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EFFECTIVENESS OF LASER IN THE MANAGEMENT OF PROLAPSED LUMBER INTERVERTEBRAL DISC

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DECLARATION

I declare that the work presented here is my own. All source used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of the study. I would be bound to take written consent from my supervisor.

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Abbreviations

SAIC	: Student admission information center
SCMST	: SAIC College of medical science and technology
DU	: Dhaka University
BPT	: B.Sc. in Physiotherapy
LASER	: Light Amplification by the stimulated emission of radiation
PLID	: Prolapsed lumber intervertebral disc
ADL	: Activities of daily living
ROM	: Range of motion
ODI	: Oswestry disability index
LT	: Laser therapy
LLLT	: Low level laser therapy
HLLT	: High level laser therapy
CLBP	: Chronic low back pain
VAS	: Visual analogue scale
MODQ	: Modified Oswestry Disability Questionnaire
WHO	: World Health organization
WALT	: World Association of Laser Therapy
NSCLBP	: Nonspecific chronic low back pain
CCD	: Chronic compression of dorsal root ganglion
DDG	: Dorsal root ganglion
ATP	: Adenosine triphosphate
OA	: Osteoarthritis
RCTs	: Randomised Controlled trials
LBP	: Low back pain

List of figures

Abstract

Purpose: The purpose of the study was to identify the effectiveness of LASER in the management of PLID. **Methodology:** The study was performed in randomised control trail. The study was conducted on PLID patients. The sample was collected through systemic sampling procedure and the samples sizes were 12. The data was collected from Saic Physiotherapy and Rehabilitation centre and Physio for You physiotherapy and rehabilitation centre, Ashulia, Dhaka. The data was collected through questionnaire with face to face interview. The questions were structured and some close ended and some open ended. Data was analyzed with Microsoft Office Excel 2010 using SPSS 25 version software program. **Result:** Among 12 participants in which 6 were in control group and 6 were in experimental group. Participants of control group were received conventional physiotherapy treatment and experimental group were received LASER therapy with conventional physiotherapy treatment. The significance level of pain intensity in sitting, bending, sit to stand, walking, ADL, travelling and sleeping were respectively p<.026, .020, .024, .041, .034, .026, .026, .020 in experimental group where the Z value from Wilcoxon signed rank test values were respectively 2.226, 2.333, 2.271, 2.042, 2.121, 2.226, 2.220, 2.333 and in control group p<.027, .026, .024, .042, .074, .045, .038, .038 and Z values were 2.214, 2.226, 2.264, 2.032, 1.787, 2.003, 2.070, 2.070. The significance in range of motion in lumber flexion, extension, side gliding were respectively p<.157, .854, .221 in experimental group and Z values were 1.414, .184, 1.225 and .593 in control group p<.414, .131, .593 where Z values were .816, 1.512, .535. There was observed improving changes in flexion and side gliding not in extension. The ODI score was also significantly changed. In control group ODI score found p<.026 where Z value was 2.207 and in experimental group p<.027 where Z value 2.226. In experimental group after treatment a significant change was seen in ODI score, pain intensity in different condition, ROM, socio demographic factors that was better than the changes occurred in control group mostly. **Conclusion:** PLID is very common. But there is need to add more alternative treatment facilities so that do not require the operation. Conventional physiotherapy treatments are beneficial in a wide range for this condition but from this study found that conventional physiotherapy with LASER very useful to treat PLID rather than only conventional physiotherapy.

Key words: LASER, PLID, ROM, ODI score.

Chapter: I Introduction

Background 1.1

Vertebral disc is made up of the outer tough annulus fibrosis and the inner gel like nucleus pulposus and the annulus fibrosis generally undergoes degenerative changes and the inner nucleus pulposus protrudes out, degenerative disc disease and aging both can lead to disc degeneration and this condition is known as disc prolapse or commonly slipped disc (Alayat et al., 2013). The highest percentages of patient have the pain because of bulging disc regarding for at least 40% in various series (Dall'oloi et al., 2014). Prolapsed disc is influencing in our community as most of the people earn their living through stressful works which leads them to spinal injuries and ultimately leading to disc prolapse and disc prolapse is mostly occur posterior-lateral due to the presence of posterior longitudinal ligament; however, central disc herniation does occur and in greater number (95%) of disc prolapses occurs in lumbar region at the level of L4/L5 or L5/S13 (Alayat et al., 2013). Whenever it occurred, one or can be more than one of the nerve of the spine may undergo pressure (Li et al., 2015).Professionals usually sitting for prolong period in the offices, smoking, weight lifting, trauma and driving are all at a greater risk for disc prolapse on the other hand age is the common thing as it is related to wear and tear of the disc as per to the most authors, degenerative diseases are more important cause of disc prolapse than trauma (Alayat et al., 2013). As per the statistic of WHO, PLID has become the major reason of disability of life in both developed and developing countries (Li et al., 2015). Professional athletes are very prone to disc injuries, backache due to pressure on ligaments, and sciatica, due to compression of nerves, mostly forms the initial presentation of the disc prolapse in a wide range and the life time incidence of sciatica occurs has been reported from 13 to 40% in the general population (Alayat et al., 2013).Prolapse of the lumbar intervertebral disc (PLID), frequently confronted in clinic, and may often induce low back and/or leg pain. The outbreak is 1.9%–7.6% in men, and 2.2%-5.0% in women. For the patients who have been already treated by conservative therapies with no symptomatic relief, the surgical removal of nucleus pulposus and the intervertebral fusion are usually consulted (Junaid et al., 2016). Low back pain prone to prolapse of lumbar intervertebral discs (PLID) is a major cause of

morbidity. Its lifetime menifestation is 60 to 80%, with a true sciatica rate of 5% in men and 4% in women (Xiu et al., 2008). Both surgical and non-operative patients tasted significant improvement over time and intent-to-treat analyses showed no significant differences between the randomized groups for the primary outcome measures (Weinstein et al., 2006). Laser therapy (L\T) alleviates the inflammatory conditions without adverse consequences by reducing pain and swelling and supporting the repair of the tissue (Ann rehabil Med., 2018). Laser therapy significantly enhances microcirculation, activates angiogenesis, and stimulates immunological processes and nerve regeneration. Moreover, it has an analgesic effect through stimulating an raised production of endorphins. It is capable to animate areas that are difficult to reach with the low-power laser, such as the large and/or deep joints (Alayat et al., 2013). The new medical therapeutic method of low label laser therapy (LT) uses low-energy-lasers or light-emitting diodes to animate or avert cellular function. Low level laser (LLL) is used inn wide range by specialists to treat non-healing ulcers, autoimmune diseases, acute and chronic musculoskeletal pains, chronic inflammations, hemangiomas and burns. It has already been mesmerized to be useful in treatment of peripheral and central nervous system injuries, musculoskeletal injuries, Buerger disease and sympathetic nervous system dysfunction. LLL is also favored to deal chronic impaired hearing, sudden sensorineural hearing impairment, Meniere disease and some other balance disorder (Montazeril et al., 2017). The favorable upshots of reduction in pain and inflammation process without any significant side effect justifies the use of laser therapy as an adjunct in chronic low back pain (NaMbi et al., 2018). Laser therapy also reponsed to act on peripheral neural stimulation and the regulation of microcirculation, interrupting pain mechanism and promoting analgesia. The normalization of microcirculation and the receptivity of neural transmission obtained through laser therapy have been narrated as responsible for the interruption of the vicious circle that gives rise to and perpetuates pain (carvalho et al., 2012). High-intensity laser therapy (HILT), also recognised as laser heat therapy, is an even more recent development; initial publications appeared in 2011. Laser therapy entangles a simple, non-invasive, “point-and-shoot” technique which can be represented by technicians. These effects lead to raised cell proliferation and migration by fibroblasts; reduction in the levels of cytokines, growth factors, leading to enhanced control of the inflammatory process, reduced pain, and improved wound healing (White et al., 2017).

Justification 1.2

In this country's perspective mainly a PLID patient get medication and operated by physician but Physiotherapy intervention has also a great role to prevent PLID and restore the functions maximizing the ability to perform daily life. So evidence based physiotherapy is important to build up the liability to the patients also professionals. Different Physiotherapy approaches and techniques play an important role in the treatment and improvement of symptoms in patients with PLID. But the main concentration of this study is to find out the evidence using LASER therapy with conventional Physiotherapy for the improvement of prolapsed lumber intervertebral disc condition. This will help us to find out the gaps we have and to generate a good reference for upcoming cases also for the professionals. Meanwhile laser therapy and its effects are not well known to the commoners in our country. As the medical profession and its treatment ways are developing day by day laser needs to be introduced properly about its advantages to people for their benefits. And finally this study will help to find out the effectiveness of laser in the management of PLID.

Hypothesis and Null-Hypothesis 1.3

Hypothesis

Laser therapy along with the conventional Physiotherapy is more effective than only conventional Physiotherapy for the treatment of prolapsed lumber intervertebral disc ($H_A > H_O$).

Ha: $\mu 1 - \mu 2 \neq o$, $\mu 1 < \mu 2$

Null-Hypothesis

Laser therapy along with the conventional Physiotherapy is not effective than the conventional Physiotherapy alone for the treatment of prolapsed lumber intervertebral disc ($H_O \neq H_A$).

Ho: $\mu 1 - \mu 2 = 0$ or $\mu 1 \geq \mu 2$;

Where,

Ho= Null hypothesis

Ha= Alternative hypothesis

$\mu 1$= Mean difference in initial assessment

$\mu 2$= Mean difference in final assessment

Objectives 1.4

1.4.1 General objective

Effectiveness of laser in the management of prolapsed lumber intervertebral disc

1.4.2 Specific objectives

To explore the socio demographic factors of the participants;

To identify the disability score between the patients who get conventional physiotherapy and who get conventional therapy with laser therapy in the patient of PLID;

To compare the activities of daily living among the patients who get conventional physiotherapy and who get conventional therapy with laser therapy of PLID patient

To evaluate the pain intensity.

Operational definition 1.5

LASER

A **laser** is a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation. The term "**laser**" originated as an acronym for "light amplification by stimulated emission of radiation".

PLID

A **prolapsed lumber intervertebral disc** is a technical term for what is commonly called a slipped disc. These disc**s** are placed between each of the vertebrae of the spine and pose as shock absorbers. When the fibrous outer part of the dis**c** breaks, it allows the gel-like core to bulge outwards.

ROM

Range of motion is the measurement of movement around a joint. Passive range of motion requires full assistance for an individual to move their joint. Active-assistive requires partial assistance, and active range of motion is when the client is able to move their joint independently.

ADL

Activities of daily living is the term which is used in individual health care that refers to the people's daily life self-management or care activities like eating, bathing, toileting, dressing, transferring etc.

Osteoarthritis

Sometimes it is also called degenerative joint disease or "Wear and tear" arthritis, Osteoarthritis is the most common chronic condition of joints. It occurs when the cartilage or cushion between joint breaks down to leading pain, stiffness and swelling.

Low back pain

Common causes of low back pain (lumber backache) include lumber strain, nerve irritation, lumber radiculopathy, bony encroachment and conditions of the bone and joints. The condition is characterized by localized discomfort the low back area with onset after an even that mechanically stressed the lumber tissues.

Conceptual framework 1.6

Independent variables

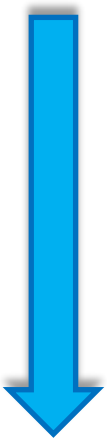
Factors of socio demographic

Age, occupation, living area, education, family type, monthly income, religion.

Factors of pain and functional activities

Intensity of pain, range of motion, activities of daily livings.

Dependent variable



LASER

Chapter: II Literature review

The outbreak rate of low back pain in a number of studies ranged from 22% to 65% in only one year and the lifetime outbreak ranged from 11% to 84% and worldwide it was found by stating that herniated disc or nucleus palposus is one of the major causes of low back pain in which various kinds of treatment modalities for herniated disc has been included conservative management, minimally invasive procedures such as intradiscal steroid, chemonucleolysis, inntradiscal decompression, annuloplasty and surgical management (DAS., 2009). Non-invasive conservative treatment procedures nowadays have been the first choice in most of cases, but when the patients do not respond much, minimally invasive percutaneous measures or surgery have been warranted and the attainment rate of lumber disc surgeries ranges from 49% to 95%. Therefore, there many are continuously studying to search for safer alternative methods. (DAS., 2009).

LASER therapy had already been studied widely for many years to build up an evidence based clinical practice although many evidences had been established to deal with LASER, the effectiveness for treating many conditions it remains not well defined due to unsolved outcome from different studies (Law et al., 2014). As we know LASER is a high concentrated light beam which is noninvasive, nonionizing, monochromatic and electromagnetic and it is now-a-days widely used in various medical conditions like rheumatological and musculoskeletal disorder (Dogan et al., 2010).

LASER therapy has been added as a medicine. In this study LASER was widely discussed and one is low label laser therapy which is known as cold laser therapy, has used in USA since 2002 and another one is high intensity laser therapy that is known as heat therapy, is also beneficial in minimizing pain, disability, increasing range of motion in patients (White et al., 2017). Low label laser therapy's principles are based on photochemistry that rise via photochemical or non-thermal effect on cell (wang., 2015) .

Low-intensity laser therapy is currently used in the treatment of patients with CLBP and it is considered an effective physical therapy modality for increasing ROM and shoulder pain knee arthritis and chronic ankle pain. Fiore et al. compared the short-term effectiveness of HILT with ultrasound therapy in the treatment of low back pain.

Study participants received HILT over a period of 3 consecutive weeks and showed a significant decrease in pain levels, greater than with ultrasound treatment (Alayat et al., 2013). But it was also reported that low label laser therapy has various application in different medical condition, the exact mechanism accounting for low label laser therapy mediated pain relief had not been identified (wang et al., 2015) .Laser therapy is generally believed to alter cellular and tissue function, depending on the characteristics of the laser itself (e.g., wavelength, coherence), the pulsed Nd: YAG laser has a wavelength of 1,064nm and works in a therapeutic window that allows it to penetrate and spread more easily through tissue, as human skin does not have an adequate concentration of endogenous chromophores to efficiently absorb this wavelength and absorption at the tissue level is characterized by light diffusional directions (the scattering phenomenon), which increases the mitochondrial oxidative reaction and subsequently increases adenosine triphosphate (ATP), RNA, and DNA production. These so-called photochemistry effects result in the phenomenon of tissue stimulation, also known as the photobiology effect. When the Nd: YAG laser is used in a continuous fashion, thermal accumulation occurs (Alayat et al., 2013).

In cinar et al. reported that low label laser therapy treatment could great improving function at 3 weeks and effectively developing walking distance and also walking surface that is according to subscale of American Orthopedic Foot and Ankle society score.

Cellular chromophores are infered to be the receptor sites accountable for the beneficial effects of the laser light beam, including both cytochrome oxidase (with absorption peaks in the near-infrared range) and photoactive porphyrins. Mitochondria are also considered to be a site for the therapeutic effects of infrared light, leading to increased ATP production, modulation of reactive oxygen species, and induction of transcription factors (White et al., 2017).

On the other hand, high intensity laser therapy that has laser irradiation with higher intension HILT, the laser was used with a particular waveform, a peak power of up to 3 kW, regular peaks of elevated amplitude for a very brief duration and a very short duty cycle to decrease thermal accumulation in tissues, and to rapidly induce the deep-tissue photochemical and photothermal effects. These features resultant in greater radiation propagation in the target tissues with a very low histological risk, that leading to the possibility of treating deep tissues and structures. The photothermal

effect could be controlled for patient safety and comfort by modulating the pulse intensity and frequency. The efficacy of the pulsed Nd: YAG laser had already been proven in the treatment of many musculoskeletal diseases and it has been believed to have anti-inflammatory, anti-edema, analgesic, and reparative effects. The analgesic effect of HILT was based on different mechanisms of action, including its ability to slow the transmission of the pain stimulus and to increase the production of morphine-mimetic substances in the body. In addition, it might have a direct effect on nerve structures, which could increase the speed of recovery from conduction blocker inhibit A δ-and C-fiber transmission. The treatment using this also increases blood flow, vascular permeability, and cell metabolism. In the study it has been reported that, the effect of combined laser therapy with exercise was greater than that of placebo laser with exercise. This study also suggested that placebo treatments are important tools that may be applied by the medical community to complement regular therapies; most physicians' blind folded look on their use to be ethically permissible. However, the placebo treatment that used in clinical medicine leftovers controversial. The outcomes of this study authorized with the finding so many studies, that laser therapy gave a greater effect than sham laser in treating pain and disability, as measured by VAS and MODQ results. A systemic review that was examined the placebo effect associated with the treatment of CLBP and showed that none of the included studies could demonstrate a clinically meaningful improvement in pain and disability scores after the using of sham laser (Alayat et al., 2013).

In this study reported that laser therapy as an alternative treatment have been failed to achieve broad acceptance due to reliance on opioid containing medication to manage acute and chronic pain that is really not surprising the laser therapy was ascertained as a pain reducer and most effective treatment without any serious side effects (White et al., 2017).

According to data obtained from WHO many people in the world have been suffering from chronic pain due to many reasons and it is reflecting in physical disability that related to work activities. On the other hand, chronic pain that causing in some extent a limiting factors in better quality of life in modern society. Recent studies had shown that 10% of world population who are suffering from diffuse chronic pain and most of these are related to prolapsed lumber intervertebral disc (Carvalho et al., 2018).

Billions of dollars are being expanded all over the world every year in diagnostic, treatment, lost work days and judicial process because of the chronic pain. On the others hand, the well development of many efficient therapies are also showing an important reduction in financial cost in relation to chronic pain (Carvalho et al., 2018).

Recent some research confirms that the people who are suffering from pain, taking physical therapy, electrotherapies and they are satisfied with these types of treatment 70% participants who are going through the pain sought physical therapy and electrotherapy treatment apart from medication received great improvement in reducing pain (Carvalho et al., 2018). In this report it was also shown that they took thirty-three studies provided sufficient data to calculate effect sizes for key outcome measures using Revman (The Cochran collaboration) and it was also included in Meta -analysis. This study had also show mixed type of result as reported by the authors, there was two third positive effects reporting favored laser and one third was in conclusive (Law et al., 2014).

In this study author shown that the low label laser therapy programmer showed significant upliftment in pain severity, range of motion measurement, functional status and it has become renowned in the musculoskeletal disorder treatment and the ttreatment is very beneficial for prolapsed lumber intervertebral disc condition (Dogan et al., 2010).

In another study it was reported that, the mechanism of action for LLLT-mediated pain relief was not really fully understood. .

Several possible mechanisms were taken into consideration to count for the effects of LLLT, such as following: (a) increase endogenous opioid neurotransmitter production; (b) raised threshold to thermal pain and enhanced local circulation; (c) increased oxygen consumption by accelerating the redox reaction rate of the electron respiratory chain of mitochondria; (d) increased adenosine triphosphate (ATP) production at the cellular level; (e) increased production of anti-inflammatory cytokines. Many of the variables affected the clinical therapeutic effects of laser therapy, such as wavelength, energy density, the number of treatment session and their duration. The parameter which is wavelength was also considered an essential parameter for beneficial outcomes of LLLT; it determined the ability of a laser to penetrate tissue. Wavelengths in a range of 700-1000 nm were used for most of the time to treat deep tissues because of their superior penetration.

The recommended LLLT wavelengths per World Association of Laser Therapy (WALT) guidelines were 780-860 nm and 904 nm overhang upon the condition being treated. Previous studies results had also reported better therapeutic effects of LLLT with higher energy density, number of session and frequency of application. All the studies were conducted they used a wavelength within the recommended range. It has been well recognized that the effects of phototherapy are time-depended. We also executed this phenomenon as it was demonstrated in this meta-analysis by significant short-term but not moderate-term benefit. In the contrast to pain outcomes, they were not able find any significant improvement in disability or ROM due to LLLT. There might have several reasons for this.

For one, the cause of NSCLBP was not unclear. Usually it was hard to determine the precise etiology of the pain. Some theories suggested that NSCLBP is linked to a reflex response of the back-extensor muscles, resulting in a loss of flexion relaxation of the back muscles and a reduction of spinal flexion with secondary increased tissue strain. LLLT might relieve the pain by increasing oxygen consumption and blood supply to the muscles. With respect to duration, the effect was comparable to other interventions (e.g., antidepressants and traction), which are effective in the short term. A primary effect on muscle might explain why they did not find any significant effect of LLLT on knee osteoarthritis (OA) pain, in which the sources of pain are diverse. Moreover, NSCLBP was likely a heterogeneous group of disease, which had different etiologies but share similar symptoms. Thus, some of them might react well to LLLT while others not.

Only two studies provided data on ROM. For this outcome, negative results might relate to inadequate study power that could be overcome with more high-quality investigations with ROM. Finally, like other LBP interventions, effects on pain appeared to be stronger than effects on function. Seven years ago, Yousefi-Nooraie et al. conducted a meta-analysis of LLLT for nonspecific low back pain (NSLBP); it contained seven studies of both acute and chronic NSCLBP. The authors concluded data were insufficient to confirm the clinical effectiveness of LLLT for NLBP. Our study is more specific, focusing on NSCLBP, and is an update on this topic now demonstrating the likelihood of a beneficial effect of LLLT on low back pain. The difference in conclusions can likely be attributed to several strengths of our study (Heslerud., 2018). In this study another reported that, to verify the pain relief effects

of LLLT (Low label laser therapy), rats with CCD (chronic compression of the dorsal root ganglion) were treated with or without LLLT and monitored for the behavioral patterns associated with mechanical and thermal hyperalgesia.

In the CCD group not subjected to laser irradiation, both the mechanical and thermal thresholds were significantly decreased after 4 and 8 days of compression compared to the control group. In comparison to the CCD group, the CCD+LLLT group which was subjected to j/cm2 of laser irradiation showed significant increases in both the mechanical and thermal threshold after 4 and 8 days of laser treatment, although the increase in the mechanical threshold was not as great as in the control group. These are the findings indicated that how effectively improved pain abidance in consequence of chronic DRG compression. LLLT had been extensively employed in clinical contemplation to neutralize nerve regeneration and soothe pain. An in vivo study it was found greeting peripheral nerve injury, exceptionally those concerning sciatic nerve lesion bin rats have demonstrated that the petition of low power laser irradiation to injure to nerves set on histological and morphological alterations and develops functional release. LLLT downfallen the inflammation explanations and flatulence around compressed DRG within 4 days, which successfully downfallen the mechanical and thermal threshold in the CCD+LLLT group. Consequently, into the bargain work will be essential to regard the functional saving in day 1 to day 4 after CCD and to ordain the correlation functional saving and the manifestation levels of inflammatory cytokines (Y-J et al., 2014).

Following to the more than 4000 analysise on pub.med.gov, it could be terminated that the greater number of laboratory and clinical analysis had exhibited that low label laser therapy has a positive oucome on acute and chronic musculoskeletal pain (H.micheal 2015). Founded on the many narrations in the literature on the efficiency of LLLT for different kinds of musculoskeletal pain types and on our own onetime experiences with low label laser therapy for pain in other areas, they hypothesised that low level laser therapy (LLLT) could be a compatible treatment for pain associated with cervical disk hernia (Takahashi et al., 2012). Many more studies narrated that excellent usefullness of laser therapy in the treatment of low back pain (Fiore et al., 2011). It was also reported that LLLT enhance pain diminish concerning to changes in cell membrane permeability, vasodilation, and edema reduction, blocking the nerve fibers (Pessoa et al., 2018).

Chapter: III Methodology

3.1 Study Design

The study was designed using an experimental design quantitative research which was Randomised Control Trial (RCT). The aim of this study is to evaluate the effectiveness of physiotherapy treatment combining LASER therapy along with the Conventional physiotherapy treatment in prolapsed lumber intervertebral disc patients. This design is best for the compare to the effectiveness between the experimental and control group. LASER therapy and Conventional Physiotherapy was applied to the experimental group and only Conventional Physiotherapy was applied to the control group. The study was a single blinded technique where participants were not informed who were experimental and control grouping.

3.2 Study Area

Data was collected from the physiotherapy outdoor of Saic Physiotherapy and Rehabilitation center and physio for u physiotherapy and rehabilitation centre at Ashulia , Dhaka. Because these patients came at Saic collage of medical science and technology and physio for u rehabilitation centre.

3.3 Study Population

The study population was the patients diagnosed as PLID that referred for physiotherapy services in the physiotherapy outdoor of Saic Physiotherapy and Rehabilitation centre and physio for u physiotherapy and rehabilitation centre at Ashulia , Dhaka.

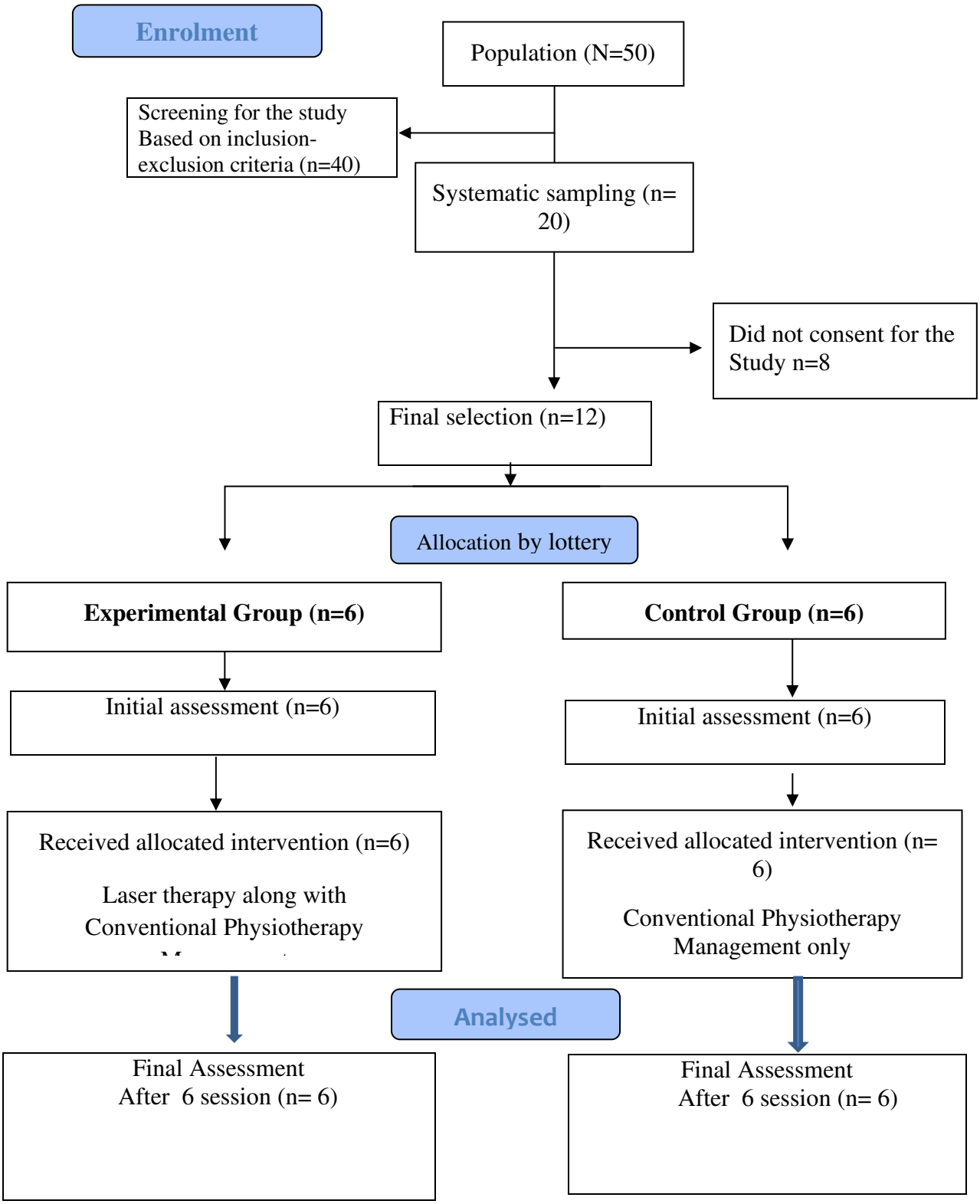
3.4 Sample Size

Sample size was 12 where 6 were in experimental group and 6 were in control group. The researcher couldn't include more subjects because of time constraint but I believe that it would be represent the picture of the study fruitfully.

3.5 Sampling Procedure

A Sampling frame was prepared by 20 total number of PLID patients. Then a Systematic sampling procedure was carried out to select the study population from the sampling frame. Among them 8 participants did not give their consent to participate in this study. Consequently 12 participants were selected for this study. Finally a simple random sampling process was followed to allocate the participants in experimental and control groups. The participants' selection procedure is shown in a given flow chart.

Flow-chart of the phases of Randomised Controlled Trial



3.6 Data Collection Tools

- Record or Data collection form
- Consent Form
- Structured questionnaire.
- Numeric pain rating scale
- Oswestry disability index questionnaire. Both open and close ended questions.
- Pen, Papers.

3.7 Data Collection Procedure

The researcher used the structured questionnaire for collecting data. In a brief, after screening the patient at department, the patients were assessed by a graduate physiotherapist. Every subject has received 6 sessions of physiotherapy treatment in 2 weeks. A pre-test (before intervention) and post-test who were completed 6^{th} sessions intervention was administered with each subject of both groups. The data was collected by using a written questionnaire form. Data was gathered by Oswestry Disability Index and structural questionnaire was used for the socio-demographic indicators and others. Bengali Questionnaires was used for easy understanding for the participants.

3.7.1 Measurement

To conduct this study, the researcher collected data through using different types of data collection tools. The researcher has used numeric pain rating scale (NPRS) for pain measurement in different working positions and also activities, Oswestry Low Back Pain Disability Questionnaire were used for disability measurement and socio-demographic information and others has collected for evaluate the status of the participants.

3.7.2 Oswestry disability index

The Oswestry disability index (ODI) was included 10 sections of questions. The sections had selected from experimental questionnaires that aimed to assess several aspects of daily living. The ODI domains were the following: pain intensity, personal care, lifting objects, walking, sitting, standing, sleeping, sex life and social life. Each section contained six statements that were scored from 0 (minimum degree of difficulty in that activity) to 5 (maximum degree of difficulty). If more than one statement was marked in each section, the highest score should be taken. The total score was obtained by summing up the scores of all sections, giving a maximum of 50 points. The ODI form is given in the appendix.

3.8 Data Analysis

Data was analysed by using SPSS version 25.00 to compute the descriptive statistics using pie chart, bar chart, linear chart diagram and also percentages and parametric tests were conducted using Wilcoxon signed rank test.

The researcher calculated the variables mean, mean difference, standard deviations and significant level to show that experimental group and control group mean difference was significantly different.

❑ Inclusion criteria 3.9

- ❖ Patients with prolapsed lumber intervertebral disc.
- ❖ Both male and female.
- ❖ Those who were motivated and given consent to include in the study.

❑ Exclusion criteria 3.10

- ❖ Patients associated with bowel and bladder incontinence
- ❖ Any history of spinal and hip surgery.
- ❖ Patients who had history of recent fracture, dislocation etc.
- ❖ Current history of psychiatric disorders or under psychological treatment.

❑ Treatment regimen 3.11

Control group	**Experimental group**	
Conventional physiotherapy	**Conventional physiotherapy**	**Laser therapy**
Postural advice	Postural advice	
McKenzie Approach	McKenzie Approach	
Soft tissue release	Soft tissue release	
Mobilization	Mobilization	
Strengthening exercise	Strengthening exercise	
Stretching exercise	Stretching exercise	
Traction	Traction	
Electrotherapeutic modalities: IRR, TENS, Hot water bag and home advice.	Electrotherapeutic modalities: IRR, TENS, Hot water bag and home advice.	

Ethical consideration 3.12

I took permission to conduct the study from saic college of medical science and technology. As I collected data also from Saic college of medical science and technology that's why took permission also for data collect and I also took permission from the physio for you physiotherapy and rehabilitation Centre Ashulia, Dhaka as I collected data also from this center.

Limitation of the study 3.13

As a student, this study conducted by my own finance. So, there might have some limitation of financial aspect within this study;

There were less time to be carried out this study and thus calculated sample couldn't be taken;

This study doesn't represent whole population within the country;

This research is a part of my academic study and I am not expert on statistical analysis. So, there might have poor analytical effect;

Only male participants were included in experimental group.

Chapter: IV Result

Table 1: Socio demographic information

Age of the participants						
Control group				Experimental group		
Value	Frequency	Percentage	Mean ±SD	Frequency	Percentage	Mean ±SD
Less than 25	1	16.7	38.33±11.725	1	16.7	48.83±2.401
25 to 35	1	16.7		4	66.7	
More than 35	4	66.7		1	16.7	
Sex of the participants						
Male	2	33.3		6	100.0	
Female	4	66.7				
Educational status of the participants						
PSC	3	50.0		1	16.7	
SSC		16.7		1	16.7	
HSC	1	33.3				
Graduate				1	16.7	
Masters				2	33.3	
Others	2			1	16.7	
Family type of the participants						
Nuclear	5	83.3		6	100	
Extended	1	16.7				
Marital status of the participants						
Married	4	66.7		6	100	
Unmarried	1	16.7				
Widowed	1	16.7				
Living area of the participants						
Rural	1	16.7		1	83.3	
Urban	2	33.3		5	16.7	
Semi urban	3	50.0				
Occupation of the participants						
Business	1	16.7		2	33.3	
Student	1	16.7				
Housewife	3	50.0				
Teacher				1	16.7	
Government service				1	16.7	
Others	1	16.7		2	33.3	
Monthly income of the participants						

Less than 11000	3	33.3	24500.00±27449.954	3	50.0	33333.33±28925.191
11000 to 22000	2	50.0		1	16.7	
More than 22000	1	16.7		2	33.3	

Table 2: Pain related information

Distribution of participants by nature of pain											
Pre control group			Post control group			Pre experimental group			Post experimental group		
Value	Frequency	Percentage	Value	Frequency	Percentage	Value	Frequency	Percentage	Value	Frequency	Percentage
Sharp	4	66.7	Sharp	1	16.7	Dull	3	50.0	Dull	3	50.0
Dull	2	33.3	Dull	2	33.3	Others	3	50.0	Others	3	50.0
			Burning	1	16.7						
			Others	2	33.3						
Distribution of participants by reference of pain											
Pre control group			Post control group			Pre experimental group			Post experimental group		
Value	Frequency	Percentage	Value	Frequency	Percentage	Value	Frequency	Percentage	Value	Frequency	Percentage
Yes	5	83.3	Yes	1	33.3	Yes	6	100	Yes	2	33.3
No	1	16.7	No	5	66.7				No	4	66.7
Distribution of participants by pain at right lower limb											
Pre control group			Post control group			Pre experimental group			Post experimental group		
value	Frequency	Percentage	Frequency	Percentage		Frequency	Percentage		Frequency	Percentage	
Yes	2	33.3	1	16.7		2	33.3		0	0	
No	4	66.7	5	83.3		4	66.7		6	100	
Distribution of participants of control group by pain at left lower limb											
Pre control group			Post control group			Pre experimental group			Post experimental group		
value	Frequency	Percentage	Frequency	Percentage		Frequency	Percentage		Frequency	Percentage	

Yes	1	83.3	2	33.3	5	83.3	2	33.3
No	5	16.7	4	66.7	1	16.7	4	66.7
Distribution of participants of control group by pain at both lower limbs								
Pre control group			Post control group		Pre experimental group		Post experimental group	
value	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Yes	2	33.3	1	16.7				
No	4	66.7	5	83.3	6	100	6	100
Distribution of participants by parenthesis to lower limb								
Pre control group			Post control group		Pre experimental group		Post experimental group	
value	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Yes	4	66.7	2	33.3	4	66.7	0	0
No	2	33.3	4	66.7	2	33.3	6	100
Distribution of participants by tingling sensation to lower limb								
Pre control group			Post control group		Pre experimental group		Post experimental group	
value	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Yes	3	50.0	0	0	3	50.0	0	0.00
No	3	50.0	6	100	3	50.0	6	100.0
Distribution of participants by pain relieved by rest to lower limb								
Pre control group			Post control group		Pre experimental group		Post experimental group	
value	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Yes	4	66.7	5	83.3	6	100	6	100
No	2	33.3	1	16.7				

Pain intensity in NPRS: 1

This figure represents that among 6 participants before 6 session of treatment 50.0% had pain intensity less than 4, 33.3% had pain intensity 4 to 7 , 16.7% had pain intensity more than 7 and after 6 session of treatment 100.0% had pain intensity less than 4.

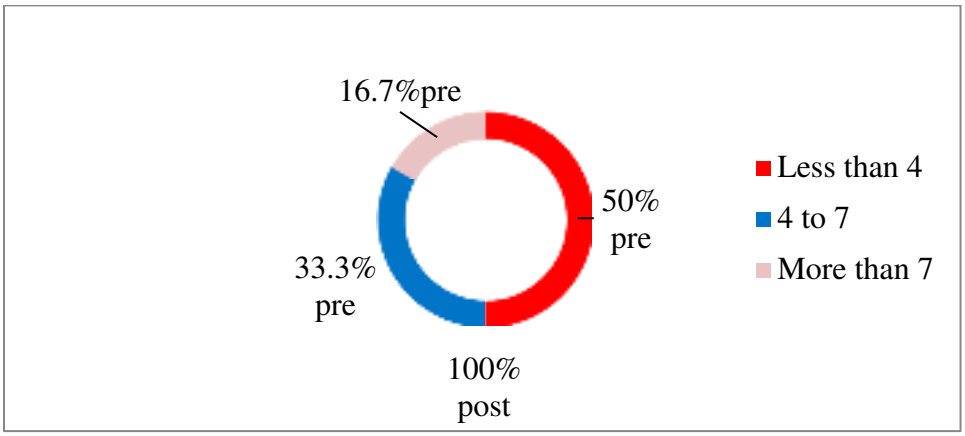


Fig no 1.1: Distribution of participants of control group by pain intensity during sitting

This figure represents that among 6 participants before 6 session of treatment 16.7% had pain intensity less than 4, 83.3% had pain intensity 4 to 7 ,0% had pain intensity more than 7 and after 6 session of treatment 100.0% had pain intensity less than 4.

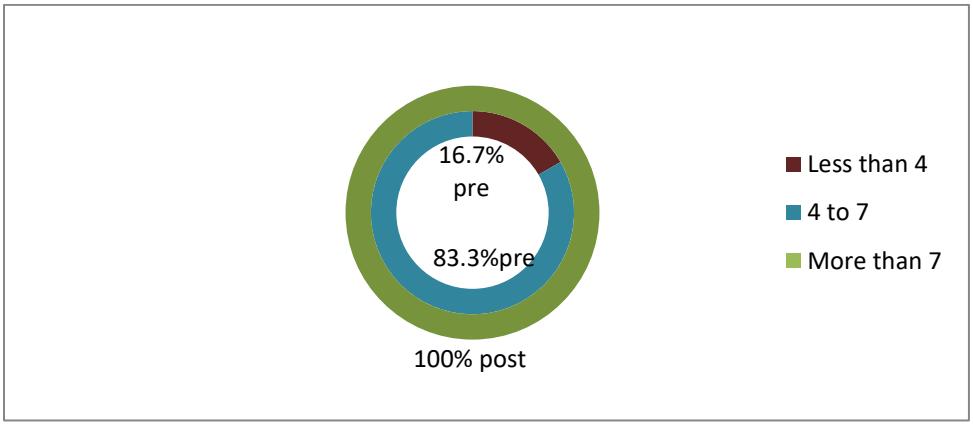


Fig no 1.2: Distribution of participants of experimental group by pain intensity during sitting

This figure represents that among 6 participants before 6 session of treatment 0% had pain intensity less than 4, 83.3% had pain intensity 4 to 7 ,16.7% had pain intensity more than 7 and after 6 session of treatment 100.0% had pain intensity less than 4.

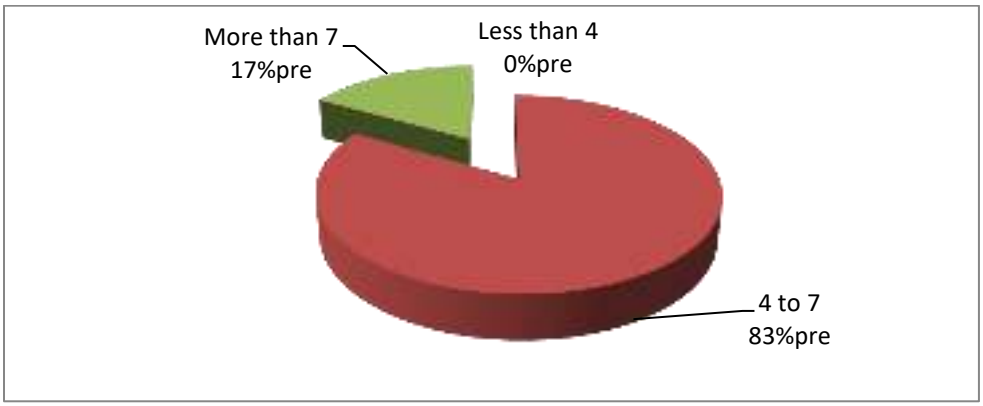


Fig no 1.3: Distribution of participants of control group by pain intensity during bending position

This figure represents that among 6 participants before 6 session of treatment 0% had pain intensity less than 4, 83.3% had pain intensity 4 to 7 ,16.7% had pain intensity more than 7 with and after 6 session of treatment 33.3% had pain intensity less than 4, 66.7% had pain intensity 4 to 7.

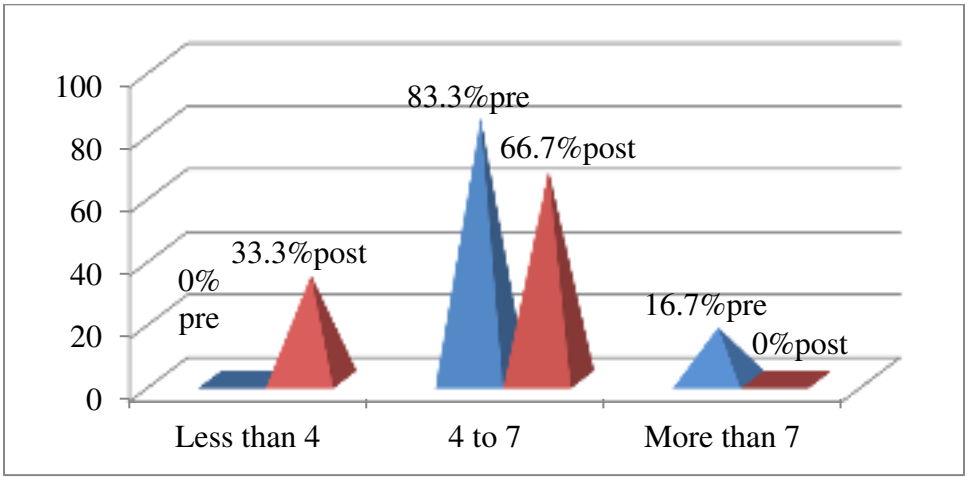


Fig no 1.4: Distribution of participants of experimental group by pain intensity during bending position

This figure represents that among 6 participants before 6 session of treatment 16.7% had pain intensity less than 4, 66.6% had pain intensity 4 to 7 , 16.7% had pain intensity more than 7 and after 6 session of treatment 100.0% had pain intensity less than 4.

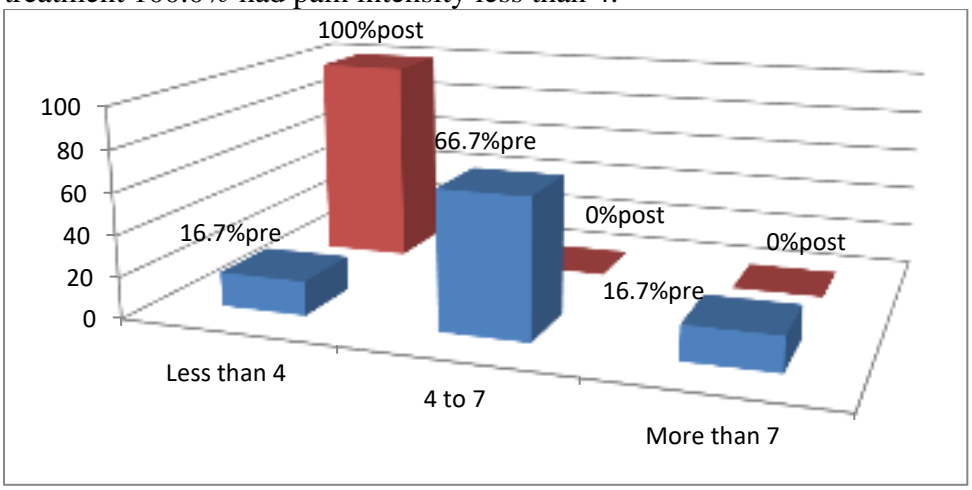


Fig no 1.5: Distribution of participants of control group by pain intensity during sit to stand

This figure represents that among 6 participants before 6 session of treatment 33.3% had pain intensity less than 4, 66.7% had pain intensity 4 to 7 ,0.00% had pain intensity more than 7 and after 6 session of treatment 100.0% had pain intensity more than 4.

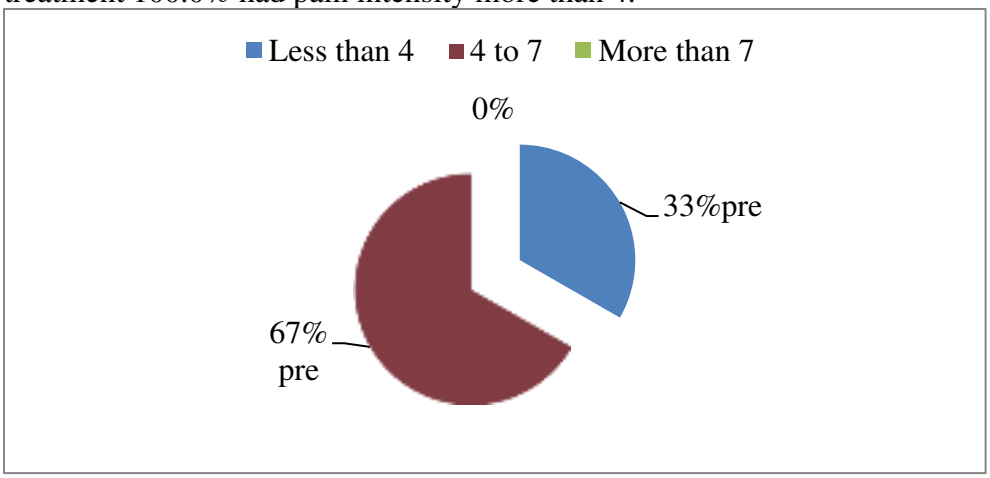


Fig no 1.6: Distribution of participants of experimental group by pain intensity during sit to stand

This figure represents that among 6 participants before 6 session of treatment 16.7% had pain intensity less than 4, 83.3% had pain intensity 4

to 7 ,0.00% had pain intensity more than 7 and after 6 session of treatment 100.0% had pain intensity less than 4.

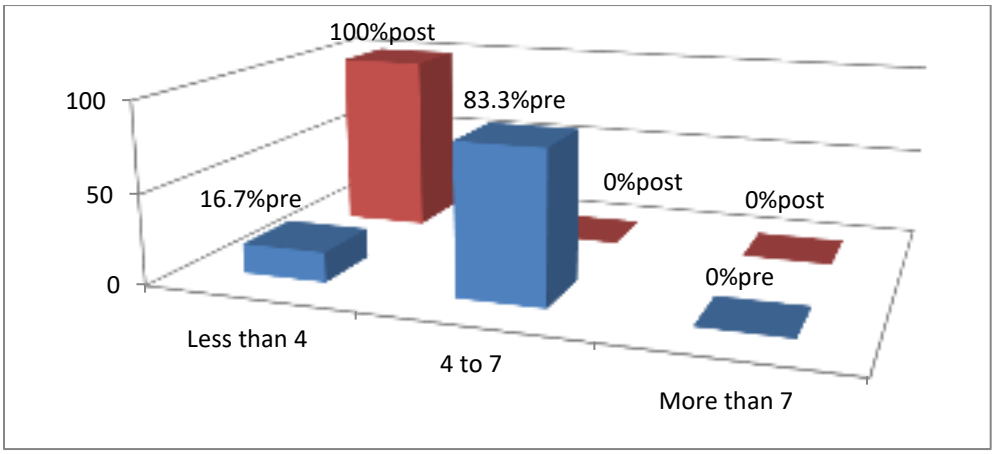


Fig no 1.7: Distribution of participants of control group by pain intensity in standing

This figure represents that among 6 participants before 6 session of treatment 16.7% had pain intensity less than 4, 66.7% had pain intensity 4 to 7 ,16.7% had pain intensity more than 7 and after 6 session of treatment 100.0% had pain intensity less than 4.

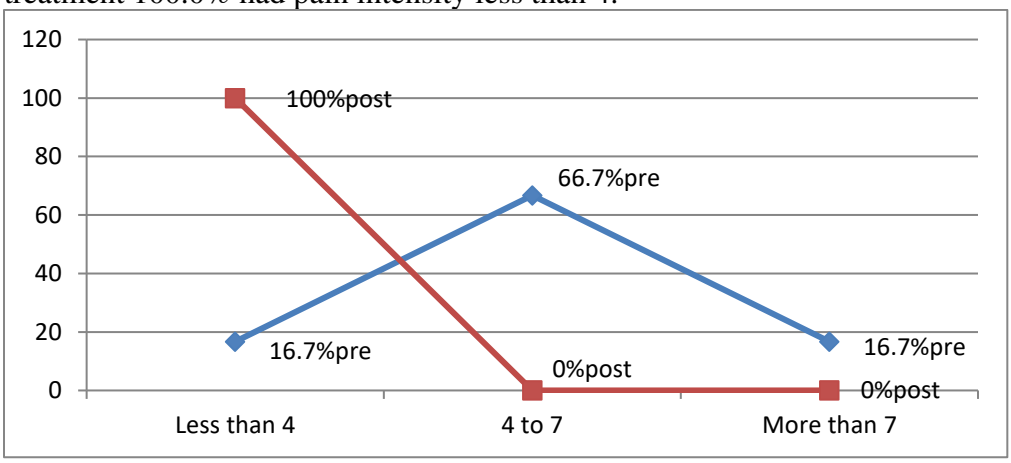


Fig no 1.8: Distribution of participants of experimental group by pain intensity in standing

This figure represents that among 6 participants before 6 session of treatment 33.3% had pain intensity less than 4, 66.7% had pain intensity 4 to 7 ,0.00% had pain intensity more than 7 and after 6 session of treatment 83.3% had pain intensity less than 4, 16.7% had pain intensity 4 to 7.

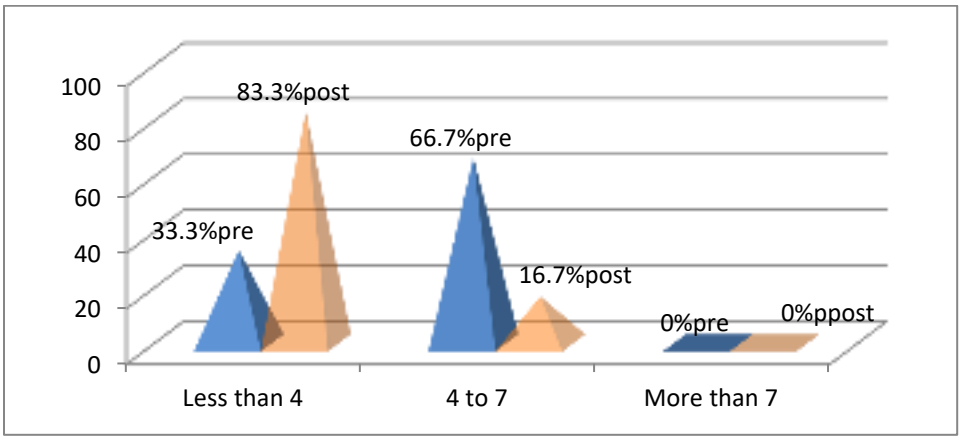


Fig no 1.9: Distribution of participants of control group by pain intensity during walking

This figure represents that among 6 participants before 6 session of treatment 50.0% had pain intensity less than 4, 50.0% had pain intensity 4 to 7, 0.00% had pain intensity more than 7 and after 6 session of treatment 83.3% had pain intensity less than 4, 16.7% had pain intensity 4 to 7, 0.00% had pain intensity more than 7.

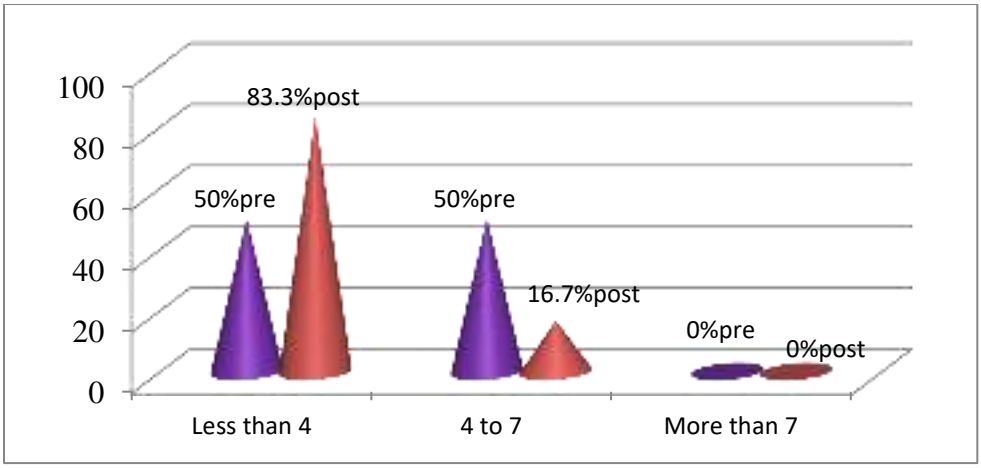


Fig no 1.10: Distribution of participants of experimental group by pain intensity during walking

Table 3: Distribution of participants by pain intensity during ADL

Pre control group				Post control group		
value	Frequency	Percentage	Mean ±SD	Frequency	Percentage	Mean ±SD
Less than 4	2	33.3	6.00±2.000	6	100.0	2.83±.753
4 to 7	3	50.0		0	0	
More than 7	1	16.7		0	0	
Pre experimental group				Post experimental group		
value	Frequency	Percentage	Mean ±SD	Frequency	Percentage	Mean ±SD
<4	2	33.3	5.67±1.71	4	66.7	3.17±1.472
4-7	4	66.7		2	33.3	
>7	0	0		0	0	

This figure represents that among 6 participants before 6 session of treatment66.7% had pain intensity less than 4, 33.3% had pain intensity 4 to 7 ,0.00% had pain intensity more than 7 and after 6 session of treatment 83.3% had pain intensity less than 4, 16.7% had pain intensity 4 to 7.

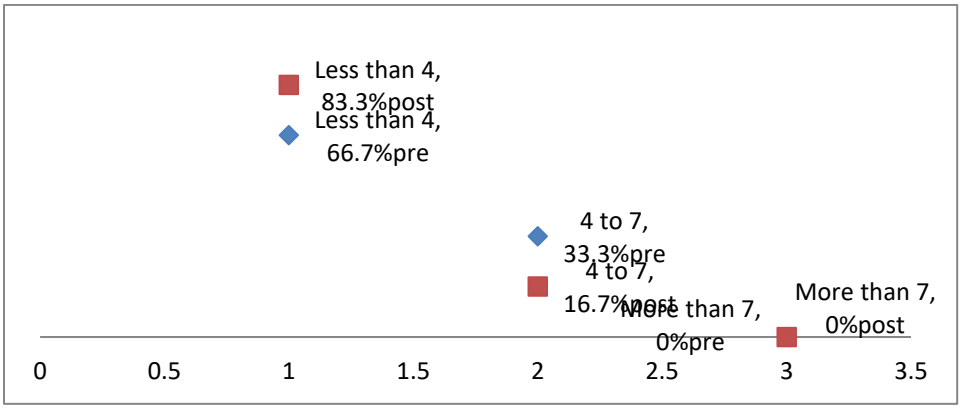


Fig no 1.11: Distribution of participants of control group by pain intensity while travelling

This figure represents that among 6 participants before 6 session of treatment 16.7% had pain intensity less than 4, 33.3% had pain intensity 4 to 7 ,50.0% had pain intensity ,more than 7 and after 6 session of treatment 50.0% had pain intensity less than 4, 50.0% had pain intensity 4 to 7.

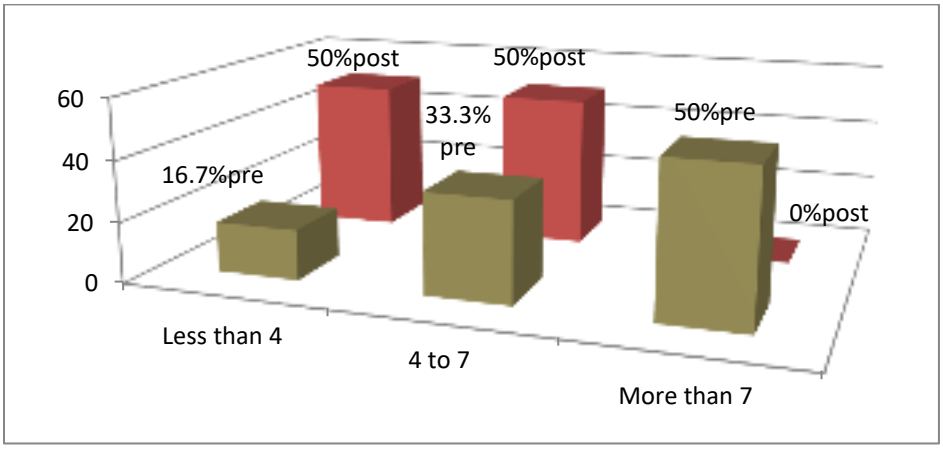


Fig no 1.12: Distribution of participants of experimental group by pain intensity while travelling

Table 4: Distribution of participants of control group by pain intensity while sleeping

	Pre control group			Post control group		
value	Frequency	Percentage	Mean ±SD	Frequency	Percentage	Mean ±SD
Less than 4	6	100.0	1.83±.753	6	100.0	.67±.516
4 to 7	0	0.00		0	0	
More than 7	0	0.00		0	0	
Distribution of participants of experimental group by pain intensity while sleeping						
Less than 4	6	100.0	2.00±1.095	6	100.0	.67±.516

Outcome of range of motion: 2

This figure represents that among 6 participants outcome of active flexion of range of motion of control group 50.0% were less than18, 33.3% were 18 to 37, 16.7% were more than 37.

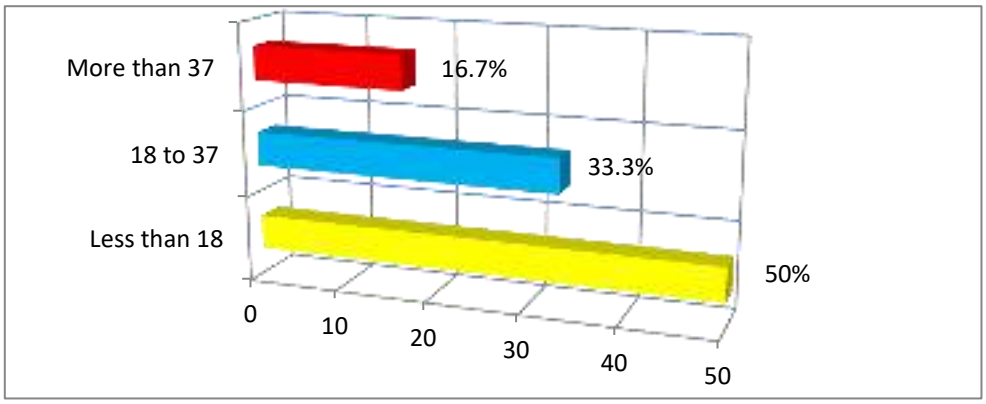
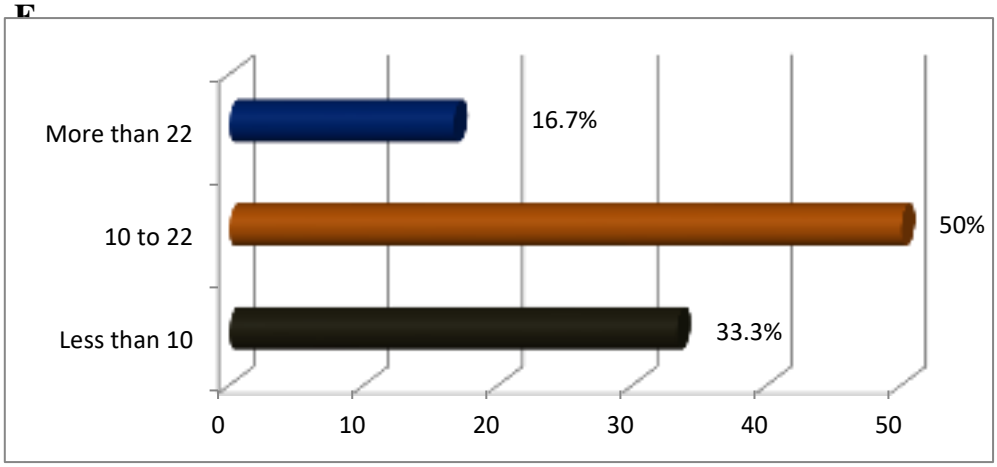


Fig no 2.1: Distribution of participants by outcome of active flexion of range of motion of control group

This figure represents that in experimental group 33.3% were less than 10, 50.0% were 10 to 22, 16.7% were more than22.

F



Distribution of participants by outcome of active flexion of range of motion of experimental group

This figure represents that among 6 participants outcome of passive flexion of range of motion of control group 33.3% were less than 10, 50.0% were 10 to 12, 16.7% were more than 12.

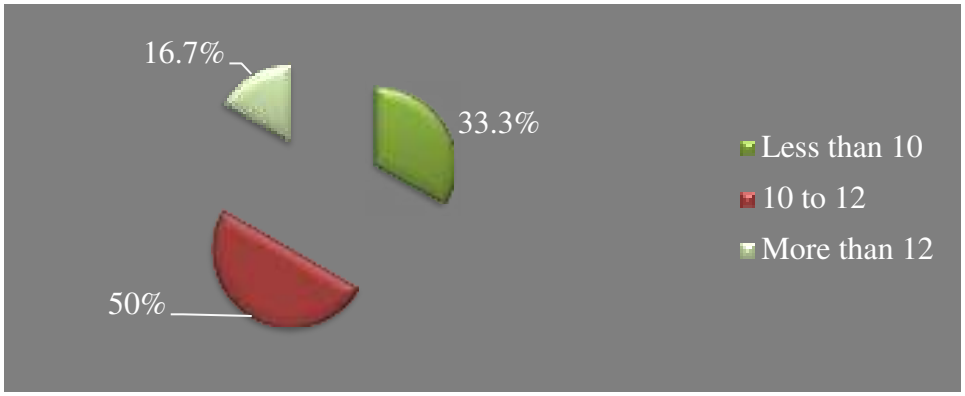


Fig no 2.3: Distribution of participants by outcome of passive flexion of range of motion of control group

This figure represents that in experimental group 16.7% were less than 10, 50.0% were 10 to 12, 33.3were more than 12.

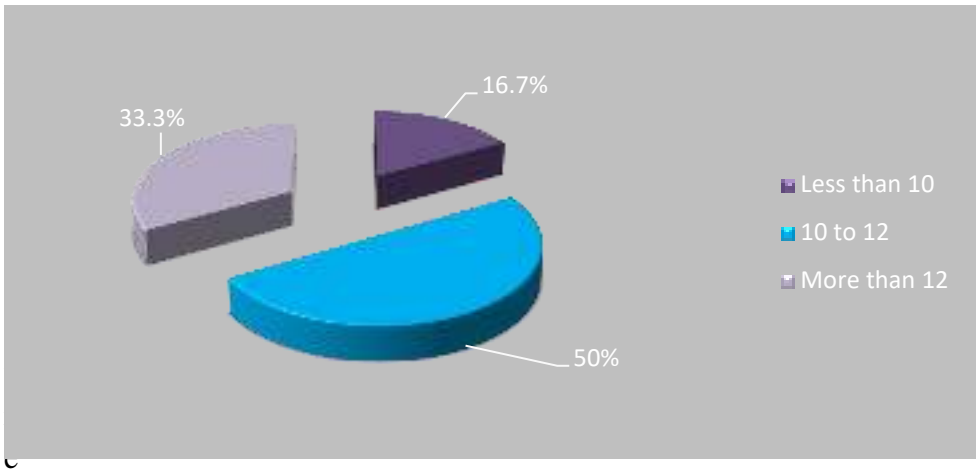


Fig no 2.4: Distribution of participants by outcome of passive flexion of range of motion of experimental group

This figure represents that among 6 participants outcome of active extension of range of motion of control group 33.3% were less than 6, 50.0% were 6 to 12, 16.7% were more than 12.

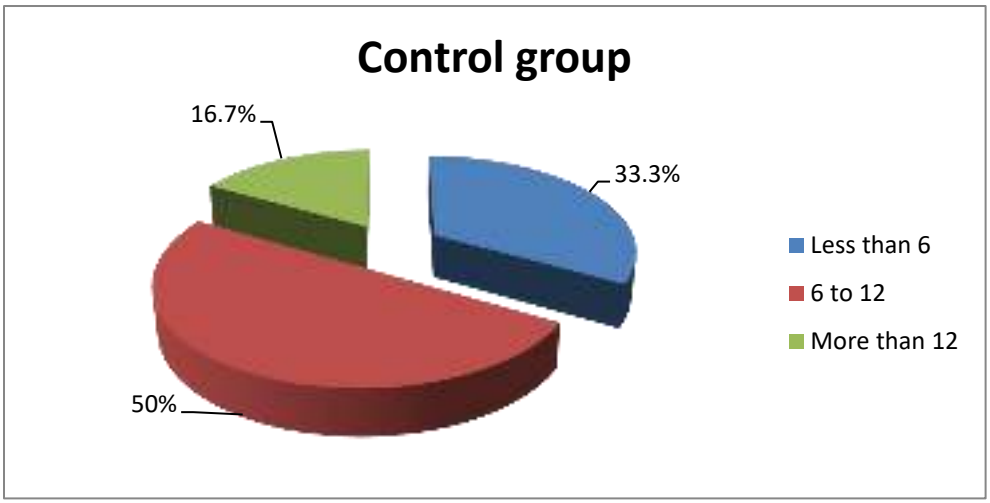


Fig no 2.5: Distribution of participants by outcome of active extension of range of motion

This figure represents that hand experimental group 50.0% were less than 6, 16.7% were 6 to 12 ,33.3% were more than 12.

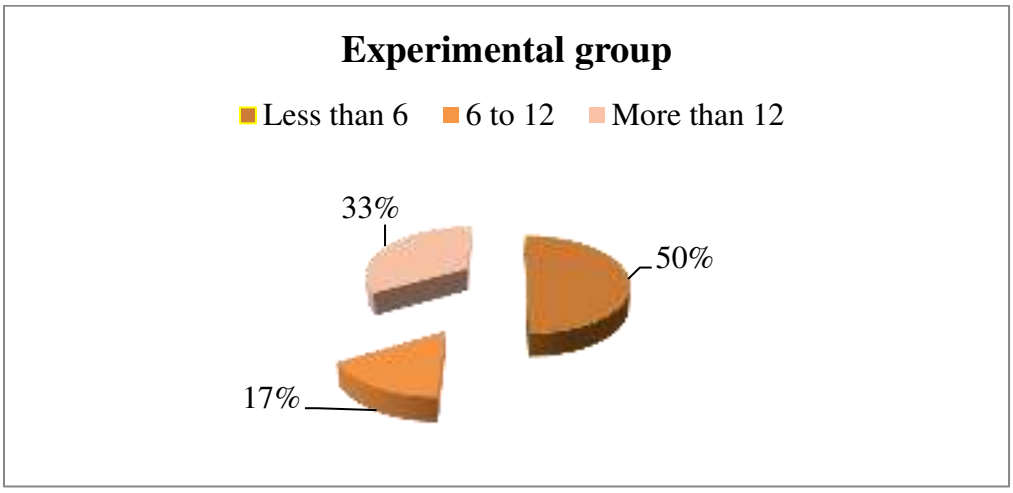


Fig no 2.6: Distribution of participants by outcome of active extension of range of motion

This figure represents that among 6 participants outcome of passive extension of range of motion of control group 33.3% were less than 11, 50.0% were 11 to 18, 16.7% were more than 18

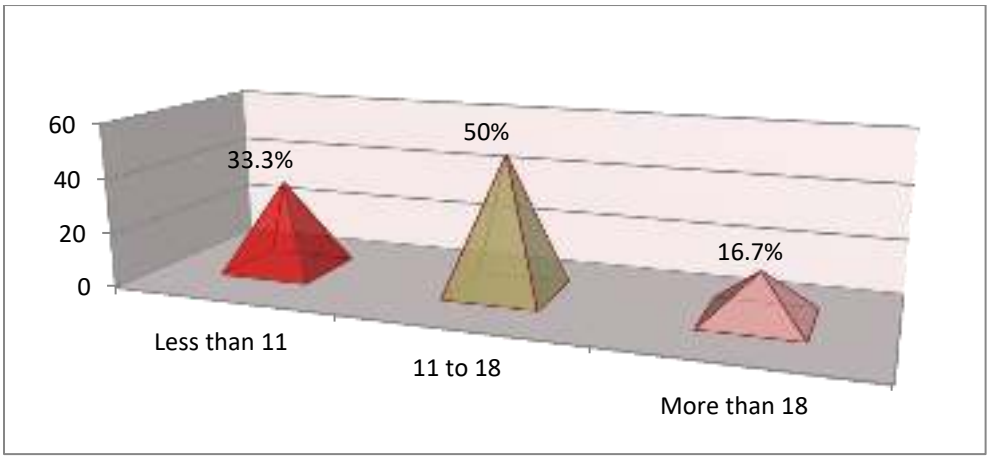


Fig no 2.7: Distribution of participants of conntrol group by outcome of passive extension of range of motion

This figure represents that in experimental group 50.0% were less than 5, 16.7% were 5 to 12, 33.3% were more than 12.

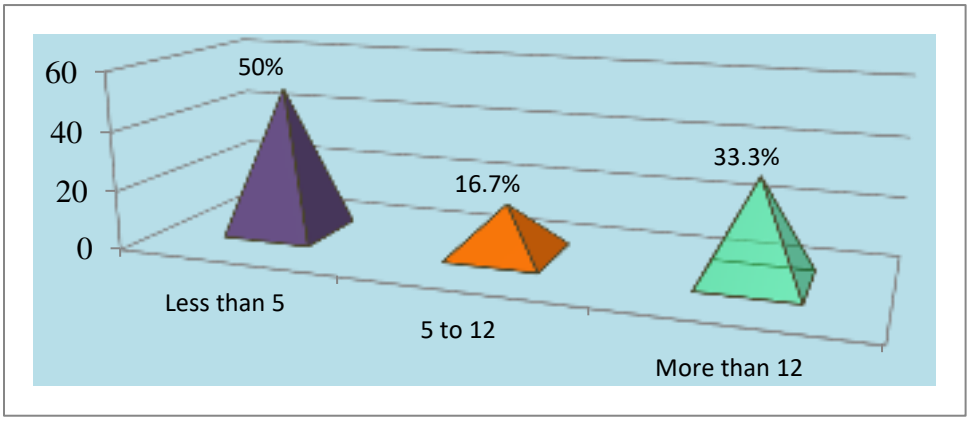


Fig no 2.8: Distribution of participants experimental group by outcome of passive extension of range of motion

This figure represents that among 6 participants outcome of active side gliding of range of motion of control group 50.0% were less than 6, 33.3% were 6 to 12, 16.7% were more than 12.

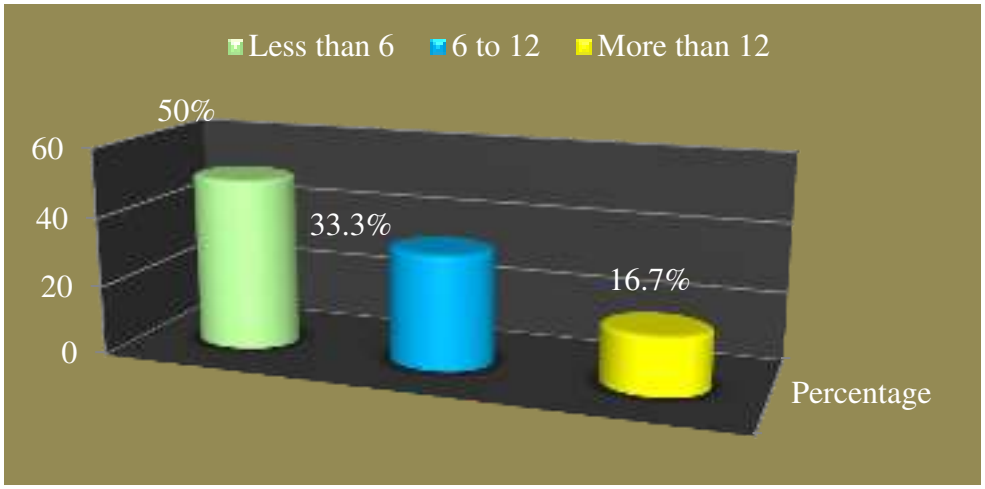


Fig no 2.9: Distribution of participants of control group by outcome of active side gliding of range of motion

This figure represents that among 6 participants in experimental group 66.7% were less than 6, 16.7% were 6 to 12,16.7% were more than 12.

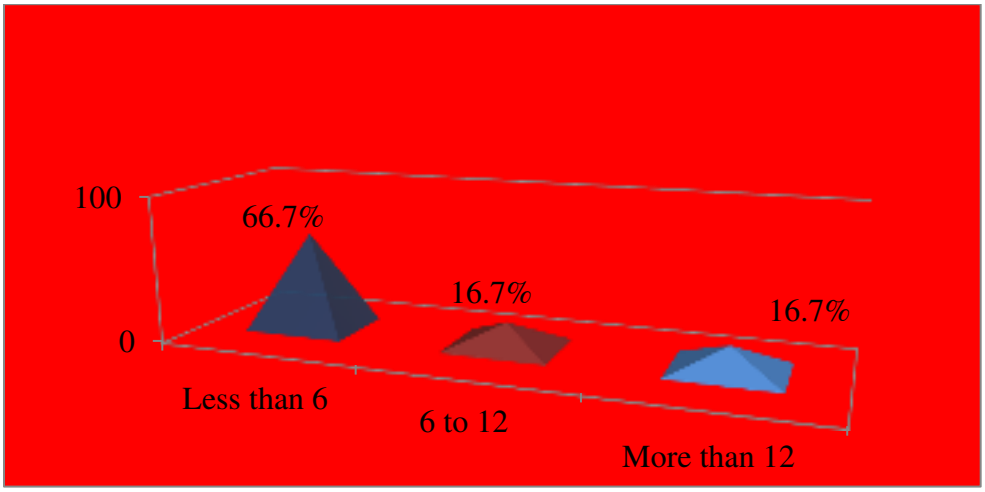


Fig no 2.10: Distribution of participants of experimental group by outcome of active side gliding of range of motion

Table 5: Distribution of participants by outcome of passive side gliding of range of motion

control group				Experimental group			
value	Frequency	Percentage	Mean ±SD	Value	Frequency	Percentage	Mean ±SD
Less than 6	4	66.7	6.83±5.154	Less than 6	5	83.3	3.00±5.292
6 to 12	0	33.3		6 to 12	0	0.00	
More than 12	2	0.00		More than 12	1	16.7	
Total	6	100.0			6	100.0	

This figure represents that among 6 participants before 6 session of treatment 0.00 % had ODI score 0 to 20, 16.7% had ODI score21 to 40, 33.3% had ODI score 41 to 60 ,50.0% had ODI score 61 to 80, 0.00% had ODI score 81 to 100 and after 6 session of treatment 16.7% had ODI score 0 to 20, 50.0% had ODI score 21 to 40, 33.3% had ODI score 41 to 60, 0.00% had ODI score 61 to 80, 0.00% had ODI score 81 to 100.

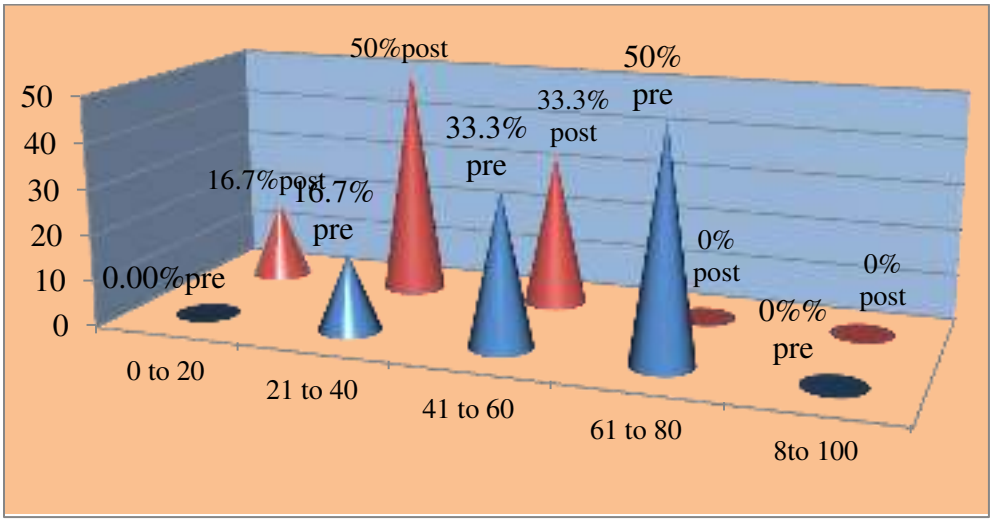


Fig no 2.11: Distribution of participants of control group by ODI score

Table 6: Distribution of participants of experimental group by ODI score

Pre experimental group				Post experimental group		
value	Frequency	Percentage	Mean ±SD	Frequency	Percentage	Mean ±SD
0 to 20	0	0.00	51.00±15.166	6	100.0	14.00±2.828
21 to 40	1	16.7		0	0.00	
41 to 60	4	66.7		0	0.00	
61 to 80	1	16.7		0	0.00	
81 to 100	0	0.00		0	0.00	
Total	6	100		6	100	

Table 1: socio demographic information of the participant

Serial no.	Variables	Z value	P value	Mean rank	Control group Mean ±SD	Experimental group Mean ±SD
Pair no-1	Age of the participants	1.787	.074	2.00,3.80	38.33±11.725	48.83±2.401
Pair no-2	Monthly income	.674	.500	2.50,3.33	24500.00±27449.954	33333.33±28925.191

Table: 2-Pain intensity according to NPRS

		Control group					Experimental group				
Serial no.	Variables	Wilcoxon singed rank test (Z value)	P value	Mean rank	Mean ±SD		Z value	P value	Mean rank	Mean ±SD	
					Pre	Post				Pre	Post
Pair no-1	During sitting	2.214	.027	3.50	4.50±2.28	1.67±.86	2.226	.026	3.50	6.33±1.211	3.33±1.36
Pair no-2	Bending position	2.226	.026	3.50	6.50±1.049	3.17±.753	2.333	.020	3.50	6.50±1.225	4.33±1.033
Pair no-3	Sit to stand	2.264	.024	3.50	6.00±2.191	2.33±1.211	2.271	.024	3.50	5.50±2.074	3.17±1.169
Pair no-4	Standing	2.032	.042	3.00	5.67±1.862	2.67±.816	2.042	.041	3.00	5.33±2.422	2.50±1.378
Pair no-5	Walking	1.787	.074	3.80	5.83±1.835	3.33±1.033	2.121	.034	3.00	4.50±2.345	2.33±1.506
Pair no-6	ADL	2.003	.045	4.00	6.00±2.000	2.83±.753	2.226	.026	3.50	5.67±1.751	3.17±1.472
Pair no-7	Travelling	2.070	.038	3.00	6.83±1.169	3.83±.753	2.220	.026	3.50	6.83±1.602	3.83±1.722
Pair no-8	Sleeping	2.070	.038	3.00	1.83±.753	.67±.516	2.333	.020	3.50	2.00±1.095	.67±.516

Table: 3- Outcome of active and passive ROM of the participants

		Control group					Experimental group				
Serial no.	Variables	Z value	P value	Mean rank	Mean ±SD		Z value	P value	Mean rank	Mean ±SD	
					Active	Passive				Active	Passive
Pair no-1	Flexion	.816	.414	2.25, 1.50	23.33±18.074	16.67±11.690	1.414	.157	.00, 1.50	17.50±10.368	19.17±10.206
Pair no-2	Extension	1.512	.131	1.00, 3.00	9.17±3.764	13.83±3.764	.184	.845	2.75,2.25	8.83±4.491	8.86±5.680
Pair no-3	Side gliding	.535	.593	2.00, 2.00	7.50±5.244	6.83±5.154	1.225	.221	3.00, 3.00	6.67±5.164	3.00±5.292

Table: 4- ODI score of the participants

		Control group					Experimental group				
Serial no.	Variables	Z value	P value	Mean rank	Mean ±SD		Z value	P value	Mean rank	Mean ±SD	
					Pre	Post				Pre	Post
Pair no-1	ODI score	2.207	.027	3.50	59.00±15.166	34.33±12.485	2.226	.026	3.50	51.00±15.16	14.00±2.828

Chapter:V Discussion

The LASER treatment was given to the patient with PLID for 6 sessions to experimental group and control group was getting conventional physiotherapy treatment also for 6 sessions. Total participants were 12.Each group contained 6 members. This study was conducted to find out that in prolapsed lumber intervertebral disc treatment LASER treatment with conventional therapy is more effective or , only conventional physiotherapy is more effective and finally to compare the treatment result. In the findings the socio demographic information, pain intensity level in NPRS, ROM, and ODI score was included.

Socio demographic information

The age of the participants of socio demographic information that the mean and standard deviation were 38.33±11.725 with age range 19 to 55 years among 6 participants and the percentages were 16.7% belonged to age less than 25 years, 16.7% belonged to 25 to 35 years and 66.7% belonged to more than 35 years in control group where p value .074 and the mean and standard deviation were 48.83±2.401 with age range 45 to 52 years among 6 participants the percentages were 16.7% belonged to age less than 25 years, 66.7% belonged to 25 to 35 years and 16.7% belonged to more than 35 years in experimental group where p value .500.

In another research found from their study among total 72 participants where 28 participants were in experimental group and 24 were in control group. The mean±SD were 31.54±4.47 in control group and 33.4286±4.40 in experimental group where p value was .234 on the other hand in control group the p value of this study found .074 (Alayat, M.S.M., 2014).

ROM related information

The outcome of active flexion of ROM of this study from control group 50.0% were less than 18, 33.3% were 18 to 37, 16.7% were more than 37 with mean and standard deviation 23.33±18.074 on the other hand in experimental group 33.3% were less than 10, 50.0% were 10 to 22,16.7% were more than 22 with mean and standard deviation 17.50±10.368 and the outcome of passive flexion of range of motion of control group 33.3% were less than 10, 50.0% were 10 to 12, 16.7% were more than 12 with mean and standard deviation 16.67±11.690 on the other hand in experimental group 16.7% were less than 10, 50.0% were 10 to 12, 33.3were

more than 12 with mean and standard deviation 19.17±10.206 and p value of control group .414 and in experimental group .157.

On the other hand another research found in flexion the mean±SD were 25.54±3.43 and p value <0.0001in control group and the mean±SD were 29.46±3.69 with p value was <0.0001 in experimental group (Alayat, M.S.M., 2014). outcome of active extension of range of motion of control group 33.3% were less than 6, 50.0% were 6 to 12, 16.7% were more than 12 with mean and standard deviation 9.17±3.764 on the other hand in experimental group 50.0% were less than 6, 16.7% were 6 to 12 ,33.3% were more than 12 with mean and standard deviation 8.83±4.491 and outcome of passive extension of range of motion of control group 33.3% were less than 11, 50.0% were 11 to 18, 16.7% were more than 18 with mean and standard deviation 13.83±3.764 on the other hand in experimental group 50.0% were less than 5, 16.7% were 5 to 12, 33.3% were more than 12 with mean and standard deviation 8.86±5.680 with p value was .131 in control group and .854 was in experimental group.

Alayat, M.S.M. et al found in extension the mean±SD were 5.62±1.91 and p value was <0.0001 in control group and the mean±SD were 7.04±2.24 with p value <0.0001. participants outcome of active side gliding of range of motion of control group 50.0% were less than 6, 33.3% were 6 to 12, 16.7% were more than 12 with mean and standard deviation 7.50±5.244 on the other hand in experimental group 66.7% were less than 6, 16.7% were 6 to 12,16.7% were more than 12 with mean and standard deviation 6.67±5.164 and outcome of passive side gliding of range of motion of control group 66.7% were less than 6, 33.3% were 6 to 12, 0.00% were more than 12 with mean and standard deviation 6.83±5.154 on the other hand in experimental group 83.3% were less than 6, 0.00% were 6 to 12, 16.7% were more than 12 with mean and standard deviation 3.00±5.292 and p value was in control group .693 and in experimental group was .221 where Mohamed S et al found in right bending the mean±SD were 24.16±3.81 in control group and 29.46±4.16 in experimental group with p value <0.0001 and in left bending the mean±SD were 24.79±4.16 in control group and 28.39±3.61 with p value <0.0001(Alayat et al., 2014).

Pain intensity in different condition in NPRS

The conditions are sitting, bending, sit to stand, standing, walking, ADL, travelling and seeping. At the time of sitting before 6 session of treatment 50.0% had pain intensity less than 4, 33.3% had pain intensity 4 to 7 , 16.7% had pain intensity more than 7 with mean and standard deviation 4.50±2.258 and after 6 session of treatment 100.0% had pain intensity less than 4 with

standard deviation 1.67±.816 with p value .027 and mean rank 3.50 in control group meanwhile before 6 session of treatment 16.7% had pain intensity less than 4, 83.3% had pain intensity 4 to 7 ,0% had pain intensity more than 7 with mean and standard deviation 6.33±1.211 and after 6 session of treatment 100.0% had pain intensity less than 4 standard deviation 3.33±1.366 with p value .026 and mean rank 3.50 in experimental group.
Before 6 session of treatment 0% had pain intensity less than 4, 83.3% had pain intensity 4 to 7 ,16.7% had pain intensity more than 7 with mean and standard deviation 6.50±1.049 and after 6 session of treatment 100.0% had pain intensity less than 4 standard deviation 3.17±.753 with p value .026 and mean rank 3.50 in control group meanwhile before 6 session of treatment 0% had pain intensity less than 4, 83.3% had pain intensity 4 to 7 ,16.7% had pain intensity more than 7 with mean and standard deviation 6.50±1.225 and after 6 session of treatment 33.3% had pain intensity less than 4, 66.7% had pain intensity 4 to 7 with standard deviation 4.33±1.033 with p value .020 and mean rank3.50 in experimental group in bending position.

Pain intensity evaluation during sit to stand of control group before 6 session of treatment 16.7% had pain intensity less than 4, 66.6% had pain intensity 4 to 7 , 16.7% had pain intensity more than 7 with mean and standard deviation 6.00±2.191 and after 6 session of treatment 100.0% had pain intensity less than 4 with standard deviation 2.33±1.211 with p value .024 and mean rank 3.50 and in experimental group before 6 session of treatment 33.3% had pain intensity less than 4, 66.7% had pain intensity 4 to 7 ,0.00% had pain intensity more than 7 with mean and standard deviation 5.50±2.074 and after 6 session of treatment 100.0% had pain intensity more than 4 with standard deviation 3.17±1.169 with p value .024 and mean rank 3.50.

Evaluation of pain intensity in standing of control group before 6 session of treatment 16.7% had pain intensity less than 4, 83.3% had pain intensity 4 to 7 ,0.00% had pain intensity more than 7 with mean and standard deviation 5.67±1.862 and after 6 session of treatment 100.0% had pain intensity less than 4 with standard deviation 2.67±.816 with p value .042 and mean rank 3.00 and in experimental group before 6 session of treatment 16.7% had pain intensity less than 4, 66.7% had pain intensity 4 to 7 ,16.7% had pain intensity more than 7 with mean and standard deviation 5.33±2.422 and after 6 session of treatment 100.0% had pain intensity less than 4 with standard deviation 2.50±1.378 with p value .041 and mean rank 3.00.

During walking in control group participants before 6 session of treatment 33.3% had pain intensity less than 4, 66.7% had pain intensity 4 to 7 ,0.00% had pain intensity more than 7 with mean and standard deviation 5.83±1.835 and after 6 session of treatment 83.3% had pain intensity less than 4, 16.7% had pain intensity 4 to 7 with standard deviation 3.33±1.033 with p value .074 and mean rank 3.80 and in experimental group before 6 session of treatment 50.0% had pain intensity less than 4, 50.0% had pain intensity 4 to 7 ,0.00% had pain intensity more than 7 with mean and standard deviation 4.50±2.345 and after 6 session of treatment 83.3% had pain intensity less than 4, 16.7% had pain intensity 4 to 7, 0.00% had pain intensity more than 7 with standard deviation 2.33±1.506 with p value .034 and mean rank 3.00.

During ADL in control group before 6 session of treatment 33.3% had pain intensity less than 4, 50.0% had pain intensity 4 to 7 ,16.7% had pain intensity more than 7 with mean and standard deviation 6.00±2.000 and after 6 session of treatment 100.0% had pain intensity less than 4 with standard deviation 2.83±.753 with p value .045 and mean rank 4.00 and in experimental group before 6 session of treatment 33.3% had pain intensity less than 4, 66.7% had pain intensity 4 to 7 ,0.00% had pain intensity more than 7 with mean and standard deviation 5.67±1.751 and after 6 session of treatment 66.6% had pain intensity less than 4, 33.3% had pain intensity 4 to 7 with standard deviation 3.17±1.472 with p value .026 and mean rank 3.50. During travelling in control group before 6 session of treatment66.7% had pain intensity less than 4, 33.3% had pain intensity 4 to 7 ,0.00% had pain intensity more than 7 with mean and standard deviation 6.83±1.169 and after 6 session of treatment 83.3% had pain intensity less than 4, 16.7% had pain intensity 4 to 7 with standard deviation 3.83±.753 with p value .038 and mean rank 3.00 and in experimental group before 6 session of treatment 16.7% had pain intensity less than 4, 33.3% had pain intensity 4 to 7 ,50.0% had pain intensity ,more than 7 with mean and standard deviation 6.83±1.602 and after 6 session of treatment 50.0% had pain intensity less than 4, 50.0% had pain intensity 4 to 7 with standard deviation 3.83±1.722 with p value .026 and mean rank 3.50.

Where in a research researcher evaluated the pain intensity in VAS and the mean and standard deviation 8.21±1.1 before treatment and 3.71±1.30 after treatment that had after 12 weeks with p value <0.0001 in control group and 8.36±.0.95 before treatment and 2.64±1.25 with p value

<0.0001 also after 12 weeks (Alayat et al., 2014). In another study found 26.92±13.2 with p value <0.001 (Takahashi et al., 2012). In another study found that changes in VAS score after treatment among 197 participants 95 were in control group and 102 were on experimental group there the weighted mean difference was -12.00[-2.02,-21.98] with p value 0.012 (Huang et al., 2015).

The disability score measured by ODI

It measures the intensity of pain, lifting activities like ability to care, ability to walk, ability to sit, sexual function, ability to stand, social life, sleep quality and ability to travel. From this study found that the ODI score in control group before 6 session of treatment 0.00 % had ODI score 0 to 20, 16.7% had ODI score21 to 40, 33.3% had ODI score 41 to 60 ,50.0% had ODI score 61 to 80, 0.00% had ODI score 81 to 100 with mean and standard deviation 59.00±15.166 and after 6 session of treatment 16.7% had ODI score 0 to 20, 50.0% had ODI score 21 to 40, 33.3% had ODI score 41 to 60, 0.00% had ODI score 61 to 80, 0.00% had ODI score 81 to 100 with mean and standard deviation 34.33±12.485 with p value 0.027 and mean rank 3.50 meanwhile in experimental group before 6 session of treatment 0.00% had ODI score 0 to 20, 16.7% had ODI score21 to 40, 66.7% had ODI score 41 to 60 ,16.7% had ODI score 61 to 80, 0.00% had ODI score 81 to 100 with mean and standard 51.00±15.166 and after 6 session of treatment 100.0% had ODI score 0 to 20, 0.00% had ODI score 21 to 40, 0.00% had ODI score 41 to 60, 0.00% had ODI score 61 to 80, 0.00% had ODI score 81 to 100 with mean and standard deviation 14.00±2.828 with p value .026 and mean rank 3.50. Another study found the ODI score after treatment in experimental group the mean difference 0.37(-0.51, 1.26) with p value 0.001 and found significant improvement (Huang et al., 2015).

Chapter: VI Conclusion and Recommendation

Conclusion 6.1

PLID is very common that's why there is need to add more alternative treatment facilities so that do not require the operation more. A conventional physiotherapy treatment are beneficial in a wide range for this condition but from this study found that conventional physiotherapy with LASER was very useful to treat PLID in increasing lumber range of motion, decreasing pain and functional disability rather than only conventional physiotherapy.

Recommendation 6.2

More session of treatment may provide better outcomes for the patients with prolapsed lumber intervertebral disc when used in combination of LASER with conventional physiotherapy.

Refferances

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Appendix: I

SAIC INSTITUTE OF MEDICAL TECHNOLOGY (SIMT)

(A Sister Concern of Saic Educational Society) Reg. S-2711 (124)/2002

Ref: Phy/SIMT/7/05/2019 Date: 07.05.2019

7th May 2019

To

Farzana Rahman

4th Professional B.Sc. in Physiotherapy

SAIC Institute of Medical Technology (SIMT)

Mirpur-13, Dhaka-1216.

Sub: Permission to collect data.

Dear Farzana Rahman,

Ethical review board (ERB) of SIMT pleased to inform you that your proposal has been reviewed by ERB of SIMT and we are giving permission you to conduct study entitle of "Effectiveness of LASER in the management of PLID" for successful completion of this study you can start data collection from now.

Wishing you all the best.

Thanking You.

7.05.19

Chairman

Ethical Review Board

SAIC Institute of Medical Technology

Dr. Mo. Nurul Uddin (PT)

BSC. PT (DU), CRP

Senior Physiotherapist

Dhanmondi, Ashuliā, Dhaka-1216

Dr. Ali Ahsan

Vice Principal

MBBS, MPH (CM) BSMMU, DMU (SUB)

SAIC Institute of Medical Technology (SIMT)

Mirpur, Dhaka.

Principal

SAIC Institute of Medical Technology

Mirpur-13, Dhaka-1216

Office :
Saic Tower, M-1/6
Mirpur-13, Dhaka-1216.

Mobile : 01936005804
01715067370

Appendix: II

Consent form

Dear participant, Respondent ID no:

I am **Farzana Rahman** student of B.sc in physiotherapy department in Saic Institute of Medical Technology which is affiliated by university of Dhaka carrying the study entitled **"Effectiveness of laser in management of prolapsed lumber intervertebral disc"** as a part of my thesis work for favoring achievement of my bachelor degree. There is some list of questions that you need to fill up which include socio demographic, condition related information, treatment purpose information. You need to fill up each question of the questionnaire list. To answer these questions in this self-administered interview process will take around 15-20 minutes. The information obtained from this questionnaire will be applied for academic purpose and will be kept confidential. Your participation in this study will totally voluntarily and you are allowed to withdraw from the interview without any clarification at any moment. You are allowed to ask any question to the researcher regarding the study to meet up your quarry. Looking forward your kind co-operation.

Declaration of the participant

I have been answering in this survey. All the information has been read to me and that have been answered to my satisfaction. I have noticed that participation in this study is totally voluntary and I have the right to withdraw any information from the interview without any clarification at any moment. I give my consent voluntarily to be a participant in this study.

Respondent name:

Signature and date:

Witness's signature:

Appendix: III

Questionnaires (English)

Title

Effectiveness of LASER in the management of prolapsed lumber intervertebral disc

Name of participant …….

Address ……

Mobile no…….

Code no:

Date of first meeting:

Date of next meeting:

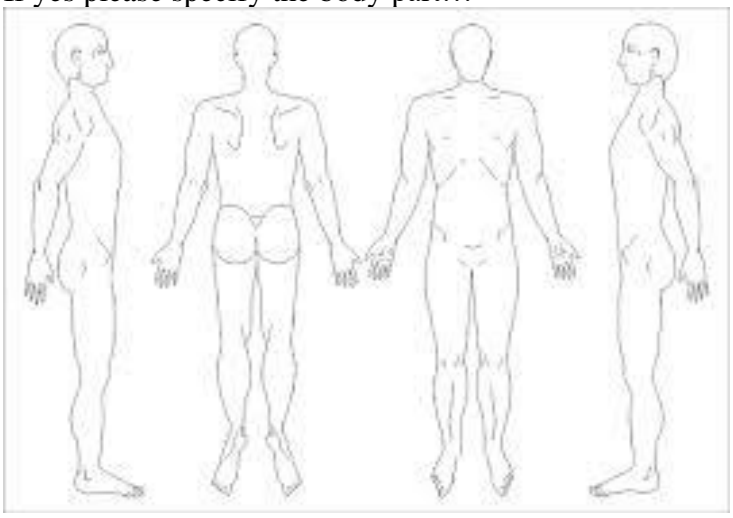
Socio demographic information

Question no.	Question	Answer
1.	Age?	
2.	Sex?	
3.	Educational status? 1) Illiterate 2) PSC 3) JSC 4) SSC 5) HSC 6) Graduate 7) Masters	

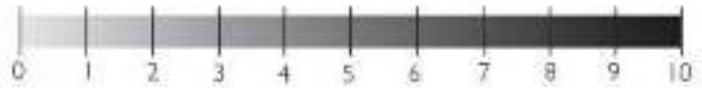
	8) Others	
4.	Family type? 1) Extended 2) Nuclear	☐
5.	Marital status? 1) Married 2) Unmarried 3) Divorced 4) Widowed 5) Separated 6) Others	☐
6.	Living area? 1) Rural 2) Urban 3) Semi urban	☐
7.	Occupation? 1) Teacher 2) Government service 3) Businessman 4) Banker 5) Student 6) House wife 7) others	☐
8.	Monthly income?	☐
9.	Religion? 1) Islam 2) Hindu 3) Buddhist 4) Christian 5) other	☐

Pretest information

Pain related information

Question no.	Question	Answer
10.	The nature of pain? 1) Sharp 2) Dull 3) Shooting 4) Burning 5) Others	☐
11.	The pain refers? 1. Yes 2. No If yes please specify the body part…  Side view® Back view Front view Side view(L)	
12.	Paresthesia to lower limb? 1.Yes 2.No	☐
13.	Tingling sensation to lower limb? 1.Yes 2.No	☐
14.	Pain relieved by rest? 1.Yes 2.No	☐

Please answer the below questions according to the scale……



Ref: McCaffery, M., Beebe, A., et al. (1989). Pain: Clinical manual for nursing practice, Mosby St. Louis, MO

15.	Pain intensity during sitting...	
16.	Pain intensity during bending position...	
17.	Pain intensity during sit to stand…	
18.	Pain intensity in standing position…	
19.	Pain intensity during walking…	
20.	Pain intensity during ADL…	
21.	Pain intensity while travelling…	
22.	Pain intensity while sleeping…	

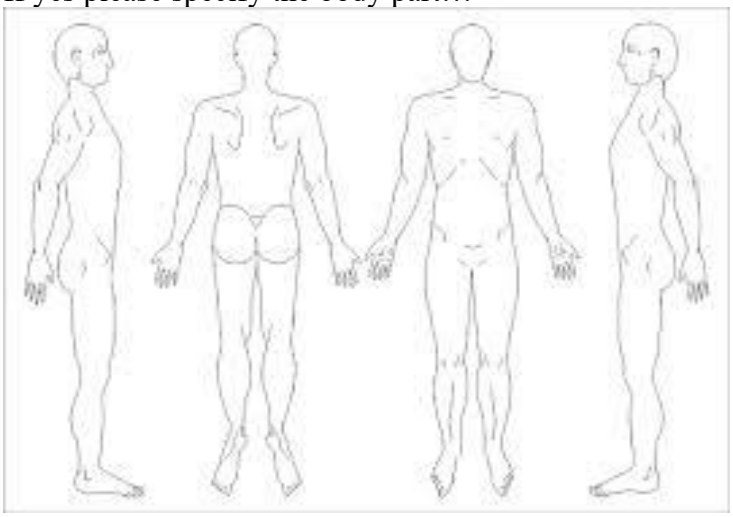
Range of motion related information

Movement name	**Active**	**passive**
Flexion		
Extension		
Side gliding		

Neurological and others information		
Sensory deficit	1.Absent 2.Impaired 3.Normal	☐
Motor deficit	Oxford muscle grading…	☐
Reflexes of lower limb	1.Loss 2.Impaired 3.Normal	☐
Spinal curvature	1.Reduce 2.Accelerated 3.Normal	☐
Posture	1.Good 2.Fair 3.Poor	☐

Post-test information

Pain related information

Question no.	Question	Answer
15.	The nature of pain? 6) Sharp 7) Dull 8) Shooting 9) Burning 10) Others	
16.	The pain refers? 3. Yes 4. No If yes please specify the body part…  Side view® Back view Front view Side view(L)	
17.	Paresthesia to lower limb? 1.Yes 2.No	
18.	Tingling sensation to lower limb? 1.Yes 2.No	
19.	Pain relieved by rest? 1.Yes 2.No	

Please answer the below questions according to the scale……

Ref: McCaffery, M., Beebe, A., et al. (1989). Pain: Clinical manual for nursing practice, Mosby St. Louis, MO

15.	Pain intensity during sitting...	
16.	Pain intensity during bending position...	
17.	Pain intensity during sit to stand…	
18.	Pain intensity in standing position…	
19.	Pain intensity during walking…	
20.	Pain intensity during ADL…	
21.	Pain intensity while travelling…	
22.	Pain intensity while sleeping…	

Range of motion related information

Movement name	**Active**	**passive**
Flexion		
Extension		
Side gliding		

Neurological and others information		
Sensory deficit	1.Absent 2.Impaired 3.Normal	☐
Motor deficit	Oxford muscle grading…	☐
Reflexes of lower limb	1.Loss 2.Impaired 3.Normal	☐
Spinal curvature	1.Reduce 2.Accelerated 3.Normal	☐
Posture	1.Good 2.Fair 3.Poor	☐

এপেনিডক্স: IV

সম্মতিপত্র

উত্তরদাতার আইডি নম্বর | | | |

প্রিয় অংশগ্রহণকারী,

আমি ফারজানা রহমান সাইক ইনস্টিটিউট অব মেডিকেল টেকনোলজির বিএসসি ইন ফিজিওথেরাপী বিভাগের ফাইনাল বর্ষের ছাত্রী । আমার বিএসসি ইন ফিজিওথেরাপী ডিগ্রি সম্পন্ন করতে গবেষণার অংশ হিসেবে "প্রলাপ্সড লামবার ইন্টার ভারটিভাল ডিস্ক চিকিৎসায় লেজারের কার্যকারিতা" শিরোনামের একটি গবেষণার কাজ করছি। এখানে আপনার সামাজিক-জনতাত্তিক তথ্য, আপনার ব্যথা এবং শারিরীক অন্যান্য তথ্যবলী সম্পকে কিছু প্রশ্ন দেওয়া আছে যা আপনাকে পূরণ করতে হবে । আপনার নিজের দ্বারা দেয়া এই সাক্ষাতকার ১৫-২০ মিনিট সময় লাগবে । এখানে প্রশ্নাবলীর একটি তালিকা দেওয়া আছে এবং আপনাকে প্রত্যেকটি প্রশ্নের উত্তর দিতে হবে। এই গবেষণায় প্রাপ্ত তথ্য শুধুমাত্র শিক্ষা ক্ষেত্রে ব্যবহার করা হবে এবং অংশগ্রহণকারীর ব্যক্তিগত তথ্য সম্পূর্ণ গোপনীয়তার মধ্যে থাকবে, অন্য কোথাও প্রদান করা হবে না । গবেষণা চলাকালীন সময়ে অংশগ্রহণকারী কোনরকম দ্বিধা বা ঝুঁকি ছাড়াই যেকোন সময় এটাকে বাদ দিতে পারবেন । আপনার একান্ত সহযোগিতা কামনা করছি।।

অংশগ্রহণকারীর ঘোষণা

আমাকে এই নিরীক্ষার জন্যে আমন্ত্রণ জানানো হয়েছে । আমাকে সম্পূর্ণ প্রশ্নগুলো পড়ে বুঝানো হয়েছে এবং আমি কোন ধরণের দ্বিধা ছাড়াই উত্তর দিয়েছি । আমি লক্ষ্য করেছি, এই গবেষণায় আমার অংশগ্রহণ সম্পূর্ণ স্বেচ্ছায় এবং আমি যেকোন স ময় এটাকে বাদ দিতে পারব, কোন রকম ঝুঁকি ছাড়াই । আমি এই গবেষণায় অংশগ্রহণে সম্পূর্ণ সম্মতি জ্ঞাপন করছি ।

অংশগ্রহণকারির নাম …….....

স্বাক্ষর এবং তারিখ .....

স্বাক্ষীর স্বাক্ষর .....

এপেনিডক্স: V

বাংলা প্রশ্নাবলী

শিরোনাম

প্রলাপ্সড লামবার ইন্টার ভারটিভাল ডিস্ক চিকিৎসায় লেজারের কার্যকারিতা

কোড নং | | | |

অংশগ্রহনকারির নাম.....

ঠিকানা.....

মোবাইল নম্বর.....

প্রথম সাক্ষাতকারের তারিখ:

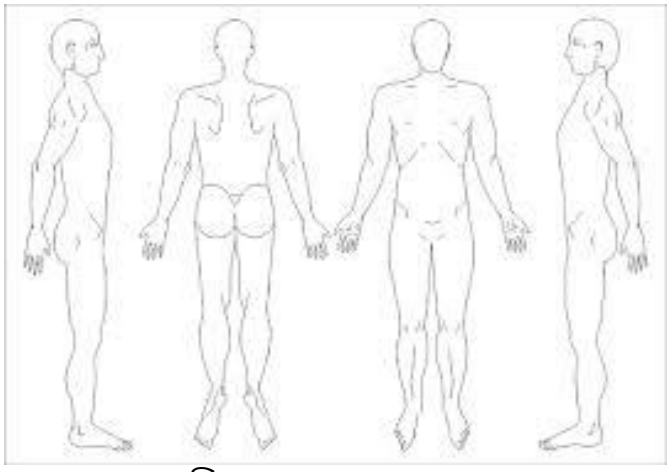
চিকিৎসার পূর্ববর্তী তথ্যবলী

সমাজতান্ত্রিক তথ্যবলী

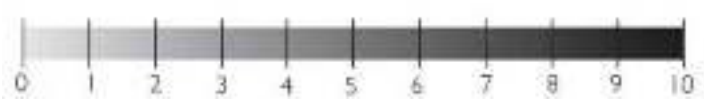
প্রশ্ন নং	প্রশ্ন	উত্তর
১.	বয়স?	
২.	লিঙ্গ?	
৩.	শিক্ষাগত যোগ্যতা? ১.নিরক্ষর ২.পিএসসি ৩.এসএসসি ৪.এইচএসসি ৫.অনার্স ৬.মাষ্টার্স	

	৭.অন্যান্য	
৪.	পরিবারের ধরন? ১.একক পরিবার ২.যৌথ পরিবার	
৫.	বৈবাহিক অবস্থা? ১.বিবাহিত ২.অবিবাহিত ৩.তালাকপ্রাপ্ত ৪.বিধবা ৫.বিচ্ছিন্ন ৬.অন্যান্য	
৬.	বসবাসের এলাকা? ১.শহর ২.গ্রাম ৩.আধা শহুরে	
৭.	পেশা? ১.শিক্ষক ২.সরকারি কর্মকর্তা ৩.ব্যবসায়ী ৪.ব্যাংক পরিচালক ৫.শিক্ষার্থী ৬.গৃহিণী ৭.অন্যান্য	
৮.	মাসিক আয়?	
৯.	ধর্ম? ১.ইসলাম ২.হিন্দু ৩.বৌদ্ধ ৪.খ্রিষ্টান ৫.অন্যান্য	

ব্যথা সংক্রান্ত তথ্যবলী

১০.	ব্যথার প্রকৃতি? ১.তীব্র ২.চাপা ৩.খোচানো ৪.জ্বালাপোড়া ৫.অন্যান্য	
১১.	ব্যাথাটি কি ছড়ায়? ১.হ্যাঁ ২.না যদি ছড়ায় তবে দয়াকরে জায়গাটি নির্দিষ্ট করুন….  ডান পাশ পিছন সামনে বাম পাশ	
১২.	শরীরের নিচের অংশে কোন অবশভাব আছে? ১.হ্যাঁ ২.না	
১৩.	শরীরের নিচের অংশে কোন খোচানো ভাব রয়েছে? ১.হ্যাঁ ২.না	
১৪.	বিশ্রাম নিলে কি ব্যাথাটি কমে? ১.হ্যাঁ ২.না	

দয়াকরে নিম্নের প্রশ্নের উত্তরগুলো উল্লেখিত স্কেলটি অনুসারে দিন….



<u>উল্লেখ্য</u>

এমসি ক্যাফারি,এম., বিবে,আ., এটি অ্যাল (১৯৮৯),পেইনঃ ক্লিনিকাল ম্যানুয়াল ফর নার্সিং প্র্যাক্টিস,মোসবি এস্টি লুইস,এমও l

১৫.	বসে থাকা অবস্থায় ব্যথার তীব্রতা..	
১৬.	ঝুকে থাকা অবস্থায় ব্যথার তীব্রতা…	
১৭.	বসা থেকে দাঁড়ানোর সময় ব্যথার তীব্রতা…	
১৮.	দাঁড়ানো অবস্থায় ব্যথার তীব্রতা…..	
১৯.	হাটার সময় ব্যথার তীব্রতা….	
২০.	দৈনন্দিন কাজের সময় ব্যথার তীব্রতা….	
২১.	ভ্রমণের সময় ব্যথার তীব্রতা…	
২২.	ঘুমানোর সময় ব্যথার তীব্রতা….	

অবস্থার পরিবর্তনে গতির পরিসর(রেন্জ অব মোশন) সংক্রান্ত তথ্যবলী

গতিবিধির ((মুভমেন্ট) নাম	সক্রিয় (অ্যাকটিভ)	নিষ্ক্রিয় (প্যাসিভ)
নমন (ফ্লেকশন)		
প্রসারণ(এক্সটেনশন)		
পাশে নমন(সাইড বেনডিং)		
ঘূর্ণন(রোটেশন)		

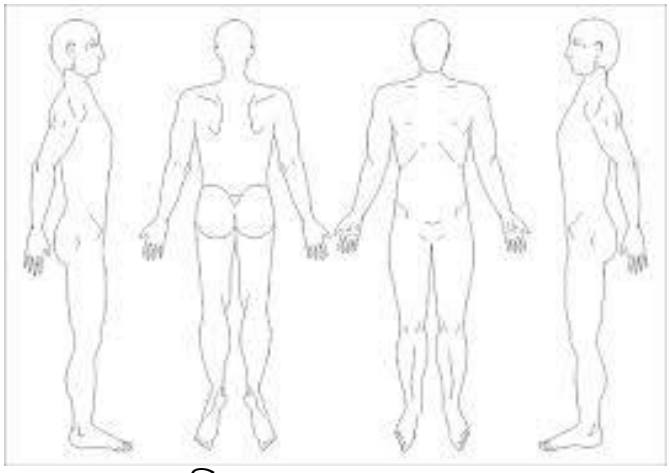
স্নায়ুতাত্ত্বিক (নিউরোলজিকাল) সংক্রান্ত তথ্যবলী

সংবেদনশীল সমস্যা (সেনসরি ডেফিসিট)	১.নাই ২.কিছুটা ৩.স্বাভাবিক	☐
পেশিসঁচালন সংক্রান্ত সমস্যা (মটর ডেফিসিট)	অক্সফোর্ড পেশীর শ্রেণী অনুযায়ী…	☐
শরীরের নিচের অংশের প্রতিফলন (রিফ্লেক্স অব লওয়ার লিম্ব)	১.নাই ২.কিছুটা ৩.স্বাভাবিক	☐
মেরুদন্ডের বক্রতা (স্পাইনাল কার্ভেচার (	১.কমেছে ২.বেড়েছে ৩..স্বাভাবিক	☐
অঙ্গভঙ্গি(পশচার)	১.ভাল ২.চলনসই ৩.খারাপ	☐

পরবর্তী সাক্ষাতকারের তারিখ:

চিকিৎসার পরবর্তী তথ্যবলী:

ব্যথা সংক্রান্ত তথ্যবলী

১০.	ব্যথার প্রকৃতি? ১.তীব্র ২.চাপা ৩.খোচানো ৪.জ্বালাপোড়া ৫.অন্যান্য	
১১.	ব্যাথাটি কি ছড়ায়? ১.হ্যাঁ ২.না যদি ছড়ায় তবে দয়াকরে জায়গাটি নির্দিষ্ট করুন....  ডান পাশ পিছন সামনে বাম পাশ	
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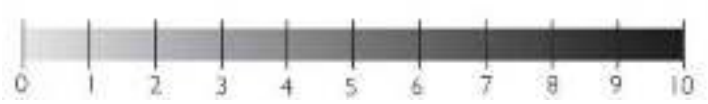
১৩.	শরীরের নিচের অংশে কোন খোচানো ভাব রয়েছে? ১.হ্যাঁ ২.না	

১৪.	বিশ্রাম নিলে কি ব্যাথাটি কমে? ১.হ্যাঁ ২.না	

দয়াকরে নিম্নের প্রশ্নের উত্তরগুলো উল্লেখিত স্কেলটি অনুসারে দিন....



<u>উল্লেখ্য</u>

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১৫.	বসে থাকা অবস্থায় ব্যথার তীব্রতা..	
১৬.	ঝুকে থাকা অবস্থায় ব্যথার তীব্রতা...	
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১৮.	দাঁড়ানো অবস্থায় ব্যথার তীব্রতা.....	
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২২.	ঘুমানোর সময় ব্যথার তীব্রতা….	

অবস্থার পরিবর্তনে গতির পরিসর(রেন্জ অব মোশন) সংক্রান্ত তথ্যবলী

গতিবিধির ((মুভমেন্ট) নাম	সক্রিয় (অ্যাকটিভ)	নিস্ক্রিয় (প্যাসিভ)
নমন (ফ্লেকশন)		
প্রসারণ(এক্সটেনশন)		
পাশে নমন(সাইড বেনডিং)		
ঘূর্ণন(রোটেশন)		

স্নায়ুতাত্তিক (নিউরোলজিকাল) সংক্রান্ত তথ্যবলী

সংবেদনশীল সমস্যা (সেনসরি ডেফিসিট)	১.নাই ২.কিছুটা ৩.স্বাভাবিক	
পেশিসঁচালন সংক্রান্ত সমস্যা (মটর ডেফিসিট)	অক্সফোর্ড পেশীর শ্রেণী অনুযায়ী…	
শরীরের নিচের অংশের প্রতিফলন (রিফ্লেক্স অব লওয়ার লিম্ব)	১.নাই ২.কিছুটা ৩.স্বাভাবিক	
মেরুদন্ডের বক্রতা (স্পাইনাল কার্ভেচার (	১.কমেছে ২.বেড়েছে ৩..স্বাভাবিক	
অঙ্গভঙ্গি(পশচার)	১.ভাল ২.চলনসই ৩.খারাপ	

Appendix: VI

Gant chart

Activities	Dec 2018	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov
Proposal presentation												
Introduction												
Literature review												
Methodology												
Data collection												
Data analysis												
Result												
1st Progress presentation												
Discussion												
Conclusion and Recommendation												
2nd Progress presentation												
Communicate with supervisor												
Final submission												