EFFECTIVENESS OF PATELLA MOBILIZATION TO IMPROVE FUNCTIONAL ACTIVITY AND DECREASE PAIN AMONG KNEE OSTEOARTHRITIS PATIENT

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EFFECTIVENESS OF PATELLA MOBILIZATION TO IMPROVE FUNCTIONAL ACTIVITY AND DECREASE PAIN AMONG KNEE OSTEOARTHRITIS PATIENT

Submitted by **Sharmin Akter**, for partial fulfilment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT).

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DECLARATION

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

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Acronyms

ADL	Activity of Daily Living
BHPI	Bangladesh Health Professions Institute.
BMRC	Bangladesh Medical Research Council
CRP	Centre for the Rehabilitation of the Paralysed.
df	Degree of Freedom
IRB	Institutional Review Board
NSAIDs	None Steroidal Anti-Inflammatory Drugs
OA	Osteoarthritis
ROM	Range of Motion
SPSS	Statistical Package for the Social Sciences
VAS	Visual Analogue Scale
WHO	World Health Organization

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Abstract

Introduction: Osteoarthritis (OA) is the most common joint disorder in the world, but it is particularly common in the knee. Patella mobilization is commonly used for treating knee pain in osteoarthritis.

Purpose: The study was conducted to identify and investigate the therapeutic effectiveness of the patella mobilization for the treatment of osteoarthritis. This study was made the comparison, in order to discover the most effective treatment approach to alleviate the symptoms of the condition. *Objectives:* To explore the effectiveness of Patella mobilization treatment with conventional physiotherapy treatment for the knee osteoarthritic patients. *Methodology:* The study was an experimental design-randomized control trial (RCT). 14 samples were selected randomly from Out-patient treatment service of Musculoskeletal Unit, Physiotherapy Department, Centre for the Rehabilitation of the Paralysed (CRP), Savar. Experimental Group received Patella Mobilization with other conventional physiotherapy while Control Group received only other conventional physiotherapy. The study has analysed by u test and pair *t* test & unrelated *t* test to compare the Experimental and Control Group and analysed by interpreting the probability level of significance of *t* value. *Results:* The results were found to be significant for *t* value in pair *t* test in case of cross sitting, pain during squatting, pain during prolong standing, pain during walking, pain during working, pain during daily living activity, pain during stairing, pain at night, pain at morning, pain at evening, pain at rest and in unrelated *t* test the results were found not significant for *t* value at probability level 0.05. The results were found to be significant for *u* value at probability level 0.05. *Conclusion:* The study concludes that the combination treatment approach is significantly capable of producing beneficial effects on pain reduction, minimization of functional disability in patients with osteoarthritis.

Keywords: *Patella Mobilization, conventional physiotherapy, osteoarthritis.*

CHAPTER- I INTRODUCTION

1.1 Background

The most common joint disorder is Osteoarthritis (OA) in the world (Arden & Nevitt, 2006). Knees, hips, hands, spine and feet is typically affected (Jordan, 2014). Osteoarthritis (OA) is a disease of the total joint, not just the articular cartilage. The Osteoarthritis Research Society International Disease State Working Group defined OA as "a progressive disease representing the failed repair of joint damage that, in the preponderance of cases, has been triggered by abnormal intra-articular stress" (Lane et al., 2011).

The incidence (risk of developing the disease) and prevalence (proportion of persons with the disease) of OA increase with advancing age in both sexes (Arden & Nevitt, 2006). In general, women have a higher incidence and prevalence of symptomatic radiographic OA, particularly in the hands and knees (Zhang & Jordan, 2010). There are ethnic and racial differences in the occurrence of OA that may be due to genetic and/or lifestyle factors; these include the lower prevalence of hand and hip OA in Chinese and the higher prevalence of hip and knee OA in African Americans compared with whites (Jordan, 2012). US national prevalence of OA is 37.4% and 12.1% and prevalence was greater among women than men (42.1% vs. 31.2%) and affects more than 1 in 10, or 4.3 million older US adults (Dillon et al., 2006). In 2013 Litwic et al. estimated that among US adults, nearly 27 million have clinical osteoarthritis.

The risk factors of OA can be divided into person-level factors including age, gender, obesity and genetics and diet, and joint-level factors, including injury and abnormal loading of the joints (Johnson et al., 2014) Age, weight, trauma to joint due to repetiting movements in particular squatting and kneeling are common risk factors of OA(Heidari, 2011). Age may be the main risk factor of OA. The suspected mechanism leading to joint damage is poorly understood but is probably multifactorial (Litwic et al., 2013). In case of gender, the prevalence of hip, knee and hand OA is higher in women than men, and the incidence increases around menopause (Srikanth et al., 2005).Several authors have suspected a role of hormonal factors in the development of OA. However, results are conflicting (Klerk et al.,

2009), and the difference between men and women could be explained by other factors (reduced volume of cartilage, bone loss or lack of muscle strength) (Johnson et al., 2014). Obesity, defined as body mass index (BMI) > 30 kg/m2, is strongly associated with knee OA (pooled odds ratio in a recent meta-analysis including 22 studies: 2.66 [95% CI 2.15–3.28]), where as the relationship between overweight (BMI > 25 kg/m2) and knee OA is lower but still significant (pooled OR 1.98 [95% CI 1.57–2.20]) (Silver wood et al., 2015) Several authors showed a dose–response relationship between obesity and risk of knee OA: for every 5-unit increase in BMI, the associated increased risk of knee OA was 35%, with the magnitude of the association significantly stronger for women than men(Jiang et al., 2012).

Major cause of OA is morbidity, activity limitation, physical disability, excess health care utilization and reduced health-related quality of life, especially in people aged 45 and above in developed countries (Lawrence et al., 2008). OA is strongly associated with ageing and the Asian region is ageing rapidly. Further OA has been associated with heavy physical occupational activity, a required livehood for many people living in rural communities in developing countries (Fransen et al., 2011)

In UK, Costs for topical and oral NSAIDs were estimated to be £19.2 million and £25.65 million, respectively. Cost of hip and knee replacements was estimated to exceed £850 million, arthroscopic surgery for osteoarthritis was estimated to be £1.34 million (Chen et al., 2012). In Singapore ,direct costs were estimated from both a societal and a patient perspective using the Singapore General Hospital database; indirect costs were estimated using the human capital approach. All costs were expressed as mean costs per patient per annum in 2003 Singapore dollars (Xie et al., 2007).

Osteoarthritis is not yet a curable disease, and its pathogenesis remains unclear. The best treatment for osteoarthritis of the knee is prevention (Michael et al., 2010). Pharmacological treatment is rofecoxib use was associated with an elevated relative risk of AMI compared with celecoxib use and no NSAID use (Barnes &Edwards, 2005). viscosupplementation is an effective treatment for OA with beneficial effects: on pain, function and patient global assessment; and at different post injection periods but especially at the 5 to 13 week post injection period (Bellamy et al., 2006). Hyaluronic acid (HA) and corticosteroids are both widely used for intra-articular

treatment of knee osteoarthritis (OA) (Qvistgaard et al., 2006). Intraarticular (IA) corticosteroid products provide opportunity to treat OA in individual knee joints. The short-term benefit of IA corticosteroids in treatment of knee OA is well established (Bellamy et al., 2009). Patients treated with corticosteroids experienced significant improvement during the 3 months of intervention, with an effect size indicating a moderate clinical effect. Although a similar significant result following treatment with HA could not be shown, the effect size indicated a small clinical improvement (Qvistgaard et al., 2006). Sometimes, an orthopedic aid or orthosis is necessary. Orthopedic aids include, among others, cushioned heels (providing a shock-absorbing function) and wedges to elevate the inner or outer side of the shoe, thereby correcting the axis to a certain extent and taking mechanical stress off the affected part of the joint (Michael et al., 2010).

The overwhelming majority of intra-articular operations are performed through an arthroscope. The main advantages of arthroscopic procedures are minimal operative trauma and a very low infection rate (under 0.1%) (Michael et al., 2010)

Physiotherapy for knee osteoarthritis includes exercise therapy as well as physical measures, including the following: ultrasound application (to relieve pain and support endogenous healing processes), electrotherapy, muscle stimulation, application of heat and cold, transverse friction (a special massage technique), acupuncture, stretching/walking, traction (Michael et al., 2010). Pollard et al. (2008) showed that manual therapy reduces pain and improves function significantly, in comparison to a control group. pain could be relieved, and function improved, by either individualized or group therapy(McNickle et al., 2008).

Most interventions are focused on the patellofemoral joint itself, with the intention of influencing patellar motion (i.e., strengthening the vastusmedialis oblique, stretching, patellar taping, patellar bracing, soft tissue mobilization, and patellar mobilization) (Powers, 2003)

Patella mobilizations may be beneficial for individuals with a variety of conditions, including post-operative rehab and knee osteoarthritis (OA) (Michael et al., 2010). Several studies have used knee mobilizations for treatment of knee pathology. Patella mobilization is critical to prevent patellar tendon adhesion and increase patellofemoral joint reaction (Hurst et al., 2010)

The burden of OA is physical, psychological and socioeconomic. It can be associated with significant disability, such as a reduction in mobility and activities of daily living (Peat et al., 2001) Psychological sequelae include distress, devalued self-worth, and loneliness. Given the high frequency of OA in the population, its economic burden is large (Litwicet al., 2013)

1.2 Justification

Pain with relevant symptoms of OA may have a profound effect on quality of life affecting both physical function and psychological parameters. It is painful and disabling disease that affects millions of patients. OA is likely to increase due to the aging of the population. About 13% of women and 10% of men aged 60 years and older have OA. Average annual prevalence of OA in the ambulatory health care system in the United States, from 2001–2005, was estimated to be 3.5% which amounts to 7.7 million with OA.

From them maximum patient received medical treatment like drugs to minimize the pain. But some patients are aware about this disorder. They receive physiotherapy treatment from various physiotherapy centers, because physiotherapy is well established as an important part of clinical management for people with osteoarthritis. The musculoskeletal department of CRP regularly conducts with many osteoarthritis patients. But it is unknown to all of us that how much improvement occurs in that case and what is the outcome of patient after taking physiotherapy. In the 4^{th} year placement I was see many patient of this condition. They were suffer from pain. That's why their daily living activity is badly hamper. So after complete this placement and saw this condition I am interested about the how much improvement of this condition or improvement of daily living activities occur after taking physiotherapy treatment.so this study will help us to know about the outcome of physiotherapy management of osteoarthritis. That will help our musculoskeletal department by know the condition of the patient who received physiotherapy from this musculoskeletal unit for osteoarthritis

1.3 Aims of the study

To find out the effectiveness of patella mobilization to improve functional activity and decrease pain among osteoarthritis patient.

1.4 Objectives of the study

1.4.1 General objective

To explore the effectiveness of patella mobilization to improve functional activity and decrease pain among osteoarthritis patient.

1.4.2 Specific objectives

- To find out effectiveness of patella mobilization for osteoarthritis patient
- To examine different working posture affecting of the osteoarthritis.
- To determine the disability level due to osteoarthritis.
- To explore the socio-demographic information of the subjects.

1.5 Hypothesis

1.5.1 Null Hypothesis

$H_0 : \mu_1 - \mu_2 = 0$ or $\mu_1 \geq \mu_2$,, where the experimental group and control group initial and final mean difference is same or control group is higher than experimental group.

1.5.2 Alternative Hypothesis

$H_a : \mu_1 - \mu_2 \neq 0$ or $\mu_1 \neq \mu_2$, where the experimental group and control group initial and final mean difference is not same.

1.6 Operational Definitions

Body mass index (BMI)

According to the World Health Organization, Body Mass Index (BMI) is a simple index of weight for height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m2). For example, an adult who weight 70kg and whose weight is 1.75m will have a BMI of 22.9. BMI = 70kg/(1.75 m2)=70/3.06 = 22.9

Risk Factor

A risk factor is something that increases your chances of getting a disease. Sometimes, this risk comes from something you do. For example, smoking increases your chances of developing colon cancer. Therefore, smoking is a risk factor for colon cancer.

Osteoarthritis

A type of arthritis marked by progressive cartilage deterioration in synovial joints and vertebrae. It is degenerative joint disease characterized by destruction of articular cartilage.

Activities of daily living (ADL)

The essential functional activities, those have to be done independently from morning to evening.

Patella mobilization

Patella mobilizations are done to discourage adhesions from limiting motion (post-surgical) or to mobilize adhesions that have already formed to promote better mobility (post or non-surgical).

CHAPTER – II LITERATURE REVIEW

Osteo means bones and arthritis mean inflammation of a joint . “osteoarthritis (OA) = can also be called O- old age, Aarthritis”(Ebnezer, 2003).Osteoarthritis of the knee is increasing with age day to day. Moreover it became more common in woman than man. There are many risk factors associated with it. The most common risk factors include obesity, knee injury, previous knee surgery, and occupational bending and lifting (Felson D. T., 2006). The word OA is derived from Greek word ‘osteo’ means ‘of the bone’ and ‘arthro’, means ’joint’, and ’itis’, meaning inflammation, although the ’itis’ of osteo arthritis is somewhat of a misnomer -- inflammation is not a conspicuous feature of the disease (Srikanth et al., 2005).

The prevalence of OA varies according to the definition of OA, the specific joint under study, and the characteristics of the study population. The age standardized prevalence of radiographic knee OA in adult’s age ≥ 45 was 19.2% among the participants in the Framingham Study and 27.8% in the Johnston County Osteoarthritis Project. In the third National Health and Nutrition Examination Survey (NHANES III), approximately 37% of participants age >60 years or older had radiographic knee OA (Zhang & Jordan, 2008).

The pain of OA is usually related to activity. For OA of the knee, activities such as climbing stairs, getting out of a chair, and walking long distances bring on pain. Morning stiffness usually lasts less than 30 minutes. OA of knee is the commonest form of OA and cause pain and disability in elderly. It is generally termed as degenerative joint disease. But OA is not simply a process of wear and tear, but an abnormal remodeling of joint tissues which is caused by a host of inflammatory mediators within the affected joint (Zhang & Jordan, 2010).

The main clinical feature of osteoarthritis is pain. Sever aching pain on weight bearing joint due to stress on the synovial membrane and bone surface. Throbbing pain occurs at night due to inflammation. Sometime pain referred distally and sharp stabbing pain comes if there is a loose body within the joint. The pain is caused by micro fractures of the subchondral bone and medullary hypertension with bone angina of

subchondralbone causes pain at the joint, osteophytes causes stretching of nerve endings in the periosteum as well as ligamentum stretch also causes pain. Inflammation of joint capsule and synovium and its distention causes pain. Due to internal pathology of the joint periarticular muscle spasm occur and which also one of the cause of pain (Aigner and Kim, 2002).

Pain is the major stimulus for people with knee osteoarthritis (OA) to seek medical attention but the causes of pain are complex and radiographs which are the standard for clinical imaging in OA are often discordant with symptoms. In recent years there has been increasing interest in the role of the synovium in painful OA. Although nowhere as florid or extensive as the inflammation observed in rheumatoid arthritis, clinical effusions and capsular thickening can be clinically evident in some joints with knee OA, and are more frequently observed using sensitive measures such as ultrasound (US) and MRI3e10. Synovial changes in OA are regarded by many as a secondary response to the degradation of cartilage11 though there are others who advocate them as a primary driver for OA which may be partly responsible for pain and disease progression (Hall et al, 2014). The menisci perform many important roles within the knee joint complex, such as improving congruity and stability of the femoro-tibial contact, mechanical shock absorption and loadsharing, facilitating limited rotation via meniscotibial translation, and generating proprioceptive feedback via internal mechanoreceptors. Menisci consist of approximately 75% collagen by dry weight, with collagen fibrils predominantly oriented in a circumferential fashion to resist tensile hoop stresses during loading. A complex of meniscotibial, meniscofemoral, and peripheral capsular attachments restrain meniscal movement, particularly outward ‘extrusion’ under loading (Cake et al, 2013)

Diagnosis of osteoarthritis focuses on two major goals. When diagnosing OA, the doctor must first differentiate osteoarthritis from other types of arthritis. It is also important to determine whether a patient has primary osteoarthritis or a secondary form of osteoarthritis associated with another disease or condition. Early, accurate diagnosis of osteoarthritis is necessary so that appropriate treatment options can be considered. To diagnose osteoarthritis, doctor will make assessments using: Medical history will include information about past medical conditions, allergies, treatments, and surgical procedures as well as current medical issues.

During the physical examination, doctor will observe for any signs and symptoms which commonly are associated with osteoarthritis. The doctor will look for: Joint swelling, Joint tenderness, Decreased range of motion in joints, Visible joint damage (i.e., bony growths)
In imaging studies X-rays are typically used to confirm the diagnosis of osteoarthritis. X-rays can reveal osteophytes at the joint margins, joint space narrowing, and subchondral bone sclerosis. Subchondral bone is the layer of bone which is just below the cartilage. While MRI (magnetic resonance imaging) is a more sensitive imaging

Recommendations and guidelines for the management of osteoarthritis have been published by several different scientific organizations However, most of them are produced by national organizations, or are restricted to the use of specific interventions, such as physical therapy in many instances, or selected drug classes many OA management recommendations across organizations, controversies remain and are related to the use of some non pharmacological interventions (e.g. acupuncture, knee braces, heel wedges) and, within pharmacological treatments, to the pharmacological class of symptomatic slow-acting drugs in osteoarthritis (SYSADOAs), mainly rep- resented by glucosamine sulfate and chondroitin sulfate, and to some extent by intra-articular hyaluronic acid (Reginster et al., 2015).

Clinical trials in OA suffer from a large placebo effect and most pharmacological treatments are shown to have, at best, a mild-to-moderate effect oral NSAIDs had an effect size in the mild-to moderate range over oral placebo, intra-articular hyaluronic acid emerged asthe most effective treatment for knee OA pain (Reginster et al., 2015).

The knee joint is commonly affected in osteoarthritis and it is estimated that 10% of people aged over 60 years experience knee osteoarthritis symptoms, resulting in substantial pain and physical dysfunction. Current evidence demonstrates beneficial effects of exercise therapy on pain and physical function in knee osteoarthritis, without the common and sometimes serious side effects associated with pharmacological and surgical interventions. Consequentially, exercise is considered the cornerstone of conservative management and is recommended in all clinical guidelines internationally (Chang et al., 2015).

Physiotherapeutic treatment, and particularly exercise, has been part of the management of knee osteoarthritis for nearly a century and is the second most frequently prescribed treatment after oral medication. (McCarthy et al., 2004).A reduction in pain and improve functional ability has been shown with patella mobilization, which is consistent for all measures of pain (Michael et al., 2010).

Hurst et al. (2010) has showed that it has also found that the arthroscopic debridement for OA was no better than a sham procedure in relieving knee pain or improving functional status, and that patients who underwent arthroscopic partial meniscectomy for a degenerative meniscal tear generally did not show more improvement than those who underwent sham meniscal resection or an intensive course of physical therapy.

Rowlands et al. (1999) has had a study where it is found that approximately half of the patient population surveyed had received patella mobilization for their knee OA. Thirty subjects were randomly allocated into two treatment groups. Group A received patella mobilization and group B received detuned ultrasound. This study obtained by the McGill Pain Questionnaire, Numerical Pain Rating Scale-101, and the Patient-Specific Functional Scale. The nonparametric Mann-Whitney U-test and Wilcoxin Sign-Rank test were used for these group statistical data, respectively. The result showed that group A showed a better statistical response to treatment than group B.

Another study that was randomized clinical trial this study conducted by Sixty volunteers randomized into 2 groups of 30 subjects each Outcome. This study used Numerical Rating Scale 101, Algometer, Patient-Specific Functional Scale, Patellofemoral Joint Evaluation Scale, and the Short-Form McGill Pain Questionnaire and Statistical analysis using SPSS utilized the t, Mann-Whitney U and Wilcoxin's signed rank tests at a 95% confidence level with $\alpha/2$ and $p \leq 0.025$.the result found that statistical significance could not be determined (Stakes et al., 2006)

CHAPTER – III METHODOLOGY

3.1 Study design

The purpose of the study was to find out the effectiveness of physiotherapy intervention to improve functional activity among osteoarthritis patient. Quantitative research design which was Randomized Controlled Trail (RCT) design was selected for conduct the study.

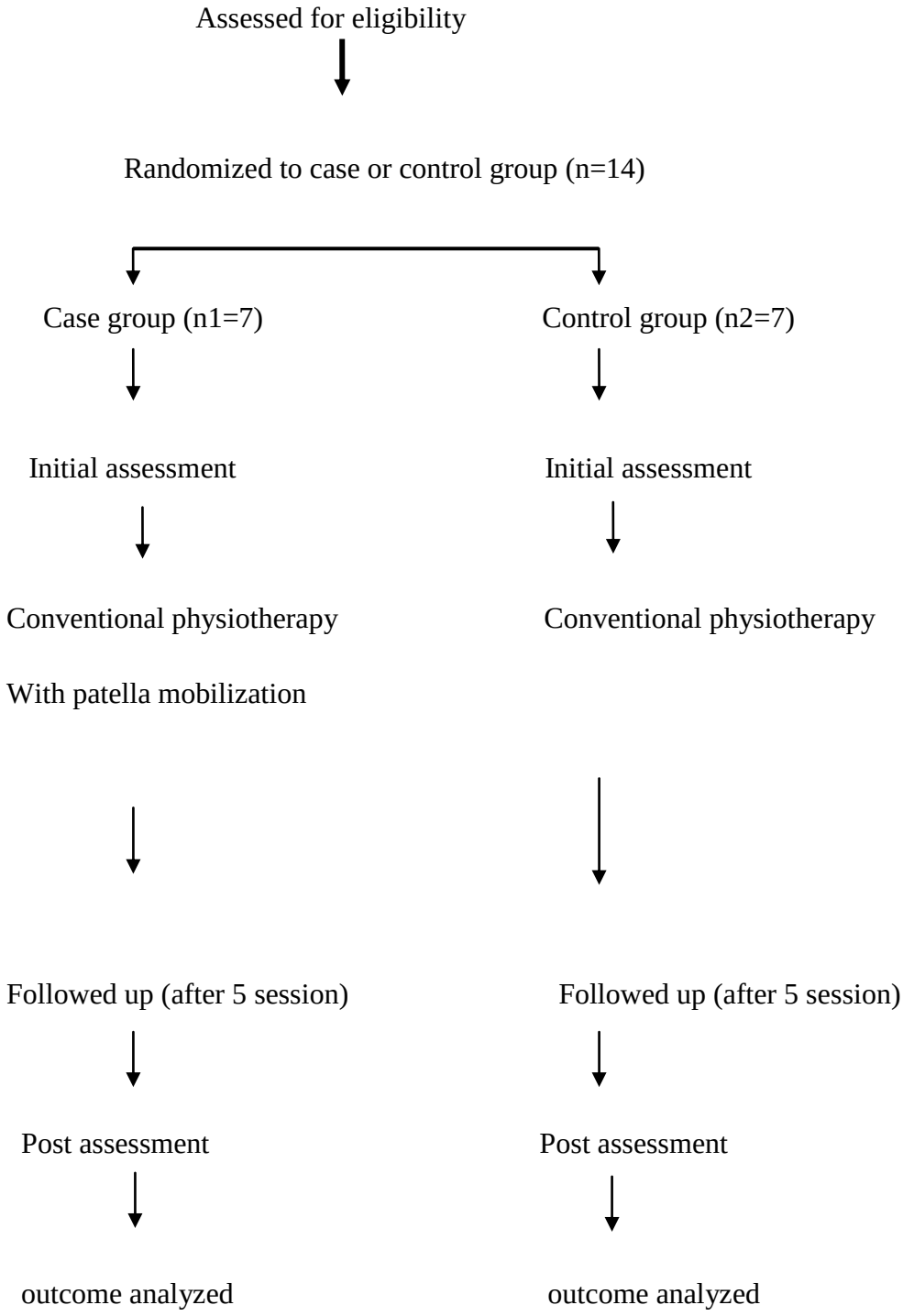
According to DePoy & Gitlin (2013) the design could be shown by:

Experimental Group	:	r	O_1	X	O_2
Control Group	:	r	O_1		O_2

The study is an experimental between two subject designs. Conventional physiotherapy with patella mobilization was applied to the experimental group and Conventional physiotherapy only was applied to the control group.

A pre-test (before intervention) and post-test (after intervention) was administered with each subject of both groups to compare the pain effects and functional activity of the subject in within group and the between group.

Flowchart of the phases of randomized controlled trial



A flowchart for a randomized controlled trial of a treatment program including Patella mobilization for patient with knee osteoarthritis.

3.2 Study site

The researcher had selected musculoskeletal unit of the Centre for the Rehabilitation of the Paralysed (CRP).

3.3 Study area

The study conducted on musculoskeletal area.

3.4 Study population and sample population

All patients with knee osteoarthritis in Bangladesh were the target population and sample population were those who came to CRP to receive treatment.

3.4.1 Sample selection

Subjects, who met the inclusion criteria, were taken as sample in this study. Fourteen patients with Osteoarthritis were selected from outdoor musculoskeletal physiotherapy department of CRP (Savar) and then 7 patients with Osteoarthritis were randomly assigned to Patella mobilization with conventional physiotherapy group and 7 patients to the only conventional physiotherapy group for this simple randomize control trial study. When the samples were collected, the researcher randomly assigned the participants into experimental and control group, because it improves internal validity of experimental research. The samples were given numerical number C1, C2, C3 etc for the control and E1, E2, E3 etc for experimental group. Total 14 samples included in this study, among them 7 patients were selected for the experimental group (received patella mobilization with conventional physiotherapy) and rest 7 patients were selected for control group (conventional physiotherapy only).

3.4.2 Inclusion criteria

- Patients who were attending in CRP for treatment.
- All male and female were same priories.
- Radiologically confirmed knee osteoarthritis.
- Patients who are willing to participate.

3.4.3 Exclusion criteria

- Patient who had received NSAIDs.
- Subject who were unconscious
- Patient with severe psychological problem.
- Patient with knee OA secondary to inflammatory arthitis.
- Patient who had received an intra-articular steroid injection in the knee.
- Patients with knee osteoarthritis and other serious associated diseases.
- Patient who had cognitive problem
- Patient who had subluxed or dislocated patella
- Patient who had a fracture

3.5 Sample size

14 participants with osteoarthritis were selected. 7 participants was in experimental group and 7 participants in control group. The sample size (14) was selected due to limited time.

3.6 Method of data collection

3.6.1 Data Collection Tools

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

3.6.2Questionnaire

The questionnaire was developed under the advice and permission of the supervisor following certain guidelines. There were twelve close ended questions with visual analogue scale (VAS) and twenty four for WOMAC scale which were measured by examiner and each question was formulated to find out the change of pain and functional activity with each activity. Social demographic criteria included age, sex, marital status, living area, education.

3.7 Measurement tool

3.7.1 Visual Analogue Scale (VAS)-In this study researcher used visual analogue scale for measuring the intensity of pain. The VAS is a simple and accurate way of subjectively assessing pain along a continuous visual spectrum. VAS consists of a straight line on which the individual being assessed marks the level of pain. The ends of the straight line are the extreme limits of pain with 0 representing no pain and 10 representing the worst pain ever experienced. According to Myles (1999), the visual analog scale (VAS) is a tool widely used to measure pain and a change in the visual analog scale score represents a relative change in the magnitude of pain sensation.

3.7.2 Western Ontario and McMaster Universities Arthritis Index (WOMAC) The Western Ontario & McMaster Universities Osteoarthritis Index is a disease-specific, tri-dimensional self-administered questionnaire, for assessing health status and health outcomes in osteoarthritis of the knee. According to Nicholas (1982), The questionnaire contains 24 questions, targeting areas of pain, stiffness and physical function to assess pain, stiffness and physical function in patients with knee osteoarthritis.

3.8 Data collection procedure

The study procedure was conducted through assessing the patient, initial recording, treatment and final recording. After screening the patient at department, the patients were assessed by qualified physiotherapist. Five sessions of treatment was provided for every subject. Fourteen subjects were chosen for data collection according to the inclusion criteria. The researcher divide all participants into two groups and coded C1 (7) for control group and E1 (7) for experimental group. Experimental group received conventional physiotherapy with patella mobilization and control group received only conventional physiotherapy.

Data was gathered through a pre-test, intervention and post-test and the data was collected by using a written questionnaire form which was formatted by the researcher. Pre test was performed before beginning the treatment and the intensity of pain and functional outcome of knee osteoarthritis were noted with VAS score and WOMAC score on questionnaire form. The same procedure was performed to take post-test at the end of five session of treatment. Researcher gave the questionnaire form to each subject before starting treatment and after six session of treatment and instructed to put mark on the VAS and WOMAC score.

The researcher collected the data both in experimental and control group in front of the qualified physiotherapist in order to reduce the biasness. At the end of the study, specific test was performed for statistical analysis.

3.9 Intervention

Table- 1. Control Group Treatment Protocol

A common intervention program was executed for control groups as conventional physiotherapy, it includes- .

Treatment option	**Duration/Repetition**
Isometric strengthening exercise	3 repetition
Stretching exercise	10 repetition
Strengthening exercise	10 repetition
Isometric strengthening exercise	10 repetition
Pendulum exercise	2-3 minutes
MWD	6 repetition
Joint play	10 repetition
Knee gaping	10 repetition
Ice	5 minutes
UST	5-7 minutes
IRR	15 minutes

Table- 2. Control Group Treatment Protocol

Treatment option	**Duration/Repetition**
Isometric strengthening exercise	3 repetition
Stretching exercise	10 repetition
Patellar mobilization	5-15 minutes
Isometric strengthening exercise	10 repetition
MWD	6 repetition
Joint play	10 repetition
Knee gaping	10 repetition
Ice	5 minutes
UST	5-7 minutes
IRR	15 minutes

3.10 Data analysis

Statistical analysis was performed by using Microsoft Excel 2013 and SPSS 20 Version and scientific calculator.

3.11 Statistical Test

In order to ensure that the research have some values, the meaning of collected data has to be presented in ways that other research workers can understand. In other words the researcher has to make sense of the results. As the result came from an experiment in this research, data analysis was done with statistical analysis.

All participants were code according to group to maintain participant's confidentiality. All subjects of both experimental and control group score their pain intensity on visual analogue scale before starting treatment and after completing treatment. Reduction of pain intensity for both groups and improvement of functional activity between pre-test and post-test score. Experimental studies with the different subject design where two groups are used and each tested in two different conditions and the data is interval or ratio should be analyzed with paired "t" test and unrelated "t" test. As it was experimental and had unmatched groups of different subjects, who was randomly assigned to conventional physiotherapy with patella mobilization and only conventional physiotherapy group, so the parametric paired "t" test and unrelated "t" test was used in this study to calculate the level of significance. Paired "t" test and unrelated "t" test and mean difference was calculated to test the hypothesis on the basis of following assumptions-

Data were ratio

Two different set of subjects in two conditions

Paired t test

Paired t-test was used to compare difference between means of paired variables. Selection of test of hypothesis is mean difference under t distribution.

Assumption

Paired variables

Variables were quantitative

Parent population of sample observation follows normal distribution.

Null and alternative hypothesis

Ho: μ1- μ2 = 0 or μ1 ≥ μ2; where the experimental group and control group initial and final mean difference was same.

Ha: μ1- μ2 ≠ o, μ1< μ2; where the experimental group and control group initial and final mean difference was not same.

Here,

Ho= Null hypothesis

Ha= Alternative hypothesis

μ1= Mean difference in initial assessment

μ2= Mean difference in final assessment

Formula: test statistic t is follows:

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

Where,

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

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

SD= standard deviation of the differences d and

n= number of paired observations.

Calculation of paired t value of the general pain intensity as below-

$$\frac{\bar{d}}{SE(\bar{d})} = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}} = \frac{\mathbf{1.80}}{\frac{\mathbf{1.8149}}{\sqrt{7}}} = \frac{\mathbf{1.80}}{\frac{\mathbf{1.8149}}{\mathbf{2.6457}}} = \frac{\mathbf{1.80}}{\mathbf{0.6859}} = \mathbf{2.338}$$

Table 3 : According to above calculation, t value has been calculated as below

	Experimental group		Control Group		
	t	Sig. (2 tailed)	df	t	Sig. (2 tailed)
General intensity of pain	2.338	.058	6	2.756	.033
Pain during cross sitting	6.930	.000	6	4.035	.007
Pain during squatting	6.821	.000	6	2.3813	.018
Pain during prolong standing	9.849	.000	6	3.200	.019
Pain during walking	5.891	.001	6	3.334	.016
Pain during working	11.307	.000	6	2.039	.088
Pain during ADLS	6.388	.001	6	4.179	.006
Pain during stairing	6.521	.001	6	1.598	.161
Pain at night	3.499	.013	6	2.183	.072
Pain at morning	12.918	.000	6	4.221	.006
Pain at evening	5.999	.001	6	1.267	.252
Resting pain	4.842	.003	6	1.751	.130

Unrelated t test

Unrelated t test was used to compare difference between two means of independent variables. Selection of test of hypothesis was two independent mean differences under independent t distribution.

The "t" formula-

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\left(\sum X_1^2 - \frac{(\sum X_1)^2}{n_1}\right) + \left(\sum X_2^2 - \frac{(\sum X_2)^2}{n_2}\right)}{(n_1 - 1) + (n_2 - 1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Where,

$\bar{x}_1$ = Mean of scores from control group.

$\bar{x}_2$ = Mean of scores from experimental group.

$\sum X_1$ = The total of the individual score from control group.

$\sum X_2$ = The total of the individual score from experimental group.

$\sum X_1^2$ = The summation of square of the each individual score from control group.

$\sum X_2^2$ = The summation of square of the each individual score from experimental group.

n_1 = Number of subjects in control group.

n_2 = Number of subjects in experimental group.

Analysis of Reduction of general intensity of pain

Subject	x_1	X_1^2	Subject	x_2	X_2^2
E1	2.5	6.25	C1	4	16
E2	5	25	C2	0.8	0.64
E3	6	36	C3	4	16
E4	3.8	14.44	C4	3.6	12.96
E5	4	16	C5	6	36
E6	5	25	C6	1	1
E7	5	25	C7	4	16
	$\sum \bar{x}_1$ = 31.3	$\sum X_1^2$ = 147.96		$\sum \bar{x}_2$ = 23.4	$\sum X_2^2$ = 98.6

$(\sum x_1)^2$= 979.69

$(\sum x_2)^2$ = 547.56

n_1= 7

n_2 = 7

$\bar{x}_1 = \frac{31.3}{7} =$ 4.47

$\bar{x}_2 = \frac{23.4}{7}$ = 3.34

Calculating the degree of freedom from the formula:

df = (n_1- 1) + (n_2 - 1) = (7 - 1) + (7 - 1) = 12

Now according to *t* formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\left(\sum X_1^2 - \frac{(\sum X_1)^2}{n_1}\right) + \left(\sum X_2^2 - \frac{(\sum X_2)^2}{n_2}\right)}{(n_1 - 1) + (n_2 - 1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$t = \frac{4.47 - 3.34}{\sqrt{\frac{\left(147.96 - \frac{979.69}{7}\right) + \left(98.6 - \frac{547.56}{7}\right)}{4}} \times \sqrt{\left(\frac{1}{7} + \frac{1}{7}\right)}}$$

$$t = \frac{1.13}{\sqrt{\frac{56.03 + 87.2}{12}} \times \sqrt{0.286}}$$

$$t = \frac{1.13}{\sqrt{11.98} \times 0.816}$$

$$t = \frac{1.13}{3.461 \times 0.816}$$

$$t = \frac{1.13}{2.824}$$

$$t = 0.40$$

In same way pain variable in different position, t value has been calculated as below

Variables	**Df**	***t value***	**Sig. level (2-tailed)**
General intensity of pain	12	0.40	.193
Pain during cross sitting	12	.366	.721
Pain during squatting	12	-.095	.926
Pain during prolong standing	12	.337	.742
Pain during walking	12	-.803	.438
Pain during working	12	.052	.960
Pain during ADLS	12	-.492	.632
Pain during stairing	12	.262	.798
Pain at night	12	.798	.441
Pain at morning	12	1.121	.284
Pain at evening	12	.371	.717
Resting pain	12	.793	.443

U Test

For the significance of the study, a statistical test was carried out. Statistical analysis refers to the well-defined organization and interpretations of the data by systemic and mathematical procure and rules (Depoy & Gitlin, 2013). The U test was done for the analysis of the balance after five session treatment of both control and tail groups.

Mann-Whitney U test is a non-parametric test that is simply compares the result obtained from the each group to see if they differ significantly. This test can only be used with

ordinal or interval/ ratio data.

The formula of Mann-Whitney U test:

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

n_1 = the number of the subjects in trail group

n_2= the number of the subjects in control group.

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

T_x= the larger rank total.

Calculation of U - value for WOMAC sore

Reduction of WOMAC scores in experimental group and only control group in the knee osteoarthritis were differences between pre-test and post-test pain scores

Subjects Of Experimental Group	WOMAC scores	Rank	Subjects Of Control Group	WOMAC scores	Rank
E1	29	2	C1	62	13
E2	8	1	C2	47	6
E3	45	5	C3	52	8
E4	39	3	C4	53	9
E5	50	7	C5	55	10
E6	40	4	C6	56	11
E7	47	6	C7	60	12
n_1 = 7		Total = 28	n_2 = 7		Total = 69

Here,

n_1 = 7

n_2 = 7

T_x= 69

Now ‘U’ formula

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

$$= 7 \times 7 + \frac{7(7 + 1)}{2} - 69$$

$$= 77 - 69$$

$$= 8$$

Level of significance of WOMAC score

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

No.	Variables	Observed ‘u’ value	Observed P value	Level of significance
1	WOMAC Score	8	<.05	Statistically significant

3.12 Significant level

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

3.13 Ethical Concideration

The whole process of this research project was done by following the Bangladesh Medical Research Council (BMRC) guidelines and World Health Organization (WHO) Research guidelines. The proposal of the dissertation including methodology was approved by Institutional Review Board (IRB) and obtained permission from the concerned authority of ethical committee of Bangladesh Health Professions Institute (BHPI). Again before the beginning of the data collection, the researcher obtained the permission ensuring the safety of the participants from the concerned authorities of the clinical setting and was allotted with a witness from the authority for the verification of the collected data. The researcher strictly maintained the confidentiality regarding participant's condition and treatments. The researcher obtained consent to participate from every subject. A signed informed consent form was received from each participant. The participants were informed that they had the right to meet with outdoor doctor if they think that the treatment was not enough to control the condition or if the condition become worsen. The participants were also being informed that they were completely free to decline answering any question during the study and were free to withdraw their consent and terminate participation at any time. Withdrawal of participation from the study 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.

CHAPTER– IV RESULTS

Mean Age of the Participants

14 Patients with adhesive Osteoarthritis were included as sample of the study, among them Experimental group mean age 53 years and control group mean age 55 years.

Experimental Group		Control Group	
Subjects	Age (Years)	Subjects	Age (Years)
E1	64	C1	60
E2	45	C2	62
E3	48	C3	50
E4	57	C4	48
E5	55	C5	50
E6	50	C6	65
E7	52	C7	51
Mean Age	53 years	Mean Age	55 years

Table 4: Mean Age of Participants

Age Range

The majority of the participants 57% (n=8) were in “46-55” years of age followed by 36% (n=5) were in “56-65” years, 7% (n=1) were in “35-45” years of age range group.

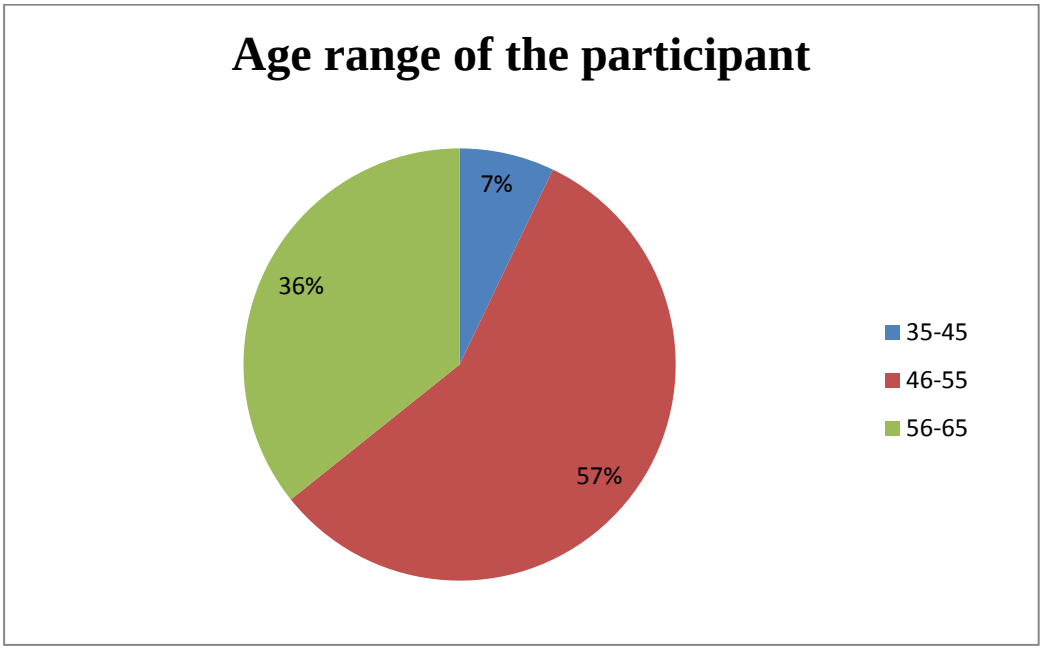
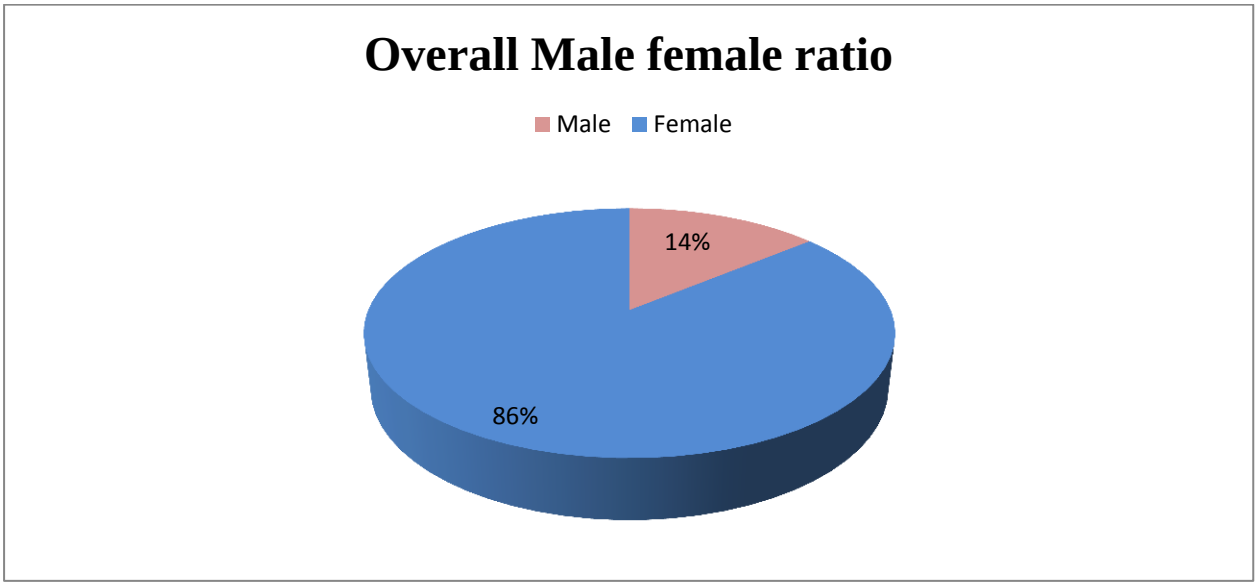


Figure 1- Age Range

Sex of the Participants

14 Patients with osteoarthritis were included as sample of the study, among them almost 14% (n=2) were male and about 86% (n=12) were female. On the other hand, In Experimental Group 43% (n=6) were Male and 7% (n=1) were Female and in Control Group 7% (n=1) were Male and 43% (n=6) were Female.



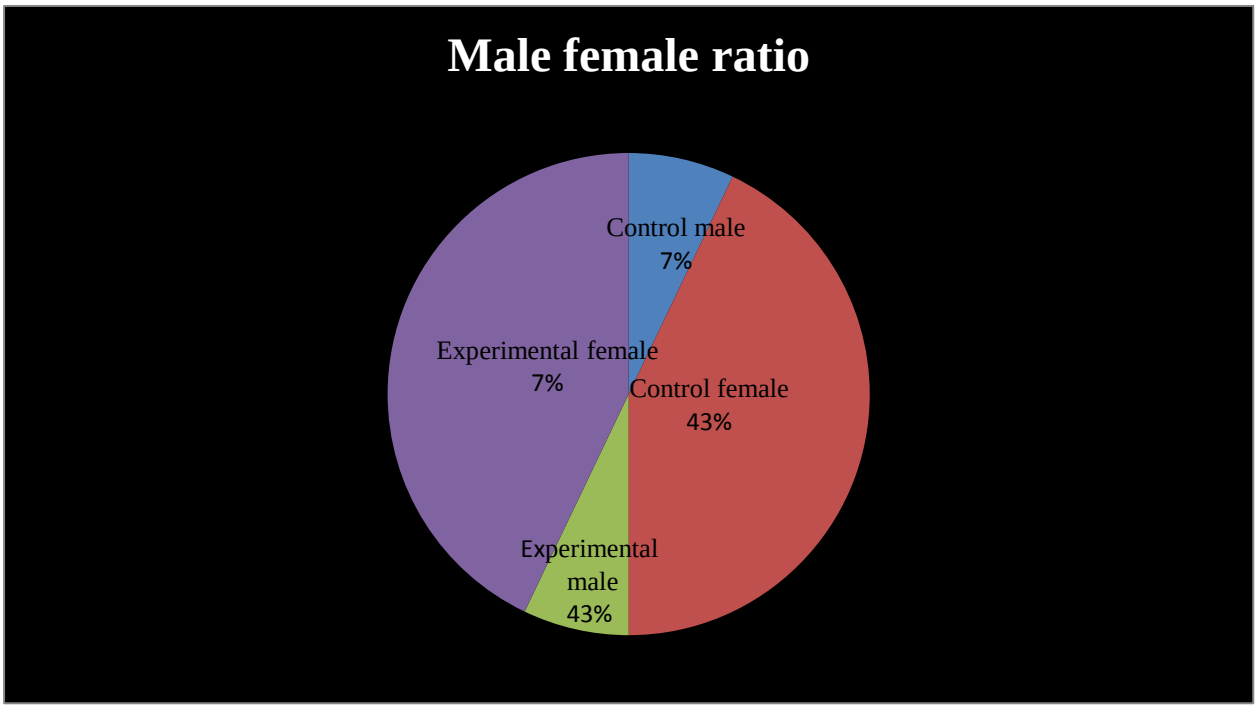
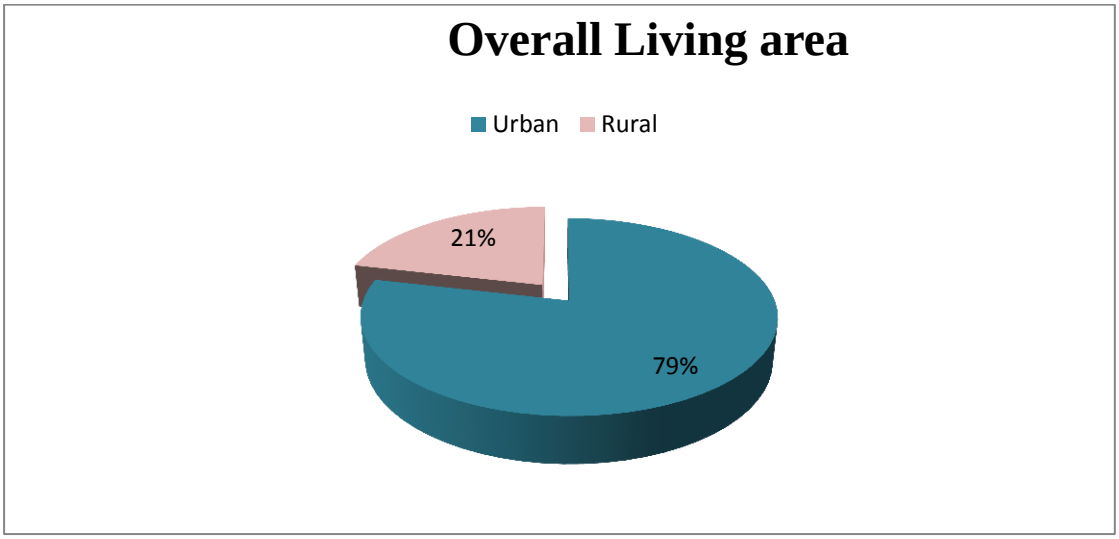


Figure 2- Gender Distribution

Living area of the Participants

14 Patients with osteoarthritis were included as sample of the study, among them almost 21% (n=3) were rural area, about 79 % (n=11) were urban area. On the other hand, In Experimental Group 14% (n=2) were rural area and 36% (n=5) were urban area and in Control Group 7% (n=1) were rural area and 43% (n=6) were urban area.



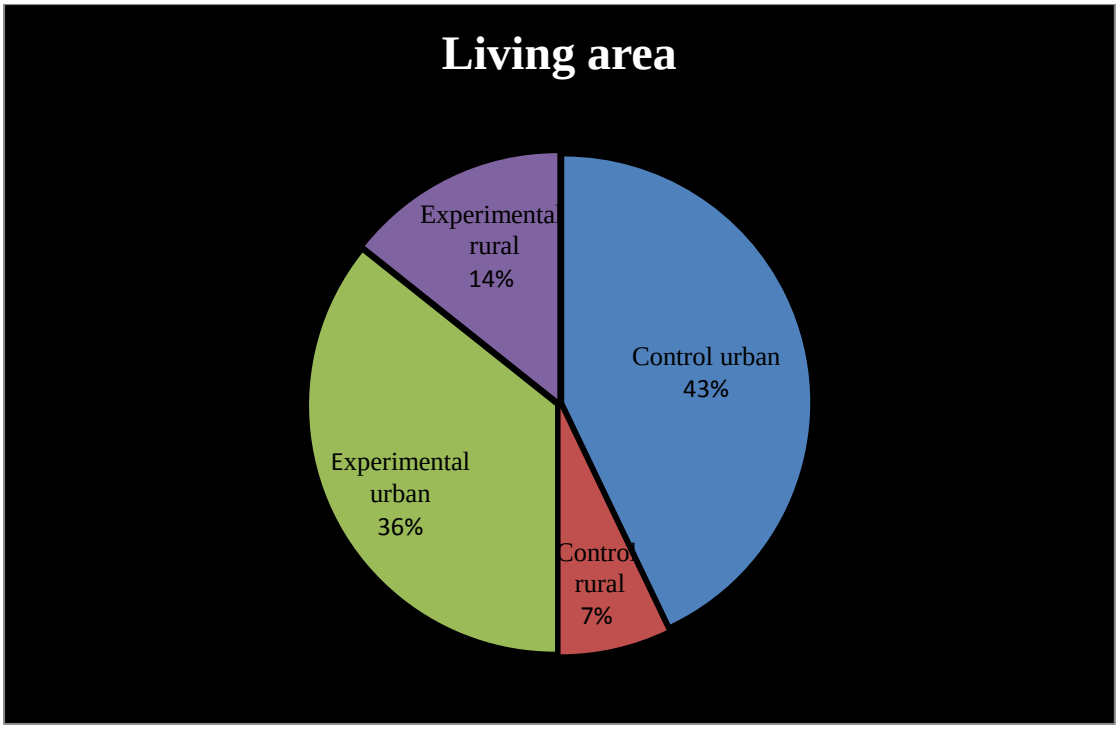
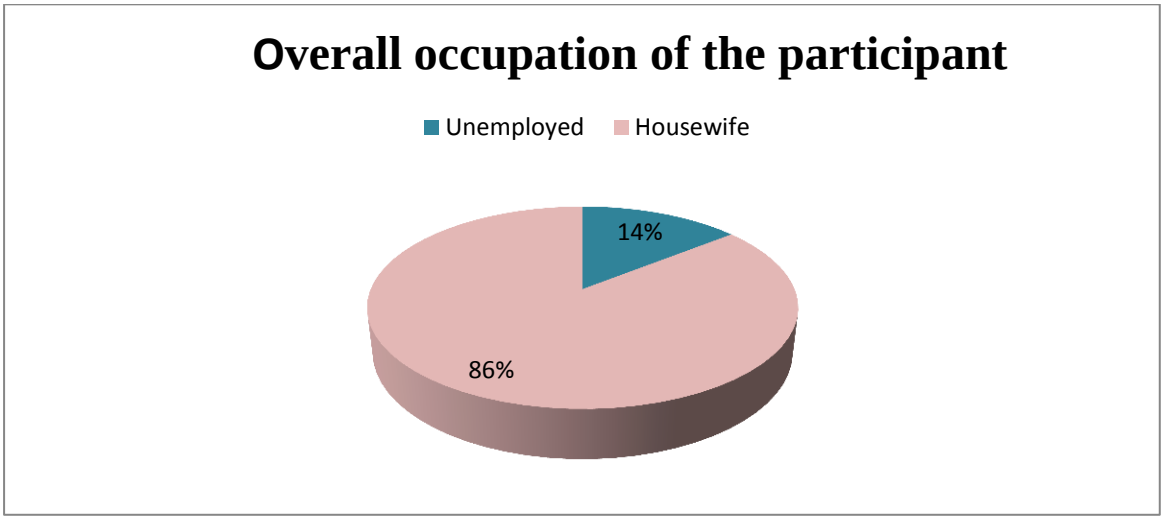


Figure 3- Living area Distribution

Occupation of the participants

14 Patients with osteoarthritis were included as sample of the study, among them almost 14% (n=2) were unemployed, about 86 % (n=12) were housewife. On the other hand, In Experimental Group 7% (n=1) were unemployed and 43% (n=6) were housewife and in Control Group 7% (n=1) were unemployed and 43% (n=6) were housewife.



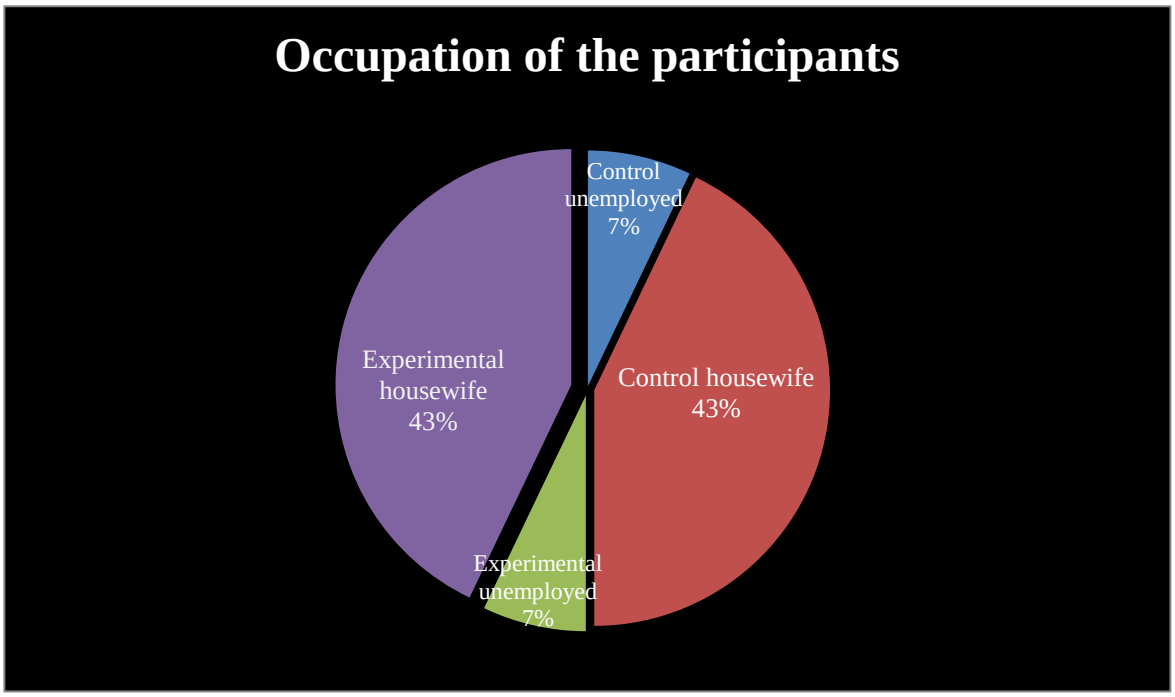


Figure 4- occupation distribution

Educational level of the participants

14 Patients with osteoarthritis were included as sample of the study, among them almost 14% (n=2) were no formal schooling, about 36 % (n=5) were primary, about 15% (n=2) were secondary, about 14% (n=2) were H.S.C, about 7% (n=1) were graduate, about 14% (n=2) were masters.

.

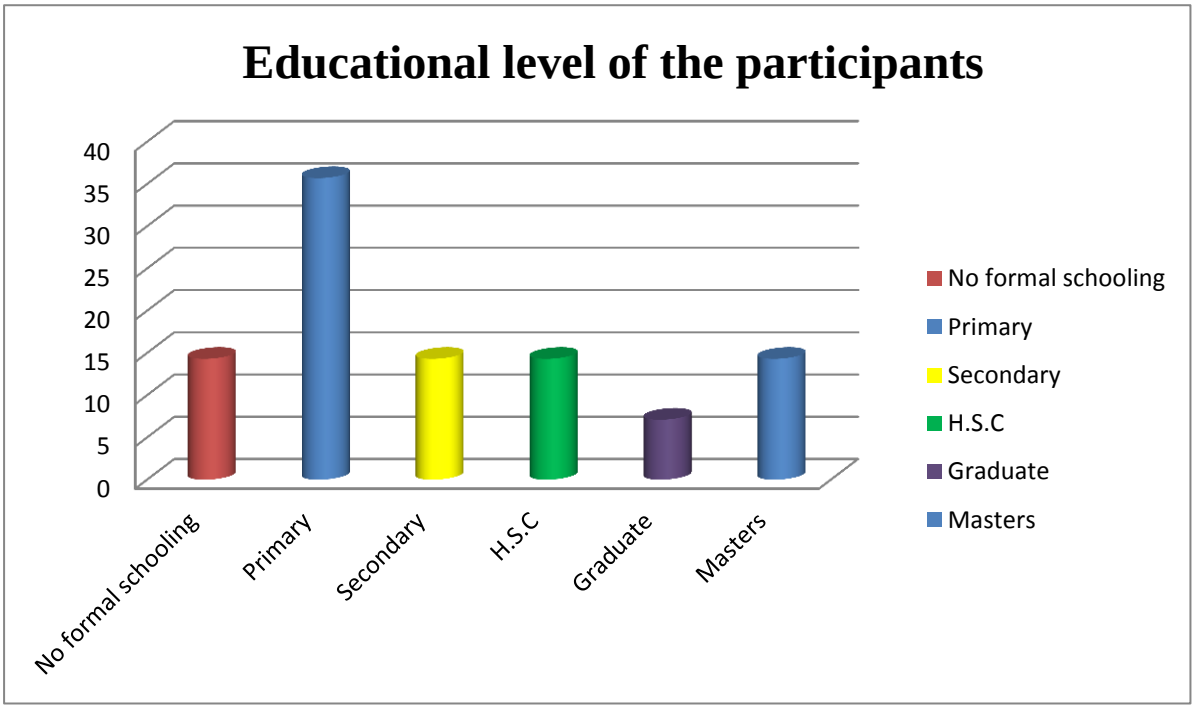


Figure 5- Educational level distribution

Results of Pain in different position

General intensity of pain

This study found that in the general pain intensity, observed t value was 2.338(1.80 ±2.0372) in the experimental group at two tailed paired t test while this same variable for control group observed value was 2.756 (1.80±1.7282) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value in general pain intensity in experimental groups which were smallar than standard t value that mean alternative hypothesis was rejected and nall hypothesis was accepted in the within group that means patella mobilization is not effective physiotherapy treatment for reducing general pain intensity. The Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was 0.40. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing general pain intensity.

Pain during cross sitting

This study found that pain during cross sitting, observed t value was 6.930 (2.21 ±.8454) in the experimental group at two tailed paired t test while this same variable for control group observed value was 4.035 (1.22±.8056) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain during cross sitting in both groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Both groups in aspect of pain during cross sitting were significant at .000% and .007% level that means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain during cross sitting. The Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was .366. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella

mobilization is not effective physiotherapy treatment for reducing pain in cross sitting.

Pain during squatting

This study found that pain during squatting, observed t value was 6.821 (2.03 ±.7868) in the experimental group at two tailed paired t test while this same variable for control group observed value was 3.243 (1.36±1.1073) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain during squatting in both groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Both groups in aspect of pain during squatting were significant at .000% and .018% level that means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain during squatting. Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was -0.95. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain in squatting.

Pain during prolong standing

This study found that pain during prolong stading, observed t value was 9.849(2.19±.5872) in the experimental group at two tailed paired t test while this same variable for control group observed value was 3.200 (1.14±.9449) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain during prolong standing in both groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Both groups in aspect of pain during prolong standing were significant at .000% and .019% level that means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain during prolong standing. Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and

same degree of freedom observed t value was .337. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain in prolong standing.

Pain during walking

This study found that pain during walking, observed t value was 5.891(2.14±.9624) in the experimental group at two tailed paired t test while this same variable for control group observed value was 3.334 (1.65±1.3151) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain during walking in both groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Both groups in aspect of pain during walking were significant at .001% and .016% level, that means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain during walking. Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was -0.803. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain in walking.

Pain during working

This study found that pain during working, observed t value was 11.307(2.76±.6451) in the experimental group at two tailed paired t test while this same variable for control group observed value was 2.039(1.10±1.4271) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain during working in experimental groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Experimental groups in aspect of pain during working were significant at .000% and control groups were not significant at .088% level, that means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain during working.

Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was .052. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain in working .

Pain during ADLS

This study found that pain during ADLS, observed t value was 6.388(2.24±.9289) in the experimental group at two tailed paired t test while this same variable for control group observed value was 4.179 (1.58±1.0040) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain during ADLS in both groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Both groups in aspect of pain during ADLS were significant at .001% and .006% level, that means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain during ADLS. Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was -0.492. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain in ADLs.

Pain during stairing

This study found that pain during stairing, observed t value was 6.521(2.37±.9621) in the experimental group at two tailed paired t test while this same variable for control group observed value was 1.598(.8286±1.3720) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain during stairing in experimental groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Experimental groups in aspect of pain during stairing were significant at .001% and control groups were not significant at .161% level, that

means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain during stairing. Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was .262. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain in staring.

Pain at night

This study found that pain at night, observed t value was 3.499(2.25±.1.7067) in the experimental group at two tailed paired t test while this same variable for control group observed value was 2.183(1.91±2.3205) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain at night in experimental groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Experimental groups in aspect of pain at night were significant at .013% and control group were not significant at .072% level, that means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain at night. Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was .798. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain at night.

Pain at morning

This study found that pain at morning, observed t value was 12.918(3.51±.7198) in the experimental group at two tailed paired t test while this same variable for control group observed value was 4.221(1.37±.8597) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain at morning in both groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group.

Both groups in aspect of pain at morning were significant at .000% and .006% level, but the mean difference of the experimental group was greater than the control group mean that means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain at morning. Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was 1.121. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain at morning.

Pain at evening

This study found that pain at evening , observed t value was 5.666(2.65±1.2408) in the experimental group at two tailed paired t test while this same variable for control group observed value was 1.267(1.41±2.9526) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t value of pain at evening inexperimental groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Experimental groups in aspect of pain at evening were significant at .001% and control group were not significant at .252 % level, that means patella mobilization for osteoarthritic pain patients was more effective than conventional physiotherapy treatment only for reducing pain at evening. Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was .371. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain at evening.

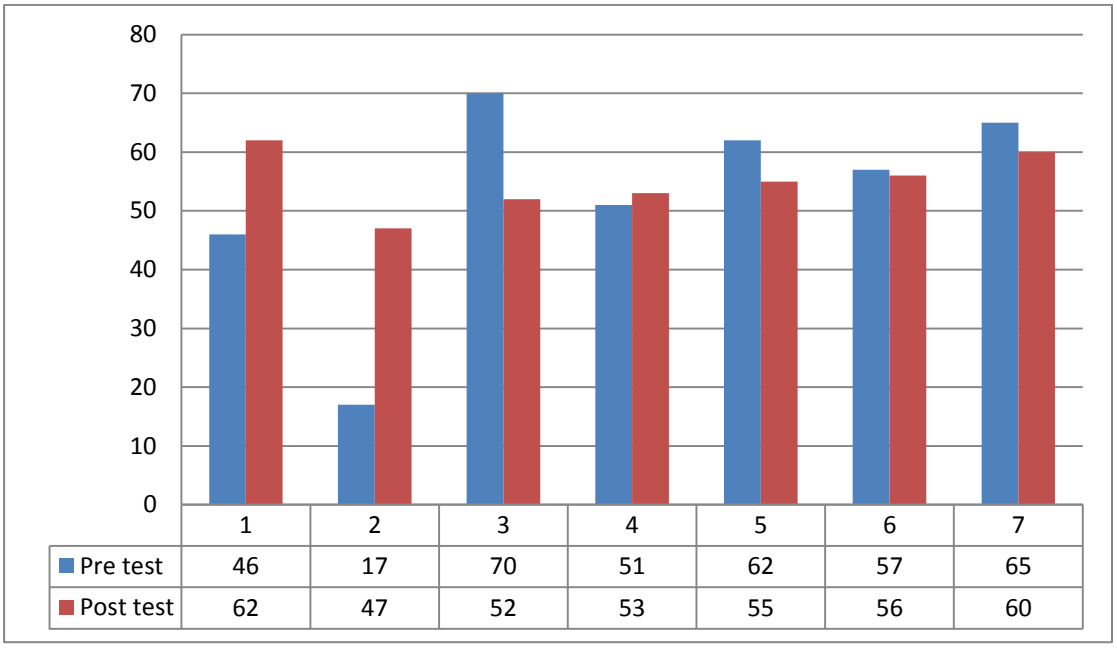
Pain at rest

This study found that pain at rest, observed t value was 4.842(2.75 ±1.5065) in the experimental group at two tailed paired t test while this same variable for control group observed value was 1.751(.9143±1.3813) in within group. 5% level of significant at 6 (six) degrees of freedom standard t value was 2.44 and observed t

value of pain at rest in experimental groups which were greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Experimental groups in aspect of pain at rest were significant at .003% and control groups were not significant at .130% level, that means patella mobilization for osteoarthritis pain patients was more effective than conventional physiotherapy treatment only for reducing pain at rest. Unrelated/independent t test in between group at 5% level of significant and 12 degrees of freedom standard table value was 2.18 and at the same significant level and same degree of freedom observed t value was .793. The observed t value was less than the table value that meant null hypothesis was accepted and alternative hypothesis was rejected which meant patella mobilization is not effective physiotherapy treatment for reducing pain at rest.

Control Group WOMAC Score

WOMAC score of control group is shown in the chart. The pre test score of 7 participants was 46,17,70,51,62,57,65 and post test score of 7 participants was 62,47,52,53,55,56,60.



	1	2	3	4	5	6	7
Pre test	46	17	70	51	62	57	65
Post test	62	47	52	53	55	56	60

Figure- 6: WOMAC Score in Control Group

Mean WOMAC in control group between pre-test and post-test are 52.57 and 55

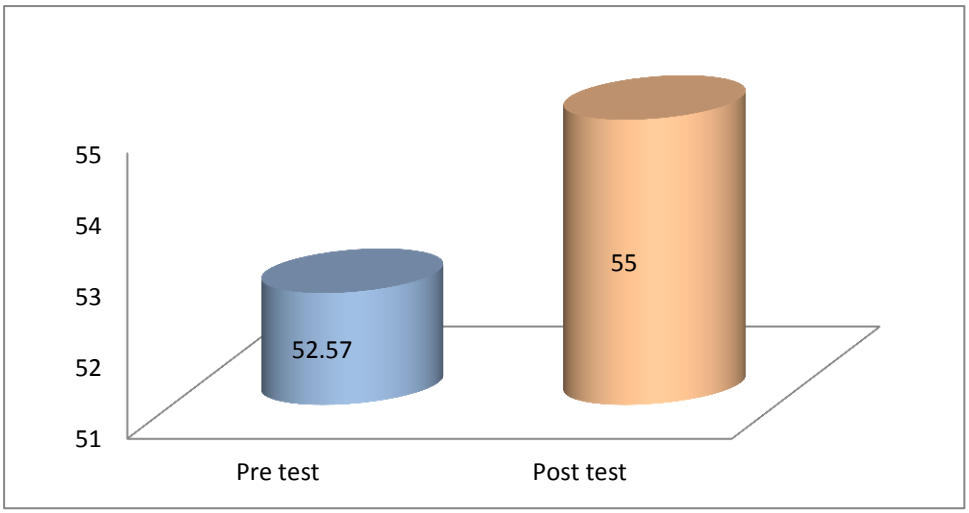
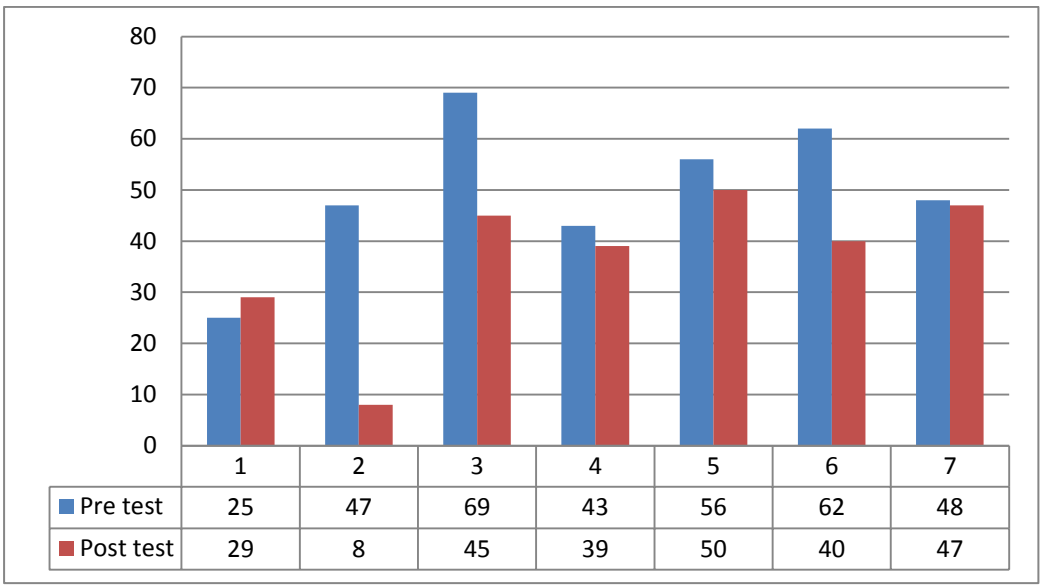


Figure-7: Mean WOMAC in Control Group

Experimental Group WOMAC Score

WOMAC scores of experimental group are shown below in the chart. The pre test score of 7 participants was 25, 47, 69, 43, 56, 62, 48 and post test score of 7 participants was 29, 8, 45, 39, 50, 40, 47.



	1	2	3	4	5	6	7
Pre test	25	47	69	43	56	62	48
Post test	29	8	45	39	50	40	47

Figure-8: WOMAC Score in Experimental Group

Mean WOMAC in Experimental Group

Mean WOMAC between pre-test and post-test in control group are 50 and 36.86.

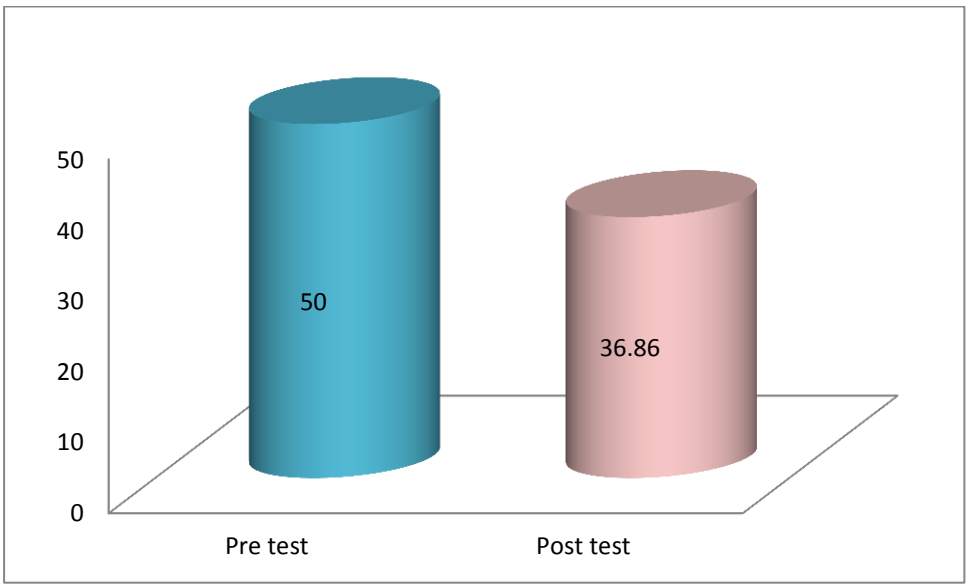


Figure-9: Mean WOMAC inExperimental Group

Mean Difference in WOMAC Score in Both Groups

Mean difference in WOMAC between both groups in pre-test and post-test has been shown below in the bar chart.

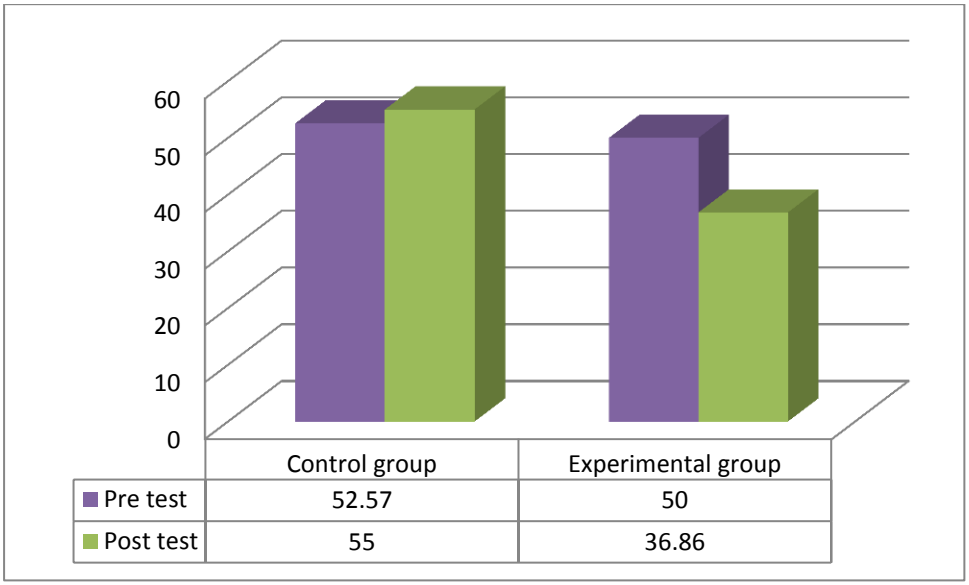


Figure – 10: Mean Difference of WOMAC Score in Both Groups

Interpretation of WOMAC score:

The researcher interprets the results by using the values of WOMAC that come from this study.

14 patients were enrolled and 7 patients were assigned to control group who receive only conventional physiotherapy. The rest of 7 patients were assigned to experimental group who received patella mobilization with conventional physiotherapy.

Mean difference between pre-test and post-test of experimental group and control group were 13.14 and 2.43 Following application of treatment the study found that the experimental group showed a significant improvement ($p<.05$) in case of knee osteoarthritis pain, stiffness and disability. In this study researcher was found the total score of WOMAC of 8 that means the observed value of 8 of WOMAC score which was statistically significant at $p<.05$ level.

CHAPTER – V DISCUSSION

The study was indicated a process that could be continuing to establish the result. Here the aim of this study achieved if the researcher could show effective support. The purpose of this study was to evaluate the effectiveness of the Patella Mobilization with conventional physiotherapy compare to only conventional physiotherapy for osteoarthritis.

In this experimental study 14 patients were enrolled and 7 patients were assigned to control group who receive only conventional physiotherapy. The rest of 7 patients were assigned to experimental group who received Patella Mobilization along with conventional physiotherapy. Each group attended for 5 sessions of treatment in the Physiotherapy outpatient Unit of CRP, Savar in order to demonstrate the improvement. The outcome was measured by using Visual Analogue Scale (VAS) for pain intensity and Western Ontario and McMaster Universities Arthritis Index (WOMAC) for measuring condition of patients with osteoarthritis of the knee and hip, including pain, stiffness, and physical functioning of the joints.

In this study there were total 14 participants. The mean age of experimental group was 53 years and the mean age of control group is 55 years. Among them almost 14% (n=2) were male and about 86% (n=12) were female. OA increase with advancing age in both sexes. In general, women have a higher incidence and prevalence of symptomatic radiographic OA, particularly in the hands and knees (Jordan, 2012).

General pain intensity of experimental group significant level was $p<0.058$ and control group significant level was $p<0.033$. But control group was highly significant in paired t test ($p<.05$ or more p value). So control group was more effective than experimental group. Pain intensity during cross sitting of experimental group significant level was $p<0.000$ and control group significant level was $p<0.007$. Here both experimental group and control group was significant in paired t test ($p<.05$ or more p value). But experimental group was more significant. So experimental group was more effective than control group. Pain intensity during squatting of experimental group significant level was $p<0.000$ but control group was not significant statistically

was p>0.018. both experimental and control group are significant. But experimental group was highly significant in paired t test (p<.05 or more p value). So experimental group was more effective than control group. Pain during prolong standing of experimental group significant level was p<0.000 but control group was not significant statistically was p>0.019. Here experimental group was highly significant in paired t test (p<.05 or more p value). So experimental group was more effective than control group. Pain intensity during walking of experimental group significant level was p<0.001 and control group was p<0.016. So experimental group was highly significant in paired t test (p<.05 or more p value).So experimental group was more effective than control group. Pain intensity during working of experimental group significant level was p<0.000 and control group significant level was p<0.088. But experimental group was highly significant in paired t test (p<.05 or more p value). So experimental group was more effective than control group. Pain intensity during daily living activity of experimental group significant level was p<0.001 and control group was p>0.052. Here both experimental and control group are highly significant but experimental group was more significant in paired t test (p<.05 or more p value). So experimental group was more effective than control group. Pain intensity during stairing of experimental group significant level was p<0.001 and control group significant level was p<0.161. Here both experimental group and control group was significant in paired t test (p<.05 or more p value). But experimental group was more significant. So experimental group was more effective than control group. Pain intensity at night of experimental group significant level was p<0.013 and control group significant level was p<0.072. But experimental group was highly significant in paired t test (p<.05 or more p value). So experimental group was more effective than control group. Pain intensity at morning of experimental group significant level was p<0.000 and control group significant level was p<0.006. Here both experimental group and control group was significant in paired t test (p<.05 or more p value). But experimental group was more significant. So experimental group was more effective than control group. Pain intensity at evening of experimental group significant level was p<0.001 but control group was not significant statistically was p>0.252. Here experimental group was highly significant in paired t test (p<.05 or more p value). So experimental group was more effective than control group. Pain intensity at rest of experimental group significant level was p<0.003 and control group significant level was p<0.130. Here both experimental group and control group was significant in

paired t test (p<.05 or more p value). But experimental group was more significant. So experimental group was more effective than control group.

By using a paired *t* test on the data the results were found to be significant in case of cross sitting (p <0.05), pain during squatting (p <0.05), pain during prolong standing (p <0.05) , pain during walking (p <0.05),pain during working (p <0.05), pain during daily living activity (p <0.05), pain during stairing (p <0.05), pain at night(p <0.05), pain at morning (p <0.05), pain at evening (p <0.05), pain at rest (p <0.05). But not statistically significant was general intensity of pain.

In comparison between experimental to the control group, mean difference of the VAS indicators had shown higher mostly in experimental group. In unrelated *t*test,all of the domains did not show any significance statistically (p>.05). Among the outcome measurements of this study, the Lequesne index for knee osteoarthritis questionnaire had used in evaluation of every session where the progression outline were improved in most of the indicators within the experimental group rather than control.

In this study the researcher found a significant improvement in case of level of pain, stiffness, functional activities in several functional position on WOMAC. Mean difference reducing WOMAC score between pre-test and post-test of experimental group and control group were 13.14 and 2.43.

A experimental study showed that among the 100 participants, control group was received conventional physiotherapy and experimental group was received patella mobilization for 2 months to improve functional activity that result concluded that in trail group, significant Improvement of functional activity in case of stairing(p<.05), toileting (p<.05),prolong standing (p<.05),and walking (p<.05) but improvement of sitting and lying in bed was same in control group (Arshad et al., 2015).

Kumar (2010) found in his study, statistically significant in the treatment of conventional physiotherapy and patella mobilization group separately. The Mean percentage of improvement in for patella mobilization group was 73 % on 5th day and 96 % in 10th day with t value 3.467 and p value less than 0.02.

Fish et al. (2008) conducted a randomized, clinical trial (n=60) in individual with knee osteoarthritis. Subject were randomized to receive topical capsaicin, knee mobilization and knee mobilization with capsaicin .This randomized clinical trial compared 3 treatments for KOA: Group 1- topical capsaicin; Group 2- knee mobilization; and Group 3- knee mobilization with capsaicin and treated 6 times over 3 weeks .The primary outcome measure was the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Secondary measures included the Short-Form McGill Pain Questionnaire (SFMPQ), NRS-101 pain scale (NPRS), and goniometry (ROM). The results suggest that significant and clinically meaningful changes in WOMAC of 42.3%, a 22.0 point decrease with NPRS, a decrease of 5.5 points with the SFMPQ, and a significant increase of 5° ROM. These changes appear to compare favorably with exercise and manual therapy trials. On the contrary, this study had examined the effect of patella mobilization to improve functional activity and decrease pain among knee osteoarthritis patient to explore the effectiveness of them collectively with the outcome measures of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Visual analogue scale (VAS).

Rowlands et al. (1999) has had a study where it is found that approximately half of the patient population surveyed had received patella mobilization for their knee OA. Thirty subjects were randomly allocated into two treatment groups. Group A received patella mobilization and group B received detuned ultrasound. This study obtained by the McGill Pain Questionnaire, Numerical Pain Rating Scale-101, and the Patient-Specific Functional Scale. The nonparametric Mann-Whitney U-test and Wilcoxin Sign-Rank test were used for these group statistical data, respectively. The result showed that group A showed a better statistical response to treatment than group B. To compare, this study had provide conventional physiotherapy and conventional physiotherapy with patella mobilization between two groups but researcher provided conventional physiotherapy for control group and conventional physiotherapy with patella mobilization for experimental group. This study showed a better statistical response who received patella mobilization but researcher could not found better statistical response in unrelated *t* test because sample size was limited.

To determine the effect of patella mobilization on pain symptoms and physical function in knee osteoarthritis.RCT had done within 60 patients screened for eligibility into 2 groups of 30 subjects each Outcome . Group A received patella mobilization and group B received ultrasound. visual analogue scale (VAS) was used to assess pain intensity and relief experienced by the patient (0=no pain, 10=unbearable pain, Algometer, Patient-Specific Functional Scale, Patellofemoral Joint Evaluation Scale, and the Short-Form McGill Pain Questionnaire. Statistical analysis using SPSS utilized the t, Mann-Whitney U and Wilcoxin's signed rank tests at a 95% confidence level with $\alpha/2$ and $p \leq 0.025$ The results suggest that statistical significance could not be determined. (Stakes et al., 2006).On the contrary, this study had examined the effect of patella mobilization to improve functional activity and decrease pain among knee osteoarthritis patient to explore the effectiveness of them collectively with the outcome measures of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Visual analogue scale (VAS).

In this Research, Researcher found improvement of functional activity and decrease pain in both conventional physiotherapy and patella mobilization group. But the comparison of both improvements shows that, patella mobilization along with conventional physiotherapy is effective in reducing knee pain and improve functional activity in pair *t* test and *u* test but not statistically significant in unrelated *t* test .

The study was conducted within short period which is the main limitation of this study.

The study was conducted with 14 patients of knee osteoarthritis, which was a very small size of samples in both groups and was not sufficient enough for the study to generalize its findings to the wider population and variable patient mass of this condition.

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

There was no available research done in this area in Bangladesh. So, relevant information about osteoarthritis patient with specific intervention for Bangladesh was very limited in this study.

CHAPTER – VI CONCLUSION AND RECOMMENDATION

The study was an experimental design to examine the effectiveness of Patella Mobilization along with conventional physiotherapy for osteoarthritis, where the results of the study have demonstrated that the combination technique is significantly capable of producing beneficial effects on pain reduction, improvement of functional activity in patients with osteoarthritis.

Reduction of pain and associated symptoms were maximum in the patients treated with combination of Patella Mobilization along conventional physiotherapy, Pain reduction as well as reduction of Functional Activity was also found clinically significant.

The result also indicate that the significant changes in both groups are due to the selection of a well- defined population of knee osteoarthritic pain patients using specific inclusion and exclusion criteria. It may be helpful for patient with knee osteoarthritic pain to increase functional abilities for osteoarthritis.

Despite the limitations of the study particularly small sample size, the results of the study give further motivation to controlled clinical trials with sufficient time and sample size. It could be also suggested that for further future study can be carried out with comparable patient variables with emphasis on ergometrics variables.

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February 17, 2016
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 Bachelor of Science 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 patella mobilization to improve functional activity and decrease pain among knee osteoarthritis patient" under honorable supervisor, Mohammad Anwar Hossain, Associate Professor & Head Department of Physiotherapy, CRP, Savar, Dhaka. The purpose of the study is to find out Effectiveness of patella mobilization to improve functional activity and decrease pain among knee osteoarthritis patient. Questionnaire will be used that will take about 20 to 30 minutes. 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 you that I will maintain all the requirements for study.

Sincerely yours,
Sharmin Akter
Sharmin Akter
Bachelor of Science in Physiotherapy (B.Sc PT)
Session: 2011-2012, DU Reg. No.: 1740
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

Recommendation from the thesis supervisor:

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

Attachment: Thesis Proposal including measurement tools and process and procedure for maintaining confidentiality, Questionnaire (English and Bengali version), Information sheet & consent form.

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনষ্টিটিউট (বিএইচপিআই)
BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)
(The Academic Institute of CRP)

Ref: CRP-BHPI/IRB/04/17/79 *Date:* 05/04/2017

To

Sharmin Akter
Bachelor of Science in Physiotherapy
Session: 2011-2012, DU Reg. No.: 1740
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal – Effectiveness of patella mobilization to improve functional activity and decrease pain among knee osteoarthritis patient.

Dear Sharmin Akter

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on February 17, 2016 to conduct the above mentioned thesis, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

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

Since the study involves answering a questionnaire that takes 20 to 30 minutes, have no likelihood of any harm to the participants, the members of the Ethics committee has approved the study to be conducted in the presented form at the meeting held at 08:30 AM on February 25, 2016 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

PERMISSION LETTER

August 31, 2016

The Head of the Physiotherapy Department, BHPI

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343.

Subject: Prayer for seeking permission of data collection to conduct my research project.

Dear Sir,

With due respect and humble submission to state that I am Sharmin akter, student of 4th Professional, B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). According to course curriculum, we have to conduct a research for the partial fulfillment of our degree. My research project entitled on "The effectiveness of patella mobilization to derease pain and improve functional activity among knee osteoarthritis patient" under the supervision of Mohammad Anwar Hossain, The head of the Physiotherapy department & associate Professor, Department of Physiotherapy & BHPI; CRP. So I need to take permission to collect data for my research project from the Musculoskeletal, unit of Physiotherapy department, CRP - Savar. I would like to assure that anything of my study will not be harmful for the participants.

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

Sincerely Yours

Sharmin Akter

Sharmin akter

4th Professional B.Sc. in Physiotherapy

Roll-34, Session: 2011-2012

Bangladesh Health Professions Institute (BHPI)

Approved

3/09/16

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

Forwarded

03/09/16

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

ANNEXURE

1. Consent Form (Bengali Version)
2. Questionnaire (Bengali Version)
3. Consent Form (English Version)
4. Questionnaire (English Version)

মৌখিকঅনুমতিপত্র/ সম্মতিপত্র

(অংশগ্রহণকারীকেপড়ে শোনাতেহবে)

আমার নাম শারমিন আক্তার, আমি এই গবেষণা প্রকল্পটি বাংলাদেশ হেলথ প্রফেশনস ইনষ্টিটিউট(বিএইচপিআই)-এ পরিচালনা করছি যা আমার ৪র্থ বর্ষ বিএসসি ইন ফিজিওথেরাপী কোর্সের অধিভুক্ত । আমার গবেষণার শিরোনাম হল-" হাঁটুতে অস্টিওআথ্রাইটিস রোগীদের ব্যথা কমাতে এবং কার্যক্ষমতা বাড়াতে পেটেলা মোবিলাইজেশনের কার্যকারিতা "। আমি এক্ষেত্রে আপনাকে কিছু ব্যক্তিগত এবং আপনার বাথ্যা সম্পর্কে আনুষঙ্গিক কিছু প্রশ্ন করতে চাচ্ছি। এতে আনুমানিক ৩০-৪০ মিনিট সময় নিবো ।

আমি আপনাকে অনুগত করছি যে, এটা আমার অধ্যয়নের অংশ এবং যা অন্য কোন উদ্দেশ্যে ব্যবহৃত হবে না। গবেষক সরাসরি এই অধ্যায়নের সাথে অর্ন্তভুক্ত। তাই এই গবেষনায় আপনার অংশ গ্রহণ বর্তমান ও ভবিষ্যৎ চিকিৎসায় কোন প্রকার প্রভাব ফেলবে না। আপনি যে সব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবংআপনার প্রতিবেদনের ঘটনা প্রবাহে এটা নিশ্চিত করা হবে যে এই তথ্যের উৎস অপ্রকাশিত থাকবে ।এই অধ্যয়নে আপনার অংশগ্রহণ স্বেচ্ছাপ্রণোদীত এবং আপনি যে কোনসময় এই অধ্যয়ন থেকে কোন নেতিবাচক ফলাফল ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন এছাড়াও কোননির্দিষ্ট প্রশ্নঅপছন্দ হলে উত্তর না দেয়ার এবং সাক্ষাৎকারের সময় কোন উত্তরনা দিতে চাওয়ার অধিকারও আপনার আছে । এই অধ্যয়নে অংশগ্রহণকারী হিসেবে যদি আপনার কোন প্রশ্ন থাকে তাহলে আপনি আমাকে অথবা/এবং আমার সুপারভাইসর মোহাম্মাদ আনোয়ার হুসাইন , সহযোগী অধ্যাপক, ফিজিওথেরাপী বিভাগ, বিএইচপিআই, সিআরপি, সাভার,ঢাকা-তে যোগাযোগ করতে পারেন। সাক্ষাৎকার শুরু করার আগে কি আপনার কোন প্রশ্ন আছে? আমি আপনার আনুমতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি ।

হ্যাঁ ☐

না ☐

১। অংশগ্রহণকারীর স্বাক্ষর.....

২।সাক্ষাৎগ্রহনকারীর স্বাক্ষর.....

৩। সাক্ষীর সাক্ষর.....

হাঁটুতে অস্টিওআথ্রাইটিস রোগীদের ব্যথা কমাতে এবং কার্যক্ষমতা বাড়াতে পেটেলা

মোবিলাইজেশনের কার্যকারিতা

অস্টিওআথ্রাইটিসের জন্য প্রশ্নপত্র

অংশ-১: ব্যাক্তিগত বিবরণ

তারিখঃ

কোড নংঃ

রোগীর নামঃ

বাবার নামঃ

বর্তমান ঠিকানা ঃ

স্থায়ী ঠিকানাঃ

ব্যাক্তিগত মোবাইল নংঃ

ফোন নংঃ

অংশ-২ঃসামাজিক প্রেক্ষাপটের প্রশ্নাবলী

প্রশ্ন নং	প্রশ্ন	উত্তর	কোড নং
১.	বয়স		
২.	লিঙ্গ	পুরুষ মহিলা	০১ ০২
৩.	ধর্ম	ইসলাম হিন্দু খ্রিষ্টান বৌদ্ধ অন্যান্য	০১ ০২ ০৩ ০৪ ০৫
৪.	বৈবাহিক অবস্থা	বিবাহিত অবিবাহিত তালাকপ্রাপ্ত বিধবা	০১ ০২ ০৩ ০৪
৫.	আবাসিক এলাকা	কহর গ্রাম	০১ ০২
৬.	পেশা	রিকশাচালক কৃষক কারখানা/গার্মেন্টস শ্রমিক ব্যবসায়ী দিনমজুর বেকার গৃহিণী সরকারী নিযুক্ত বেসরকারী নিযুক্ত অন্যান্য	০১ ০২ ০৩ ০৪ ০৫ ০৬ ০৭ ০৮ ০৯ ১০
৭.	শিক্ষাগত যোগ্যতা	প্রাতিষ্ঠানিক যোগ্যতা নেই স্কুল প্রাথমিক মাধ্যমিক এস এস সি এইচ এস সি স্নাতক স্নাতকোত্তর অন্যান্য	০১ ০২ ০৩ ০৪ ০৫ ০৬ ০৭ ০৮ ০৯

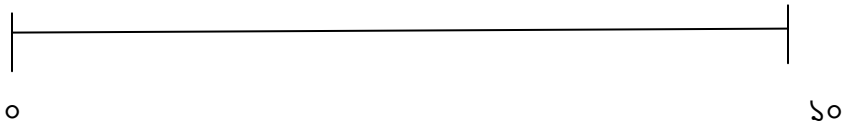
অংশ-৩ঃ অস্টিওআথ্রাইটিসের জন্য ব্যথার প্রশ্নপত্র (চিকিৎসার পূর্বে)

এই প্রশ্নপত্র আপনার অস্টিওআথ্রাইটিস ব্যথার জন্য নকশা করা হয়েছে। যেখানে প্রতিটি প্রশ্নের সাথে দীর্ঘ রেখা আছে। এই রেখা আপনার ব্যথার অবস্থা উপস্থাপন করবে। বাম পাশের শেষ প্রান্ত নির্দেশ করবে কোন ব্যথা নেই,যখন রেখা বরাবর অগ্রসর হবেন তখন নির্দেশ করবে আপনার ব্যথা বাড়তেছে। ডান পাশের শেষ প্রান্ত নির্দেশ করবে খারাপ।সব সময় মনে রাখবেন,বাম পাশ নির্দেশ করবে কোন ব্যথা নেই এবং ডান পাশ নির্দেশ করবে অসহনীয় ব্যথা ।

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

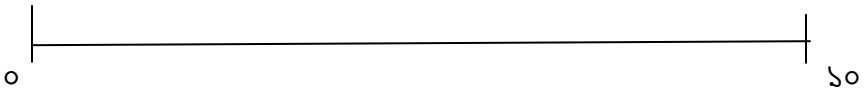
দয়া করে রেখার উপর (০) চিহ্ন দিন যেখানে আপনি ব্যথা অনুভব করবেন।

১।আপনার ব্যথার তীব্রতা আজকে কততুকু?



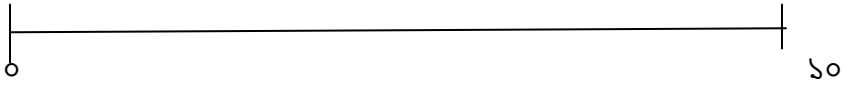
ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

২। আসন করে বসার সময় কতটুকু ব্যথা বাড়ে?



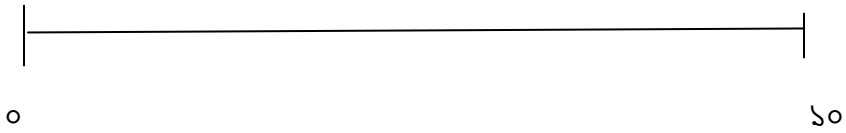
ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

৩। হাটুঁ ভাজ করে বসার সময় কতটুকু ব্যথা বাড়ে?



ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

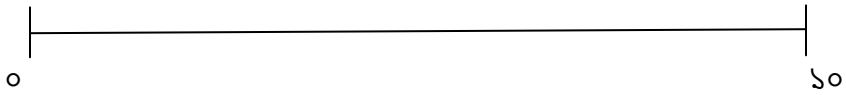
৪। দীর্ঘক্ষণ দাঁড়ানোর সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

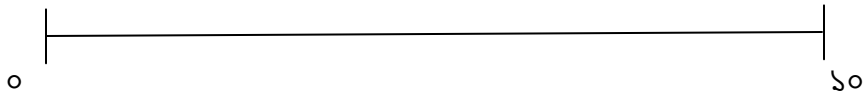
৫।হাটার সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

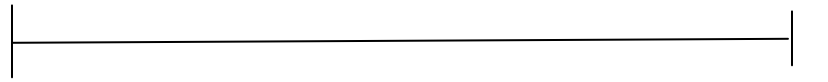
৬।কাজের সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

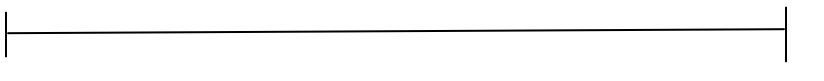
৭।দৈনিক কাজের সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

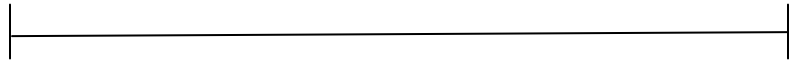
৮। সিঁড়ি দিয়ে উঠা নামার সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

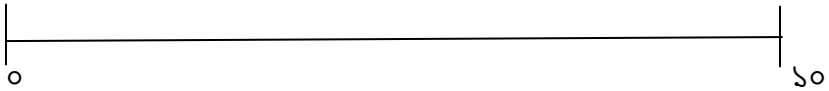
৯। রাতে কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

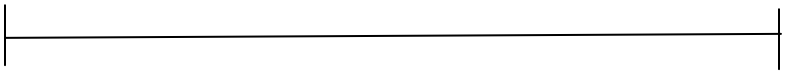
১০ ।সকালে কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

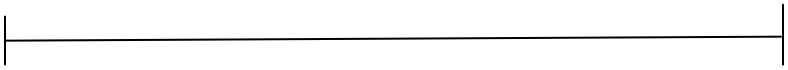
১১ ।সন্ধ্যায় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

১২ ।বিশ্রামের সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

অস্টিওআথ্রাইটিসের জন্য ব্যথার প্রশ্নপত্র (চিকিৎসার পর)

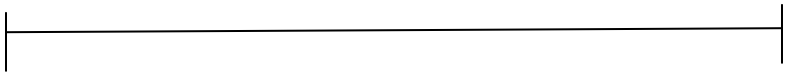
এই প্রশ্নপত্র আপনার অস্টিওআথ্রাইটিস ব্যথার জন্য নকশা করা হয়েছে। যেখানে প্রতিটি প্রশ্নের সাথে দীর্ঘ রেখা আছে। এই রেখা আপনার ব্যথার অবস্থা উপস্থাপন করবে। বাম পাশের শেষ প্রান্ত নির্দেশ করবে কোন ব্যথা নেই,যখন রেখা বরাবর অগ্রসর হবেন তখন নির্দেশ করবে আপনার ব্যথা বাড়তেছে। ডান পাশের শেষ প্রান্ত নির্দেশ করবে খারাপ ।সব সময় মনে রাখবেন,বাম পাশ নির্দেশ করবে কোন ব্যথা নেই এবং ডান পাশ নির্দেশ করবে অসহনীয় ব্যথা ।

০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

দয়া করে রেখার উপর (০) চিহ্ন দিন যেখানে আপনি ব্যথা অনুভব করবেন।

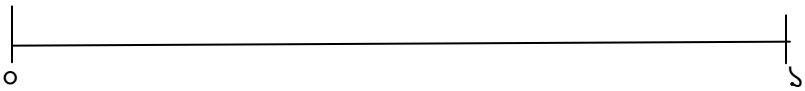
১ ।আপনার ব্যথার তীব্রতা আজকে কতটুকু?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

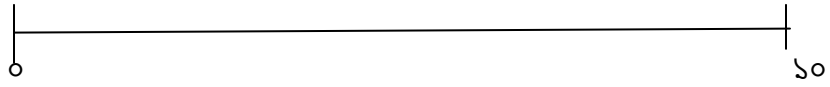
২। আসন করে বসার সময় কতটুকু ব্যথা বাড়ে?



০ ১০

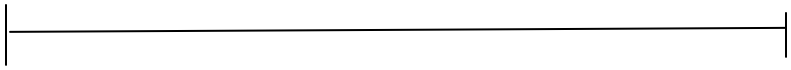
ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

৩। হাটুঁ ভাজ করে বসার সময় কতটুকু ব্যথা বাড়ে?



ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

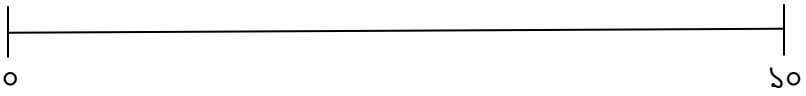
৪। দীর্ঘক্ষণ দাঁড়ানোর সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

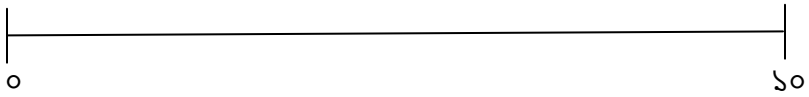
৫।হাটার সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

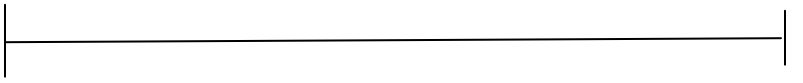
৬।কাজের সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

৭।দৈনিক কাজের সময় কতটুকু ব্যথা বাড়ে?



০ ১০

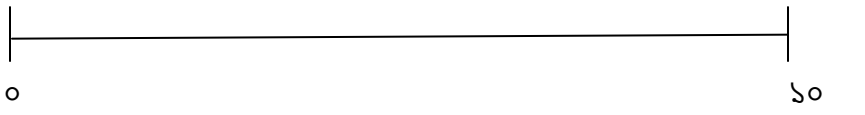
ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

৮। সিঁড়ি দিয়ে উঠা নামার সময় কতটুকু ব্যথা বাড়ে?

০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

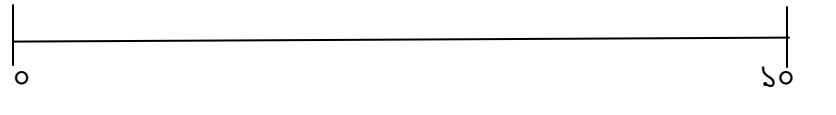
৯। রাতে কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

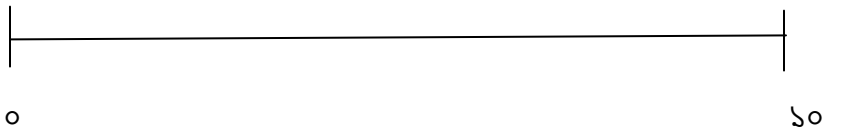
১০।সকালে কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

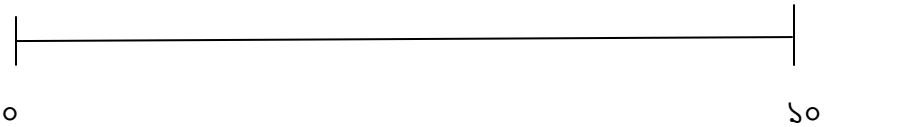
১১।সন্ধ্যায় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

১২।বিশ্রামের সময় কতটুকু ব্যথা বাড়ে?



০ ১০

ব্যথা নাই সম্ভাব্য অসহনীয় ব্যথা

অংশ ৪ঃ অস্টিওআথ্রাইটিসের জন্য প্রশ্নপত্র (চিকিৎসার পূর্বে)

নির্দেশনা ঃ দয়া করে নিম্নোক্ত অসুবিধা / সমস্যার স্কেল অনুযায়ী প্রতিটি বিভাগের কার্যক্রম নির্ধারিত করুন ।

০=নাই, ১=হালকা, ২=মাঝারি, ৩=অনেক, ৪=সর্বাধিক

ব্যথার জন্য

নিচের প্রশ্নগুলো আপনি যে হাঁটু ব্যথার সম্মুখীন হচ্ছেন তা পরিমাপ করবে। প্রতিটি পরিস্থিতির জন্য আপনার অভিজ্ঞতার পরিমান লিখুন।

প্রশ্ন নং	প্রশ্ন	উত্তর	কোড নং
১.	যখন একটি সমতল জায়গার উপর হাঁটেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২.	যখন সিড়িঁ দিয়ে উঠা নামা করেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৩.	রাতে যখন বিছানায়?(তার মানে ব্যথা যা আপনার ঘুমকে ব্যাহত করে)	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৪.	বসা অথবা শোয়া অবস্থায়?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৫.	যখন দাড়িয়ে?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪

শক্ত হয়ে যাওয়ার জন্য

প্রশ্ন নং	প্রশ্ন	উত্তর	কোড নং
৬.	সকালে প্রথমবার ঘুম থেকে উঠার পড়ে আপনার শক্ত হয়ে যাওয়ার তীব্রতা কতটুকু?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৭.	বসা বা শোয়ার পর অথবা দিনের অন্য সময়ে আপনার শক্ত হয়ে যাওয়ার তীব্রতা কতটুকু?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪

শারীরিক কাজের জন্য

নিচের প্রশ্নগুলো আপনার শারীরিক কাজ পরিমাপ করবে।এটার দ্বারা আমরা উল্লেখ করব আপনার চলাফেরা করার এবং আপনার দেখাশুনা করার ক্ষমতা। নিম্নলিখিত প্রতিটি কার্যকর্মের জন্য, আপনি বিগত ৪৮ ঘণ্টার মধ্যে আপনার হাঁটুর অসুবিধার অভিজ্ঞতা আছে তা উল্লেখ করুন।

প্রশ্ন নং	প্রশ্ন	উত্তর	কোড নং
৮.	যখন সিড়ি দিয়ে নামেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৯.	যখন সিড়ি দিয়ে উঠেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১০.	যখন বসা থেকে দাড়াঁন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪

১১.	যখন দাড়িঁয়ে?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১২.	যখন মেঝের দিকে ঝুকেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৩.	যখন সমতল জায়গায় হাটেঁন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৪.	গাড়িতে উঠা এবং নামা অথবা বাসে উঠা-নামা করেন ?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৫.	কেনাকাটার সময়?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৬.	যখন আপনি মোজা পরেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৭.	যখন বিছানা থেকে উঠেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৮.	যখন আপনি মোজা খুলেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৯.	যখন বিছানায় শুয়ে থাকেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪

২০.	গোসল জেতে অথবা ফিরতে থাকেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২১.	যখন বসে থাকেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২২.	যখন টয়লেটে যান অথবা বের হন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২৩.	যখন ভারী গৃহস্থলীর কাজ করেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২৪.	যখন হালকা গৃহস্থলীর কাজ করেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪

অস্টিওআথ্রাইটিসের জন্য প্রশ্নপত্র (চিকিৎসার পর)

নির্দেশনা ঃ দয়া করে নিম্নোক্ত অসুবিধা / সমস্যার স্কেল অনুযায়ী প্রতিটি বিভাগের কার্যক্রম নির্ধারিত

করুন ।

০=নাই, ১=হালকা, ২=মাঝারি, ৩=অনেক, ৪=সর্বাধিক

ব্যথার জন্য

নিচের প্রশ্নগুলো আপনি যে হাঁটু ব্যথার সম্মুখীন হচ্ছেন তা পরিমাপ করবে। প্রতিটি পরিস্থিতির জন্য

আপনার অভিজ্ঞতার পরিমান লিখুন।

প্রশ্ন নং	প্রশ্ন	উত্তর	কোড নং
১.	যখন একটি সমতল জায়গার উপর হাঁটেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২.	যখন সিড়ি দিয়ে উঠা নামা করেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৩.	রাতে যখন বিছানায়?(তার মানে ব্যথা যা আপনার ঘুমকে ব্যাহত করে)	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৪.	বসা অথবা শোয়া অবস্থায়?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৫.	যখন দাড়িয়ে?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪

শক্ত হয়ে যাওয়ার জন্য

প্রশ্ন নং	প্রশ্ন	উত্তর	কোড নং
৬.	সকালে প্রথমবার ঘুম থেকে উঠার পড়ে আপনার শক্ত হয়ে যাওয়ার তীব্রতা কতটুকু?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৭.	বসা বা শোয়ার পর অথবা দিনের অন্য সময়ে আপনার শক্ত হয়ে যাওয়ার তীব্রতা কতটুকু?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪

শারীরিক কাজের জন্য

নিচের প্রশ্নগুলো আপনার শারীরিক কাজ পরিমাপ করবে।এটার দ্বারা আমরা উল্লেখ করব আপনার চলাফেরা করার এবং আপনার দেখাশুনা করার ক্ষমতা। নিম্নলিখিত প্রতিটি কার্যকর্মের জন্য, আপনি বিগত ৪৮ ঘণ্টার মধ্যে আপনার হাঁটুর অসুবিধার অভিজ্ঞতা আছে তা উল্লেখ করুন।

প্রশ্ন নং	প্রশ্ন	উত্তর	কোড নং
৮.	যখন সিড়িঁ দিয়ে নামেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
৯.	যখন সিড়িঁ দিয়ে উঠেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১০.	যখন বসা থেকে দাড়াঁন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১১.	যখন দাড়িঁয়ে?	নাই হালকা মাঝারি অনেক	০০ ০১ ০২ ০৩

		সর্বাধিক	০৪
১২.	যখন মেঝের দিকে ঝুকেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৩.	যখন সমতল জায়গায় হাটেঁন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৪.	গাড়িতে উঠা এবং নামা অথবা বাসে উঠা-নামা করেন ?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৫.	কেনাকাটার সময়?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৬.	যখন আপনি মোজা পরেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৭.	যখন বিছানা থেকে উঠেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৮.	যখন আপনি মোজা খুলেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
১৯.	যখন বিছানায় শুয়ে থাকেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২০.	গোসল জেতে অথবা ফিরতে থাকেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪

২১.	যখন বসে থাকেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২২.	যখন টয়লেটে যান অথবা বের হন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২৩.	যখন ভারী গৃহস্থলীর কাজ করেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪
২৪.	যখন হালকা গৃহস্থলীর কাজ করেন?	নাই হালকা মাঝারি অনেক সর্বাধিক	০০ ০১ ০২ ০৩ ০৪

VERBAL CONSENT STATEMENT

(Please read out to the participant)

Assalamualaikum/Namasker, my name is Sharmin Akter. I am conducting this study for a B.sc in Physiotherapy project study dissertation titled "The effectiveness of patella mobilization to improve functional activity and decrease pain among osteoarthritis patient." under Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related information regarding to your problem. You will perform some tasks which are mention in this form. This will take approximately 30-40 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. The researcher is not directly related with this area, so your participation in the research will have no impact on your present or future treatment in this area (musculoskeletal unit). All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous.

Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview.

If you have any query about the study or your right as a participant, you may contact with me, researcher and/or my supervisor Mohammad Anwar Hossain**,** , Associate Professor, Department of Physiotherapy & BHPI; CRP, Savar, Dhaka-1343.

Do you have any questions before I start?

……

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

YES

NO

Signature of the Participant _____

Signature of the Interviewer _____

Signature of the witness _____

Title: The effectiveness of patella mobilization to improve functional activity and decrease pain among osteoarthritis patient.

Questionnaire for osteoarthritis

Part- I:Personal details

Date:

Code no:

Name of the patient:

Father's name:

Present address:

Permanent address:

Personal mobile no:

Any emergency mobile no:

Phone no:

Part 2 : Socio-demographic questions

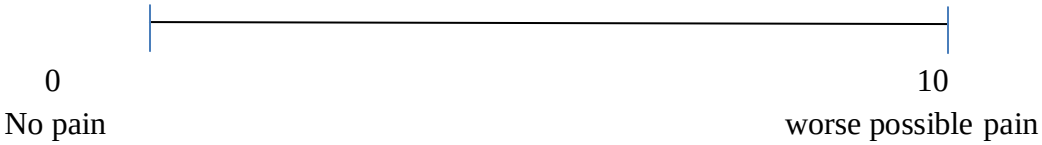
QN	Questions	Responses	Code
1.	Age		
2.	Sex	Male Female	01 02
3.	Religion	Islam Hindu Others	01 02 03
4.	Marital status	Married Unmarried Divorced Widow	01 02 03 04
5.	Residential area	Urban Rural	01 02
6.	Occupation	Rickshaw puller Agriculture Factory/garments worker Businessman Day laborer Unemployed Housewife Teacher Others	01 02 03 04 05 06 07 08 09
7.	Educational level	No formal Schooling primary Primary Completed SSC Completed HSC Completed Graduate Completed Masters Completed Others Completed	01 02 03 04 05 06 07 08

part: 3 Pain questionnaire for osteoarthritis (pre test)

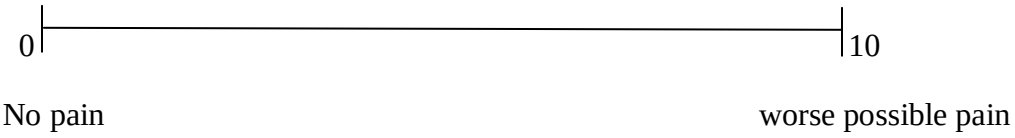
This questionnaire is designed for your osteoarthritic pain. With each question there long line. The line represents your pain situation. The left hand end represents no pain, as you move along the line the pain you feel is increasing. At the right hand end the pain is the worse. Always remember that the point at the left side no pain and point right side is intolerable pain.

Please a mark (0) on the line where you feel it shows how much pain you have.

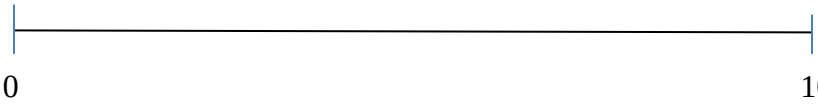
1. How would you describe your pain in general intensity? Point out on the scale, mark with a (0) on the scale.



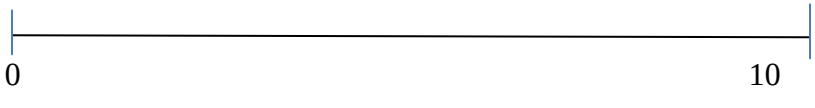
2.How much pain increase during cross sitting? Point out on the scale, mark with a (0) on the scale.



3. How much pain increase during Squatting? Point out on the scale, mark with a (0) on the scale.

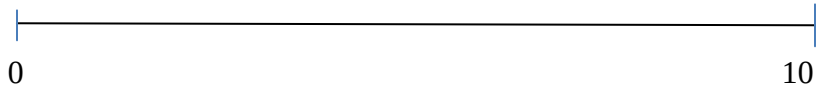


4. How much pain increase during prolong standing? Point out on the scale, mark with a (0) on the scale.

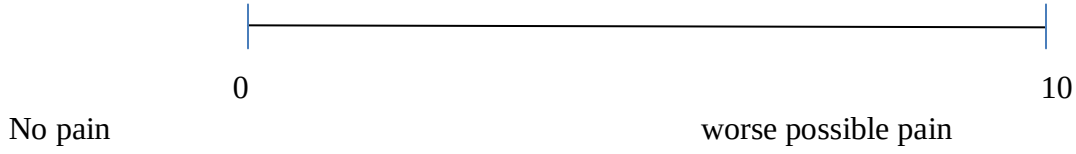


5. How much pain increase during walking? Point out on the scale, mark with a (0) on the scale.

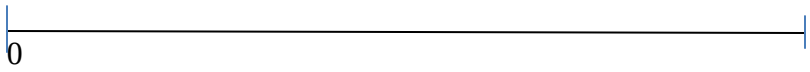
6. How much pain increase during working ? Point out on the scale, mark with a (0) on the scale.



7. How much pain increase during ADL ? Point out on the scale, mark with a (0) on the scale.

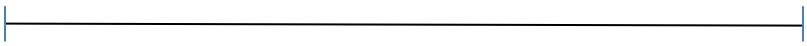


8.How much pain increase during stairing ? Point out on the scale, mark with a (0) on the scale.



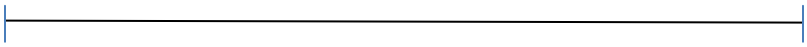
No pain worse possible pain

9. How much pain increase at night ? Point out on the scale, mark with a (0) on the scale.



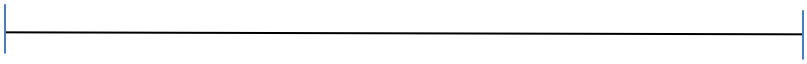
No pain worse possible pain

10. How much pain increase at morning ? Point out on the scale, mark with a (0) on the scale.



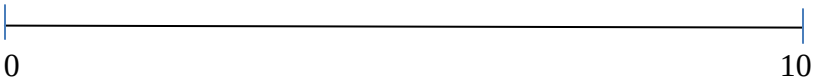
No pain worse possible pain

11. How much pain increase at evening ? Point out on the scale, mark with a (0) on the scale.



No pain worse possible pain

12. How much pain at rest? Point out on the scale, mark with a (0) on the scale.



No pain worse possible pain

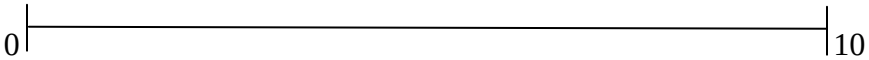
Pain questionnaire for osteoarthritis (post test)

1. How would you describe your pain in general intensity? Point out on the scale, mark with a (0) on the scale.

0 10

No pain worse possible pain

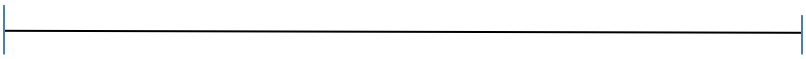
2. How much pain increase during cross sitting? Point out on the scale, mark with a (0) on the scale.



0 10

No pain worse possible pain

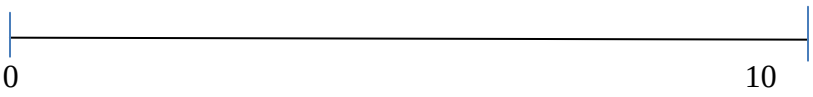
3. How much pain increase during Squatting? Point out on the scale, mark with a (0) on the scale.



0 10

No pain worse possible pain

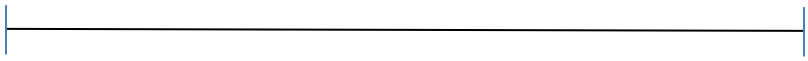
4. How much pain increase during prolong standing? Point out on the scale, mark with a (0) on the scale.



0 10

No pain worse possible pain

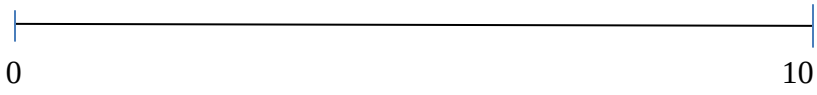
5. How much pain increase during walking? Point out on the scale, mark with a (0) on the scale.



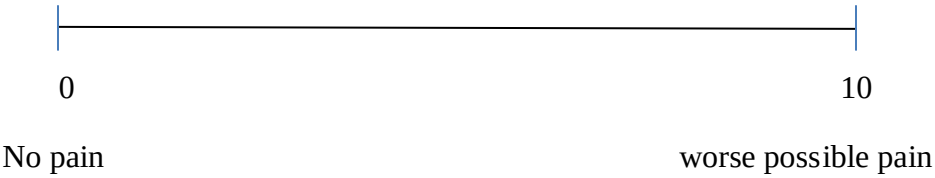
0 10

No pain worse possible pain

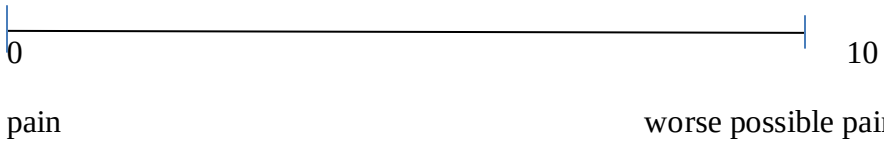
6. How much pain increase during working ? Point out on the scale, mark with a (0) on the scale.



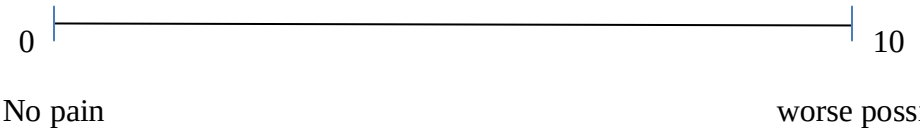
7. How much pain increase during ADL ? Point out on the scale, mark with a (0) on the scale.



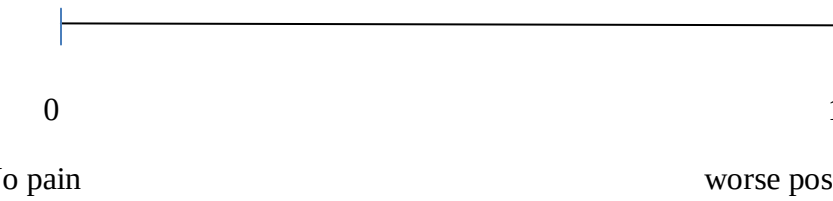
8.How much pain increase during stairing ? Point out on the scale, mark with a (0) on the scale.



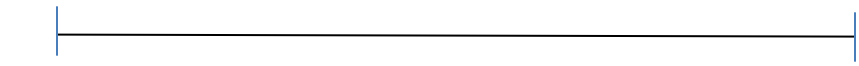
9. How much pain increase at night ? Point out on the scale, mark with a (0) on the scale.



10. How much pain increase at morning ? Point out on the scale, mark with a (0) on the scale.



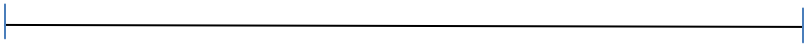
11. How much pain increase at evening ? Point out on the scale, mark with a (0) on the scale.



0 10

No pain worse possible pain

12. How much pain at rest? Point out on the scale, mark with a (0) on the scale.



0 10

No pain worse possible pain

Part: 4 Questionnaire for osteoarthritis (pre test)

Instructions: Please rate the activities in each category according to the following scale of difficulty: 0 = None, 1 = Slight, 2 = Moderate, 3 = Very, 4 = Extremely

QN	Questions	Responses	Code
1.	when walking on a flat surface?	none mild Moderate Severe extreme	01 02 03 04 05
2.	when going up or down stairs?	none mild Moderate Severe extreme	01 02 03 04 05
3.	At night while in bed? (that is - pain that disturbs your sleep)	none mild Moderate Severe extreme	01 02 03 04 05
4.	while sitting or lying down?	none mild Moderate Severe extreme	01 02 03 04 05
5.	while standing?	none mild Moderate Severe extreme	01 02 03 04 05
6.	How severe has your stiffness been after you first woke up in the morning?	none mild Moderate Severe extreme	01 02 03 04 05
7.	How severe has your stiffness been after sitting or lying down or while resting later in the day?	none mild Moderate Severe extreme	01 02 03 04 05
8.	when going down the stairs?	none mild	01 02

		Moderate Severe extreme	03 04 05
9.	when going up the stairs?	none mild Moderate Severe extreme	01 02 03 04 05
10.	when getting up from a sitting position?	none mild Moderate Severe extreme	01 02 03 04 05
11.	while standing?	none mild Moderate Severe extreme	01 02 03 04 05
12.	when bending to the floor?	none mild Moderate Severe extreme	01 02 03 04 05
13.	when walking on a flat surface?	none mild Moderate Severe extreme	01 02 03 04 05
14.	getting in or out of a car, or getting on or off a bus?	none mild Moderate Severe extreme	01 02 03 04 05
15.	while going shopping?	none mild Moderate Severe extreme	01 02 03 04 05
16.	when putting on your socks or panty hose or stockings?	none mild Moderate Severe extreme	01 02 03 04 05
17.	when getting out of bed?	none mild Moderate Severe	01 02 03 04

		extreme	05
18.	when taking off your socks or panty hose or stockings?	none mild Moderate Severe extreme	01 02 03 04 05
19.	while lying in bed?	none mild Moderate Severe extreme	01 02 03 04 05
20.	when getting in or out of the bathtub?	none mild Moderate Severe extreme	01 02 03 04 05
21.	while sitting?	none mild Moderate Severe extreme	01 02 03 04 05
22.	when getting on or off the toilet?	none mild Moderate Severe extreme	01 02 03 04 05
23.	while doing heavy household chores?	none mild Moderate Severe extreme	01 02 03 04 05
24.	while doing light household chores?	none mild Moderate Severe extreme	01 02 03 04 05

Questionnaire for osteoarthritis (post test)

Instructions: Please rate the activities in each category according to the following scale of difficulty: 0 = None, 1 = Slight, 2 = Moderate, 3 = Very, 4 = Extremely

QN	Questions	Responses	Code
1.	when walking on a flat surface?	none mild Moderate Severe extreme	01 02 03 04 05
2.	when going up or down stairs?	none mild Moderate Severe extreme	01 02 03 04 05
3.	At night while in bed? (that is - pain that disturbs your sleep)	none mild Moderate Severe extreme	01 02 03 04 05
4.	while sitting or lying down?	none mild Moderate Severe extreme	01 02 03 04 05
5.	while standing?	none mild Moderate Severe extreme	01 02 03 04 05
6.	How severe has your stiffness been after you first woke up in the morning?	none mild Moderate Severe extreme	01 02 03 04 05
7.	How severe has your stiffness been after sitting or lying down or while resting later in the day?	none mild Moderate Severe extreme	01 02 03 04 05
8.	when going down the stairs?	none mild Moderate Severe	01 02 03 04

		extreme	05
9.	when going up the stairs?	none mild Moderate Severe extreme	01 02 03 04 05
10.	when getting up from a sitting position?	none mild Moderate Severe extreme	01 02 03 04 05
11.	while standing?	none mild Moderate Severe extreme	01 02 03 04 05
12.	when bending to the floor?	none mild Moderate Severe extreme	01 02 03 04 05
13.	when walking on a flat surface?	none mild Moderate Severe extreme	01 02 03 04 05
14.	getting in or out of a car, or getting on or off a bus?	none mild Moderate Severe extreme	01 02 03 04 05
15.	while going shopping?	none mild Moderate Severe extreme	01 02 03 04 05
16.	when putting on your socks or panty hose or stockings?	none mild Moderate Severe extreme	01 02 03 04 05
17.	when getting out of bed?	none mild Moderate Severe extreme	01 02 03 04 05
18.	when taking off your socks or panty	none	01

	hose or stockings?	mild Moderate Severe extreme	02 03 04 05
19.	while lying in bed?	none mild Moderate Severe extreme	01 02 03 04 05
20.	when getting in or out of the bathtub?	none mild Moderate Severe extreme	01 02 03 04 05
21.	while sitting?	none mild Moderate Severe extreme	01 02 03 04 05
22.	when getting on or off the toilet?	none mild Moderate Severe extreme	01 02 03 04 05
23.	while doing heavy household chores?	none mild Moderate Severe extreme	01 02 03 04 05
24.	while doing light household chores?	none mild Moderate Severe extreme	01 02 03 04 05