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University of Dhaka

“EFFECTIVENESS OF SPECIFIC LUMBAR STABILIZATION EXERCISES FOR LOW BACK PAIN AMONG POSTPARTUM WOMEN”

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October, 2019

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“EFFECTIVENESS OF SPECIFIC LUMBAR STABILIZATION EXERCISES FOR LOW BACK PAIN AMONG POSTPARTUM WOMEN”

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DECLARATION

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

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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 great success. I would like to pay my gratitude towards my parents who constantly encourage me to carry out this project.

I would like to express the deepest appreciation to my supervisor Fabiha Alam, Lecturer of Physiotherapy Department, BHPI. She helps me to select this field of study and continually and convincingly conveyed a spirit of adventure in regard to research. Without her keen supervision, excellent guidance and persistent help this dissertation would not have been possible. In addition, I would like to thank Professor Md. Obaidul Haque, Head of the Department of Physiotherapy, Vice Principal, BHPI, CRP; Mohammad Anwar Hossain, Associate Professor, Physiotherapy, BHPI, Senior Consultant & Head of the Department of Physiotherapy, CRP. I want to express my gratitude to Ehsanur Rahman, Assistant Professor, Department of Physiotherapy, BHPI, CRP and all the concerned authorities who allowed me to carry out this study. Also, it's my honour to mention Md. Shofiqul Islam, Assistant Professor, Department of Physiotherapy, BHPI, CRP for good advice, support and guide to conduct this research. All clinical Physiotherapists of Gynecological and Women's Health Unit, CRP extended their helping hand in data collection procedure, I am obliged to Shati Aziz Khan and Sharmin Rima.

I would like to special thanks to my beloved family and Abdur Rahman Dilshad for giving me enormous support during conducting this research project.

I would like to reimburse my special appreciation to Tamal Ghosh Tripto, Amrita Chowdhury, Ahnaf Al Mukit, Tuhin Ahmed, Mahin Ahmed Shishir, Safin Ahmed, Aisha Habiba Effat, Sumaiya Islam, Nirupom Bardhon, Homyra Nishat, Redwanul Tasmerin Masuda who supported me through smooth conversation during data collect and analysis period.

I would also like to give special thanks to BHPI librarian Mrs. Mohosina to her heartily help and library assistant Mr. Anichur Rahman for positive help during the project study. Finally, I would like to thank to all participants of the study for their enormous co- operation. Without their help and cooperation, this research would not have been possible.

Acronyms

ABD	Assisted birth Delivery
BHPI	Bangladesh Health Professions Institute
BMRC	Bangladesh Medical Research Council
CRP	Centre for the Rehabilitation of the Paralysed
CS	Caesarian Section
HQOL	Health Related Quality of Life
LBP	Low Back Pain
MF	Multifidus Muscle
MLBP	Mechanical Low Back Pain
MRI	Magnetic Resonance Imaging
MS	Musculo-skeletal
NSAID's	Non-Steroidal Anti-inflammatory Drug
NVD	Normal Vaginal Delivery
PFM	Pelvic floor Muscle
PPP	Postpartum Pelvic Pain
PT	Physiotherapy
QOL	Quality of life
RCT	Randomized Control Trial
SE	Stabilization Exercise
SUI	Stress Urinary Incontinence
TA	Transverse Abdominis Muscle
UI	Urinary Incontinence
UST	Ultrasound Therapy
WE	Walking Exercise
WHO	World Health Organization

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Abstract

Background: Postpartum back pain is common, with upto 75% of women experiencing back pain immediately following birth due to ligament laxity and postural changes. Besides the lack of pelvic floor muscles strength, urine leakage problem during coughing and sneezing also arises in this condition. The purpose of this study was to compare the effect of stabilization exercise (SE) and Kegel exercise.

Objective: To evaluate the pain intensity in rest and different functional activities before and after introducing spinal stabilization exercises in postpartum women with low back pain and also find out the effect of Kegel exercise. **Methodology:** A Quasi-Experimental (one group) pretest-posttest design was used. 27 patients with postpartum low back pain, attended at Gynecological and Women's Health unit, CRP, Mirpur were purposively chosen to conduct the study. Spinal stabilization exercise was applied to the participants to find out the effectiveness of this exercise. Kegel exercise was also introduced who have urine leakage problem among 27 patients. All patients were receiving treatment for 2 days in a week and total for 6 weeks. Numeric pain rating Scale was used to measure pain intensity indifferent functional activities such as swiping, squatting, chair sitting heavy weight lifting, walking, journey by bus or rickshaw and staring. Pain score was analyzed by calculating "Wilcoxon Signed Ranked test". **Results:** Results showed that relative improvement occurs in all participants in the experimental group. Pain scores on numeric pain rating Scale on different functional activities such as during toilet sitting, stair climbing, during walking, during weight lifting, were relatively reduced that was also statistically significant. Participants who have a urine leakage problem also recover from this problem. **Conclusion:** Lumbar stabilization exercises has an effect on reducing pain and improving functional activities, and to solve urine leakage problem Kegel exercise alsoeffective.

Keywords: Spinal stabilization exercises, Low back pain, Postpartum low back pain, Kegel exercise.

1.1 Background

Low back pain (LBP) is a multifactorial disorder with a high prevalence. Pain is experienced by most of the people at different points of life. It has a great impact on individuals and families in the society and the healthcare systems. Pain is the most common disorder that is marked as the reason for disability, participation restriction, a career burden, the use of health-care resources, and a financial burden. Musculoskeletal physiotherapy is one of the most accepted methods of conservative intervention for LBP (Gomes-Neto et al., 2017).

According to a recent survey, the incidence of low back pain in the United Kingdom is about 9% of patients with back pain per year visit physiotherapists, and 37% of 1632 million have to pay for health-related problem associated with low back pain. In the United States low back pain is the most common reason for visiting the physician office. After observing data from different countries like Sweden, the United Kingdom, Scandinavia, and Australia there comes out a piece of important information about LBP during pregnancy. It ensures that LBP is a common problem during pregnancy all over the world. In our total population at least 80% of people at some point in their lives will suffer from LBP (Wang et al., 2004).

Low back pain is recognized as a universal problem. low back pain disabling episodes increased 26% from 1974-1978, but only 7% population is increased (Kulie et al.,2010). According to recent studies, the prevalence of LBP is highest in women (Bunzli et al., 2011). Studies said that pain will disappear after pregnancy within 1 year, but the prevalence of LBP within 2 to 18 months postpartum is about 2% to 65%. Almost 70% of women experienced LBP during the lifetime, whereas 50% of women affected during pregnancy and 66% following their reproductive years (Chou et al., 2007).

Postpartum means who just gave birth. The postpartum period is counting initially from delivery to two years later. Usually, the weakness of the abdominal muscles and decreased stability of the lumbar spine are the reasons behind producing LBP during the postpartum period. On this condition the lumbar spine is unable to provide support to the increased weight of mother's body (Depledge J et al., 2005) It can happen in the rare case that the coccyx bone can be fractured during a forceps delivery. Many habitual, physiological and diseased conditions are key factors to produce this kind of pain. It includes muscle strain, coccyx pain, sedentary lifestyle, bad posture and hormonal factor (Emily et al., 2012). To understand pregnancy-related LBP, biomechanical, musculoskeletal, hormonal and vascular mechanism are describing most commonly as its etiology exist on theoretical perception during pregnancy (Darryl et al., 2007).

Almost all people who experience LBP can return their normal activities within a few days, but some individuals experience progressively worsening LBP. Condition is going so tough that their routine activities are going to be limited. It is a wonder that a large number of these women said about their first episode of LBP occurred during a pregnancy period. From several studies, it comes to know that women with severe LBP during pregnancy are at extremely high risk for developing a new episode of severe LBP during a subsequent pregnancy as well as later in life (Norén et al., 2001). Many women report that LBP not only compromises their ability to work during pregnancy but also interferes with activities of daily living (Wang et al., 2004).

According to Vermani et al., (2010), women with Pelvic girdle pain and Post-partum low back pain feel difficulty while performing normal daily activities. Difficulties can be felt in the activities, when they are in sitting position and try to get up, while in bed trying to turn over in, sitting for a long time, long time walking, during dressing and undressing, and lifting and when small weights are carried by them. Sometimes women have to use crutches and wheelchairs in problem with combined lumbar and posterior pelvic pain. In severe case, women are usually moving with the help of crutches and sexual difficulties also arise during this condition.

There are many approaches to the treatment of LBP in physiotherapy. The individually tailored treatment process is called conventional physiotherapy. It includes advice and education, manual therapy, and exercise. Effectiveness has been

found from a fitness program and general exercise in the treatment of chronic LBP, but there is no evidence for the effectiveness of “specific” stabilization exercise and it is unresolved. Clinically, this is at odds with much current physiotherapy practice and management (Cairns et al., 2006).

Emily et al. (2012) stated that specific stabilization exercises are advised to reduce pain, improve long term outcomes and prevent chronicity in case of postpartum rehabilitation for back musculature. Damen et al. (2002) showed on the study that Postpartum pain focused on the importance of two muscles, transverse abdominis (TA) and multifidus (MF). These two muscles are lying deep in the spine, to form the functional core stability of the body. The multifidus muscle increased core stability of back muscles by stabilizes the joints at each segmental level of the spine. In pregnancy-related back pain, these two muscles are weakened, if these problems are not addressed, chances for recurrence of back pain would be increased.

Several studies have found TA muscle and PFM co-activation while performing TA muscle contraction, which facilitates the activity of the PFM and vice versa. So it indicates that it is effective to focus on TA muscle to improve PFM activity in women with postpartum LBP (Tajiri et al., 2014). Along with LBP, Urine leakage problem is also a common problem in postpartum women. In this study, some Participants were facing this problem. Here we introduce them with Kegel exercise to increase pelvic floor muscle strength as well as solve this problem. Stuge et al., (2004) mentioned that specific stabilizing exercise program in women with post-partum pelvic pain and LBP improved functional status and reduced pain. Ehsani et al. (2019) also said that stabilization exercise retrains the optimal control and improve coordination of the deep spinal muscles.

According to stuge et al. (2004) this study aimed to determine the effectiveness of spinal stabilization exercises in postpartum low back pain. It is proven clinically and statistically that specific stabilizing exercise program in postpartum low back pain has a better effect on decreasing pain, improving functional status, health-related quality of life. (Stuge et al., 2004).

1.2 Rationale

This research aims to find out the effectiveness of spinal stabilization exercises for mechanical low back pain among postpartum. It controls the lumbar segments and the pelvic joints by activating the local muscles in coordination with the global muscles dynamically. Bangladesh is a country with over one-third of the population living in and another one-third living just above the poverty level. According to The World Health Organization (2010), Bangladesh has poor prenatal and postpartum care, nutritional deficiencies, high incidence of no- skilled birth attendant utilization and the second-highest maternal mortality and morbidity rates next to sub-Saharan Africa. As a result, Bangladesh becomes more vulnerable to live for women because of arising complications during pregnancy and it is continuing into the postpartum period and in conclusion, it may reduce their health-related quality of life (HRQOL). About 80% Women in Bangladesh reported at least one morbidity during one to three years following the birth, either by C-section (CS), normal vaginal delivery (NVD) or assisted vaginal delivery (AVD). Low back pain has the leading role in complication after pregnancy period. Different studies exist in different clinical settings in different countries about the effectiveness of spinal stabilization exercises for low back pain. But no study is available about the effectiveness of spinal stabilization exercises for postpartum complications such as low back pain. However, research helps to improve the knowledge of health professionals, as well as to develop the profession. The results of this study may help to guide physiotherapists to give evidence-based treatments to patients with postpartum LBP, which will be beneficial for both the patient with postpartum LBP. So, for the development of the physiotherapy profession in gynecological sectors will establish by conducting this type of research work.

1.3 Aims of the study

To examine the effectiveness of lumbar stabilization exercises for low back pain among postpartum women.

1.4 Objectives of the study

1.4.1 General objective

To Examine the effectiveness of lumbar stabilization exercises for low back pain among postpartum women.

Specific Objectives

1. To identify the socio-demographic characteristic (age, sex, occupation) of the postpartum low back pain patient.
2. To evaluate the pain intensity at rest before and after introducing spinal stabilization exercises.
3. To evaluate the pain intensity during different functional activities before and after applying spinal stabilization exercises.
4. To examine the effectiveness of Kegel exercise for urine leakage problem during coughing and sneezing.

1.5 Hypothesis

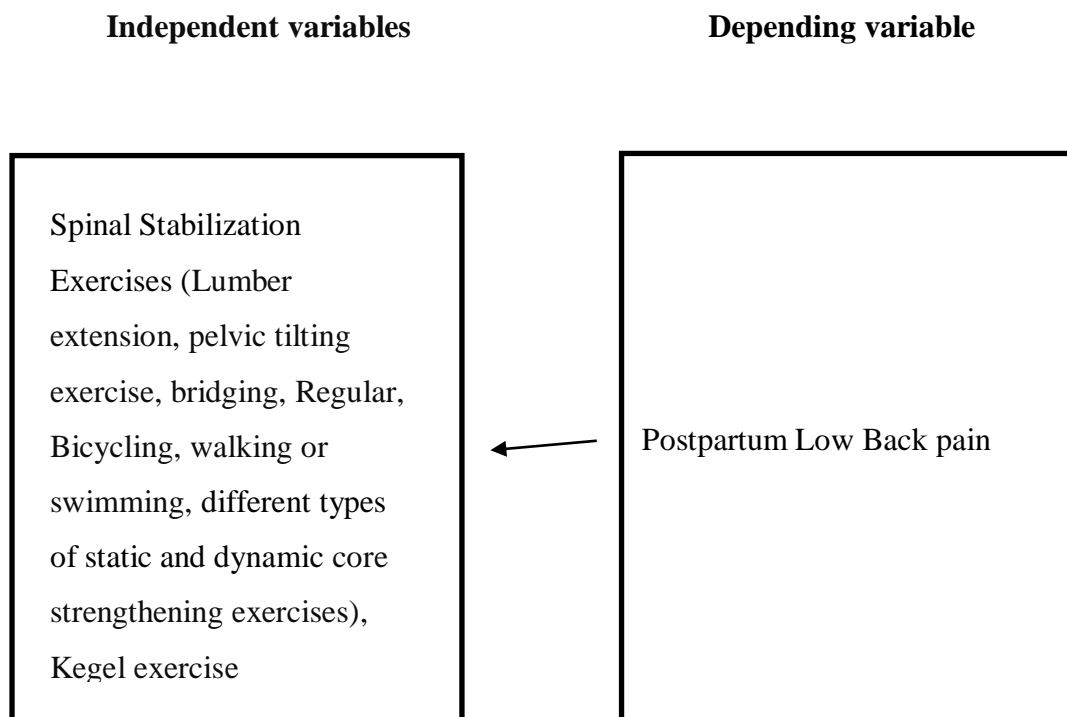
1.5.1 Alternative Hypothesis

Spinal stabilization exercises are an effective intervention for the treatment of low back pain among postpartum women.

1.6 Null Hypothesis

Spinal stabilization exercises are no more effective intervention for the treatment of low back pain among postpartum women.

1.7 List of variables



1.8 Operational definitions

Spinal stabilization exercises

The spinal stabilization program is a program of back exercises designed to teach patients strengthening and flexibility in a pain-free range. It is not only improving the patient's physical condition and symptoms but also helps the patient with efficient movement. It provides the patient with movement awareness, knowledge of safe postures, functional strength and coordination that promotes management of low back pain (Bunzli et al., 2011).

Low back pain

Low back pain is a very common problem and has a ubiquitous distribution. Among the galaxy of causative factors both spinal and extra-spinal. Bad posture plays a very significant role in the genesis of this disease. Ebenezer (2003) mentioned that back pain remains at the lumbosacral area of the spine confined into space between L1 vertebrae to the S1 vertebrae.

Postpartum women

A postpartum period begins immediately after the birth of a child as the mother's body. The term postpartum period is commonly referring to as the first six weeks following childbirth. Referring to the period following childbirth concerning the mother (Ozgular et al., 2000).

Kegel exercise

Repetitive contractions of the pelvic muscles that control the flow in urination to strengthen these muscles specially to control or prevent incontinence are called also Kegel Exercise (Price et al., 2010).

International Association for the study of pain says that pain is “An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or describes in terms of such damage”. Pain may produce an unpleasant sensation in a specific part of the body. The terms pain is usually narrated as a penetrating or tissue destructive process like Stabbing, burning, twisting, tearing, and squeezing and or of a bodily or emotional reaction including terrifying, nauseating, and sickening (Kumar & Elavarasi, 2016).

Low back pain is counted as one of the most common health problems. It generates a substantial personal, community, and financial burden all over the worlds. According to country-specific prevalence data, it can be said that pain is a universal burden and can be defined as “activity-limiting low back pain that lasts for at least 1 day” (Hoy et al., 2012). LBP occurs when there is any disorder of the muscles, nerves, and backbones. Pain can vary from different range such as dull constant ache to a sudden sharp feeling. It is reported that depending on the duration of LBP, it may be divided as acute which may extend from six weeks to twelve weeks, or chronic that may extend from more than twelve weeks (Koes et al., 2010). Manusov et al. (2012) included that depending on the cause, it may be further classified as either mechanical, non-mechanical, or referred pain. Normally the symptoms of LBP increase within a few weeks from the time they start, among them about 40-90% are completely better within six weeks (Menezes et al., 2012).

Low back pain is defined as pain and discomfort, localized below the costal margin and above the inferior gluteal folds, with or without leg pain. LBP plays a leading role and most common cause for seeking physician office visits and it also the second causes for which people have to fall in high direct and indirect costs. It influences the individual, family and society in the medical, social and economic sector (Oh et al., 2007).

During the examination of frequency of pain recurrence from a subsequent acute episode, the recurrence rate is found to be staggeringly high. It ranges from 60% to 86% for patients suffering recurrences, particularly in the first year after the acute

episode. Barguest-Ullman and Larsson conducted a detailed study of 217 workers in an industrial setting in Sweden. The median duration of pain for the initial episode was 35 days and short-term resolution of painful symptoms occurred in the majority of cases (70% within 2 months, 86% within 3 months). However, during the 1 year follow-up, 62% of the patients experienced at least one recurrence of LBP and a further 36% experienced two or more recurrences. The median time from a resolution of the initial episode to the first recurrence of LBP was only 2 months. The identification of the factors is very important by which it can be related to this vulnerability to recurrence (Hides et al., 2001).

The prevalence of low back pain and pelvic girdle pain which is said as “activity-limiting low back pain and lasts for at least 1 day” about 20-90% in the pregnant population, but a small number of women may suffer from a combination of both pains (Corso et al., 2016). Typically, PGP is more common and intense during pregnancy, while LBP is more intense and common in the postpartum period (Ostgaard et al., 1996). Moegane et al. (2008) reported that about forty percent may continue to experience pain that may extend to 6 months. For those with a history of LBP during pregnancy, LBP seems to decrease over the postpartum period. It is found that women who experience LBP or PGP at 3 months postpartum were at higher risk for persistent or chronic LBP. Among them, only six percent recover within 6-18 months after giving birth (Corso et al., 2016).

Researchers have been unable to identify etiologic factors relating to postpartum LBP and PGP (Bastiaansen et al., 2005), and simply having a baby may not be the only reason for pain at this time. According to authors the main reason of post-partum LBP or PGP may be rare cases of sacral stress fractures during and after pregnancy (Speziali et al., 2015), postpartum pyogenic sacroiliitis (Milwala et al., 2015), and osteomyelitis of the pubic symphysis (Dunk RA et al., 2010).

Although spinal stability encompasses passive, active, and neural control subsystems. Due to loss of control or excessive motion in the spinal segment's neutral zone, which is associated with injury, degenerative disc disease, and muscle weakness that make spinal segmental more unstable. In vitro, biomechanical studies have shown that muscles can provide segmental stabilization by controlling motion in the neutral zone, and the neutral zone can be returned to within physiologic limits by effective muscle

control. While various muscles may be able to control and protect the spinal segments, one muscle that has been investigated to this role is the lumbar multifidus. The multifidus play role in segmental stiffness and control motions in the neutral zone (Hides et al., 2001).

It is desired to control and protect the spinal segments by optimal functioning of the muscle system following injury. If the initial resolution of painful symptoms occurs but sometimes it fails to protect spinal segments results in an increase in the likelihood of a recurrence of symptoms. In chronic low back pain, patients' Specific exercises are very useful. Because it targets the multifidus and transverse abdominis muscles that have been shown to decrease pain and disability. Studies said that the occurrence of localized segmental dysfunction of the multifidus muscle after an initial episode of acute unilateral LBP (O'Sullivan et al., 1997).

a It is not considered as an important health problem, although back pain is experienced by more than half of all pregnant women at some time during pregnancy (Borg-Stein et al., 2005) It is not marked as an important health problem. Almost all pregnant women consider back pain to be a normal part of pregnancy and expect it to spontaneously disappear after delivery (Moon et al., 2000). According to Padua et al, (2005), around half of women who experience back pain during pregnancy still complain of back pain symptoms at 1 year after delivery. Low back pain reportedly occurs in 30% -45% of women during the post-partum period (To & Wong et al., 2003). However, back pain in pregnancy is a substantial problem because it can persist into the post-partum period and thereby influence the post-partum recovery (Nilsson -Wikmar et al., 2005).

Back pain after birth can come from several sources. Muscle Strain during the actual birth can occur. The lower back muscles are used, along with the pelvic muscles, during vaginal birth. Recent research has focused on the importance of coactivity of the spinal stabilizer muscles, including the diaphragm, TA and pelvic floor muscle (PFM), is essential for mechanical stability of the lumbar spine (Hodges et al., 2003).

During pregnancy, the area of the brain, corpus luteum and the uterine decidua secret a hormone called relaxin which is polypeptide in nature is produced in the high amount into our body. When the connective tissue is relaxing it helps to occur greater

laxity the ligament and on the pelvic joint. On a radiological image in pregnant women, there found widening and separation of the symphysis pubis. Moreover, a recent post-partum study found the proof of the increasing amount of both SIJ laxity and the volume of synovial fluid is greater in pregnant women. A systematic review by Vermani et al. (2010) found that patients with PGP have increased motion in their pelvic joints as compared with healthy pregnant controls. When the pelvic joints motion is increased in pregnant women with PGP, that results in decreased the efficiency of load transmission thus the shear forces increased into the joints. So, LBP in pregnant women with PGP, these increased shear forces might be responsible (Vermani et al., 2010). While the soft tissues surrounding the lumbar segments are placed on prolonged stretch there arising pain that is strictly intermittent in nature. The postural syndrome arising from different mechanical deformation of postural origin that causes pain. A forward head, rounded shoulders, and a flexed low back are the features of Poor sitting posture (Machado et al., 2006).

Postural dysfunction syndromes, spondylosis, trauma are developed as a result of poor postural habit. While the need for achieving for full normal end range movement there producing pain because of adaptive shortening and the resultant loss of mobility. The pain started to arises during test movements while in end range and then abolishes as soon as the patient's soft tissues are off stretch (Winjnhoven et al., 2006). When the normal resting position is disturbed by two adjacent vertebrae at that time derangement syndrome is produced. There is a nucleus in between two adjacent vertebrae. The derangement syndrome occurs when the fluid nucleus between these surfaces is begun to change its position. Therefore, annular material is also disturbed because of the alteration of the position of the nucleus (Machado et al., 2006).

Although the most common and leading disabling musculoskeletal symptom is low back pain, the danger point of low back pain is not clearly understood. There are so many factors are working behind it that includes mechanical stresses, repetitive heavy lifting, a sedentary lifestyle, obesity, certain personality profiles, and psychological stresses. Besides with frequency, severity and resultant disability of low back pain, those factors are marked as an essential risk factor for producing low back pain (Bach et al., 2009).

Working platforms are not suitable according to individual needs. A very important fact is that there designed seating instrument is so poor. In domestic, commercial and transportation purpose the use of the poorly designed sitting instrument is responsible for bad sitting posture. Some authorities have said that hyper lordosis is related to produce around 75% of postural back pain (Borenstein, 2010).

The most frequent danger site of LBP is physical activity, carrying or lifting a heavy load, bad posture and whole-body jerky movement. Smoking behavior, lack of physical exercise and short sleep hours are Some different lifestyle factors like Smoking behavior, lack of physical exercise and short sleep hours are responsible for increasing LBP. Another risk factor for having LBP is working periods of 8 hours or more and Above 40 years old person is mostly affected by LBP because of extending working periods about 8 hours or more. In the case of pregnancy and obesity in its later stages can distort the curvature of the spine and produce low back pain (Bakker et al., 2007).

Sometimes, low back pain can be developed by some sleeping positions and work-related postures such as long sitting, standing and walking. Overstretch of ligamentous structures may produce LBP which occurs as a result of worse postural or position (Altinelet al., 2008). During and After pregnancy, stress urinary incontinence is a common complaint in women, which can have an important influence on the quality of her life (Di Benedetto et al., 2009). Its prevalence is between 10% and 40%, and the most common form is stress urinary incontinence (SUI). Age, body mass index (BMI), genetic factors, pregnancy and delivery, and a history of hysterectomy, smoking, race, constipation, and menopause have been considered as its risk factors (Kashanian et al., 2011).

However, these figures probably do not reflect the true scope of the problem. Women don't express if they go with this problem because it creates social embarrassing situation associated with the condition (Price et al., 2010). Haylen et al., (2010) said in his study that during coughing or laughing stress urinary incontinence (SUI) is involuntary urine leakage upon physical exertion.

. Its prevalence varies at 10–39%. Mixed urinary incontinence (MUI) is urine leakage with a combination of SUI and detrusor over activity and has a prevalence of 7.5–25% (Dumoulin et al., 2014).

In 1948 Dr. Arnold Kegel first found out the successful outcomes in women with SUI symptoms using pelvic floor muscle exercises, in 1948. Since 1948, several physiotherapy methods have been used (biofeedback, electrostimulation, vaginal cones, vaginal ball, individual or group therapy) in the treatment of UI, with different success rates. In a recent review, pelvic floor muscle training (PFMT) has been found to improve UI symptoms in all types of incontinence (Dumoulin et al. 2014). In the literature, most PMFT programs have been performed under regular control of a physiotherapist in physiotherapy centers, which may not be cost-effective and is time-consuming (Cavkaytar et al., 2014).

In this study, we aimed to assess the effects of simple home-based Kegel exercises in women who were on urine leakage problem along with postpartum low back pain. When women presenting with low back pain after pregnancy, treatment should be started sequentially by a thorough history and physical examination. The aim is to find out other causes of pain to PLBP, to evaluate the nature of the disability, and for designing an individualized management plan. Other serious causes of pain may be a traumatic history, weight loss that occurs due to unexplained cause, a cancer history, due to use steroid, drug abuse, being infected by human immunodeficiency virus or state of immunosuppression, different types of neurological symptoms and signs, fever or poor physical condition. The inflammatory condition, infective, the traumatic incident, neoplastic, degenerative disease condition, or metabolic disorder are the common presentation which called red flags in case of this condition. It should be taken as a serious condition when pain exists in spite of taking adequate rest. Moreover, it indicates unbearable pain that makes people more disable and need some examination, investigations for diagnosis, then refer the patient to the specialist. Focal inflammatory signs and tenderness of the spine may suggest The diagnosis of osteomyelitis can be assured when there is a presence of some inflammatory signs feeling of tenderness and after performing some steps of inspection and observation of spine then it may suggest as spondylolisthesis. So that information should be researched to find out the actual cause of pain (Van Tulder et al., 2006).

Aim of clinical assessment is to identify patients with acute LBP or any neurological deficit that requires urgent specialist management. Moreover, functional limitations are also assessed if it is caused by the pain. In this way, the therapist determines the clinical management options (Sparker et al., 2005). Depending on the causes and duration of the symptoms a wide range of treatment is available for LBP. If patients are suffered from acute low back pain, generally advised to stay active rather than bed rest and taking over the counter pain medicines. If the pain persists longer than 3 months, patients are benefited from the more intensive treatment program. Surgery is rarely needed for low back pain (Quittan, 2002).

Bunzli et al. (2011) mentioned that after investigating the factors in a trial & an economical evaluation of medication and surgical interventions for low back pain, the role of physical therapy adds in this existing literature. Moreover, another study showed that the most effective treatment option is physical therapy (Bjorck et al., 2008). Chartered Society of Physiotherapy defined physiotherapy as “Physiotherapy is a health care profession concerned with human function and movement and maximizing potential performance. To promote, maintain and restore physical, and social well-being, taking account of variations in health status it uses physical approach. Scientifically Physical therapy is a proven approach because only after examined thoroughly, to extend, after application according to the part wise testing system, evaluating the findings and at last whole evidence were reviewed by the therapist. Moreover, physical therapy informs all about its practice guideline and provide treatment in a different case. Besides, the course also includes the exercise of clinical judgment and informed interpretation (Bunzli et al., 2011).

Nowadays A common approach is used in the physical therapy management of LBP. It includes low load, high repetition training of the abdominal and trunk muscles, stabilization or muscle imbalance training. And it is developed partially in response to evidence. Its indicates specific neuromuscular alterations in the control and activation of the back and abdominal muscles. By performing these types of exercises it has been shown improving objective and subjective outcomes in specific subgroups of patients with LBP. And these improved outcome is found in radiologic evidence of instability, acute, first-episode LBP, and postpartum pelvic pain. An article shows the results of a randomized controlled trial which tests the additional benefit of spinal

stabilization exercises over and above conventional physiotherapy for the treatment of low back pain (Cairns et al., 2006).

Postural correction is a must and very essential in the treatment of LBP. It allows the release of end stress loading in posture and dysfunction syndrome. Besides, it maintains the reduction in derangement syndrome (Rinkus et al., 2008). Physical therapy is an essential part of acute back pain rehabilitation. It promotes rapid recovery from pain and returns to work as early as possible. Heat and ice are helpful to relax the muscles and reduce inflammation. Osteopathic physicians and chiropractors provide spinal manipulation techniques. Generally, in the treatment of sub-acute and chronic spine pain, thrust, muscle energy, counter-strain articulation, and myofascial release technique are most commonly used (Samad et al., 2010).

The McKenzie approach is one of the most frequently used types of physiotherapy for acute back pain. The European Guidelines do not recommend the use of any specific programs, such as stretching, strengthening, flexion or extension exercises for acute back pain (Vleeming et al., 2008). Exercise can improve back extension strength, mobility, endurance, and functional disability. Various exercises, such as lumbar stabilization exercise (SE), motor control exercise, core exercise, lumbar flexion exercise, walking exercise (WE), and bracing exercise, have been proposed to mitigate chronic LBP. These exercises focus on lumbar stabilization and core strengthening (Geneen et al., 2017)

In a case-control study by Kim et al., (2016) said that lumbar SE is primarily aimed at improving neuromuscular control, strength, and endurance of the muscles, which are considered to be central to the maintenance of dynamic spinal and trunk stability. It is considered as a safe exercise with the advantages of having multiple stages, as well as cost-effectiveness. Each individual has different lumbar muscular strengths, and therefore, lumbar SE programs should be individualized, comprising of various postures with varying intensities to maximize therapeutic benefit to a particular individual (Kim et al., 2016)

To improve compliance, the intensity level of each exercise can be modified according to each patient's capacity, with changes in the postures of the upper and lower extremities or neck as well as changes in the duration of exercise time (Kim et

al., 2016). Therefore, individualized graded lumbar SE (IGLSE) will allow for a customized exercise program that caters to the needs of a specific patient. IGLSE is not only safe, as it can strengthen the lumbar musculature without flexion or extension, but it also has the potential to offer high compliance owing to the graded protocol with modifiable intensity.

Stabilization exercise is more effective in the reduction of pain than usual physical exercise. To enhance physical functional activity in patients who are suffering from prolog LBP, stabilization exercise is a must. However, there is no proven difference between the efficacy of stability exercise and with manual therapy(Wang et al., 2012)and along with stretching exercises have demonstrated the largest improvements compared with controls (Hayden et al., 2005).

These classic trunk strengthening exercises activate the abdominal and Para spinal musculature at high levels of contraction. Such gross strengthening exercises differ from stabilization exercises in which there is preferential training of stabilizing muscles, initially with low-level isometric activation followed by progressive integration into everyday activities (May & Johnson, 2008). Lumber extension, pelvic tilting exercise, bridging, Regular, Bicycling, walking or swimming, different types of static and dynamic core strengthening exercises of abdominal and back muscle are low impact cardiovascular exercises helps to increase stability. Moreover, gentle stretching for maintaining flexibility are parts of an exercise programmed for the back and spine to avoid or prevent re-injury and in the reduction of LBP (Samad et al., 2010).

The patients are advised to perform regular exercise which will use to increase their strength as well as their body will be flexible than before after performing exercise regularly in a range where the pain is absent there introduced a stabilization program for back exercises. Specific stabilizing exercise program in women with post-partum pelvic pain improved functional status and reduced pain (Stuge et al., 2004). Stabilization exercise makes patients physically more stable and reduces symptoms as well as maintained smooth efficient movement. Stabilization exercise program generally increases awareness about movement, knowledge of safe postures, and functional strength and coordination as well as promotes management of low back pain (Crisns et al., 2006).

3.1 Study design

It was a quasi- experimental design of a single group study and provides an intervention during the experiment. This design did not have a control group to compare with the experimental group.

Quasi-experimental design differs from a true experimental design in that, although it contains an independent variable that is manipulated in order to look for an effect on a dependent variable, either control group or randomization is lacking. These designs are useful to the researcher looking for validation of treatment method and techniques, (Bailey, 1997). In experimental design, all three of the components-manipulation, control, and randomization-are required. (Bailey, 1997). But in this study, all the three components were not present.

Therefore, this study was a quasi-experimental research design. Here, standard physiotherapy treatment such as spinal stabilization exercise was applied to the post-partum women with low back pain. To identify the effectiveness of this treatment approach, Numeric pain rating Scale used as a measurement tool for measuring the pain intensity in several functional positions.

Quasi-experimental design (Pretest-Posttest):

The Pretest-Posttest design is valuable in describing what occurs after the introduction of the independent variable. This design can answer questions about change over time in that the pretest is given before the introduction of the independent variable. If the subject pregnancy-related low back pain is tested before the intervention, a change in scores on the dependent variable can be reported but cannot be attributed to the influence of the independent variable (Depoy & Gitlin, 1998). This study has been conducted at gynecological physiotherapy department of CRP, Mirpur. A before and after the intervention that expressed as pretest and posttest were administered with each subject of groups to compare the pain effects before and after the treatment.

The design could be shown by-

E	O ₁	X ₁	O ₂	(One group)
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O₁= Pretest, O₂= Posttest, X₁= Treatment

3.2 Study area

Outdoor Gynecological and Women's Health Physiotherapy Unit, CRP, Mirpur.

3.3 Study duration

The data has been collected from 20th February 2019 to 30th August 2019.

3.4 Study Population

A population means the entire group of people or items that meet or fulfill the criteria set by the researcher. The populations of this study were the postpartum women with low back pain who attended at Gynecological and Women's health unit, of CRP Mirpur.

3.5 Sample selection

In this study, subjects who fulfill the inclusion criteria are selected as sample. Twenty-seven patients with postpartum low back pain are selected from outdoor of Gynecological and Women's health unit of CRP, Mirpur who are randomly selected for spinal stabilizing exercises. The samples were given a numerical number of 1,2,3. Total of 27 samples was included in this study in one group to conduct the study.

3.6 Inclusion criteria:

- The participants were those individuals who were diagnosed previously as postpartum mechanical low back pain or recently diagnosed by Physiotherapist.
- Patients within 6 months to 2 years postpartum.
- Aged between 18 to 35 years.
- Patients with LBP, with or without radiating leg pain.
- Voluntary participants.
- Patients had a minimum of 1 previous episode of LBP, alteration in normal activities or for which medical care or intervention had been ineffective.

3.7 Exclusion Criteria:

- Low back pain from the pathological cause.
- The participants who had a deformity of the spine.
- Patients with a clinical disorder which may become worse with the lumbar stabilization exercises e.g.: severe uncontrolled hypertensive patient, severe acute bronchial asthma, recent fracture around the lumbar spine.
- Low back pain from spondylolisthesis, spondylosis, spondylolysis.
- Numbness and paresthesia of toes of one or both lower limb as a result of low back pain.
- Subjects who were mentally unstable.

3.8 Method of data collection

Data collection tools

A written questionnaire, pen and paper used as data collection tools in this study.

Questionnaire

The questionnaire developed under the advice and permission of the supervisor following certain guidelines. There were ten close-ended questions with numeric pain rating scale which measured by the examiner and each question will be formulated to identify the change of pain with each activity and next question will be formulated to identify the change of urine leakage problem after intervention.

Measurement tool

Numeric pain rating Scale

In this study, researcher used a numeric pain rating scale for measuring the intensity of the pain (Mann et al., 2003), experienced in patients by using the numeric scale to categorize the pain status. It is known as the Numeric Pain Rating Scale. The scale is a 10cm long scale ranging from 0-10. Here a zero (0) means no pain, 1-3 indicates mild pain, 4-6 indicates that pain is in moderate state and 7-10 is severe pain feeling experienced by patients. NPRS consists of a straight line on which the individual being assessed marks the level of pain (Haefeli & Elfering, 2005).

Rating	Pain Level
0	No pain
1-3	Mild pain
4-6	Moderate pain
7 – 10	Severe pain

Table-1: Numeric Pain Rating Scale

Data collection procedure

The data collection procedure is performed after assessing the patient, initial recording, treatment, and final recording. After screening the outdoor patients at Gynecological and Women’s health unit, the sample was taken from a population with purposive sampling.

Twenty-seven subjects were selected for data collection according to the inclusion criteria. Then researcher-made only one group with 27 subjects and provided the consent form to the sample and also briefly understand the aims and objectives of the corresponding research project. The responsible physiotherapist did pretest on that group and the intensity of pain noted with numeric pain rating score on questionnaire form. The evidence-based treatment protocol that is spinal stabilization exercises performed by one qualified physiotherapist. After 12 sessions of treatment provided for every subject in the group, again above procedure is followed to take post-test.

The participant received treatment as regular patients in the Gynecological and Women’s health unit; they continue their treatment as per their schedule. Each participant received 2days per week. Treatment program arranges for 6 weeks.

Before started the treatment there did the initial assessment where the responsible physiotherapist assessed pain, specific activities and usual activities of the patient with low back pain after pregnancy that carried out in each area that provides the pretest score.

During this time, the participants have continued their treatment as per their schedule. After 12 session of treatment and instructed to encircle the number of numeric pain rating scale according to their pain intensity in face to face conversation between responsible physiotherapist and participants in order to reduce the biasness. The SPSS version 20.0 software was used in the performance of statistical analyses for the mean and standard deviation. The normality of the distributions was tested with the Wilcoxon Signed Rank Test.

Intervention

Experimental group exercise protocol

Participants underwent these exercise for 45 minutes, 2 times a week, for a total duration of 6 weeks. All participants were educated on the correct posture and lumbar stabilization exercise with core stabilizing system. All exercise was enlisted according to recent evidence-based study (Stuge et al., 2004) and by consulting with a specialist physiotherapist who has more than ten-year experiences and got special training in gynecology and women's health.

The education session was performed at the clinic by a trained physical therapist at the first visit. Moreover, a printed pamphlet with instructions on how to perform the exercises was given to each patient. The exercises were performed at home 5 times a day by all participants.

Exercise 1: Core strengthening (Static)

- Therapist: Give the instruction to the patient so that the patient will be able to perform the exercise solely beyond the painful range.
- Patient position: Prone lying on the bed.

Steps:

- Four-point kneeling on the bed, continue to breathe normally. Slowly try to draw in your abdominal wall. Holding this position for 10 seconds.
- Then relax your abdominal wall. Elbow straight with shoulder level. Maintain normal thoracic and lumbar curve. Perform it ten times per set, 5 sets a day. Stop performing beyond the painful range.

Exercise 2: Core strengthening (Dynamic, Cat Camel exercise)

- Therapist: Give the instruction to the patient so that the patient will be able to perform the exercise solely beyond the painful range.
- Patient position: Prone lying on the bed.

Steps:

- Four-point kneeling on the bed, continue to breathe normally. Elbow straight with shoulder level, maintain the normal spinal curve. Move the trunk and pelvis into upward and downward direction rhythmically.
- Perform it ten times per set, 5 sets a day. Stop performing beyond the painful range.

Exercise 3: Core strengthening (Dynamic, Superman exercise)

- Therapist: Give the instruction to the patient so that the patient will be able to perform the exercise solely beyond the painful range.
- Patient position: Prone lying on the bed.

Steps:

- Maintain normal neutral spine on prone lying. Bring your legs together and extend your arms overhead so your biceps are alongside your ears. Using the muscles of your back with a little help from your glutes, raise your legs and torso off the ground, keep your leg straight.
- Hold this position for five seconds. Lower back down to the ground with control. Perform it ten times per set, 5 sets a day. Stop performing beyond the painful range.

Exercise 4: Lumber extension.

- Therapist: Give the instruction to the patient so that the patient will be able to perform the exercise solely beyond the painful range.
- Patient position: Prone lying on the bed.

Steps:

- Elbow straight and hand place on the ground with shoulder level. Raise head & trunk, Pelvic neutral. Hold it for 10 seconds. Return to the starting position.

- Perform it 10 times per set, 5 sets a day. Stop performing beyond the painful range.

Exercise 5: Hook lying combination exercise.

- Therapist: Give the instruction to the patient so that the patient will be able to perform the exercise solely beyond the painful range.
- Patient position: Supine lying on the bed.

Steps:

- Hook lying position on the bed, maintain a normal neutral spine. Holding the hands together and arms straight up. Raise knees so that it comes horizontal to the bed level and leg goes out, Arms go overhead at the same angle of the leg. Hold each position for 10 seconds. Slowly return to the starting position.
- Alternate in the other leg and arm. Hold each position for 10 seconds. Perform it five times per set, 5 sets a day. Stop performing beyond the painful range.

Exercise 6: Bridging exercise.

- Therapist: Give the instruction to the patient so that that patient will be able to perform the exercise solely beyond the painful range.
- Patient position: Supine lying on the bed.

Steps:

- Maintain normal neutral spine and breath normally. Raise your buttock about 2 inches above the bed, not raise the head, trunk. Holding this position for 10 seconds. Gently down the lower back.
- Perform it 10 times per set, 5 sets a day. Stop performing beyond the painful range.

Exercise 7: Straight leg raising.

- Therapist: Give the instruction to the patient so that the patient will be able to perform the exercise solely beyond the painful range.
- Patient position: Prone lying on the bed.

Steps:

- Straight Leg Raise of one leg about six inches above the table. Then slowly return. Perform it ten times per set, three sets a day.
- Perform it ten times per set, 5 sets a day. Stop performing beyond the painful range.

Exercise 8: Pelvic tilting exercise.

- Therapist: Give the instruction to the patient so that the patient will be able to perform the exercise solely beyond the painful range.
- Patient position: Sitting on the physio ball.

Steps:

- Try to move the ball forward & backward, side to side. Perform it for 5 minutes.

Exercise 9: Kegel exercise.

If the patient has a problem of urinary incontinence after C-section with LBP, then only introduce this exercise.

- Therapist: Give the instruction to the patient so that the patient will be able to perform the exercise solely beyond the painful range.
- Patient position: Supine lying, knee 90 semi-flex, sole touched on the bed.

Steps:

- Breath freely during exercise. Tighten the pelvic floor muscle, not try to contract the muscle of abdominal, thigh & buttocks. Then relax for 5 seconds, try to perform it four or five times in a row.
- Perform it 5 times a day, 10 repetitions, 1 set.

Ethical consideration

The research proposal was submitted for approval to the administrative bodies of the ethical committee of CRP and also had followed the Bangladesh Medical Research guideline (BMRC) and the World Health Organization (WHO) guideline. Again Before data collection, permission from the Ethical Committee of Bangladesh Health Professions Institute (BHPI) took and a requested letter hand over to the appropriate authority of the study area for taking permission and seeking assistance for smooth access to data collection with insurance of patient's safety. In order to eliminate ethical claims, the participants were set free to receive treatment for other purposes as usual. Each participant was informed about the study before beginning and given written consent. The researcher received verbal and signed an informed consent form to participate in this study from every subject. The participants were informed that they have the right to meet with an outdoor doctor if they think that the treatment is not enough to control the condition or if the condition becomes worse. The participants were also informed that they were completely free to decline to answer any question during the study and were free to withdraw their consent and terminate participation at any time. If the patient wants to withdraw herself from the study, it would not affect their treatment in the physiotherapy department and they would still get 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.

3.9 Data analysis

The meaning of data collection has to be presented in ways that other research workers or professionals can understand easily so that it can ensure its values to the researcher. It can be said in another way that the researcher has to make an idea or perception of the results. As a result, came from an experiment in this research, data analysis was done with statistical analysis (Mann, 2003).

All participants had code in order to ensure that the research has some values, the meaning of collected data has to number according to the group to maintain participant's confidentiality. Pain intensity score on a numeric pain rating scale of all subjects of the group was put before starting treatment and after completing treatment.

Reduction of pain intensity is the difference between pre-test and post-test score of each subject of the group.

Experimental studies with the different subject design within one subject groups and the data is non-parametric and numerical data, which should be analyzed with “Wilcoxon Signed Rank Test:” As it was quasi-experimental and had within groups of different subjects, who were selected to spinal stabilization exercises and the measurement of the outcome came from collecting Numeric pain rating score, with considering numerical data, so the “Wilcoxon Signed Rank Test” was used in this study to calculate the level of significance. “Wilcoxon Signed Rank Test:” was calculated to test the hypothesis on the basis of following assumptions-

- Data were numerical.
- Data were not well distributed
- Within-group comparison among subjects.

Wilcoxon sign test denoted by Z test, after the conclusion of the observed value and p-value whenever it is less than the table value of significance 0.05 level then null hypothesis was considered as rejected and alternative hypothesis considered as accepted.

$$Z = \frac{T - \frac{1}{4}n(n+1)}{\sqrt{\frac{n(n+1)(2n+1)}{24}}}$$

Here, T = Sum of (positive or negative) rank

n = Total number of sample

3.10 Significant level

Here, the researcher calculated the “p” value to find out the significance of the study. The “p” values refer to the probability of the results for the experimental study. Probability means the accuracy of the findings. A “p” value is called the level of significance for an experiment study and for health service research a “p” value of <0.05 was accepted as a significant result. If the p-value is equal or smaller than the significant levels, the results are considered as significant.

3.11 Elimination of confounding variables

Confounding variable has an effect on the study variables which can affect the result of the study. There were some confounding variables in this study such as patient’s age, history of taking recent physiotherapy intervention, oral NSAID, steroid injection or other treatment which could influence the result of the study. To control the confounding variables, the researcher set the inclusion criteria as to include only those subjects who have no history of taking recent physiotherapy intervention, oral NSAID, steroid injection or other treatment.

Socio-demographic Information**4.1 Table-1 Mean age of the participant of the group (n=27)**

Subjects in the Experimental group		
Age in Years	Frequency	Percentage
18-20	1	3.7
21-23	3	11.1
24-26	6	22.2
27-29	7	25.9
30-32	7	25.9
33-35	3	11.1
Total	27	100.0
Mean \pm SD	27.56 \pm 3.683	

The table reveals that among the 27 participants the mean age of the participants were 27.56 ± 3.683 years with a range from 18 to 35 years and the minimum age was 19 years and maximum age was 33 years. It is found from table 1 that 3.7%, 11.1%, 22.2% and 25.9%, 25.9%, 11.1% of the participants belonged to age group 18-20 years, 21-23 years, 24-26 years, 27-29 years 30-32 years and 33-35 years. n=1 participant was between 18-20 years, n= 3 were between 21-23 years and n=6 were between 24-26 years, n= 7 were between 27-29 year, n=7 were between 30-32 year, and n= 3 were between 33-35 years

4.2 Occupational Status of the participants

The occupation of the participants is found in this study. Among n= 27 patients, 22 participators were housewife, 3 participators were service holder, n= 1 was banker, n=1 was a doctor. In percentage 81.5% participators were housewife, 11.1% participators were service holder, 3.7% was banker, 3.7% was doctor.

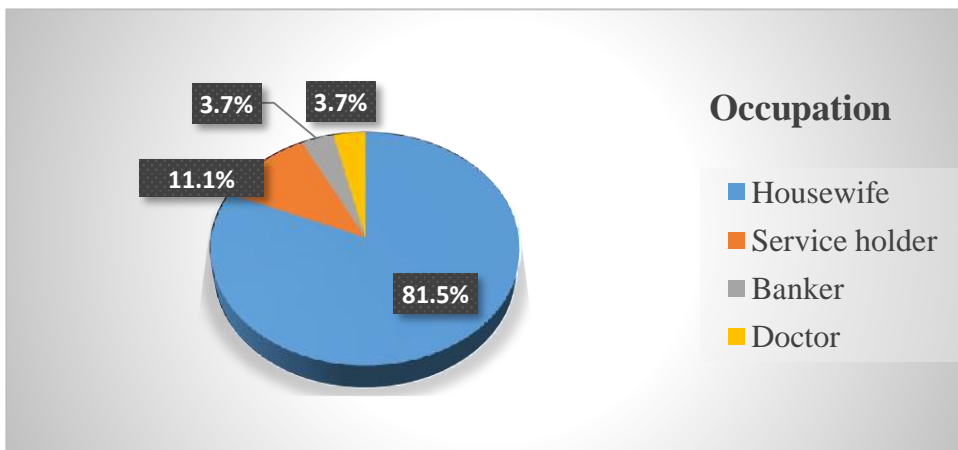


Figure-1: Occupation of the participants (n= 27)

4.3 Reason of receiving treatment

The Figure-2 shows about 70.4% patients had only the complain of pain at lower back region and about 18.5% patients had weakness of the lower limb associated with low back pain and 11.1% patients has both low back pain associated with weakness and numbness in the lower limb. Researcher's focus was on low back pain not associated symptoms with pain due to a limited time period.

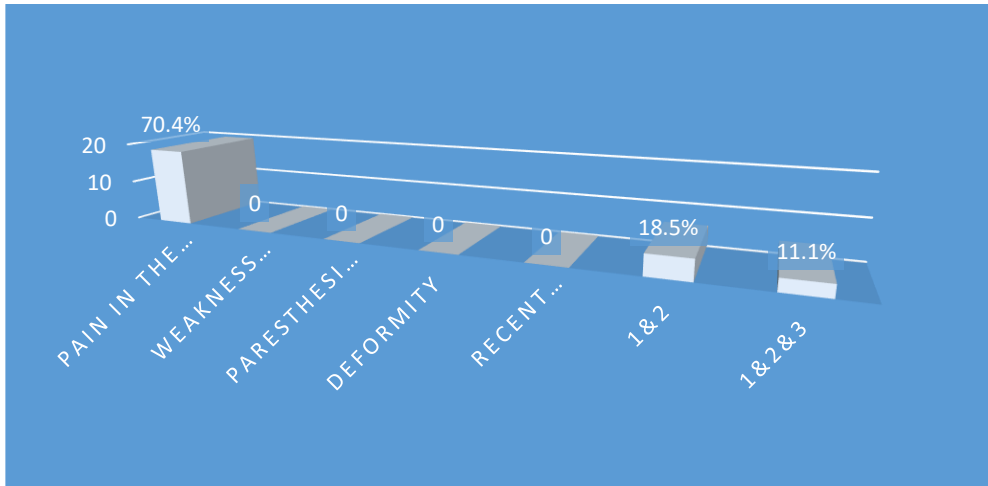


Figure-2: Reason of receiving treatment (n= 27).

4.4 Onset of current problem

The Figure-3 shows among total participants, 22.2% of participant's onset of a current problem was from the last six months, 77.8% was before 1 year before coming to the respective unit.

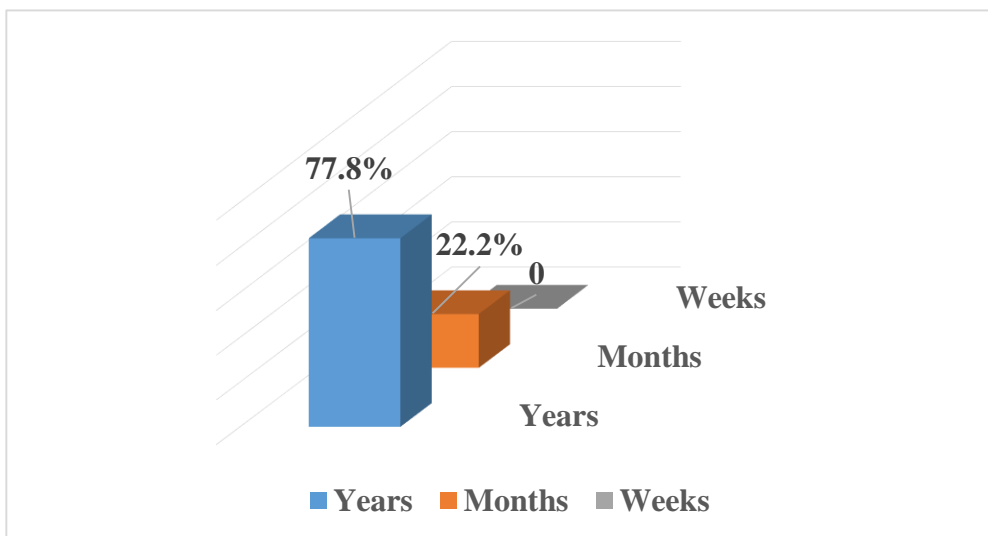


Figure-3 Onset of current problem (n= 27)

4.5 Time of last delivery

The Figure-4 shows time of last delivery period of the participants was within 6 months of 7.4% participants and within 1 year of 85.2% participants and 2years or not more than two years of 7.4% participants.

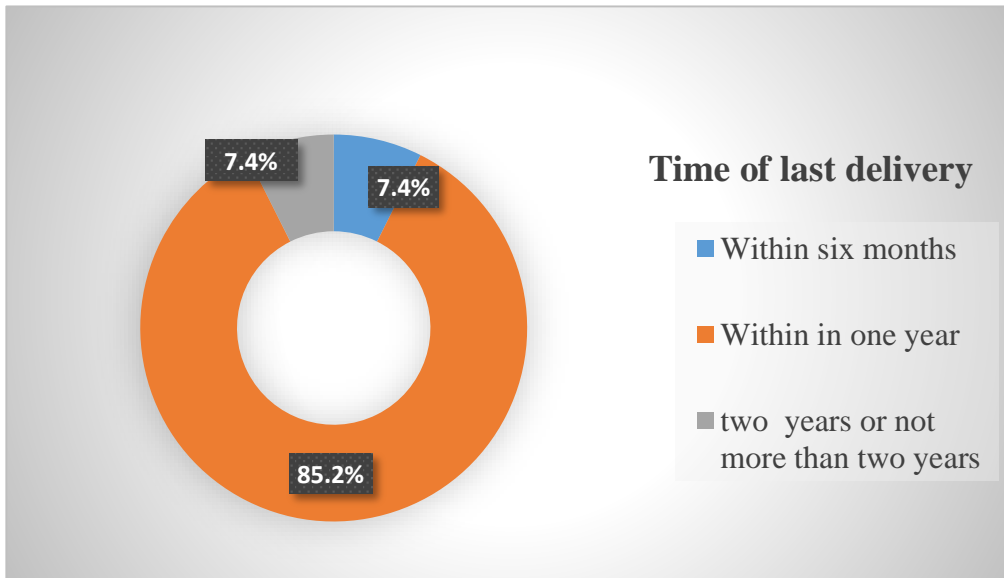


Figure-4: Time of last delivery.

4.6 Exact location of pain

The exact location of the pain of the participants was a lower back region that is the distance from the 1st lumbar vertebrae to the 1st sacral vertebrae.

4.7 Household work performance

All participants were habituated to perform repetitive and household work that was included in the questionnaire by the researcher.

4.8 Resting pain

Table-2 Comparison of pain on Numeric pain rating Scale at resting position among individuals in group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	0	0
E2	0	0
E3	1	0
E4	1	1
E5	0	0
E6	4	1
E7	3	0
E8	0	0
E9	1	1
E10	1	0
E11	0	0
E12	1	1
E13	1	0
E14	4	2
E15	2	1
E16	0	0
E17	2	1
E18	3	1
E19	3	1
E20	0	1
E21	2	1
E22	2	1
E23	2	0
E24	0	0
E25	0	0
E26	3	1
E27	3	0
Mean± SD	1.44 ± 1.34	0.52 ± .58

In this study, session 1 mean of pretest score of pain on Numeric Pain Rating Scale was (1.44 ± 1.34) and after completing 12 sessions mean of post-test scores came out $(0.52 \pm .58)$. It shows that pain on the Numeric Pain Rating Scale had relatively reduced in all the individuals in groups.

Table-3 Rank and statistics of pain during resting position.

Posttest- Pretest pain during resting position	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	15	8.77	131.50	3.34	0.001
Positive Ranks	1	4.50	4.50		
Ties	11				
Total	27				

From statistical test researcher found the observed “Z” value is 3.334 and the corresponding p-value is .001. which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variable.

4.9 Pain during sweeping

Table-4: Comparison of pain on Numeric pain rating Scale during sweeping among individuals in the group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	2	1
E2	7	2
E3	8	3
E4	8	3
E5	8	4
E6	7	4
E7	6	4
E8	8	3
E9	7	4
E10	7	4
E11	7	3
E12	7	3
E13	7	3
E14	7	4
E15	7	4
E16	8	4
E17	8	4
E18	8	5
E19	8	3
E20	7	4
E21	6	3
E22	7	4
E23	8	4
E24	7	3
E25	5	3
E26	7	4
E27	7	4
Mean± SD	7 ± 1.24	3.48 ± .80

In this study, session 1 mean of pre-test score of pain on the Numeric Pain Rating Scale was (7 ± 1.24) among individuals of the group. On session 12 mean of post-test scores after treatment is ($3.48 \pm .80$) so, it indicates that pain on the Numeric Pain Rating Scale had relatively reduced in the individual of the group.

Table-5 Rank and statistics of pain during sweeping.

Pretest-posttest pain during sweeping	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	27	14.00	378.00	4.60	0.00
Positive Ranks	0	.00	.00		
Ties	0				
Total	27				

From statistical test researcher found the observed “Z” value is 4.60 and the corresponding p-value is 0.00. which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variables

4.10 Pain at toilet sitting

Table-6: Comparison of pain on Numeric pain rating Scale at toilet sitting among individuals in group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	5	2
E2	8	3
E3	8	4
E4	8	4
E5	8	3
E6	7	3
E7	7	2
E8	8	4
E9	7	5
E10	7	3
E11	7	4
E12	7	4
E13	7	3
E14	6	4
E15	7	4
E16	8	4
E17	8	5
E18	8	4
E19	8	5
E20	8	5
E21	6	4
E22	7	4
E23	8	4
E24	7	4
E25	6	3
E26	7	4
E27	7	4
Mean± SD	7.22 ± .80	3.77 ± .80

In this study, session1 mean of pre-test score of pain on the Numeric Pain Rating Scale was $(7.22 \pm .80)$. On session 12 mean of post-test scores was $(3.77 \pm .80)$ after treatment. So, it is clear that pain on the Numeric Pain Rating Scale had relatively reduced in all individuals in the groups.

Table-7 Rank and statistics of pain during toilet sitting.

Posttest- Pretest pain during toilet sitting	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	27	14.00	378.00	4.61	0.00
Positive Ranks	0	.00	.00		
Ties	0				
Total	27				

From statistical test researcher found the observed “Z” value is 4.61 and the corresponding p-value is 0.00 which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variables

4.11 Pain during floor sit to stand

Table-8: Comparison of pain on Numeric pain rating Scale during floor sit to stand among individuals of the group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	5	3
E2	6	3
E3	8	3
E4	8	4
E5	7	3
E6	7	3
E7	6	2
E8	8	3
E9	6	5
E10	6	4
E11	6	4
E12	6	4
E13	7	3
E14	6	3
E15	7	3
E16	7	3
E17	8	5
E18	7	5
E19	8	5
E20	7	5
E21	5	4
E22	6	3
E23	7	3
E24	7	4
E25	6	3
E26	6	3
E27	7	3
Mean± SD	6.68± .88	3.58 ± .87

In this study, session 1 mean of pre-test score of pain on the Numeric Pain Rating Scale was $(6.67 \pm .88)$. On session 12 mean of post-test scores after treatment was $(3.58 \pm .87)$. It showed that pain on the Numeric Pain Rating Scale had relatively reduced in all individuals.

Table-9 Rank and statistics of pain during floor sit to stand.

Posttest- Pretest pain during floor sit to stand	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	27	14.00	378.00	4.58	0.00
Positive Ranks	0	.00	.00		
Ties	0				
Total	27				

From statistical test researcher found the observed “Z” value is 4.58 and the corresponding p-value is 0.00 which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variables.

4.12 Pain during sitting on chair

Table-10 Comparison of pain on Numeric pain rating Scale during sitting on chair among individuals in the group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	2	0
E2	2	0
E3	3	0
E4	3	1
E5	6	1
E6	2	1
E7	3	1
E8	4	0
E9	3	2
E10	4	1
E11	3	1
E12	4	2
E13	2	0
E14	6	2
E15	2	1
E16	4	1
E17	3	1
E18	3	2
E19	4	2
E20	1	2
E21	2	1
E22	3	1
E23	3	1
E24	4	1
E25	1	1
E26	3	2
E27	3	1
Mean± SD	3.07 ± 1.2	1.08 ± .68

The table reveals that, session 1 mean of pre-test score of pain on the Numeric Pain Rating Scale was (3.07 ± 1.21) . On session 12 mean of post-test scores after treatment was $(1.07 \pm .68)$. So, it is clear that pain on the Numeric Pain Rating Scale had relatively reduced in all individuals in the group.

Table-11 Rank and statistics of pain during sitting on a chair.

Posttest- Pretest pain during sitting on chair	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	25	13.88	347.00	4.42	0.00
Positive Ranks	1	4.00	4.00		
Ties	1				
Total	27				

From statistical test researcher found the observed “Z” value is 4.42 and the corresponding p-value is 0.00 which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variables.

4.13 Reduction of pain during walking

Table-12: Comparison of pain on Numeric pain rating Scale during walking among individual in the group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	8	4
E2	7	3
E3	7	3
E4	7	3
E5	8	3
E6	5	2
E7	7	3
E8	6	3
E9	7	5
E10	6	4
E11	7	4
E12	7	4
E13	6	3
E14	5	3
E15	6	3
E16	7	3
E17	7	4
E18	7	5
E19	7	3
E20	6	4
E21	6	4
E22	7	4
E23	7	4
E24	7	3
E25	6	3
E26	7	4
E27	6	4
Mean ± SD	6.63 ± .74	3.60 ± .70

In this study, session 1 mean of pre-test score of pain on the Numeric Pain Rating Scale was $(6.63 \pm .74)$. On session 12 mean of post-test scores after treatment was $(3.16 \pm .70)$. It indicates that pain on the Numeric Pain Rating Scale had relatively reduced in all individuals in group.

Table-13 Rank and statistics of pain during walking.

Posttest- Pretest pain during walking	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	27	14.00	378.00	4.60	0.00
Positive Ranks	0	.00	.00		
Ties	0				
Total	27				

From statistical test researcher found the observed “Z” value is 4.60 and the corresponding p-value is 0.00 which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variables.

4.14 Reduction of pain during journey by bus or rickshaw.

Table-14: Comparison of pain in Numeric Pain Rating Scale during journey by bus or rickshaw among individuals in the group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	8	3
E2	7	2
E3	6	3
E4	5	3
E5	5	3
E6	5	2
E7	5	3
E8	7	2
E9	5	4
E10	6	4
E11	6	3
E12	7	5
E13	5	4
E14	5	4
E15	6	3
E16	7	3
E17	5	4
E18	6	4
E19	6	4
E20	7	4
E21	6	4
E22	5	3
E23	6	3
E24	6	3
E25	6	3
E26	6	3
E27	5	2
Mean± SD	5.89 ± 0.85	3.26 ± 0.76

In this study, session 1 mean of pre-test score of pain on the Numeric Pain Rating Scale was ($5.89 \pm .85$). On session 12 post-test scores after treatment was ($3.26 \pm .76$). It showed that pain on the Numeric Pain Rating Scale had relatively reduced in all individuals.

Table-15 Rank and statistics of pain during journey by bus or rickshaw.

Posttest- Pretest pain during journey by bus or rickshaw	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	27	14.00	378.00	4.591	.000
Positive Ranks	0	.00	.00		
Ties	0				
Total	27				

From statistical test researcher found the observed “Z” value is 4.59 and the corresponding p-value is 0.00 which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variables.

4.15 Reduction of pain during stair climbing

Table-16: Comparison of pain on Numeric pain rating Scale during stair climbing among individuals in the group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	7	3
E2	8	3
E3	8	3
E4	7	3
E5	7	3
E6	7	3
E7	7	3
E8	7	3
E9	7	5
E10	7	3
E11	6	4
E12	7	6
E13	6	3
E14	6	4
E15	6	4
E16	7	4
E17	7	6
E18	7	4
E19	7	3
E20	7	4
E21	5	4
E22	6	4
E23	7	4
E24	7	4
E25	5	4
E26	7	4
E27	6	3
Mean± SD	6.70 ± .72	3.74 ± .86

The table reveals that, session 1 mean of pre-test score of pain on the Numeric Pain Rating Scale was $(6.70 \pm .72)$. On session 12 mean of post-test scores after treatment was $(3.74 \pm .86)$. It indicates that pain on the Numeric Pain Rating Scale had relatively reduced in all individuals.

Table-17 Rank and statistics of pain during stair climbing.

Posttest- Pretest pain during stair climbing.	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	27 ^v	14.00	378.00	4.57	0.00
Positive Ranks	0 ^w	.00	.00		
Ties	0 ^x				
Total	27				

From statistical test researcher found the observed “Z” value is 4.57 and the corresponding p-value is 0.00 which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variables.

4.16 Reduction of pain during heavy weight lifting

Table-18 Comparison of pain on Numeric pain rating Scale during heavy weight lifting among individuals in the group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	7	4
E2	8	3
E3	7	3
E4	6	4
E5	7	3
E6	7	3
E7	7	4
E8	6	3
E9	7	5
E10	7	4
E11	7	4
E12	7	5
E13	7	4
E14	6	4
E15	7	4
E16	7	4
E17	7	5
E18	8	4
E19	8	4
E20	8	5
E21	7	4
E22	7	4
E23	7	4
E24	7	4
E25	6	4
E26	6	4
E27	7	4
Mean± SD	6.96 ± .59	3.96 ± .59

In this study, session 1 mean of pre-test score of pain on the Numeric Pain Rating Scale was ($6.96 \pm .59$). On session 12 post-test scores after treatment was ($3.96 \pm .59$). So, it is clear that pain on the Numeric Pain Rating Scale had relatively reduced in all individuals.

Table-19 Rank and statistics of pain during heavy weight lifting.

Posttest pain during rest - Pretest pain during rest	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	27	14.00	378.00	4.63	0.00
Positive Ranks	0	.00	.00		
Ties	0				
Total	27				

From statistical test researcher found the observed “Z” value is 4.63 and the corresponding p-value is .000. which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variables.

4.17 Pain during bed rolling (Supine to left or right side rolling)

Table-20 Comparison of pain on Numeric pain rating Scale during bed rolling among individuals in the group.

Subject of Experimental group	Session 1 Pre	Session 12 Post
E1	5	0
E2	4	1
E3	3	1
E4	2	0
E5	4	1
E6	1	1
E7	4	0
E8	1	0
E9	1	1
E10	2	1
E11	0	0
E12	2	2
E13	1	0
E14	2	1
E15	2	0
E16	2	0
E17	1	2
E18	3	1
E19	3	1
E20	5	3
E21	4	2
E22	4	1
E23	4	1
E24	3	1
E25	3	1
E26	4	1
E27	4	1
Mean± SD	2.74 ± 1.38	.89 ± .75

In this study, session 1 mean of pre-test score of pain on the Numeric Pain Rating Scale was (2.74 ± 1.38). On session 12 post-test scores after treatment were ($0.89 \pm .76$). It clearly shows that pain on the Numeric Pain Rating Scale had relatively reduced in all individuals.

Table-21 Rank and statistics of pain during rolling (supine to left or right)

Posttest pain during rest - Pretest pain during rest	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P- value
Negative Ranks	22	12.41	273.00	4.16	0.00
Positive Ranks	1	3.00	3.00		
Ties	4				
Total	27				

From statistical test researcher found the observed “Z” value is 4.16 and the corresponding p-value is 0.00 which is less than 0.05 ($p < .05$) so, it was considered as a significant for these variables.

4.18 Urine leakage problem during sneezing and coughing.

Table-22: Present condition of urine leakage problem after receiving treatment.

Experimental group					
Subject	Pretest	Posttest	Subject	Pre-Test	Post test
E1	Yes	No	E15	Yes	No
E2	Yes	No	E16	No	No
E3	Yes	No	E17	Yes	No
E4	Yes	No	E18	Yes	No
E5	No	No	E19	Yes	No
E6	Yes	No	E20	Yes	No
E7	No	No	E21	Yes	No
E8	Yes	No	E22	Yes	No
E9	No	No	E23	No	No
E10	Yes	No	E24	No	No
E11	Yes	No	E25	No	No
E12	Yes	No	E26	No	No
E13	No	No	E27	Yes	No
E14	No	No			

In this study, from 27 participants, 17 participants had urine leakage problem during coughing and sneezing in pretest examination. After providing Kegel exercise all participants recovered from this problem.

Variables in the study statistically significance at the following level of significance

Serial No.	Variables	Mean pre-test	Mean post-test	Mean difference	“z” Value	“p” value
01.	Pain at resting Position	1.44	0.52	0.93	3.34	0.001
02.	Pain during swiping	7.00	3.48	3.52	4.60	0.00
03.	Pain during toilet Sitting	7.22	3.78	3.45	4.61	0.00
04.	Pain during floor sit to stand	6.67	3.55	3.11	4.58	0.00
05.	Pain during sitting on chair	3.07	1.07	2	4.42	0.00
06.	Pain during walking	6.63	3.52	3.11	4.60	0.00
07.	Pain during journey by bus or rickshaw	5.59	3.26	2.33	4.59	0.00
08.	Pain during stair climbing	6.70	3.74	2.99	4.57	0.00
09.	Pain during weight lifting	6.96	3.96	3	4.63	0.00
10.	Pain during bed rolling	2.74	0.89	1.85	4.16	0.00

Table-23 Level of significance in different variables of pain.

Mean of pretest pain at resting position of all participants is 1.44 and mean of posttest is .52. Mean pretest of pain at toilet sitting of all participants is 7.22 and mean posttest is 3.78. Mean pretest pain during floor sit to stand and during walking, during heavy weight lifting and during rolling is sequentially 6.67, 6.63, 6.96 and 2.74. Mean of posttest of those variables are sequentially 3.55, 3.52, 3.96, .88. The results clearly showed that pain on Numeric Pain Rating Scale in all functional position had relatively reduced in all individuals.

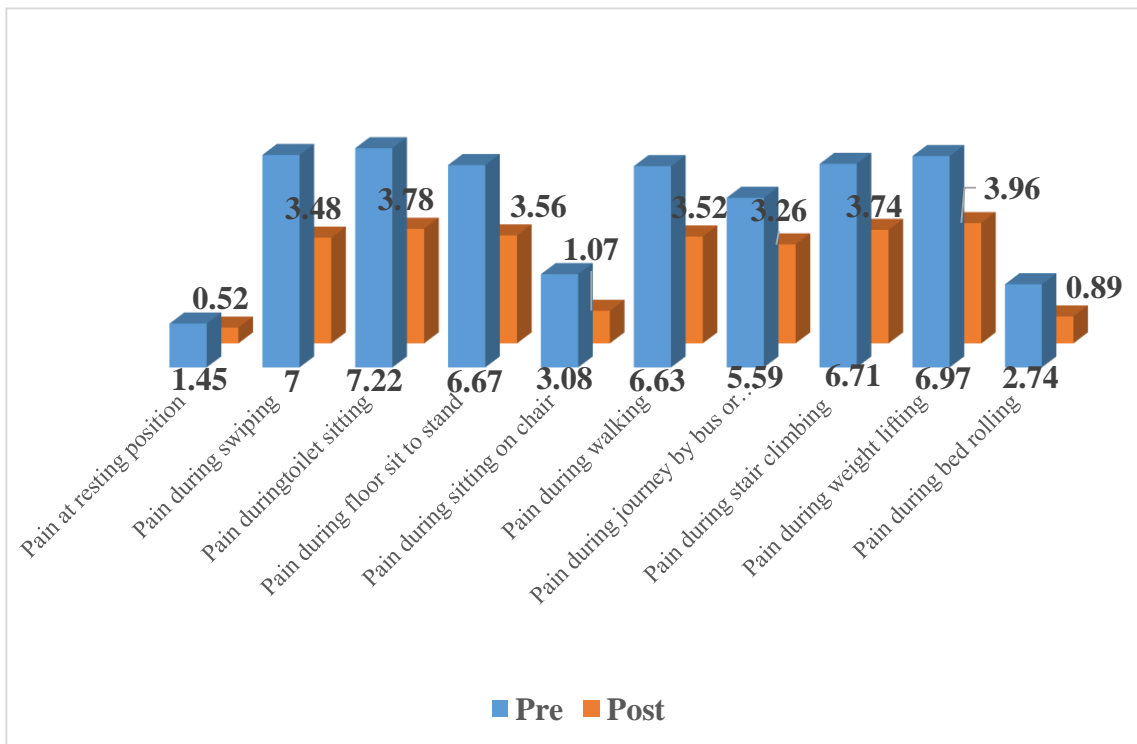


Figure- 5: Mean improvement of different variables in a different functional position

4.18 Interpreting the Result

The total findings of the study show that the average mean score after receiving treatment is lower than before receiving treatment. Statistical analysis of the data represented that the findings of the study are significant (data is presented in Table 23).

The researcher got significant result for all other variables on the basis of Z-value corresponding with the p-value. To find out the level of significance ($P < .05$) for two-tailed hypothesis using the Wilcoxon test, the critical value of T is 98 for sample number 27 ($n-1=26$) (Hicks, 1999). Here as the observed Z-value of all variables such as pain during resting position, sweeping, toilet sitting, walking, stair climbing, heavy weight lifting, during rolling, is lower than the critical value of T, so it can be said that null hypothesis is rejected and the alternative hypothesis is accepted.

The purpose of the study was to find out the changes of pain intensity by spinal stabilization exercises in low back pain among postpartum women, and the objectives were to identify the socio-demographic characteristic (age, occupation), the reason of receiving treatment, the onset of pain, the exact location of pain, household work performance. To find out the pain intensity to evaluate the functional outcome of specific activities and to evaluate the functional outcome of usual activities in case of low back pain among postpartum. In this experimental study 27 patients with low back pain in postpartum who received specific stabilization exercise. They were attended for 2 days per week within 6 weeks at Gynecological and Women's health unit, of CRP Mirpur to find out the change. The numeric pain rating scale is used to measure the outcome for pain intensity and pre-test & post-test score for functional disability in the different functional situation.

This research found significant improvement of pain. Pretest and posttest, mean difference of pain at rest is .93 and their p-value ($p < 0.05$), Also there was most significant improvement of Pain at various usual and specific activities such as, sweeping, toilet sitting, floor sit to stand, chair sit to stand, in walking, during journey by bus, stair climbing, weight lifting, during rolling from supine to side lying in initial and after as the pre-test and post-test mean difference were consecutively 3.52, 3.45, 3.11, 2, 3.11, 2.33, 2.99, 3, 1.85 and their p-value is ($P < 0.05$).

The result of this study showed that, in subjects with postpartum low back pain who received spinal stabilization exercises relatively decrease pain in resting position and also all functional activities compared to individual's initial pain status by calculating the mean difference. Considering these findings, it seems that spinal stabilization exercises are more pronounced in individuals with postpartum low back pain.

To evaluate the efficacy of specific stabilization exercises for patients with postpartum low back pain to reduce pain and improve functional status, a study was conducted in Norway in 2004. Eighty-one postpartum women (after one to three months of pregnancy and their mean age was 32years) were randomized into a trial group ($n = 40$) and a control group ($n = 41$). Subjects in the intervention group were

instructed specific stabilization exercises with conventional physiotherapy management and control group received only individualized physiotherapy by six experienced physiotherapists over a period at two different clinical settings. One-year follow-up evaluation also conducted at home. The results of the study showed that a treatment program with specific stabilizing exercises, integrated functionally was effective in reducing pain and improving functional status (Stuge et al., 2004).

In 2019 a randomized controlled trial was conducted in 48 participants with chronic LBP. After screening, were randomized to 1 of 4 groups; Flexibility exercise, walking exercise WE, stabilization exercise (SE), and stabilization with WE (SWE) groups. Participants underwent each exercise for 6 weeks. This study suggested that the stabilization exercise and walking exercise might have some favorable effects on muscle strength and physical endurance. Considering the efficiency of the WE and the SE on reducing pain and improving the physical endurance, it is recommended that these interventions should be applied to treat chronic LBP (Suh et al., 2019).

Ehsani et al., (2019) found in her study that, the TA and PFM muscles activity is improved among the subjects with postpartum LPP, who performed SE exercises and the significant improvement found in the ability to contract the TA after a SE exercise program is consistent. Another key finding of this study was increased PFM activity without training it directly by activating the TA muscle with SE exercises in postpartum women with LPP. The significant improvement came out due to receive specific lumbar stabilization exercise along with the core stabilizing system of the spine had measured in the study. On another study, results showed the significance of these exercises to all of these subjects. Breen et al reported that the overall incidence of back pain 1-2 months postpartum in this population was related to predisposing factors like the previous history of back pain, younger age, and greater weight. They showed that core stabilization exercises and postural correction resulted in improvement. Macarthur et al., (1995) also showed that postpartum low back pain was common and decreased considerably over time with the help of core stabilizing exercises.

In this study researcher also found significant improvement by calculating statistical test (Wilcoxon signed-rank test) in ten functional activities considering the p-value <0.05 (Suh et al., 2019). Resting position, sweeping, chair sit to stand, journey by bus or rickshaw, toilet sitting, waking stair climbing, weight lifting and bed rolling are following functional activities. This improvement may be found due to the exercises used were based on those that have been widely advocated and publicized to promote spinal stability and integration of exercises into daily activities (Sullivan, 2000).

This research found mean age is 26.74 and most of them are housewife. The last delivery date of most of the participants is within one year, and most of them are suffering from this problem for one year and all participants are habituated to all kinds of household work.

Participants who have urine leakage problem initially at the treatment after performing Kegel exercise, their problem were solved. So it can be said that Kegel exercise is one of the most effective interventions in urine leakage problem during coughing and sneezing.

5.1 Limitations

In Bangladesh, postpartum low back pain related research work was performed the first time, so there were some limitations and barriers during conducting the research project.

First, the short study period is the main limiting factor of this study. Here the participant gets only 6 weeks' treatment sessions due to lack of time limitation. This is the reason behind not exploring the long term effect of spinal stabilization exercises for postpartum LBP.

Second, the causes of LBP were heterogeneous. Nonetheless, this study is still valuable as the purpose of the study was to determine an effective exercise method to solve postpartum LBP.

Third, the research was carried out in Gynecological and Women's health unit of CRP Mirpur, such a small environment and 27 participants of postpartum low back pain were included in this study and this is a very small quantity of samples in one group. So there is a lack of sufficiency of sample for the study to generalize the wider population of this condition.

Fourth, the researcher took participants of both acute, chronic and follow up cases with low back pain which also influence the study.

It is limited by the fact all daily activities of the subject were not monitored which could have influenced.

6.1 Conclusion

The rate of education is very poor in Bangladesh, besides Government and non-Government activities in Health sectors are not sufficient, now a day's Government Health policy is yet to meet the demand of the population and different private clinic and hospitals are trying to bring latest medical services in our country.

Most of the people do not know about physiotherapy. But in the other developed country physiotherapy is considered as an important treatment. As a developing medical profession, it is the duty of the physiotherapy in Bangladesh should make strong evidence for practice which will increase strength and improve the skill of the physiotherapy as well as developed our physiotherapy profession.

The study consists of 27 participants in one group. All participants underwent an extensive relevant physical, medical history, and orthopedic examinations, also medical report if available from which their diagnosis of postpartum mechanical low back pain was made. All participants received 6 sessions of treatment, then follow up and evaluation was made.

The results of the study suggest that pain at resting, during toilet sitting, floor sit to stand, sitting on a chair, walking, stair climbing, weight lifting, bed rolling on numeric pain rating scale was statistically significant but not statistically significant effect found during swiping and journey by bus or rickshaw.

Ultimately, the performance of Spinal stabilization exercise with core stabilizing system is a very effective protocol for postpartum LBP as it will increase back muscle strength and endurance. From this research, the researcher wishes to explore the effectiveness of Spinal stabilization exercise to reduce the features of postpartum patients with low back pain and Kegel exercise to solve urine leakage problem after pregnancy which will be helpful to facilitate their rehabilitation through physiotherapy management and to enhance functional activities.

Low back pain is a global health problem that just not affects Not only postpartum women but also pregnant and non - pregnant women are suffering from LBP so it can be said that it is a universal health problem. Usually, features are not only pain but also limited range in movements and abstinence from daily living. This research also showed that, the specific variables and comparison of their improvement rates. So it will be very helpful for the professionals to decide the specific evidence-based protocol for applying interventions in case of postpartum low back pain in the next time.

6.2 Recommendations

For future studies, the following recommendations may be made:

Larger sample size may improve the statistical significance of some of the results.

Mindy C et al., (2006) mentioned on the study that longer time frame and long-term follow-up examination (1 month after the study and if possible 6 to 12months after the study) may prove valuable in showing the long-term effect of the treatment.

Though the researcher found effective feedback of intervention for Postpartum LBP.

Researcher planned to conduct Randomized Control Trail within two groups (Control & Trail group) and maintaining the double blinding procedure to find the actual rate of effectiveness of Lumber stabilization exercise in postpartum LBP in the future.

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APPENDIX-1

Consent Form (English)

Assalamu-Alaikum / Namasker,

My name is Nusrat Jahan Jabu, student of B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI), CRP. I am conducting a study for partial fulfillment of Bachelor of Science in Physiotherapy degree, titled, “Effectiveness of stabilization exercises for mechanical Low Back Pain among postpartum ”.

Through this research, I will see the efficacy of specific stabilization exercises along with existing physiotherapy for the case of postpartum low back pain. For this regard, I would need to collect data from the postpartum women having low back pain. Considering the area of research, you have met the inclusion criteria and I would like to invite you as a participant of my study. If you participate in this study, I will evaluate for a particular intervention (Effectiveness of specific stabilization exercises in Combination with Conventional Physiotherapy) for low back pain. The interventions that would be given are safe and will not cause any harm.

I want to meet with you a few couple of sessions during your as usual therapy. Your participation will be voluntary. You have the right to withdraw consent and discontinue participation at any time. If you have any query about the study or your right as a participant, you may contact with, researcher Nusrat Jahan Jabu or Fabiha Alam, Lecturer, Department of physiotherapy, BHPI, CRP, Savar, Dhaka-1343.

Do you have any questions before I start?

So may I have your consent to proceed with the interview? Yes/No.....

I have read and understand the contents of the form.

I agree to participate in the research without any force. Signature of the participant

_____ Signature of the interviewer _____

Questionnaire (English)

SECTION-A (1) Subjective Information

This questionnaire is developed to measure the pain of the patient with post-partum low back pain. And this section will be filled by physiotherapist by using a pencil.

Patient code no.

This questionnaire is developed to measure the pain of the patient with post-partum low back pain.

Patients name:

Occupation:

Age:

Address:

Sex:

(Circle all that are appropriate)?

1. What is the main issue that brought you in today?

- I. Pain in lower back
- II. Weakness of the lower limb
- III. Paresthesia or numbness in toes
- IV. Deformity
- V. Recent injury in back
- VI. I & II
- VII. I, II & III

2. Your last delivery time.....

- I. Within six months
- II. Within in one year
- III. Two years or not more than two years

3. How long has the current problem been going on?

- I. Years.....
- II. Months.....
- III. Weeks...

4. Where is the location of your pain?

- I. Lumbar region
- II. Posterior pelvic area
- III. Buttock area
- IV. Posterior thigh area
- V. Extend into the foot

5. Do you perform any repetitive or forceful household tasks or movements?

- I. Yes
- II. No

SECTION-B (2) Pain Status before treatment

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


This section 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?

Pretest:

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----


2. How severe is your pain during swiping?



Pretest:

0 1 2 3 4 5 6 7 8 9 10


3. How severe is your pain during toilet sitting?



Pretest:

0 1 2 3 4 5 6 7 8 9 10


4. How severe is your pain during floor sit to stand?



Pretest:

0 1 2 3 4 5 6 7 8 9 10

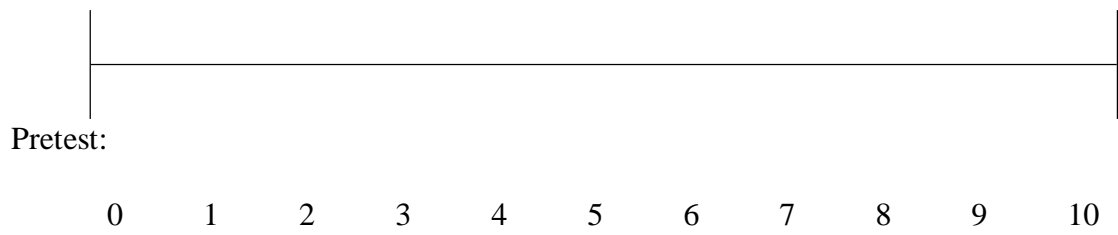
5. How severe is your pain during sitting on chair?



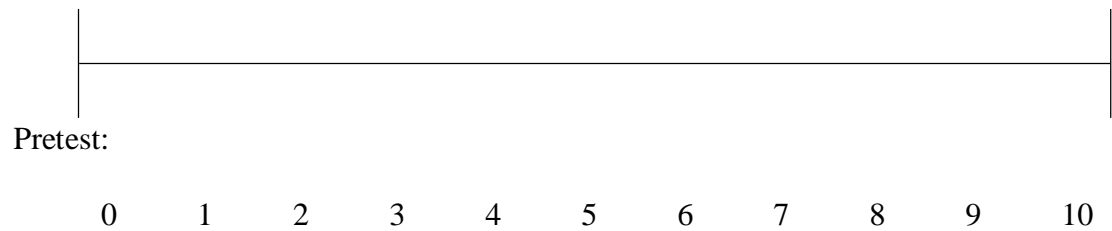
Pretest:

0 1 2 3 4 5 6 7 8 9 10

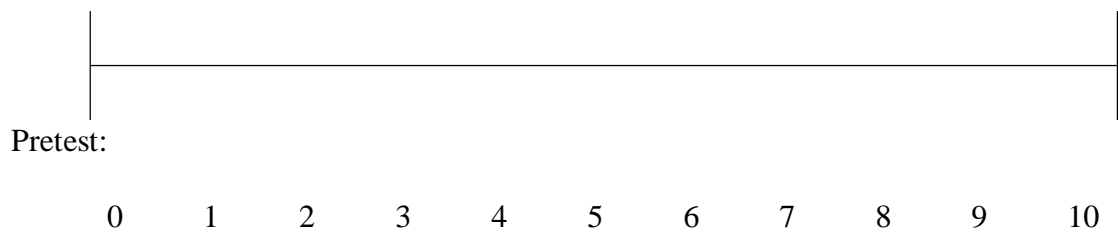
6. How severe is your pain during walking?



7. How severe is your pain during journey by bus or rickshaw?




8. How severe is your pain during stair climbing?



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


Pretest:



0 1 2 3 4 5 6 7 8 9 10

10. How severe is your pain during rolling (Supine to right and supine to left)?

Pretest:



0 1 2 3 4 5 6 7 8 9 10

11. Do you have urine leakage problem during sneezing & coughing?

Pretest:

Ans:

A) Yes.

B) No.

SECTION-C (3) Pain Status after treatment

1. How severe your pain is at resting position?

Post-test:



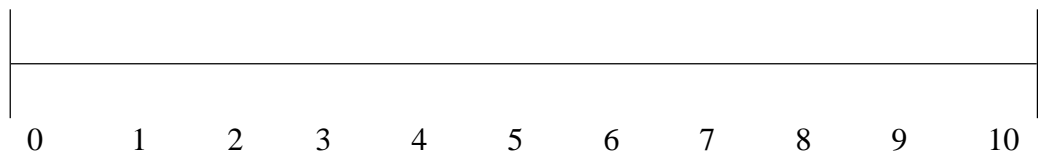
2. How severe is your pain during swiping?

Post-test:



3. How severe is your pain during toilet sitting?

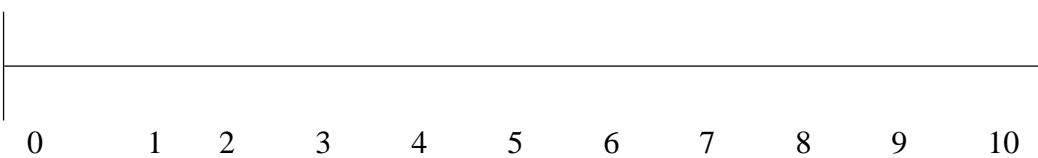
Post-test:




4. How severe is your pain during floor sit to stand? Post-test:



5. How severe is your pain during sitting chair? Post-test:



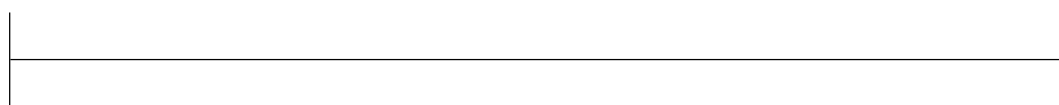
6. How severe is your pain during walking?



Post-test:

0 1 2 3 4 5 6 7 8 9 10

7. How severe is your pain during journey by bus or rickshaw?

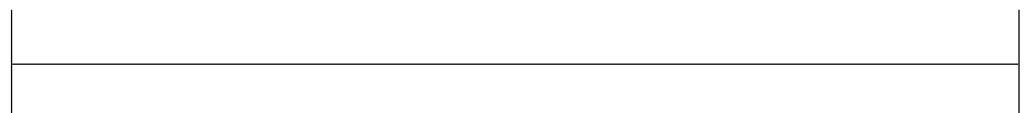


Post-test:

0 1 2 3 4 5 6 7 8 9 10

8. How severe is your pain during stair climbing?


Post-test:



0 1 2 3 4 5 6 7 8 9 10

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


Post-test:



0 1 2 3 4 5 6 7 8 9 10

10. How severe is your pain during rolling (Supine to right and supine to left)?

Post-test:



0 1 2 3 4 5 6 7 8 9 10

11. Do you have urine leakage problem during sneezing & coughing?

Post- test:

Ans:

A) Yes.

B) No.

APPENDIX-2

সম্মতিপত্র

আসসালামুআলাইকুম/ নমস্কার,

আমার নাম নুসরাত জাহান জেবু, বাংলাদেশ হেলথ ইপ্রফেশনস ইনস্টিটিউট এর ফিজিওথেরাপী তৃতীয় বর্ষের ছাত্রী। আমি এই গবেষণাটি ব্যাচেলর অব সায়েন্স ইন ফিজিওথেরাপীডিগ্রির পরিপূর্ণতার জন্য করছি। আমার গবেষণার নাম- গর্ভ পরবর্তী (৫ মাস থেকে ২ বছর পর্যন্ত) মাজা ব্যাথা রোগীদের জন্য নির্দিষ্ট কিছু স্টাবিলাইজেশন ব্যায়াম এর উপকারিতা।

এই গবেষণার মাধ্যমে আমি জানতে পারব - গর্ভ পরবর্তী (৫ মাস থেকে ২ বছর পর্যন্ত) মাজা ব্যাথা রোগীদের জন্য নির্দিষ্ট কিছু স্টাবিলাইজেশন ব্যায়াম এর উপকারিতা। এই জন্য আমার গর্ভ পরবর্তী (৫ মাস থেকে ২ বছর পর্যন্ত) মাজা ব্যাথা রোগীদের থেকে প্রয়োজনীয় তথ্য জানতে হবে।

গবেষণার ক্ষেত্রে অনুযায়ী, আপনি এই গবেষণায় অন্তর্ভুক্তির যোগ্যতা অর্জন করেছেন। আমি আপনাকে এই গবেষণায় অংশ গ্রহনের আমন্ত্রণ জানাচ্ছি যে সব চিকিৎসা পদ্ধতি আপনার উপর প্রয়োগ করা হবে তা সম্পূর্ণ নিরাপদ এবং নিশ্চিত যে, কোন ক্ষতি সাধন করবে না।

আমি আপনার সাথে বেশ কয়েকবার দেখা করব। আমার অংশ গ্রহন হবে ঐচ্ছিক। এই গবেষণায় যে কোন মুহূর্তে আপনি আপনার সম্মতি নিতে পারেন কিংবা অংশ গ্রহন থেকে বিরত থাকতে পারে।

আপনার যদি এ গবেষণা সম্পর্কে কোন জিজ্ঞাসা থাকে তবে অনুগ্রহপূর্বক যোগাযোগ করবেন গবেষক নুসরাত জাহান জেবু অথবা ফাবিহা আলম দিশা, প্রভাষক, ফিজিওথেরাপী বিভাগ, বি এইচ পি আই, সিআরপি, সাভার, ঢাকা-১৩৪৩।

শুরু করার পূর্বে আপনার কি কোন প্রশ্ন আছে?

আমি কি শুরু করতে পারি?

হ্যাঁ

না

প্রশ্নকর্তার স্বাক্ষর

আমি..... এই সম্মতি পত্রটি পড়েছি ও বুঝেছি। আমি স্বেচ্ছায় এই গবেষণায় অন্তর্ভুক্ত হচ্ছি।

অংশগ্রহণকারীর স্বাক্ষর

১ নং সাক্ষীর স্বাক্ষর

২নং সাক্ষীর স্বাক্ষর

প্রশ্নপত্র (বাংলা)

বিষয়ঃ গর্ভ পরবর্তী ৫ মাস থেকে ২ বছর পর্যন্ত মাজা ব্যাথা রোগীদের জন্য নির্দিষ্ট কিছু স্টাভিলাইজেশন ব্যায়াম এর উপকারিতা

খণ্ড – এ) ১ (রোগীর সম্পর্কে বর্ণনা)

(এই প্রশ্নপত্র শুধুমাত্র গর্ভ পরবর্তী মাজা ব্যাথা রোগীদের ব্যাথা পরিমাপ করার জন্য সাজানো হয়েছে এবং এই অংশটুকু ফিজিওথেরাপিস্ট পেন্সিল দ্বারা পূরণ করবেন) .তারিখ:

রোগীর নাম: পেশা:

বয়স: ঠিকানা:

চিকিৎসা শুরুর সময়ঃ-----

চিকিৎসা শেষ হবার সময়ঃ-----

(সঠিক উত্তরে গোল দাগ দিন)

১|আপনি প্রধানত কোন সমস্যার জন্য আজ এখানে এসেছেন?

- ১| মাজা ব্যাথা
- ২|পায়ের মাংসপেশীতে দুর্বলতা
- ৩|পায়ের আঙ্গুলে অবশ ভাব অনুভব করা
- ৪|কোমরের শিরদাঁড়া বিকৃত হয়ে যাওয়া
- ৫|সাম্প্রতিক কমরে আঘাত প্রাপ্ত হওয়া
- ৬|১ এবং ২ নং সমস্যা
- ৭|১, ২ এবং ৩ নং সমস্যা

২|আপনার সর্বশেষ গর্ভপাতের সময়কাল.....

- ১|৬ মাসের মধ্যে
- ২|১ বছরের মধ্যে
- ৩|২ বছর অথবা তারচেয়ে কম সময়কাল

৩|বর্তমান সমস্যাটি কতদিন ধরে হচ্ছে?

- ১|সপ্তাহ.....
- ২|মাস.....
- ৩|বছর.....

৪। আপনার ব্যাথার সঠিক অবস্থানটি কোথায়?

১। কোমরের নিম্নাংশে

২। শ্রেণীদেশীয় এলাকা

৩। পাছায়

৪। উরুর পিছন ভাগ

৫। কোমর থেকে পা পর্যন্ত

৫। আপনি কি প্রতিনিয়ত গৃহস্থলিয় ভারি কাজকর্ম করতে অভ্যস্ত?

১। হ্যাঁ

২। না

খণ্ড – বি) ২ (চিকিৎসার পূর্বে ব্যাথার পরিমাণ)

এই প্রশ্নপত্র শুধুমাত্র গর্ত পরবর্তী মাজা ব্যাথা রোগীদের ব্যাথা পরিমাপ করার জন্য সাজানো হয়েছে McCaffery et al. ১৯৯১ (রোগীদের ব্যাথার অভিজ্ঞতা বর্ণনা করার জন্য নিওমেরিক পেইন রেটিং স্কেল ব্যবহার করেন। এটি একটি সংখ্যাসূচক স্কেল যা ব্যাথার পরিমাণ নির্ধারণ করে। এটি একটি ১০ সেঃ মিঃ দীর্ঘ স্কেল যেখানে ০ থেকে ১০ পর্যন্ত সংখ্যা দেয়া আছে। এখানে ০ (মানে কোন ব্যাথা নেই), ১-৩ (মানে হালকা ব্যাথা), ৪-৬ (মানে সহনীয় ব্যাথা এবং) ৭-১০ (মানে তীব্র ব্যাথা।

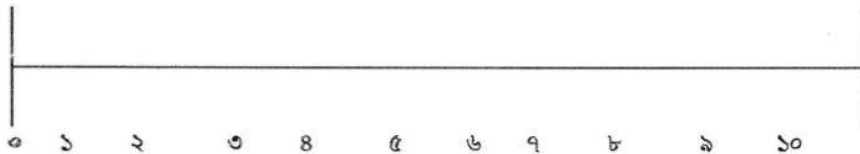
প্রশ্নপত্রের এই অংশ রোগী একটি কালো বা নীল বল কলম ব্যবহার করে রোগী পূরণ করবেন। রোগী কোন প্রশ্ন বুঝতে না পারলে ফিজিওথেরাপিস্ট সে অংশ বুঝতে সাহায্য করবেন। ১) বিশ্রামরত অবস্থায় আপনার ব্যাথার পরিমাণ কত?

চিকিৎসার পূর্বেঃ



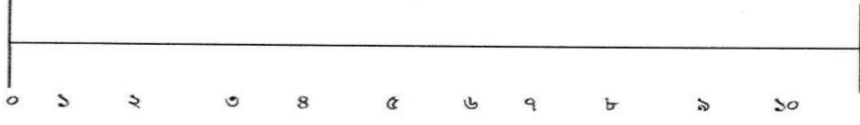
২) ঘর বাড়ু দেয়ার সময় আপনার ব্যাথার পরিমাণ কত?

চিকিৎসার পূর্বেঃ



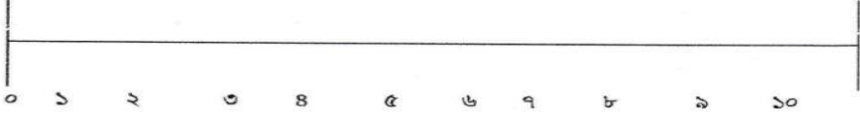
৩) টয়লেট এ বসার সময় আপনার ব্যাখার পরিমান কত ?

চিকিৎসার পূর্বেঃ



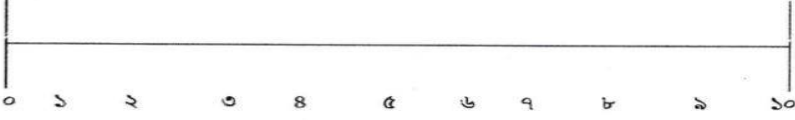
৪) বসা থেকে উঠে দাঁড়ানোর সময় আপনার ব্যাখার পরিমান কত ?

চিকিৎসার পূর্বেঃ



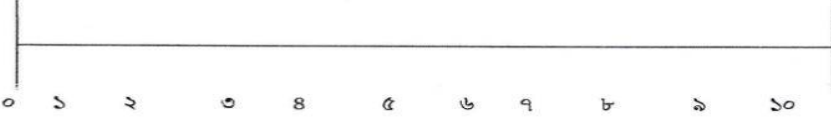
৫) চেয়ারে বসে থাকার সময় আপনার ব্যাখার পরিমান কত ?

চিকিৎসার পূর্বেঃ



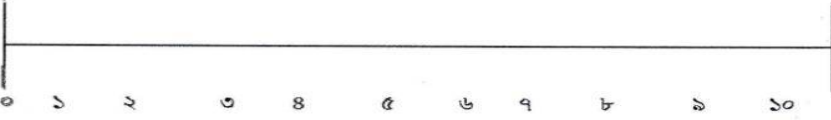
৬) হাঁটার সময় আপনার ব্যাখার পরিমান কত ?

চিকিৎসার পূর্বেঃ



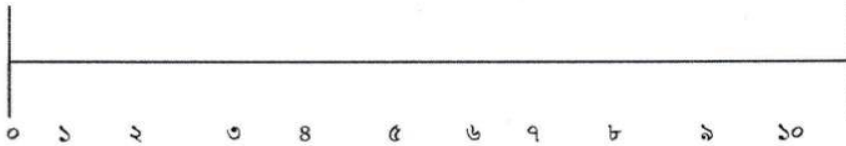
৭) রিকশা কিংবা বাস ভ্রমণের সময় আপনার ব্যাখার পরিমান কত?

চিকিৎসার পূর্বেঃ



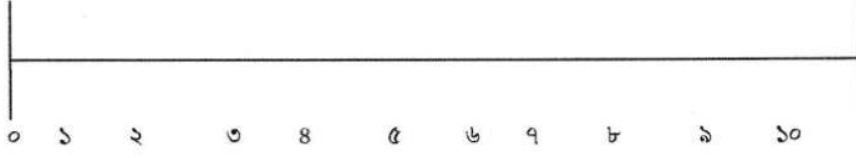
৮) সিঁড়ি বেয়ে উপরে উঠার সময় আপনার ব্যাখার পরিমান কত ?

চিকিৎসার পূর্বেঃ



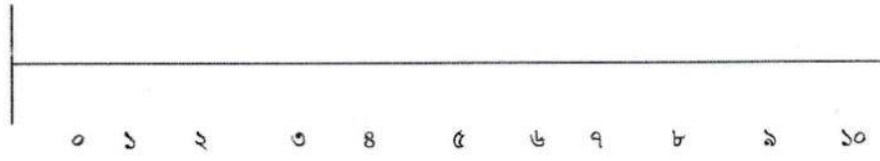
৯) ভারী বস্তু তোলার সময় আপনার ব্যাথার পরিমাণ কত ?

চিকিৎসার পূর্বেঃ



১০) চিত হয়ে শোয়া থেকে যেকোনো এক পাশ যেমন ডান পাশ বা পাশ হবার সময় আপনার ব্যাথার পরিমাণ কত ?

চিকিৎসার পূর্বেঃ



১১। হাঁচি/কাশি দেয়ার সময়ে আপনার হঠাৎ মূত্র নির্গত হয়?
চিকিৎসার-পূর্বে

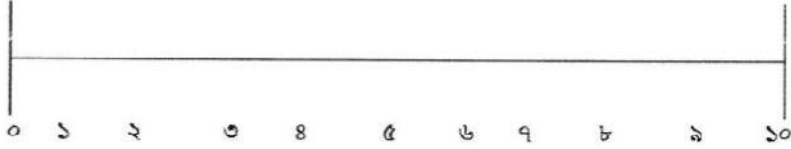
উত্তরঃ

- ক) হ্যাঁ
- খ) না

খণ্ড - সি (৩) চিকিৎসার পরে ব্যাথার পরিমাণ

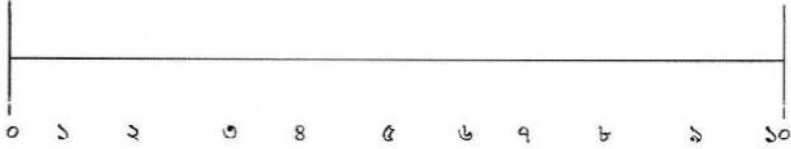
১) বিশ্রামরত অবস্থায় আপনার ব্যাথার পরিমাণ কত?

চিকিৎসার পরেঃ



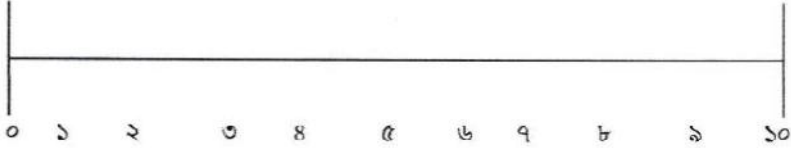
২) ঘর বাদু দেয়ার সময় আপনার ব্যাথার পরিমাণ কত ?

চিকিৎসার পরেঃ



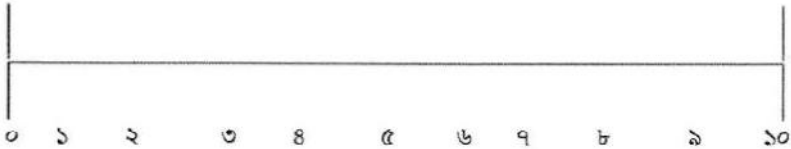
৩) টয়লেট এ বসার সময় আপনার ব্যাথার পরিমাণ কত ?

চিকিৎসার পরেঃ



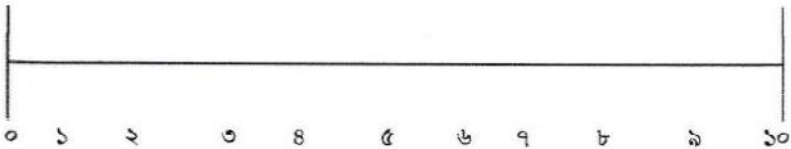
৪) বসা থেকে উঠে দাঁড়ানোর সময় আপনার ব্যাথার পরিমাণ কত ?

চিকিৎসার পরেঃ



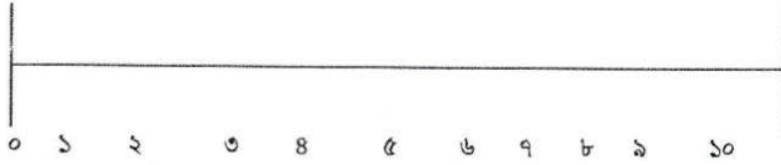
৫) চেয়ারে বসে খাওয়ার সময় আপনার ব্যাথার পরিমাণ কত ?

চিকিৎসার পরেঃ



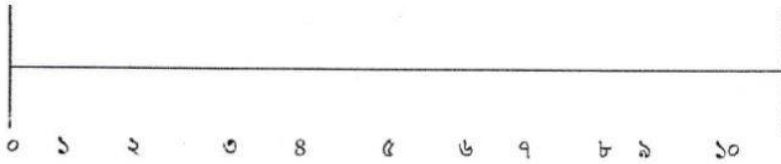
৭) রিকশা কিংবা বাস ভ্রমণের সময় আপনার ব্যাথার পরিমাণ কত?

চিকিৎসার পরেঃ



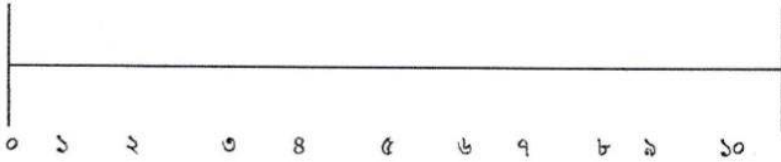
৮) সিঁড়ি বেয়ে উপরে উঠার সময় আপনার ব্যাথার পরিমাণ কত?

চিকিৎসার পরেঃ



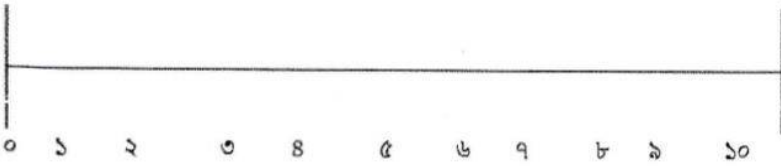
৯) ভারী বস্তু তোলার সময় আপনার ব্যাথার পরিমাণ কত?

চিকিৎসার পরেঃ



১০) চিত হয়ে শোয়া থেকে যেকোনো এক পাশে ঘেমন ডান পাশ বা পাশ হবার সময় আপনার ব্যাথার পরিমাণ কত?

চিকিৎসার পরেঃ



১১। হাঁচি/কাশি দেয়ার সময়ে আপনার হঠাৎ মূত্র নিগর্ত হয়?
চিকিৎসার-পরে

উত্তরঃ

- ক) হ্যাঁ
খ) না



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)
(The Academic Institute of CRP)
CRP-Chapain, Savar, Dhaka-1343. Tel: 02-7745464-5, 7741404

Ref: CRP-BHPI/IRB/09/19/1341

Date: 18/09/2019

To
Nusrat Jahan Jabu
B.Sc. in Physiotherapy
Session: 2014-2015, Student ID: 112140260
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

Subject: Approval of the thesis proposal “**Effectiveness of specific lumbar stabilization exercise for low back pain among postpartum**” by ethics committee.

Dear Nusrat Jahan Jabu,

Congratulations.

The Institutional Review Board (IRB) of BHPI has reviewed the above-mentioned dissertation, with you, as the Principal investigator. The Following documents have been reviewed and approved:

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

The purpose of this study is to evaluate pain intensity in rest and different functional activities before and after introducing spinal stabilization exercises in postpartum women with low back pain, that may take 10 to 15 minutes to answer the questionnaire and there is no likelihood of any harm to the participants. Data collectors will receive informed consents from all participants. Any data collected will be kept confidential. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 10.00 AM on 11th August, 2018 at BHPI.

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

Best regards,

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

Date: 18 April, 2019

The Chairman

Institutional Review Board (IRB)

Bangladesh Health Professions Institute (BHPI)

CRP-Savar, Dhaka-1343, Bangladesh.

Subject: Application for review and ethical approval.

Sir,

With due respect I would like to draw your kind attention that I am a student of B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI)- an academic institute of CRP under Faculty of Medicine of University of Dhaka (DU). I have to conduct a thesis entitled; **“Effectiveness of specific lumbar stabilization exercise for low back pain among postpartum”** under honorable Supervisor Fabiha Alam Disha, Lecturer, Department of Physiotherapy, Bangladesh Health Professions Institute (BHPI), CRP, Savar, Dhaka-1343. The purpose of the study is to evaluate the pain intensity in rest and different functional activities before and after introducing spinal stabilization exercises in postpartum women with low back pain.

The study involves use of a structured questionnaire and other instruments to measure the pain intensity in rest and different functional activities before and after introducing spinal stabilization exercises in postpartum women with low back pain. It may take 10 to 15 minutes to answer the questionnaire. There is no likelihood of any harm to the participants. Data collectors will receive informed consents from all participants. Any data collected will be kept confidential.

Therefore, I look forward to having your kind approval for the thesis proposal and to start data collection. I can also assure that I will maintain all the requirements for study.

Sincerely, *Nusrat Jahar Jabu*

Nusrat Jahar Jabu

4th professional B.sc in Physiotherapy

Class roll no: 29; session:2014-15

Bangladesh Health Professional Institute (BHPI)

CRP, Chapain, Savar, Dhaka;1343

Recommendation from the thesis supervisor *Fabiha Alam Disha* 18.04.19

Fabiha Alam Disha

Lecturer of Physiotherapy Department

CRP, Savar, Dhaka-1343, Bangladesh.

Attachment: Thesis proposal including process and procedure for maintaining confidentiality, Questionnaire (English & Bangla version), Informed consent.

April 18, 2019

To

The Centre Manager,

CRP- Mirpur,

Mirpur-14, Dhaka.

Through: Head, Department of Physiotherapy, BHPI.

Subject: Prayer for seeking permission to collect data to conduct a research study.

Sir,

With due respect and humble submission to state that I am a regular student of 4th professional, B.Sc. in Physiotherapy at Bangladesh Health Professional Institute (BHPI). The Ethical committee has approved my research project titled on "Effectiveness of specific lumbar stabilization exercise for low back pain among postpartum" under the supervision of Fabiha Alam. Disha, Lecturer, Department of Physiotherapy. It is indispensable to carry out this research project to achieve the degree of B. Sc. in Physiotherapy. My honorable teachers have suggested to collect the required data from Gynecological and Women's health unit at CRP, Mirpur branch. So I need permission for data collection from this respective unit, I would like to assure you that anything of the study will not be harmful for the participants.

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

Yours faithfully

Nusrat Jahan Jabu

Nusrat Jahan Jabu

Class Roll: 29, Session: 2014-15

4th Professional B. Sc. Physiotherapy

Bangladesh Health Profession Institute (BHPI)

Approved
A.S.
24.04.19

In-Charge (PT Branch)
Please do needful.
Amin
24.04.19

Forwarded & Recommended
18.04.19

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

APPENDIX- 3

LUMBER STABILIZATION EXERCISE



Figure: Core strengthening (Static)



Figure: Core strengthening
(Dynamic, Cat camel)



Figure: Core strengthening (Dynamic, Superman) exercise.



Figure: Lumbar extension exercise



Figure: Hook lying combination exercise



Figure: Bridging exercise



Figure: Straight leg raising



Figure: Anterior and Posterior
Pelvic Tilts



Figure: Kegel Exercise