce pain and improve mobility (Cibulka & Delitto, 2007). Nonsurgical stabilization programs have been advocated for SI joint pain. These range from the application of pelvic belts that reduce the sagittal rotation of incompetent SI joints (Cohen & Abdi, 2008). Controlled, gradual physical therapy may be helpful to strengthen the muscles around the sacroiliac joint and appropriately increase range of motion. In addition, any type of gentle, low impact aerobic exercise will help increase the flow of blood to the area, which in turn stimulates a healing response. For severe pain, hydro therapy may be a reasonable option, as the water provides buoyancy for the body and reduces stress on the painful joint (Cleland, 2007).

Spinal Manipulative Therapy

Spinal manipulative therapy (SMT) of the sacroiliac joint was shown by (Fyfer, 2005 and Fox, 2006) to have beneficial effects on pain reduction. However it is predominantly prescribed for the treatment of sacroiliac joint dysfunction and low back pain (Magee, 2007; Bergmann & Peterson, 2011). Manipulation has been found to be effective in the treatment of sacroiliac joint dysfunction (Haldeman, 2005), and the primary goal of treatment for sacroiliac joint dysfunction is the restoration of normal lumbopelvic mechanics (Paris & Viti, 2007).

CHAPTER-III METHODOLOGY

This research was an experimental design to evaluate the efficacy of tilt manipulation in sacro-iliac joint among low back pain patient. To identify the effectiveness of this treatment regime, Numeric pain rating Scale and low back pain Questionnaire were used as measurement tools for measuring the pain intensity.

3.1 Study Design

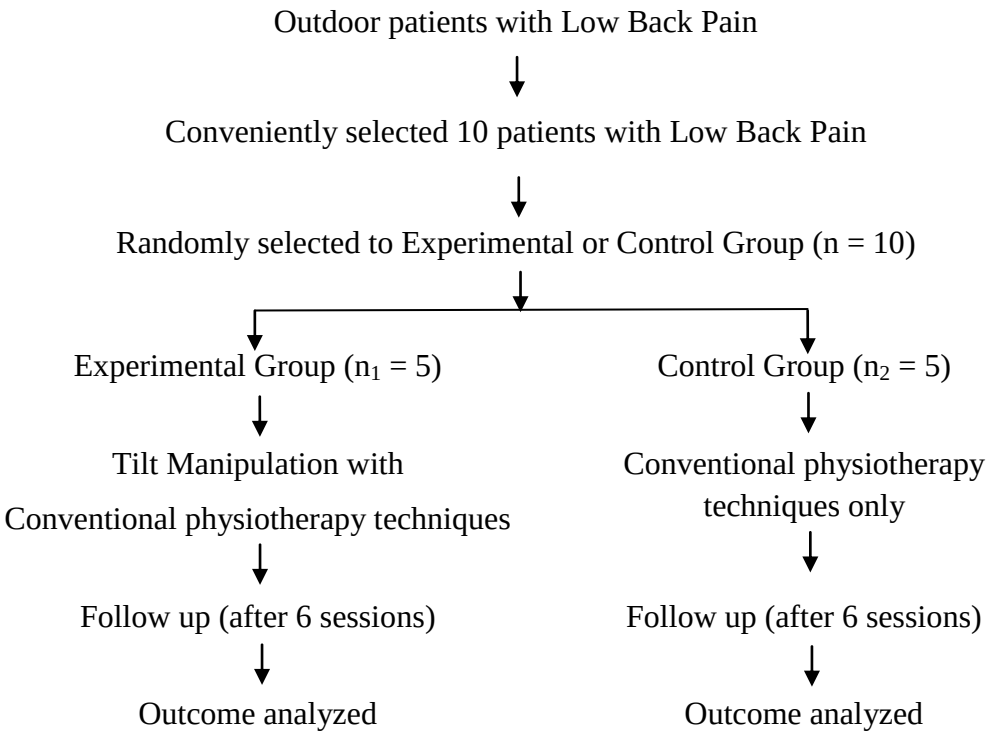
The study was an experimental design, and quantitative research. According to Depoy & Gitlin (2015) the design could be shown by:

Experimental Group	:	r	O_1	X_1	O_2
Control Group	:	r	O_3	X_2	O_3

The study is an experimental between two subject designs. Tilt Manipulation and 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) will be administered with each subject of both groups to compare the pain effects before and after the treatment.

Flow-chart of the phases of Randomized Controlled Trial



3.2 Treatment Regime

By two physiotherapists who are expertise in Tilt Manipulation in Sacro-Iliac Joint.

Experimental Group

a. Conventional Physiotherapy Techniques

- Compression
- Isometric contraction
- Muscle energy technique
- Infra-red radiation
- Support or brace

b. Tilt manipulation in Sacro-Iliac Joint.

Control Group

Conventional Physiotherapy Techniques

- Compression
- Isometric contraction
- Muscle energy technique
- Infra-red radiation
- Support or brace

Procedureof Tilt manipulation in Sacro-Iliac Joint

Subjects were randomly assigned to either of the treatment groups by the flip of a coin. The manipulation procedure is purported to affect the sacroiliac joint. Facing the supine subject with the spine laterally flexed away from the therapist, the subject was instructed to clasp his or her hands behind the neck. One of the therapist's arms was threaded through the subject's far elbow from lateral to medial and, using the subject's arms for leverage, the subject's upper trunk was rotated toward the therapist. The therapist's other hand was placed on the subject's anterior superior iliac spine on the side farthest away, and a postero-lateral-inferior thrust was administered. Immediately following the manipulation, the subject was instructed in hand-heel rocking. On follow-up visits, the manipulationhand-heel rock group was reassessed, and if three or more of the signs were present, a second manipulation was administered. No postural instruction was afforded.

Figure – 1 Procedure of Tilt manipulation in Sacro-Iliac Joint

3.3 Study Area

Musculoskeletal Outpatient Unit of Physiotherapy Department at CRP, Savar, Dhaka.

3.4 Study Population

The study population was the patients diagnosed as Sacrro-Iliac joint dysfunction that cause low back pain attended in the Musculoskeletal Outpatient Unit of Physiotherapy Department at CRP, Savar, Dhaka.

3.5 Sample Size

Sample size for this study was 10. Among them 5 participants were in experimental group and 5 participants in control group.

3.6 Sampling Technique

Simple Random sampling technique was used of this study. 10 patients with Low Back Pain who met the inclusion criteria selected conveniently from outpatient musculoskeletal unit of physiotherapy department of CRP, Savar, Dhaka and then 5 patients were randomly assigned to Experimental group comprising of treatment approaches of Tilt Manipulation along with conventional physiotherapy techniques and 5 patients to the Control group treated with only the conventional physiotherapy techniques for this study. The study was a single blinded technique. After the completion of sample collection, the researcher had randomly assigned the

participants into experimental and control group, because it improves internal validity of experimental research. The samples was given numerical number C_1, C_2, C_3 etc. for the control group and E_1, E_2, E_3 etc. for experimental group. Total 10 samples were included in this study, among them 5 patients were selected for the experimental group (received Tilt Manipulation along with conventional physiotherapy techniques) and rest 5 patients were selected for control group (received only the conventional physiotherapy techniques).

3.7 Inclusion criteria

- Participants were accepted once they had given their informed consent in writing.
- Participants had to have a sacroiliac joint dysfunction, diagnosed through special tests. Gaenslen's test, Patrick's test, Gillet's test, compression tests, static palpation, joint play tests, and motion palpation were all used to gain a clinical picture of sacroiliac dysfunction (Laslett, 2008; Rupert et al., 2009; Bergmann & Peterson, 2011).
- Participants had to be aged from 18 to 50 years of age to be accepted into this study, as patients younger than this are considered minors and prevalence of this injury increases with age (Verral et al., 2011), and patients older than 50 are more likely to have degenerative changes and fibrous ankylosis of the sacroiliac joints (Kirkaldy-Willis et al., 2012).
- Both male and female patient were included.

3.8 Exclusion Criteria

- Acute injuries of the Sacro-iliac Joint of less than 21 days history (Orchard & Best, 2012).
- Contraindications to spinal manipulative therapy including: atherosclerosis of major blood vessels, abdominal aortic aneurysm, tumors, bone infections, traumatic injuries such as fractures, arthritis, metabolic disorders, neurologic disorders, osteoporosis with patients being excluded.
- If the participant received any other treatment for their hamstring or sacroiliac joint dysfunction during the duration of the study.
- History of taking physiotherapy intervention or Corticosteroid injection.
- Deformity of the spine. Such as lordosis, kyphosis, sclerosis.
- Patient below 18 years and above 50 years (Verral et al., 2011).

3.9 Data Processing

3.9.1 Data Collection Tools

- Record or Data collection form
- Informed Consent
- Structured questionnaire
- Numeric Pain Rating Scale – for measuring pain
- Papers, pen, and pencil

3.9.2 Measurement Tools

Numeric Pain Rating Scale– for measuring pain intensity in several function positions. Visual analogue scale is one of the most frequently used measurement scales in health care research. The Numeric pain rating scale is most commonly known and used for measurement of pain. Numeric Pain Rating Scale is a line of a defined length (10 cm), usually horizontal, anchored at each end by a descriptive word or phrase representing the extremes (e.g. worse, best). Numeric Pain Rating Scale to rate the pain status experienced by patients. It is known as Pain Rating Scale. The scale is a 10cm long scale ranging from 0-10. Here a zero (0) means no pain, ten (10) is severe pain feeling experienced by patients (Bowling, 2007).

3.9.3 Data Collection Procedure

The study procedure was conducted through assessing the patient, initial recording, treatment and final recording. After screening the patient at the department, the patients were assessed by a graduate physiotherapist. 6 sessions of treatment was provided for every subject. 10 subjects were chosen for data collection according to the inclusion criteria. The researcher divided all participants into two groups and was coded C_1, C_2, C_3, C_4, C_5 for control group and E_1, E_2, E_3, E_4, E_5 for experimental group. Data was gathered through a pre-test, intervention and post-test and the data was collected by using a written questionnaire form which has been formatted by the researcher. Pre-test was performed before beginning the treatment and the intensity of pain was noted with Numeric Pain Rating Scale's score and back pain questionnaire form. The same procedure was performed to take post-test at the end of 6 sessions of treatment. Researcher provided the assessment form to each subject before starting treatment and after 6 sessions of treatment patient was instructed to put mark on the line of Numeric Pain Rating Scale according to their intensity of pain. The researcher has collected the data of both experimental and control group in front of the qualified physiotherapist in order to reduce the biasness. At the end of the study, specific test that was "Mann-Whitney U test" has been done for statistical analysis.

3.10 Data Analysis

Statistical analysis has performed by using Microsoft Excel 2013 and scientific calculator.

3.10.1 Statistical Test

For the significance of the study, a statistical test was carried out. Statistical analysis refers to the well-defined organization and interpretations of the data by systemic and mathematical procure and rules (DePoy & Gitlin, 2015). The Mann-Whitney *U*-test was done for the analysis of the reduction of pain after six session treatment of both control and experimental groups. According to Hicks (2000), experimental studies with the different subject design where two groups are used and each tested in two different conditions and the data are either ordinal and interval/ratio should be analyzed with Mann-Whitney *U* test. This test is used when the experimental design compares two separate or different unmatched groups of subjects participating in

different conditions. When calculating the Mann-Whitney *U*-test, the value called *U* which thenlook up in the probability tables associated with the Mann-Whitney *U*-test to find out whether the *U* value represents a significant difference between the results from two groups.

The formula of Mann-Whitney *U*-test:

$$U = n_1 n_2 \frac{n_x(n_x + 1)}{2} - T_x$$

n_1 = the number of the subjects in trail group
n_2= the number of the subject in control group
n_x= the number of the subjects of the group with larger rank total
T_x= the larger rank total

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.

3.11 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). Then the proposal of the dissertation including methodology was approved and obtained permission from the concerned authority of ethical committee of Bangladesh Health Professions Institute (BHPI). Again before the beginning of the data collection, researcher obtained the permission from the concerned authorities ensuring the safety of the participants. The researcher strictly maintained the confidentiality regarding participant's condition and treatments. The researcher has obtained consent to participate from every subject. A signed informed consent form was received from each participant. The participants were informed that they have the right to meet with outdoor physiotherapist if they

think that the treatment is not enough to control the condition or if the condition become worsen. The participants were also informed that they are completely free to decline answering any question during the study and are free to withdraw their consent and terminate participation at any time. Withdrawal of participation from the study did not affect their treatment in the physiotherapy department and they still had got the same facilities. Every subject had the opportunity to discuss their problem with the senior authority or administration of CRP and have any questioned answer to their satisfaction.

CHAPTER-IV RESULTS

Initially in the research, 10 patients were enrolled in the study. Among them, 5 in the Tilt Manipulation with conventional treatment group (experimental group) and 5 in the only conventional treatment group (control group). The whole subject of both experimental and control group scored their pain on Numeric Pain Rating Scale before and after completing treatment.

Socio-Demographic Information

Age of the participants

Experimental Group		Control Group	
Subjects	**Age (Years)**	**Subjects**	**Age (Years)**
E1	42	C1	44
E2	40	C2	27
E3	21	C3	30
E4	48	C4	42
E5	35	C5	38
Mean Age	**37 years**	**Mean Age**	**36.5 years**

Table– 1 Mean age of the participants of experimental and control group

From the above mentioned table, it is obvious that mean age of participant in control group was 37 years and experimental group was 36.5 years age on average (Figure-2).

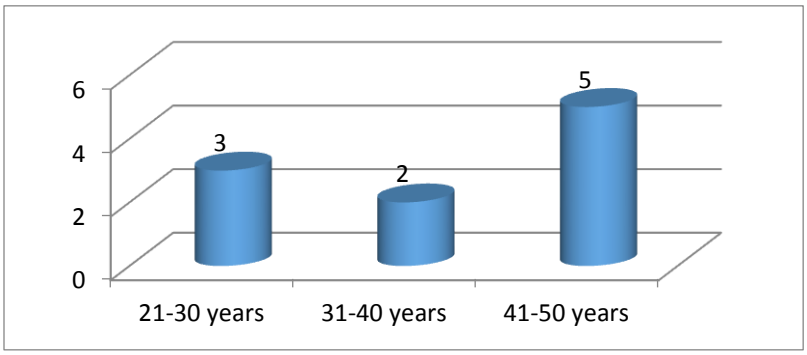


Figure – 2 Age Range of the Participants

Sex of the participants

Experimental Group		Control Group	
Subjects	**Sex**	**Subjects**	**Sex**
E1	Male	C1	Male
E2	Male	C2	Male
E3	Male	C3	Female
E4	Male	C4	Male
E5	Male	C5	Male

Table – 2 Sex of the participants

From the above mentioned table, it is obvious that sex of participant in experimental and control group was male 10% and female 90% (Figure-3).

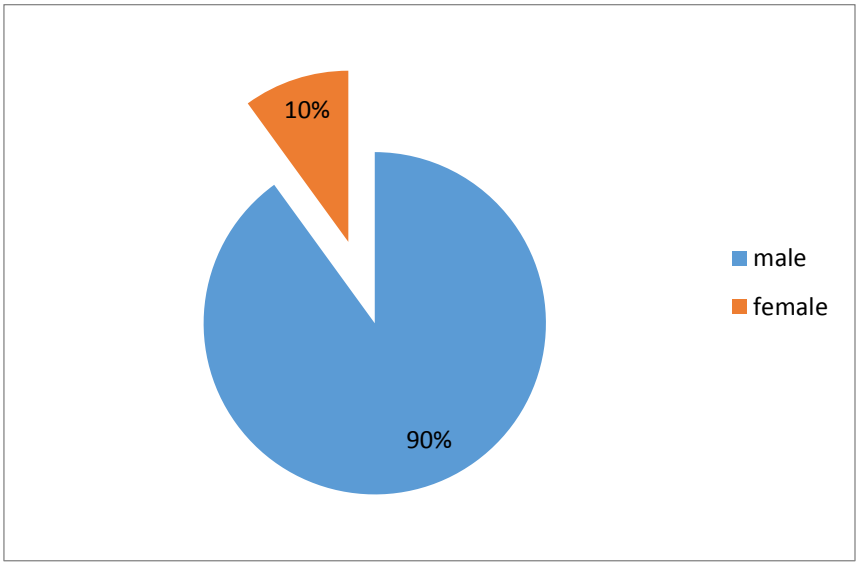


Figure – 3 Sex of total participants

Referred Pain

Experimental Group		Control Group	
Subjects	**Yes/No**	**Subjects**	**Yes/No**
E1	Yes	C1	Yes
E2	Yes	C2	Yes
E3	Yes	C3	Yes
E4	Yes	C4	Yes
E5	Yes	C5	No

Table – 3 Referred Pain of total participants

From the above mentioned table, it is obvious that 90% of participant's pain is referred, and 10% of participants pain is not referred (Figure-4).

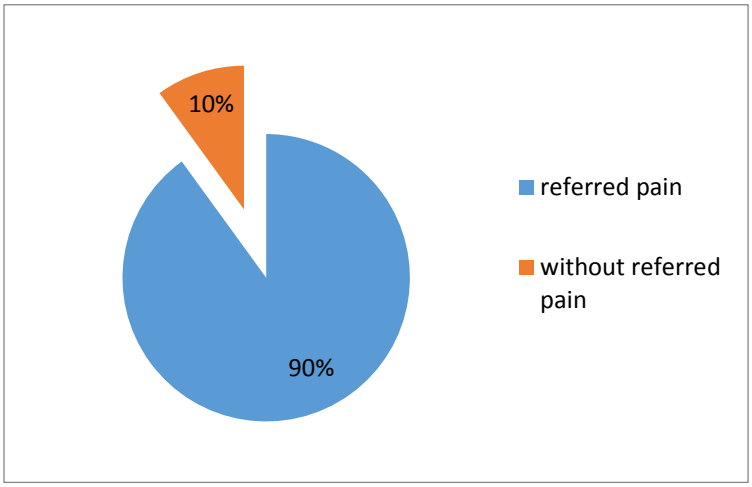


Figure – 4 Referred Pain of total participants

Comparisons of changes of pain on Numeric pain rating scale at rest between experimental and controlgroup

Experimental Group			Control Group		
Subjects	**Pre-test**	**Post-test**	**Subjects**	**Pre-test**	**Post-test**
E_1	4	1	C_1	5	2
E_2	4	1	C_2	4	2
E_3	7	1	C_3	4	1
E_4	2	1	C_4	4	2
E_5	5	1	C_5	5	2
Mean	**4.4**	**1**	**Mean**	**4.4**	**1.8**

Table – 4 Comparison of changes of pain on Numeric pain rating scaleat rest between experimental and control group

In this study, pre test score of pain onNumeric pain rating scaleat resting position was 4.4 in experimental group, 4.4 among control group. On post testscore after treatment showed that pain on Numeric pain rating scale had reduced in both groups (Figure-5).

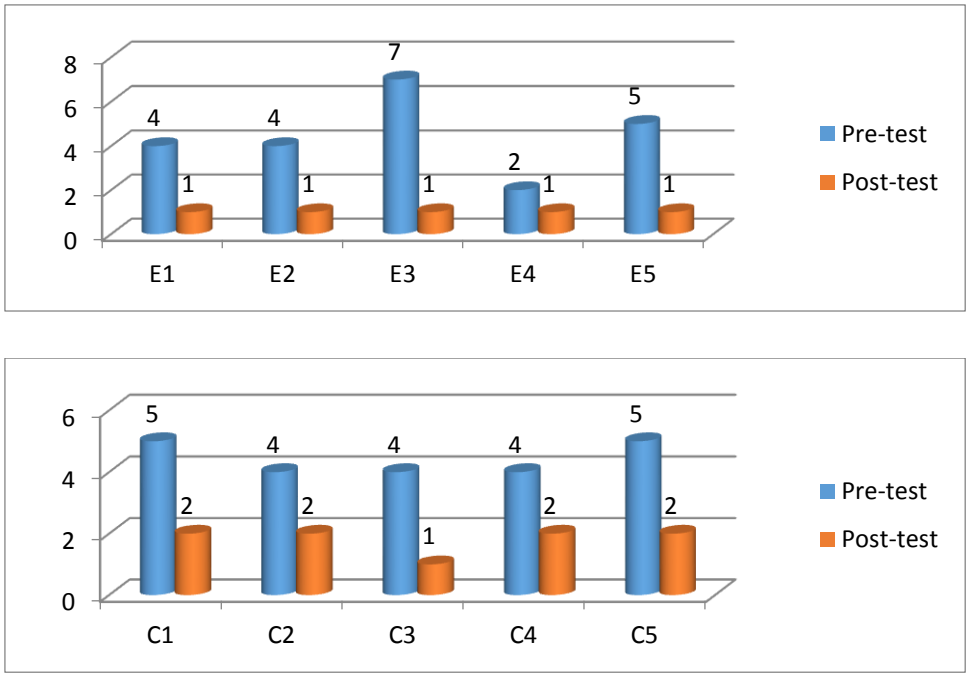


Figure – 5 Reduction of pain in resting position

Comparison of changes of pain on Numeric pain rating scale at standing between experimental and control group

Experimental Group			Control Group		
Subjects	**Pre-test**	**Post-test**	**Subjects**	**Pre-test**	**Post-test**
E_1	5	2	C_1	6	4
E_2	5	3	C_2	6	3
E_3	8	2	C_3	6	3
E_4	3	1	C_4	6	3
E_5	7	2	C_5	7	4
Mean	**5.6**	**2**	**Mean**	**6.2**	**3.4**

Table – 5 Comparison of changes of pain on Numeric pain rating scaleat standing between experimental and control group

In this study, pre test score of pain onNumeric pain rating scaleat standing position was 5.6 in experimental group, 6.2 among control group. On post test score after treatment showed that pain on Numeric pain rating scale had reduced in both groups (Figure-6).

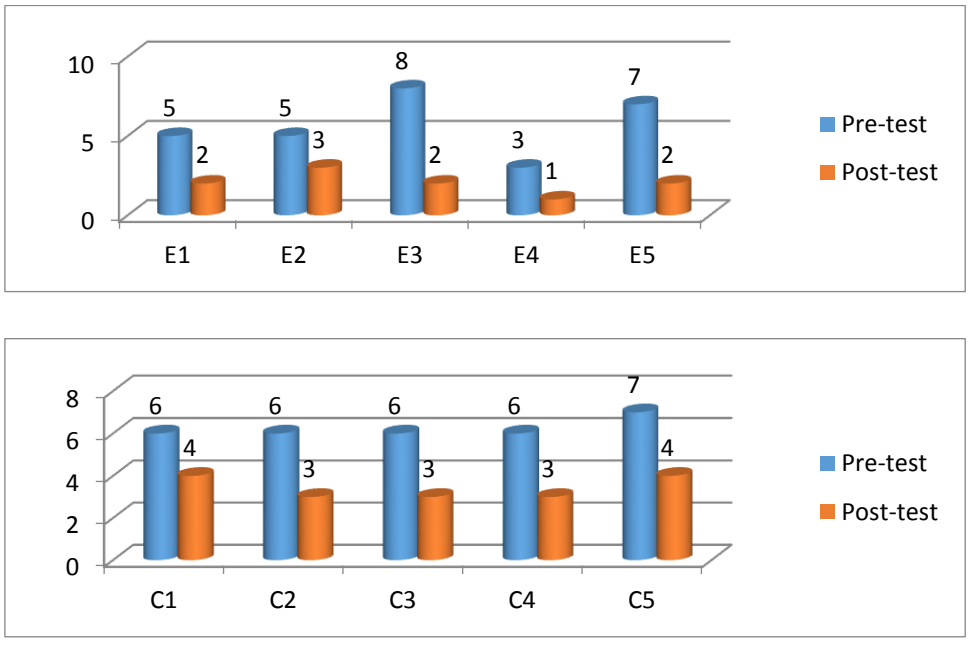


Figure – 6 Reduction of pain in standing position

Comparison of changes of pain on Numeric pain rating scale at long time standing (more than 10 minutes) between experimental and control group

Experimental Group			Control Group		
Subjects	**Pre-test**	**Post-test**	**Subjects**	**Pre-test**	**Post-test**
E_1	7	1	C_1	6	1
E_2	8	2	C_2	7	2
E_3	8	2	C_3	6	3
E_4	7	1	C_4	7	2
E_5	7	2	C_5	8	3
Mean	**7.4**	**1.6**	**Mean**	**6.8**	**2.2**

Table – 6 Comparison of changes of pain on Numeric pain rating scaleat long time standing between experimental and control group

In this study, pre test score of pain on Numeric pain rating scale atstanding position was 7.4 in experimental group, 6.8 among control group. On post test score after treatment showed that pain on Numeric pain rating scale had reduced in both groups (Figure-7).

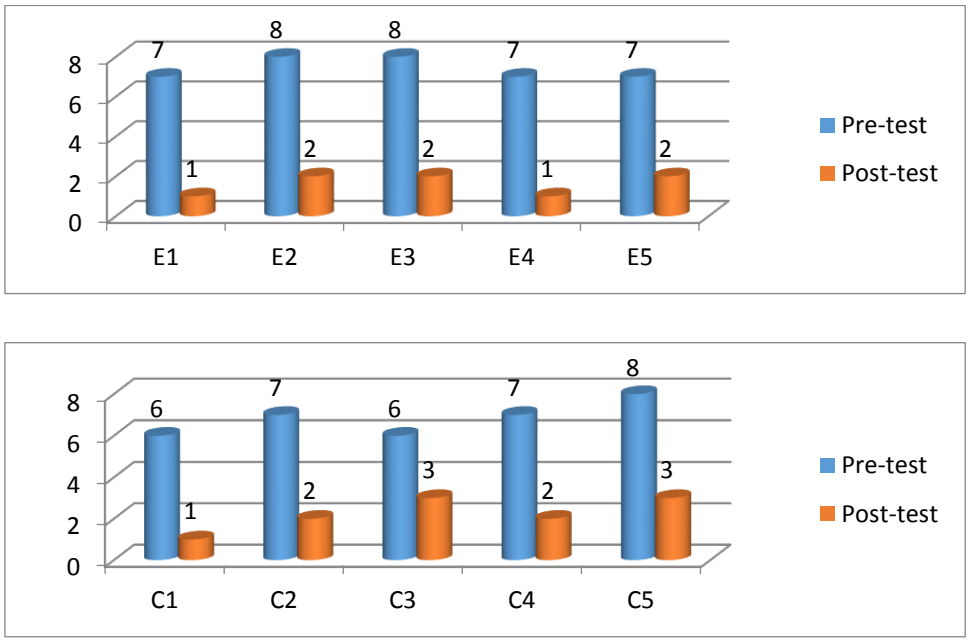


Figure – 7 Reduction of pain in long time standing

Comparisons of changes of pain on Numeric pain rating scaleat six minutes walking test, between experimental and control group

Experimental Group			Control Group		
Subjects	**Pre-test**	**Post-test**	**Subjects**	**Pre-test**	**Post-test**
E_1	8	2	C_1	6	4
E_2	8	3	C_2	7	3
E_3	8	2	C_3	7	3
E_4	7	1	C_4	7	3
E_5	7	3	C_5	7	5
Mean	**7.6**	**2.2**	**Mean**	**6.8**	**3.6**

Table – 7 Comparison of changes of pain on Numeric pain ratingscale at six minutes walking test between experimental and control group

In this study, pre test score of pain onNumeric pain rating scale at standing position was 7.6 in experimental group, 6.8 among control group. On post test score after treatment showed that pain on Numeric pain rating scale had reduced in both groups (Figure-8).

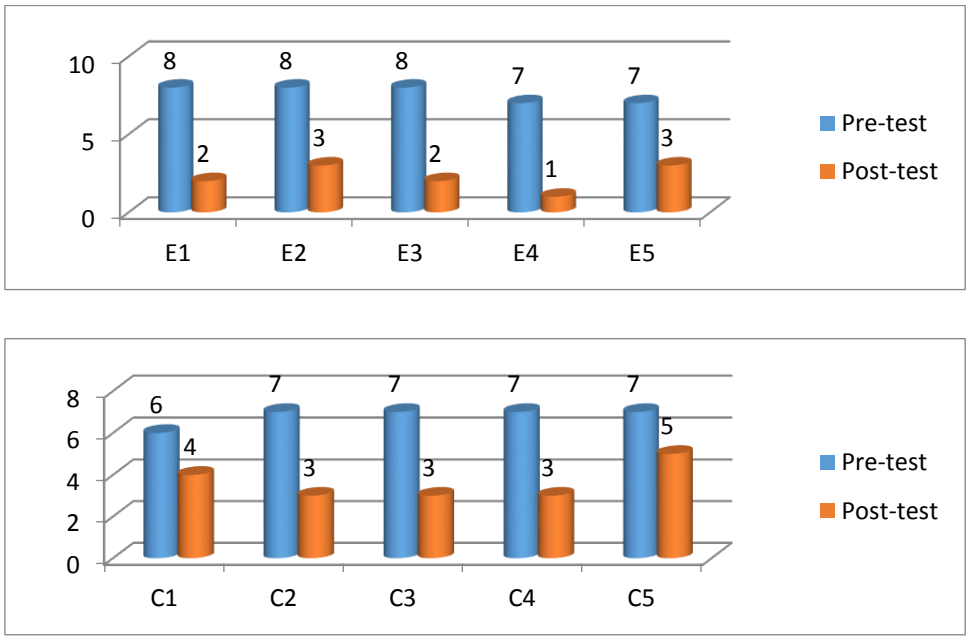


Figure – 8 Reduction of pain in six minutes walking test

Variables in statistically significance at the following level of significance

No.	Variables	Observed "U" value	Observed "P" value	Significant/Not Significant
01	Pain at rest	2.5	<.05=4	Significant
02	Pain at standing	1.5	<.05=4	Significant
03	Pain during long time standing	7	<.05=4	Not Significant
04	Pain after 6 minute walking test	3	<.05=4	Significant

Table – 8 Variables in statistically significance at the following level of significance

CHAPTER-V DISCUSSION

The result of this study reported that tilt manipulation along with conventional physiotherapy beneficial for patients with Sacro-iliac Joint Dysfunction. The analysis of significance was carried out by using non-parametric Mann-Whitney *U* test (U=2.5; U=1.5; U=7; U=3; $U \leq 4$; $n_1=n_2=5$) to compare the efficacy of tilt manipulation along with conventional physiotherapy and only conventional physiotherapy for the management of patients with Sacro-iliac Joint Dysfunction. By using non-parametric Mann-Whitney *U* test on the data the results were found to be significant (p <0.05 for a one-tailed hypothesis). The null hypothesis was rejected. This means that tilt manipulation along with conventional physiotherapy is more effective than conventional physiotherapy only for reduction of pain in patients with Sacro-iliac Joint Dysfunction. In this study the total number of participants was ten. Among them 90% (n=9) were male and 10% (n=1) were female. Participants were distributed to two groups, each containing 5 individuals. The age range of participants was experimental group "21-42" years and control group "27-44" years of age. The mean age for experimental and groups control were 37 years and 36.5 years with a mean difference of only 0.5 years. Fritz et al. (2004) mentioned in seventy-five patients with sacro-iliac joint dysfunction. The age range of participant was 19-59 years.One group received high velocity, low amplitude movement (manipulation) and other group received manually therapy. After 2 week period concluded that, both groups have a beneficial effect in different functional position. Pain at resting position was beneficial effects with manipulation (p<.013), pain at standing position was beneficial effects with manipulation (p<.02), and pain at walk was beneficial effects with manipulation (p<.035). In this study ten patients with sacro-iliac joint dysfunction among them five patients in one group received high velocity, low amplitude movement (tilt manipulation) and other group received conventional physiotherapy. Age range of participants was 21-48 years. After six session of treatment concluded that, both groups have a beneficial effect in different functional position. Pain at resting position was beneficial effects with manipulation (p< 2.5), pain at standing position was beneficial effects (p<1.5), and pain at six munities walk test was beneficial effects (p<4).

In this study pain at long time standing was anothervariables that have not beneficial effect with manipulation U=7, and observed p value (p<.05=4). There was not found in journals for justification of this variable. The cause of not significant may be short time duration, or small sample size, or poor postural habits of patients. In this study four variables, pain at long time standing, have not beneficial effectwith manipulation, where U=7, and observed p value (p<.05=4). Others three variables was, Pain at resting position have beneficial effect with manipulation, where U=2.5, and observed p value (p<.05=4); pain at standing position have beneficial effect with manipulation U=1.5, and observed p value (p<.05=4); pain at six minute walk test have beneficial effect with manipulation U=3, and observed p value (p<.05=4). In this study,the majority of variables werebeneficial effects with manipulation.

Limitations

The study was conducted with 10 patients of sacroiliac joint dysfunction, which was a very small size of samples in both groups and was not sufficient enough for the study to generalize its findings to the wider population and variable patient mass of this condition.

In this study, another limitation of this study, when Tilt Manipulation provided, it not only manipulate the SI joint, also with the Lambo Sacral region.

There was no system of long term follow-up after the post-test of the study.

In this study, the researcher could not maintain external validity but maintained internal validity during data collection due to time limitation. It was limited by the fact daily activities of the subject were not monitored which could have influenced.

In this study, interventions were given by 2 clinical physiotherapists. So, the inter-rater reliability was not maintained due to lack of time and patient's availability.

The research was carried out at the clinical settings of Outpatient treatment service, musculoskeletal unit of CRP, Savar, Dhaka. Such a small environment, so it was difficult to keep confidential the aims of the study for blinding procedure. Therefore, single blind method was used in this study.

CHAPTER-VI CONCLUSION AND RECOMMENDATION

6.1Conclusion

This study consisted of 10 participants divided randomly and equally in two groups. Experimental group consisted of who revived tilt manipulation with conventional physiotherapy, while control group consisted of who received only conventional physiotherapy. All participants received six sessions of treatment, then follow up and evaluation was made.

The study was an experimental design to examine the efficacy of Tilt Manipulation along with Conventional Physiotherapy Techniques for Sacro-iliac Joint Dysfunction, where the results of the study have demonstrated that the combination technique is significantly capable of producing beneficial effects on pain reduction, pain related symptoms minimization in patients with Sacro-iliac Joint Dysfunction.

Reduction of pain and associated symptoms were greater in the patients treated with combination of Tilt Manipulation with Conventional Physiotherapy Techniques, than those are treated with Conventional Physiotherapy Techniques alone.

The result of the study suggest that pain at long time standing (more than 10 minutes) on Numeric Pain Rating Scale was statistically significant.

6.2 Recommendation

The following recommendations could increase the validity and improve the results of this study:

A larger study involving increased number of participants may increase the significance of results.

More specific criteria in the inclusion of 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.

Future study should include time measure of improvement in both experimental and control group.

The narrowing of variables such as age, gender, race in order to increase validity.

Further motivation to controlled clinical trials with sufficient time.

It could be also suggested that for future studies can be carried out with comparable patient variables with emphasis on ergometrics and functional levels.

References

Alsaadi, S. M., Mcauley, J. H., Hush, J. M., and Maher, C. G., (2011). Prevalence of sleep disturbance in patients with low back pain. European Spine Journal, 20:737-743.

Amit, B., Daniel, G., Steven, L., and Michael, J. D., (2006). Physical therapy for low back pain. Current Opinion in Orthopaedics, 17:199–207.

Angela, M. L., Katia, M. B., Hayley, K., and Margareta, N., (2007). Association between sitting and occupational LBP. The Spine Journal, 16:283–298.

Asdrubal, F., Alisson, R. T., Thais, M., Gustavo, L. B., Diniz, K., Felipe, B., Juliana, Daniel, B., Lazzaretti, B. S., and Natalia, L. B., (2011). Low Back Pain in the Corporate Workplace. The Spine Journal, 20:500–505.

Bergmann, T.F., and Peterson, D. H., (2011). Chiropractic Technique: Principles and Procedures. 3rd ed. St Louis: Mosby.

Bernard, T. N., and Cassidy, J. D., (2005). The sacroiliac syndrome. Pathophysiology, diagnosis and management. The SpineJournal, 48: 2107–2130.

Biglarian, A., Seifi, B., Bakhshi, E., Mohammad, K., Rahgozar, M., and Serahati, S., (2012). Low Back Pain Prevalence and Associated Factors in Iranian Population: Findings from the National Health Survey. Pain Research and Treatment, doi:10.1155/2012/653060.

Bishop, A., and Foster, N. E., (2005). Psychosocial factors in patients with acute low back pain. The Spine Journal, 30:1316–1322.

Bowen, V., and Cassidy, J. D., (2007). Macroscopic and microscopic anatomy of the sacroiliac joint from embryonic life until the eighth decade. The SpineJournal, 6:620–628.

Bowling, A., (2007). Research Method in Health: Investigating health and health services. Philadelphia: Open University Press.

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

Chen, S. M., Liu, M. F., Cook, J., and Bass, S., (2009). Sedentary lifestyle as a risk factor for low backpain: a systematic review. International Archives of Occupational and Environmental Health, 82: 797–806.

Cher, D. J., and Recking, W. C., (2015). Quality of life in preoperative patients with sacroiliac joint dysfunction is at least as depressed as in other lumbar spinal conditions. Medical Devices: Evidence and Research, 8: 395–403.

Choobineh, A., Kasson, and Beek, (2007). Musculoskeletal problems among workers of an Iranian communication company, Indian Journal of Occupational and Environmental Medicine, 11(1):32-36.

Cibulka, M. T., and Delitto, A., (2007). A comparison of two different methods to treat hip pain in runners. Journal of Orthopedic Sports Physical Therapy, 17:172–176.

Cleland, J., (2007). Orthopaedic clinical examination: an evidence-based approach for physical therapists. Saunders: Elsevier.

Cohen, S. P., and Abdi, S., (2008). Lateral branch blocks as a treatment for sacroiliac joint pain: a pilot study. Registered Anesthesia Pain Medication, 28:113–119.

Cox, J. M., (2011). Low back pain mechanism diagnosis & treatment, 6th ed., Williams and wilkins: Philadelphia.

Croft, P. R., Macfarlane, G. J., Papageorgious, A. C., Thomas, E., and Silman, A. J., (2014). Outcome of low back pain in general practice: a prospective study. British Medical Journal, 316(7141):1356-1359.

DePoy, E., and Gitlin, L.N., (2015). Introduction to research: Understanding and applying multiple strategies. 5th ed. USA: Elsevier Health Sciences.

Eck, J. C., (2015). Sacroiliac Joint Dysfunction (SI Joint Pain) Causes, Symptoms, Diagnosis, Treatment, and Prevention. Available: http://journals.lww.com/anesthesaanalgesia/Fulltext/2005/11000/Sacroiliac_Joint_Pain__A_Comprehensive_Review_of.32.aspx#[assessed on 31 March 2015]

Fabunmi, A. A., Aba, S. O., and Odunaiya, N. A., (2005). Prevalence of low back pain among peasant farmers in a rural community in South West Nigeria. African Journal of Medicine and Medical Science, 34:259-262.

Fox, M., (2006). Effect on hamstring flexibility of hamstring stretching compared to hamstring stretching and sacroiliac joint manipulation. Clinical Chiropractic, 9(1): 21-32.

Fritz, J. M., Whitman, J. M., Flynn, T. W., Wainner, R. S., and Childs, J. D., (2004). Factors Related to the Inability of Individuals With Low Back Pain to Improve With a Spinal Manipulation. Physical Therapy, 84: 173-190.

Fyfer, J. B., (2005). The effect of spinal manipulative therapy in the treatment of recurrent hamstring strains. Master's in Technology: Chiropractic Dissertation. University of Johannesburg, Johannesburg, South Africa.

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

Gonzalez, J. C. A., and Oliveros, Y. S. Q., (2015). Diagnostic test scale SI5: Assessment of sacroiliac joint dysfunction. Neurocirugia, 182: 8-15.

Haldeman, S., (2005). Principles and Practise of Chiropractic. 3rd ed. New York: McGraw-Hill.

Hestbaek, L., (2008). The course of low back pain in a general population. Results from a 5-year prospective study. Journal of Manipulative and Physiological Therapeutics, 26(4):213–219.

Hicks, C. M., (2000). Research Methods for Clinical Therapists- Applied project design and analysis, 3rd ed., London: Churchill Livingstone.

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

Hoy, D., Brooks, P., Blyth, F., and Buchbinder, R., (2010). The Epidemiology of low back pain. Best Practice & Research Clinical Rheumatology, 24:769-781.

Katz, R., (2006). Impairment and disability rating in low back pain. Clinical Occupational Environmental Medicine, 5(3): 719-740.

Kelsey, J. L., (2010), Low back pain or Prolapsed lumber intervertibral disc. Rheumatic Diseases Clinics of North America, 16(3):699-716.

Kirkaldy-Willis, W. H., Burton, C. V., and Cassidy, J. D., (2012). The sight and nature of the lesion. 3rd ed. New York: Churchill and Livingstone.

Kravitz, L., and Andrews, R., (2014). Fitness and Low Back Pain, available: http://www.unm.edu/~lkravitz/Article%20folder/lowback.html, [accessed on 11 August 2015].

Laslett, M., (2008). Evidence-Based Diagnosis and Treatment of the Painful Sacroiliac Joint. Journal of Manual and Manipulative Therapy, 16(3): 142-152.

Laslett, M., Young, S. B., Aprill, C. N., Donald, M. B., (2008). Diagnosing painful sacroiliac joints: A validity study of a McKenzie evaluation and sacroiliac joint provocation tests. Australian Journal of Physiotherapy, 49:89–97.

Lee, D., (2011). The Pelvic Girdle.An approach to examination and treatment of the lumbo-pelvic-hip region. New York: Churchill Livingston.

Louw, Q. A., Morris, L. D., and Somers, G. K., (2007). The Prevalence of low back pain in Africa: a systematic review. BioMedical Central Musculoskeletal Disorder, 8:105-114.

Magee, D. J., (2007). Orthopedic Physical Assessment. 5th ed. Philadelphia: Saunders.

Maigne, J. Y., Boulahdour, H., and Chatellier, G., (2011). Value of quantitative radionuclide bone scanning in the diagnosis of sacroiliac joint syndrome in 32 patients with low back pain. The Spine Journal, 7:328–331.

Marius, A.W., (2013). Low Back Pain in the Corporate Workplace; A South African Review, available: http:Low_Back_Pain_in_the_Corporate_Workplace.html?id=MEPPNwAACAAJ&redir_esc=y [assessed on 11 August 2015].

McKenzie, R.A., (1995). The lumbar spine mechanical diagnosis & therapy. Newzealand: spinal publication.

Mitchell, F. L., (2008). The muscle energy manual, East Lansing, MI: MET Press.

Orchard, J., and Best, T. M., (2012). The Management of Muscle Strain Injuries: An Early Return versus the Risk of Recurrence. Clinical Journal of Sports Medicine, 12(1): 3-5.

Ostgaard, H. C., Andersson, G. B., and Karlsson, K., (2008). Prevalence of back pain in pregnancy, available: http://www.ncbi.nlm.nih.gov/pubmed/1828912 [accessed on14th August 2015].

Painting, S., (2005). The management of acute industrial low back pain. Physiotherapy Journal, 84(3):110-117.

Paris, S. V., and Viti, J., (2007). Differential diagnosis of low back pain. Integration of Research and Therapy. London: Churchill Livingstone.

Paris, S.V., (2010). Introduction to spinal evaluation and manipulation. 3rd ed. St. Augustine: Patris Press.

Peterson, C. K., Bolton, J. E., and Wood, A. R., (2005). A Cross-Sectional Study Correlating Lumbar Spine Degeneration with Disability and Pain. The Spine Journal, 25(2):218-223.

Robey, J. H., and Boyle, K., (2013). The role of prism glass and postural restoration in managing a collegiate baseball player with bilateral sacro iliac joint dysfunction. The International Journal of Sports Physical Therapy, 8: 716-728.

Robinson, H. S., Brox, J. I., Robinson, R., Bjelland, E., Solem, S., and Telje, T., (2007). The reliability of selected motion and pain provocation tests for the sacroiliac joint. Manual Therapy, 12:72–79.

Rubin, D. I., (2007). Epidemiology and risk factors for spine pain. The Spine Journal, 25(2):353-371.

Ruch, W. J., (2007). Atlas of common subluxations of the human spine and pelvis. Boca Raton, FL: CRC Press.

Rupert, M. P., Lee, M., Manchikanti, L., Datta, S., and Cohen, S. P., (2009). Evaluation of Sacroiliac Joint Interventions: A Systematic Appraisal of the Literature. Pain Physician, 12: 399-418.

Sadigi, A., Moradi, A., Rahimi, A. R., Ltfinia, I., and Zargami, N. A., (2008). Prevalence of LBP among women of fertility age in Tabriz and the related risk factors. Medical Journal of Tabriz University of Medical Sciences, 30(2):17-23

Salomon, J. A., Vos, T., and Hogan, D. R., (2012). Common values in assessing health outcomes from disease and injury: disability weights measurement study for the Global Burden of Disease Study. Lancet, 380(9859):2129–2143.

Sato, T., Ito, T., Hirano, T., Morita, O., Kikuchi, R., Endo, N., and Tanabe, N., (2011). Low back pain in childhood and adolescence: assessment of sports activities. The Spine Journal, 20:94-99.

Schuit, D., McPoil, T. G., and Mulesa, P., (2006). Incidence of sacroiliac joint malalignment in leg length discrepancies. Journal of American Podiatric Medicine Association, 79:380–383.

Shiel, W., (2007). Causes of Low Back Pain, available: http://www.cumc.columbia.edu/student/health/pdf/IL/Low%20Back%20Pain.pdf, [accessed on 2 August 2015].

Slipman, C. W., Sterenfeld, E. B., and Chou, L. H., (2006). The value of radionuclide imaging in the diagnosis of sacroiliac joint syndrome. The Spine Journal, 21:2251–2254.

Steenstra, I. A., Verbeek, J. H., Heymans. M. W., (2005). Prognostic factors for duration of sick leave in patients sick listed with acute low back pain. Occupational and Environmental Medicine, 62(12): 851–860.

Tissot, F., Messing, K., and Stock, S., (2009). Studying the relationship between low back pain and working postures among those who stand and those who sit most of the working day. Ergonomics, 52(11): 1402–1418.

Tomita, S., Arphorn, S., Muto, T., Koetkhlai, K., Naing, S. S., and Chaikittiporn, C., (2010). Prevalence and Risk Factors of Low Back Pain among Thai and Myanmar Migrant Seafood Processing Factory Workers in Samut Sakorn Province, Thailand. Industrial Health, 48:283-291.

Verral, G. M., Slavotinek, J. P., Barnes, P. G., Fon, G. T. and Spriggins, A. J., (2011). Clinical Risk Factors for Hamstring Muscle Strain Injuries: A Prospective Study with Correlation of Injury by Magnetic Resonance Imaging. British Journal of Sports Medicine, 35: 435-440.

Vleeming, A., Albert, H. B., and Ostgaard, H. C., (2008). European guidelines for the diagnosis and treatment of pelvic girdle pain. The Spine Journal, 17:794-819.

Wai, E. K., Roffey, D. M., Bishop, P., Kwon, B. K., and Dagenais, S., (2010). Causal assessmentof occupational bending or twisting and low back pain: results of a systematic review. The Spine Journal, 10(6):76–88.

Walker, B., (2005). The Prevalence of Low Back Pain: A Systematic Review of the Literature from 1966 to 1998. Journal of Spinal Disorders, 13(3): 205-217.

Woolf, A., and Pfleger, B., (2008). Burden of major musculoskeletal conditions, Bull World Health Organization, 81(9): 646-656.

ANNEXURE

1. Informed Consent (Bangla)
2. Informed Consent (English)
3. Questionnaire (Bangla)
4. Questionnaire (English)
5. Statistical tests
6. Permission Letter

সম্মতিপত্র

আসসালামুয়ালাইকুম / নমস্কার, আমি এস. এম. জয়নুল আবেদিন, ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধিভুক্ত বাংলাদেশ হেলথ প্রফেশনস্ ইন্সিটিটিউট এর বি.এস.সি ইন ফিজিওথেরাপিকোর্সের ৪র্থ বর্ষের একজন শিক্ষার্থী। অধ্যায়নের অংশ হিসেবে আমাকে একটি গবেষণা সম্পাদন করতে হবে এবং এটা আমার প্রাতিষ্ঠানিক কাজের একটা অংশ। নিম্নোক্ত তথ্যাদি পাঠ করার পর অংশগ্রহণকারীদের গবেষণায় অংশগ্রহনের জন্য অনুরোধ করা হলো।

আমার গবেষণার বিষয় হল **"কোমর ব্যথার রোগীদের সেক্রো-ইলিয়াক অস্থিসন্ধির টিলটম্যানিপুলেসন এর কার্যকারিতা"** এই পরীক্ষামূলক গবেষণার মাধ্যমে আমি একটি অনুমান পরীক্ষা করব যে, কোমর ব্যাথাররোগীদের ক্ষেত্রে শুধুমাত্র প্রচলিত ফিজিওথেরাপি অপেক্ষা প্রচলিত ফিজিওথেরাপির সাথে সেক্রো-ইলিয়াকঅস্থিসন্ধির টিলট ম্যানিপুলেসনবেশী কার্যকর। আমার গবেষণার উদ্দেশ্য হলো থেরাপি দেবার পূর্বে ও পরে রোগীদের ব্যথা পরিমাপ করা। আমি যদি আমার গবেষণাটি সার্থকভাবেসম্পূর্ণ করতে পারি তবে যেসব রোগীরা কোমর ব্যাথার রোগে ভুগছেন তারা উপকৃত হবেন এবং এটি হবে একটি পরীক্ষামূলক প্রমাণ।গবেষণাটি সম্পাদনের জন্য, আমার তথ্য সংগ্রহ করা প্রয়োজন হবে। গবেষণার ক্ষেত্র বিবেচনা করে আপনার মাঝে আমার গবেষণায় অংশগ্রহণ করার জন্য প্রয়োজনীয় বৈশিষ্ট্য লক্ষ্য করা গেছে। এজন্য, আপনি আমার গবেষণার একজন সম্মানিত অংশগ্রহণকারী হতে পারেন এবং আমি আপনাকে আমার গবেষণায় অংশগ্রহন করতে অনুরোধ জানাচ্ছি।

আমি প্রতিজ্ঞা করছি যে,এই গবেষণা আপনার জন্য ঝুঁকিপূর্ণ হবে না অথবা আপনার কোন ক্ষতি করবে না। গবেষণা চলাকলীন সময়ে কোন রকম দ্বিধা বা ঝুঁকি ছাড়াই যেকোন সময়ে আপনি এটাকে বাদ দিতে পারবেন। এই গবেষণার প্রাপ্ত তথ্য সম্পূর্ণভাবে গোপনীয় থাকবে এবং অংশগ্রহণকারীর ব্যক্তিগত তথ্য অন্য কোথাও প্রকাশ করা হবে না।

গবেষণা চলাকালিন সময়ে আপনাকে কোনও প্রদাহ বা ব্যাথা নিরোধকারী পথ্য গ্রহন না করার জন্য বিশেষ ভাবে অনুরধ জানাচ্ছি।

যদি আপনার গবেষণা সম্পর্কে কোনো জিজ্ঞসা থাকে তবে আপনি অনুগ্রহপূবক যোগাযোগ করতে পারেন গবেষকএস. এম. জয়নুল আবেদিনঅথবা মোহাম্মদ হাবিবুর রহমান, সহকারী অধ্যাপক, ফিজিওথেরাপি বিভাগ বিএইচপিআই, সিআরপি, সাভার, ঢাকা-১৩৪৩ এর সাথে।

শুরু করার আগে আপনার কি কোন প্রশ্ন আছে ?

আমি কি শুরু করতে পারি ?

☐ হ্যাঁ ☐ না

অংশগ্রহণকারীর স্বাক্ষর ও তারিখ .....

গবেষকের স্বাক্ষর ও তারিখ .....

সাক্ষীর স্বাক্ষর ও তারিখ .....

Consent Form

Assalamualaikum\ Namashker,

I am S.M. Joynul Abedin, 4th Professional B.Sc. in Physiotherapy student of Bangladesh Health Professions Institute (BHPI) under the Faculty of Medicine, University of Dhaka. To obtain my Bachelor degree, I have to conduct a research project and it is a part of my study. The participants are requested to participate in the study after a brief the following.

My research title is "**Efficacy of Tilt Manipulation in Sacro-Iliac Joint among Low Back Pain Patients Attending at CRP**". Through this study I will find the effectiveness of Tilt Manipulation in Sacro-Iliac Joint along with other physiotherapy for the treatment of Low Back Pain. If I can complete this study successfully, patients may get benefits who are suffering from low back pain.

To fulfill my research project, I need to collect data. So, you can be a respected participant of this research. I want to meet you a couple of sessions, during your regular therapy schedule. Given that exercises would be pain free and safe for you.

I would like to inform you that this is a purely academic study and will not be used for any other purposes. I assure that all data will be kept confidential. Your participation will be voluntary. You may have the rights to withdraw consent and discontinue participation at any time of the experiment. You also have the rights to answer a particular question that you don't like.

During continue this research, please do not take any pain killer.

If you have any query about the study or right as a participant, you may contact with researcher S.M. Joynul Abedin or Mohammad Habibur Rahman, Assistant Professor of Physiotherapy, BHPI, CPR, Savar, Dhaka-1343.

Do you have any questions before I start?

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

Yes ☐ No ☐

Signature of the participant and Date…….

Signature of the researcher and Date……..

Signature of the witness and Date……..

প্রশ্নাবলী (বাংলা)

পর্ব-ক (১):ব্যক্তিগত তথ্যাবলী

এই প্রশ্নপত্রটি গড়ে তলা হয়েছে কোমর ব্যাথার রোগীদের ব্যথা পরিমাপ করার জন্য। ব্যক্তিগত তথ্যাবলী অংশটি রুগী কিন্তু বিশেষ বিবেচনায় ফিজিওথেরাপিস্ট কালো/নীল কলমের দ্বারা পূরণ করবেন। সঠিক জবাবটির বাম পার্শে টিক (V)চিহ্নদিন।

রোগীর কোড নং তারিখ:

১. রোগীর নাম:

২. বয়স:

৩. লিঙ্গ: i. পুরুষ ii. মহিলা

৪. ঠিকানা:

গ্রাম : পোস্ট অফিস :

থানা : জেলা :

মোবাইল নম্বর : ই-মেইল :

৫ পেশা:

i. গৃহিণী
ii. চাকুরীজীবী
iii. ব্যবসায়ী
iv. অবসরপ্রাপ্ত
v. ছাত্র
vi. অন্যান্য

পর্ব-ক (২): বৈষয়িক তথ্যাবলী

১. কি সমস্যার কারণে আজ আপনি ফিজিওথেরাপিস্ট এর কাছে এসেছেন? সঠিক জবাবটির বাম পার্শে টিক (√)চিহ্নদিন।

i. ব্যথা

ii. অস্বস্তিকর অবস্থা

iii. সাম্প্রতিক আঘাত

২. আপনার বর্তমান কোমরের সমস্যা কতদিন ধরে? _____

৩. আপনার কোমরের কোন পাশে সমস্যা? সঠিক জবাবটির বাম পার্শে টিক (√)চিহ্নদিন।

i. ডান

ii. বাম

iii. উভয়

৪. ০-১০ ক্রমের একটি স্কেলে আপনার ব্যথা কে কত নম্বর দিয়ে সনাক্ত করবেন?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে শূন্য (০) মানে কোন ব্যথানেই,দশ (১০) মানে তীব্র ব্যথা।

৫. কোন অবস্থায় আপনার সমস্যা বেশী অনুভূত হয়? সঠিক জবাবটির বাম পার্শে টিক (√)চিহ্নদিন।

i. বসে থাকলে

ii. দাঁড়িয়ে থাকলে

iii. উভয় অবস্থায়

iv. হাটা চলা করলে

৬.আপনার ব্যথা কি কোমরে থেকে নিতম্ভের বা উরুর পেছনের দিকে যাই? সঠিক জবাবটির বাম পার্শে টিক (√)চিহ্নদিন।

i. হ্যাঁ

ii. না

৭. আপনার মেরুদণ্ড বা কোমরে কখনও ভেঙ্গে যাওয়ার ঘটনা আছে? সঠিক জবাবটির বাম পার্শে টিক (√)চিহ্নদিন।

i. হ্যাঁ

ii. না

৮. আপনার সমস্যাটির অগ্রগতি কেমন? সঠিক জবাবটির বাম পার্শে টিক (√)চিহ্নদিন।

i. উন্নতির দিকে

ii. অবনতির দিকে

iii. অপরিবর্তিত

৯. আপনার কাজের কত শতাংশ নিম্নের অবস্থায় করেন?

- দাঁড়িয়ে _____% এবং
- বসে _____%

১০. আপনার বর্তমান সমস্যার কারণে আপনি কী কী কাজ উপভোগ করতে পারছেন না?_____

_____

১১. এখানে আসার আগে পর্যন্ত আপনি কী কী ধরনের চিকিৎসা নিয়েছেন? (সঠিক জবাবটির বাম পার্শে টিকচিহ্নদিন)

i. ব্রেস

ii. ফিজিওথেরাপি

iii. বরফ চিকিৎসা

iv. ইনজেকশন

v. মেরুদণ্ডের/অস্থিসন্ধির বিশেষ চিকিৎসা (অপারেশন)

vi. প্রদাহ নিরোধকারী পথ্য

vii. কবিরাজি চিকিৎসা বা ঝাড়-ফুঁ করা

১২. যদি নিয়ে থাকেন, তবে তা কত দিন যাবত নিয়েছেন?_____

১৩. কি করলে ব্যথা কম বোধ করেন? _____

১৪. কি করলে ব্যথা বেশী বোধ করেন? _____

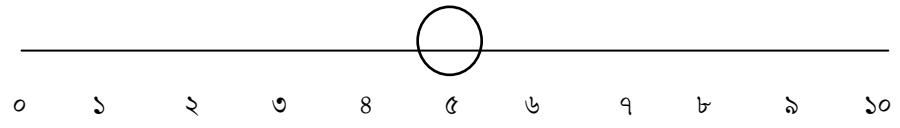
চিকিৎসাপূর্বে ব্যথার পরিমান

পর্ব-খ: ব্যথার পরিমাণ।

এই প্রশ্নাবলীসেক্রো-ইলিয়াক অস্থিসন্ধির সমস্যার কারনে, কোমর ব্যথার রোগীদের জন্য পরিকল্পনা করা হয়েছে। প্রশ্নপত্রের এই অংশটি রোগী নিজে পূরণ করবেন কালো না নীল করম দ্বারা। রোগীর কোন প্রশ্নের মানে বুঝতে না পারলে, ফিজিওথেরাপিস্টকে নির্দিষ্ট অংশেরঅর্থ পরিষ্কার করতে অনুরোধ করা হল।

সরলরেখা ব্যথা পরিস্থিতি উপস্থাপন করে, বাম হাত দিকে শূন্য (০) কোন ব্যথা এবং ডান হাত দিকে দশ (১০) তীব্র ব্যথা প্রতিনিধিত্ব করে। নিম্নলিখিত প্রশ্নে আপনার ব্যথার পরিমান লাইন চিন্হিত করুন। আপনার উত্তর দেয়ার সুবিধার্থে একটি নমুনা দেয়া হল।

ধরুন, কোন প্রশ্নের জবাবে আপনার ব্যথার পরিমাণ সহনীয় বলে মনে করছেন যেটা সংখ্যাসূচক ব্যথা নির্ধারক স্কেলে ৫ এ অবস্থান করে। এখন আপনার উত্তর যদি ৫ হয় তাহলে কলম দিয়ে স্কেলের ৫ চিহ্নিত অংশে নিম্নে দেখানো পদ্ধতিতে বৃত্ত আঁকুন।



১. বিশ্রামরত অবস্থায় আপনার ব্যথার পরিমান কত ?

---

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে, শূন্য (০) মানে কোন ব্যথানেই, দশ (১০) মানে তীব্র ব্যথা।

২. দাঁড়ানো অবস্থায় আপনার ব্যথার পরিমান কত?

---

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে, শূন্য (০) মানে কোন ব্যথানেই, দশ (১০) মানে তীব্র ব্যথা।

৩. অতিরিক্ত সময় (১০ মিনিটের বেশী) দাঁড়িয়ে থাকলে আপনার ব্যথার পরিমান কত?

---

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে, শূন্য (০) মানে কোন ব্যথানেই, দশ (১০) মানে তীব্র ব্যথা।

৪. হাঁটার সময় (৬ মিনিটের বেশী) আপনার ব্যথার পরিমান কত?

---

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে, শূন্য (০) মানে কোন ব্যথানেই, দশ (১০) মানে তীব্র ব্যথা।

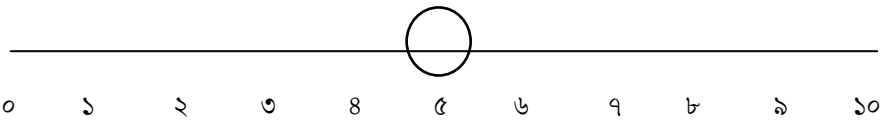
চিকিৎসা পরবর্তী ব্যথার পরিমান

পর্ব-খ: ব্যথার পরিমান

এই প্রশ্নাবলীসেক্রো-ইলিয়াক অস্থিসন্ধির সমস্যার কারনে, কোমর ব্যথার রোগীদের জন্য পরিকল্পনা করা হয়েছে। প্রশ্নপত্রের এই অংশটি রোগী নিজে পূরণ করবেন কালো না নীল করম দ্বারা। রোগীর কোন প্রশ্নের মানে বুঝতে না পারলে, ফিজিওথেরাপিস্টকে নির্দিষ্ট অংশেরঅর্থ পরিষ্কার করতে অনুরোধ করা হল।

সরলরেখা ব্যথা পরিস্থিতি উপস্থাপন করে, বাম হাত দিকে শূন্য (০) কোন ব্যথা এবং ডান হাত দিকে দশ (১০) প্রতিনিধিত্ব করে তীব্র ব্যথা মানে প্রতিনিধিত্ব করে। নিম্নলিখিত প্রশ্নে আপনার ব্যথার পরিমান লাইন চিন্হিত করুন। আপনার উত্তর দেয়ার সুবিধার্থে একটি নমুনা দেয়া হল।

ধরুন, কোন প্রশ্নের জবাবে আপনার ব্যথার পরিমাণ সহনীয় বলে মনে করছেন যেটা সংখ্যাসূচক ব্যথা নির্ধারক স্কেলে ৫ এ অবস্থান করে। এখন আপনার উত্তর যদি ৫ হয় তাহলে কলম দিয়ে স্কেলের ৫ চিহ্নিত অংশে নিম্নে দেখানো পদ্ধতিতে বৃত্ত আঁকুন।



১. গত ৬ সেশন চিকিৎসার পর, বিশ্রামরত অবস্থায় আপনার ব্যথার পরিমান কত?

---

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে, শূন্য (০) মানে কোন ব্যথানেই, দশ (১০) মানে তীব্র ব্যথা।

২. গত ৬ সেশন চিকিৎসার পরচিকিৎসার পর, দাঁড়ানো অবস্থায় আপনার ব্যথার পরিমান কত?

---

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে, শূন্য (০) মানে কোন ব্যথানেই, দশ (১০) মানে তীব্র ব্যথা।

৩. গত ৬ সেশন চিকিৎসার পরচিকিৎসার পর, অতিরিক্ত সময় (১০ মিনিটের বেশী) দাঁড়িয়ে থাকলে আপনার ব্যথার পরিমান কত?

---

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে, শূন্য (০) মানে কোন ব্যথানেই, দশ (১০) মানে তীব্র ব্যথা।

৪. গত ৬ সেশন চিকিৎসার পরচিকিৎসার পর, হাঁটার সময় (৬ মিনিটের বেশী) আপনার ব্যথার পরিমান কত?

---

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে, শূন্য (০) মানে কোন ব্যথানেই, দশ (১০) মানে তীব্র ব্যথা।

Questionnaire (English)

SECTION-A: Subjective Information

This questionnaire is developed to measure the pain of the patient with Sacro-iliac Joint Dysfunction, and this section will be filled (V) mark in the left of point by, patients but in special consideration physiotherapist using a black or blue pen.

Code No:

Date:

1. Patients name:

2. Age:

3. Sex:

i. Male

ii. Female

4. Address:

Village:	Post office:
Police station:	District:
Mobile number:	E-mail:

5. Occupation:

i. Housewife

ii. Service Holder

iii. Businessman

iv. Retires

v. Student

vi. Others

1. What is the main issue that brought you in today? (V) mark in the left of point.

i. Pain

ii. Deformity

iii. Recent Injury

2. How long has the current problem been going on? _____

3. Which side is involved? (V) mark in the left of point.

i. Right

ii. Left

iii. Both

4. On a scale of zero (0) to ten (10), what is the level of pain? _____

0 1 2 3 4 5 6 7 8 9 10

Here, zero (0) means no pain, ten (10) means severe pain.

5. Does this affect you mainly while? (V) Mark in the left of point

i. Standing

ii. Sitting

iii. Both

iv. When walking

6. Is your pain referred towards the buttock? (V) mark in the left of point

i. Yes

ii. No

7. Do you have any fracture around spine or sacro-iliac joint? (V) mark in the left of point

i. Yes

ii. No

8. Is the problem? (V) mark in the left of point

i. Improving
ii. Worsening
iii. Staying the same

9. What % of sitting ____ and standing ____ do you have at work?

10. What activities you can unable to enjoy as a result of this problem?

11. What treatments that you have tried until? (V) Mark in the left of point

i. Brace
ii. Physical Therapy
iii. Ice
iv. Injection
v. Surgery
vi. Anti-inflammatory drugs
vii. Traditional treatment

12. If you take any intervention, then how long you take that intervention/treatment?_____

13. What improves your pain? _____

14. What worsens your pain? _____

Before Treatment

SECTION-B: Pain Status

This questionnaire is designed for measure the pain of the patient with Sacro-iliac Joint Dysfunction.

This portion of questionnaire will be filled by the patient using a black or blue colored ball pen. If the patient struggles to understand the meaning of a question, physiotherapist is requested to clear the meaning of certain portions.

1. How severe your pain is at resting position?

0 1 2 3 4 5 6 7 8 9 10

Here, zero (0) means no pain, ten (10) means severe pain.

2. How severe is your pain during standing?

0 1 2 3 4 5 6 7 8 9 10

Here, zero (0) means no pain, ten (10) means severe pain.

3. How severe is your pain while standing in long time (more than 10 minutes)?

0 1 2 3 4 5 6 7 8 9 10

Here, zero (0) means no pain, ten (10) means severe pain.

4. How severe is your pain while walking (more than 6 minutes)?

0 1 2 3 4 5 6 7 8 9 10

Here, zero (0) means no pain, ten (10) means severe pain.

After Treatment

SECTION-B: Pain Status

This questionnaire is designed for measure the pain of the patient with Sacro-iliac Joint Dysfunction.

This portion of questionnaire will be filled by the patient using a black or blue colored ball pen. If the patient struggles to understand the meaning of a question, physiotherapist is requested to clear the meaning of certain portions.

1. How severe your pain at rest, after 6 section treatment?

0 1 2 3 4 5 6 7 8 9 10

Here, zero (0) means no pain, ten (10) means severe pain.

2. How severe is your pain during standing, after 6 section treatment?

0 1 2 3 4 5 6 7 8 9 10

Here, zero (0) means no pain, ten (10) means severe pain.

3. How severe is your pain in long time standing (more than 10 minutes), after 6 section treatment?

0 1 2 3 4 5 6 7 8 9 10

Here, zero (0) means no pain, ten (10) means severe pain.

4. How severe is your pain in walking (more than 6 minutes), after 6 section treatment?

0 1 2 3 4 5 6 7 8 9 10

Here, zero (0) means no pain, ten (10) means severe pain.

Statistical tests

Mann-Whitney U test:

This test is used for the analysis of the result of experimental study which has two different un-matched groups of subjects. The Mann-Whitney U test is a non-parametric test that is simply compares the result obtained from the each group to see if they differ significantly. This test can only be used with ordinal or interval/ ratio data.

The formula of Mann-Whitney *U*-test:

$$U = n_1 n_2 + \frac{n_x(n_x + 1)}{2} - T_x$$

n_1 = the number of the subjects in trail group

n_2= the number of the subject in control group

n_x= the number of the subjects of the group with larger rank total

T_x= the larger rank total

The end results after six sessions of intervention on neumeric pain rating scale pain at rest between trail group and control group are shown in the table

Subjects	Experimental group	Rank	Subjects	Control group	Rank
E1	1	3.5	C1	3	8
E2	1	3.5	C2	0	0
E3	1	3.5	C3	2	8.5
E4	1	3.5	C4	2	8.5
E5	1	3.5	C5	1	3.5
Rank total =21.5			**Rank total = 37.5**		

Table-9 U test calculation pain on Numeric pain ratingscale at rest between trial and control groups

Where,

$n_1 = 5$,

$n_2 = 5$,

$T_x = 22.5$,

$n_x = 5$

Now formula is,

$$U = n_1 n_2 + \frac{n_x(n_x + 1)}{2} - T_x$$

$$U = 5 \times 5 + \frac{5(5 + 1)}{2} - 37.5$$

$$U = 25+15-37.5$$

$$U = 2.5$$

U value 2.5 the criteria value of *U* at $p \leq 0.05$ is 4. Therefore the result is significant at $p \leq 0.05$ at one tailed hypothesis. So, difference is statistically significant.

The end results after six sessions of intervention onneumeric pain rating scalepain at standing between trail group and control group are shown in the table

Subjects	Experimental group	Rank	Subjects	Control group	Rank
E1	2	3	C1	4	9.5
E2	3	6.5	C2	3	6.5
E3	2	3	C3	3	6.5
E4	1	1	C4	3	6.5
E5	2	3	C5	4	9.5
		Rank total =16.5			**Rank total = 38.5**

Table-10 U test calculation pain on Numeric pain ratingscale at standing between trial and control groups

Where,

$n_1 = 5$,

$n_2 = 5$,

$n_x = 5$,

$T_x = 32$

Now formula is,

$$U = n_1 n_2 + \frac{n_x(n_x + 1)}{2} - T_x$$

$$U = 5 \times 5 + \frac{5(5 + 1)}{2} - 38.5$$

$$U = 25+15 - 38.5$$

$$U = 1.5$$

U value 1.5 the criteria value of *U* at $p \leq 0.05$ is 4. Therefore the result is not significant at $p \leq 0.05$ at one tailed hypothesis. So, difference is statistically significant.

The end results after six sessions of intervention onneumeric pain ratingscale pain at long time standing between trail group and control group are shown in the table

Subjects	Experimental group	Rank	Subjects	Control group	Rank
E1	1	2	C1	1	2
E2	2	6	C2	2	6
E3	2	6	C3	3	9.5
E4	1	2	C4	2	6
E5	2	6	C5	3	9.5
		Rank total = 22			**Rank total = 33**

Table-11 U test calculation pain on Numeric pain ratingscale at long time standing between trial and control groups

Where,

n_1 =5,

n_2 =5,

n_x=5,

T_x=38.5

Now formula is,

$$U = n_1 n_2 + \frac{n_x(n_x + 1)}{2} - T_x$$

$$U = 5 \times 5 + \frac{5(5 + 1)}{2} - 33$$

$$U = 25+15 - 33$$

$$U = 7$$

U value 7. The criteria value of *U* at $p \leq 0.05$ is 4. Therefore the result is not significant at $p \leq 0.05$ at one tailed hypothesis. So, difference is statistically not significant.

The end results after six sessions of intervention onneumeric pain ratingscale pain at six minute walking testbetween trail group and control group are shown in the table

Subjects	Experimental group	Rank	Subjects	Control group	Rank
E1	2	2.5	C1	4	9
E2	3	6	C2	3	6
E3	2	2.5	C3	3	6
E4	1	1	C4	3	6
E5	3	6	C5	5	10
		Rank total = 18			**Rank total = 37**

Table-12 U test calculation pain on Numeric pain ratingscale at six minute walking test between trial and control groups

Where,

n_1 =5,

n_2 =5,

n_x=5

T_x= 37

Now formula is,

$$U = n_1 n_2 + \frac{n_x(n_x + 1)}{2} - T_x$$

$$U = 5 \times 5 + \frac{5(5 + 1)}{2} - 37$$

$$U = 25+15 - 37$$

$$U = 3$$

U value 3. The criteria value of *U* at $p \leq 0.05$ is 4. Therefore the result is significant at $p \leq 0.05$ at one tailed hypothesis. So, difference is statistically significant.

Permission letter

August 31, 2015

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

CRP-Chapain, Savar, Dhaka-1343.

Through: Head, Department of Physiotherapy, BHPI.

Subject: Seeking permission to collect data for research project.

Dear Sir,

With due respect and humble submission I beg to state that, I am S.M. Joynul Abedin, student of 4th professional B.Sc. in Physiotherapy at Bangladesh Health Profession Institute (BHPI). As per approval of ethical review committee of BHPI, I would like to conduct a research project on **"Efficacy of Tilt Manipulation in Sacro-Iliac Joint among Low Back Pain Patients Attending at CRP"**. In order to accomplish this study, Mohammad Habibur Rahman, Assistant Professor of Physiotherapy has been supervising me. In addition, this research project is the partial requirement for the degree of B.Sc. in Physiotherapy. I want to collect necessary data from the patients attending at musculoskeletal outpatient department of Physiotherapy. Therefore I need your kind written permission to start data collection. I would like to assure that ethical principles would be followed as per guidelines of this institution/department.

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

Forwarded
H Sib 31.8.15

may be allowed for data collection
31/08/15

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

Sincerely Yours,

S.M. Joynul Abedin

S.M. Joynul Abedin

Student of 4th Professional B.Sc. in Physiotherapy

Session: 2010-2011

Bangladesh Health Professions Institute (BHPI)

CRP-Chapain, Savar, Dhaka-1343.

Permission has given, please contact with Mr. Shahidul Islam and Mr. Parvez Islam, as a counterpart of this data collection process

31/08/15

Mohammad Habibur Rahman
Assistant Professor &
Head of Physiotherapy Dept.
CRP-Chapain, Savar, Dhaka-1343