PAIN CHARACTERISTICS AMONG THE KNEE OSTEOARTHRITIS PATIENTS, ATTENDED AT CRP

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

Pain characteristics among the knee osteoarthritis patients, attended at CRP

Submitted by **Mst. Najnin Sultana**, for the partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT).

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DECLERATION

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 my supervisor and Head of Physiotherapy Department of Bangladesh Health Professions Institute (BHPI).

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Acronyms

&	And
ADL	Activities of Daily Living
BHPI	Bangladesh Heath Professions Institute
BMRC	Bangladesh Medical Research Council
CRP	Center for the Rehabilitation of the Paralyzed
IRB	Institutional Review Board
NSAIDS	Non-Steroidal Anti Inflammatory Drugs
OA	Osteoarthritis
ROM	Range of Motion
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization
WOMAC	Western Ontario and McMaster Universities Index of Osteoarthritis

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Abstract

Purpose: The aim of the study was to explore the pain characteristics among the knee osteoarthritis patients, attended at CRP. *Objectives:* to determine the age range of the patients; to identify the gender distribution and occupation of the Participants ; to explore the severity of pain at resting position; to determine the number of involvement of knee joint with OA; to evaluate the type of ROM of knee; correlation between age group and severity of pain; gender distribution and severity of pain and also association between gender distribution and pain during stairing, pain during rising from sitting and ROM of knee cross tabulation; have any pain during rising from sitting among the patients; any difficulty during walking and felt any pain during ascending and descending stairing, during squatting. *Methodology:* A quantitative cross-sectional study design was chosen to accomplish the objectives of the study. 50 samples were selected through purposive sampling technique from the musculoskeletal department of CRP. A structural questionnaire was used for collecting data from the participants. Data was numerically coded and analyzed statistically with the software named (SPSS) Version 16.0.*Results:*The study was conducted on 50 participants of knee osteoarthritis. Participants n= 7 (14%) in (>60 years) age group, n= 43 (86%) in (<60 years) age group. Also demonstrated that n=35 (70%) female were more responded than where as n=15 (30%) were male by knee OA. Among the participants affected by knee OA, n=20 (40.00%) was involved by right knee OA, n=12 (24%) was involved by left knee OA and n=18 (36%) patients was involved by both knee OA. Among the participants, n=5 (10%) patients felt mild knee pain, n=31 (62%) felt moderate knee pain and n=14 (28%) felt severe knee pain at resting position. The patients, n=25 (50%) patients knee ROM had presented full ROM, n=4 (8%) patients had restricted ROM at knee and patients, n=21 (42%) knee ROM had limited. Among the participants, n=46 (92%) patients felt pain during rising from sitting and n=4 (8%) patients did not felt pain during rising from sitting, 98% patients felt difficulty in walking. Patients experienced, 100% patients felt pain during stairing and more pain in squatting position. Patient experienced locking at knee joint that's had past history of trauma at knee joint; leg external rotation etc. *Conclusion:* The vulnerable age range to develop OA knee is over 40 and females are more prevalent than males. Pain is the common symptom of knee OA, if the patients

receive physiotherapy and maintain therapeutic home exercises and aware about aggravating factors, then may minimize and control the symptoms of knee OA and the pain contributing factors and improve the quality of life.

CHAPTER-I INTRODUCTION

1.1 Background

Osteoarthritis (OA) is the most common degenerative joint disorder and a major public health problem throughout the world.The burden of musculoskeletal conditions is rising; all over the world osteoarthritis is one of them. It is the major burden of musculoskeletal condition and causes pain in the limb. Reaching epidemic proportions has been described as; symptomatic knee osteoarthritis affects 10% of adults over age 55 and maximum leading to be disabled. The incidence of knee OA increases with age and their aging process and it results from degenerative changes in cartilage which have multi-factorial etiology including age, gender, body mass index ,decrease range of motion etc (Muraki et al., 2013).

Knee pain contributes significantly to disability among elders. The prevalence of Knee Osteoarthritis is 10% in Bangladesh (Radha and Gangadhar, 2015). It has been estimated that 25% or more of older persons have presented knee pain. It is a leading cause of disability and increases the risk of disability due to physical conditions (Moyer et al., 2010).Symptomatic and radiographic osteoarthritis (OA) of the knee are most common in the older age group people. The knee is the large weight bearing site which affected by joint pain in older adults where it is usually attributed to OA in this age-group. More than a half of people aged 50 and over reported that having knee pain and a quarter have severe and disabling knee pain. Developing knee pain can be a significant and persistent reduction in the ability to undertake everyday activities (Fernandez-Lopez et al., 2008).

The pain associated with knee OA is a major cause of activity limitation, functional disability and reduced health related quality of life. The exact cause of knee pain in patients with OA remains unknowable because not only the hyaline articular cartilage lost, but also bony remodel occurs and cannot be the direct cause of knee osteoarthritis pain. Pain fibers affected in other structures in the knee, such as the joint capsule, periosteum, insertion sites of the ligaments and muscles. In some patients, present in synovitis, laxity of the ligaments and lesions in the bone marrow develop that may represent trauma to bone. Localized areas of loss of cartilage can increase focal stress across the joint, leading to further cartilage loss. With a large area of

cartilage loss or with bony remodeling occurs, then the joint becomes tilted, and mal-alignment develops. Mal-alignment is the most risk factor for structural deterioration of the joint, as it increases further the degree of focal stresses, creating the joint damage that eventually can lead to joint failure. Local inflammation in the cartilage and the synovium may contribute to pain and joint damage and that source of knee pain (Solomon et al., 2010).

The high prevalence of knee OA and its impact on physical functioning and the quality of life, that means identifying approaches to prevention should be a public health priority (Blagojevicy et al., 2010). Approximately 5% people greater than 26 years of age and 17% of people greater than 45 years of age there have symptomatic knee osteoarthritis (OA) and that may cause of disability and increases the risk of disability due to abnormal physical conditions. Painful, severely disabling radiographic knee osteoarthritis affects about 1.5% of adults over the age of 55. Painful knee osteoarthritis associated with mild to moderate disability affects up to 10% of adults aged over 55.This percentage is higher in the older age categories (Plotnikoff et al., 2015). Many study shows that while knee is the large weight bearing joint, so there have been presented functional limitations, reduce joint mobility and gait dysfunction present in knee OA patients and also shown that abnormal gait patterns presented due to arthritis(Moyer et al., 2010).

Osteoarthritis is the commonest cause of disability in older people. Prevalence figures for knee osteoarthritis range from 7-25% in people aged over fifty five with over 70%of sufferers experience pain and limitations in performing activities of daily living. Main problems of balance and gait are associated with immobility and falls, which noticeably impair the quality of life (Jahn et al., 2010). At least 20% of older adults require the assistance of another person or use special equipment to walk because in walking limitation increase by aging process (Alexander et al., 2005).Walking is a common functional activity of daily living. This study provides meaningful information about pain characteristics among the patients with knee OA. The ability to walk is the major factor that determines whether the patient will return to the previous level of activity or not, because independent ambulation is essential for community reintegration and social involvement and reduce his disability (Connelly et al., 2015).

1.2 Rationale of the study

Knee osteoarthritis (OA) is a common and major health problem and causes chronic pain and disability among elderly in most of the developed countries. It is a common cause of disability in older person associated with mobility impairment , limitations in performing daily activities that causes decrease in physical function. The prevalence of OA increases with age and aging is associated with decreasing physiological functions, thus leading to major health problems(Messier,2012).

Knee osteoarthritis affecting more than 7 million people in the United States. More disability and clinical symptoms results that OA of the knee is more than from any other joint. It also reported to be a major health problem in the worldwide (Deyle et al.,2005).It has been estimated that 7.5% of the population aged over 55 years of age have some degree of knee pain and disability associated with radiographic changes and that 1.5% of older adults may have severe pain and disability related to knee osteoarthritis (Pollard et al.,2008).

OA is a progressively developed chronic degenerative disease which have different aetiology, including age, obesity and joint injury.It is characterized by degradation of articular cartilage which resulting changes in biochemical properties. Alteration of biochemical properties that results loss of articular cartilage,narrowing of joint space,cyst and osteophyte formation (Muraki et al., 2013).OA is a common musculoskeletal disorder in Bangladesh and that is closely related to the physiotherapy. There are many study findings that the prevalence of knee osteoarthritis is increasing day by day. It is hypothesized to be one study that excessive localized weight loading within the knee joint during walking is an important risk factor for the progression of knee osteoarthritis and that osteoarthritis patients have knee kinematics and kinetics abnormality than normal individuals (Elbaz et al., 2014).

The purpose of the study is to determine the pain characteristics among knee osteoarthritis patients. This gender difference may partially explain the increased prevalence of OA in females. OA is characterized by joint pain resulting in functional limitations, sleep disturbance, fatigue, mood disturbance and difficulty to do daily activities (Liu et al., 2014).The goal of the study demonstrates that pain characteristics among knee osteoarthritis patients and measures of the knee OA pain experience.

1.3 Research question

What are the pain characteristics among the knee osteoarthritis patients, attended at CRP?

1.4 Aims of the study

To find out, pain characteristics among the knee osteoarthritis patients, attended at CRP.

1.5 Objectives of the study

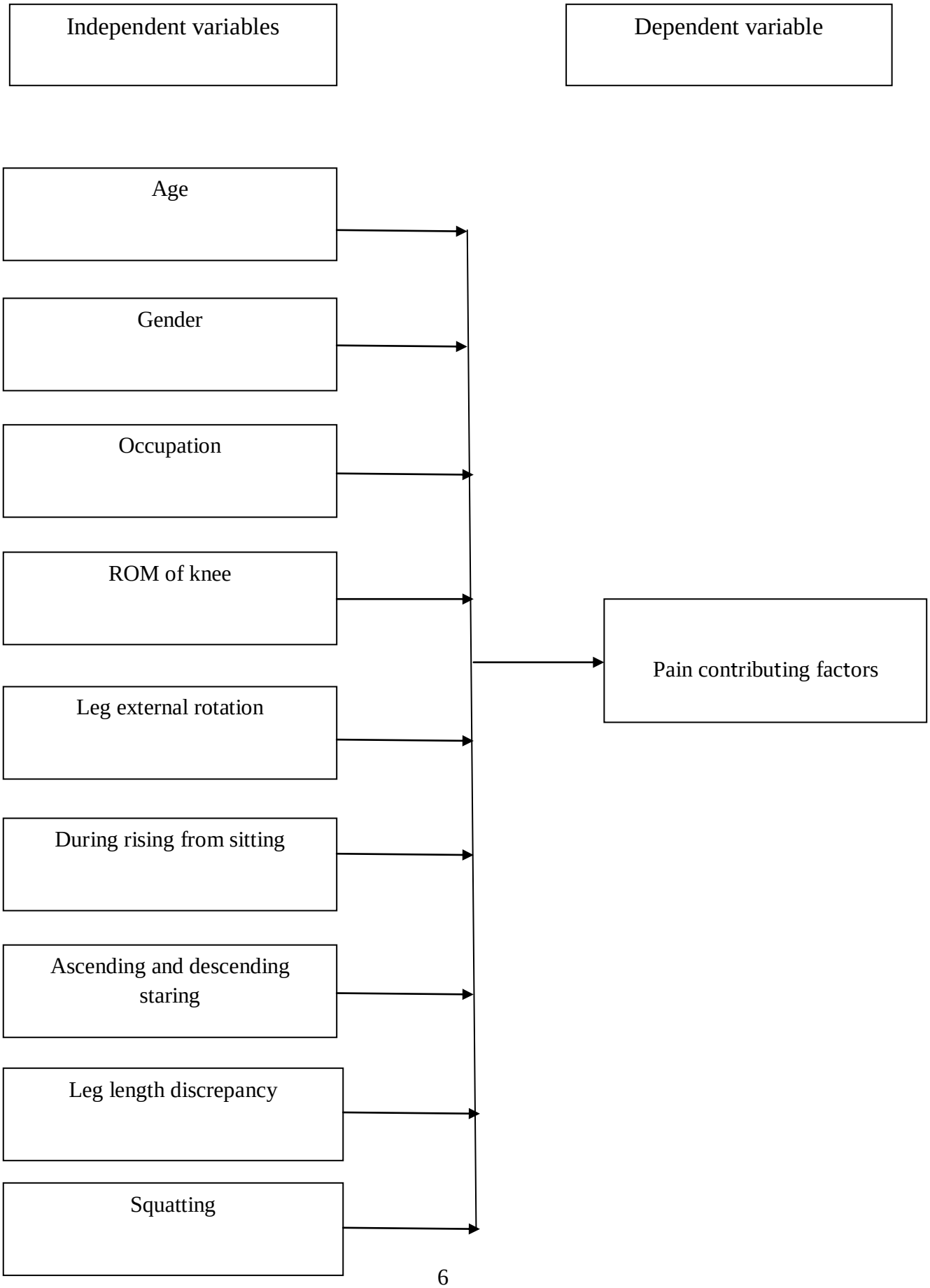
General objective

To find out, pain characteristics among the knee osteoarthritis patients.

Specific objectives

1. To identify the age group of the patients, gender distribution and occupation of the knee Osteoarthritis patients.
2. To find out association between age group and severity of pain among the patients with knee Osteoarthritis.
3. To find out association between gender distribution of participants and severity of pain, correlation between pain in ascending and descending staring and pain rising from sitting and ROM of knee cross tabulation among the patients with knee Osteoarthritis.
4. To identify the number of involvement of knee joint, severity of pain at resting position, ROM of knee, have any difficulty during walking among the patients with knee osteoarthritis.
5. To explore have any pain during rising from sitting, during ascending and descending staring, during squatting among the patients with knee osteoarthritis.

1.6 Conceptual Framework



1.7 Operational definition

Knee Osteoarthritis

Non inflammatory chronic degenerative disease of the knee joint consisting of pain at knee, that block normal synchondronous movement, which is the barrier to perform activity of daily living properly and abnormal pathways of motion that cause stress concentrations to joint resulting in changes to articular cartilage and decreased joint range of motion.

Pain

Pain is an unpleasant sensory and emotional response to a stimulus which causes actual or potential tissue damage. Pain may occur acute or chronic pain.

Severity of pain

Severity of pain may classified - mild, moderate and severe.

Range of motion

How much patient bend his/her knee actively.

Older

The ageing process is of course a biological reality which has its own dynamic, largely beyond human control. The age of 60 or 65 in most developed countries, is said to be the beginning of old age.

CHAPTER-II LITERATURE REVIEW

Osteoarthritis" is derived from the Greek word "osteo", means "of the bone", and "arthro", means "joint" and "itis", means inflammation, although the "itis" of osteo arthritis is somewhat of a misnomer inflammation is not a evident feature of the disease (Williams et al., 2010). Osteoarthritis is a chronic degenerative disease with exacerbation of acute inflammation that is related to the ageing process and is a major cause of pain and disability. Osteoarthritis of the knee is an active disease process involving cartilage destruction, new bone formation and subchondral bone thickening, mainly its degree of cartilage loss and bony structural change occurs. Radiographic appearance has traditionally been the foundation of diagnosis because the effects of the pathological processes can be identified at joint space narrowing, subchondral sclerosis, and osteophyte formation on x-ray findings (Cibere et al., 2010).

Osteoarthritis is one of the most prevalent articular disorders affecting humanity and a major cause of disability and socioeconomic burden. The knee joint is the major weight bearing joint which commonly subject to degenerative changes. There is a higher prevalence of OA with advanced age. In fact, most knee pain occur in elderly person is due to OA. Knee osteoarthritis produces significant changes in health-related quality of life, mainly physical, mental and social components of health (Williams et al., 2010).

The hallmark symptom of osteoarthritis (OA) is the most common form of arthritic pain. This is the symptom that drives individuals to seek medical attention and contributes to functional limitations and reduced quality of life and mainly cause of pain, lower extremity OA is well-recognized as the leading cause of mobility impairment. Approximately 8.5 million UK adults and 27 million US adults are estimated to have clinical OA that defined on the basis of symptoms and physical findings. Prevalence of OA that increases by aging; 13.9% of adults age 25 and older have clinical OA of at least one joint, while 33.6% of adults age 65. In large epidemiologic studies, OA is often distinct on the basis of standard radiographic assessments. The prevalence of symptomatic knee OA in UK studies ranged from 11 to 19% and that estimates of 5 to 15% were noted in surveys undertaken in other countries. Recently US data demonstrated that half of people with symptomatic knee

OA are diagnosed by age of 55. Quadriceps strength deficits have been reported in 20%–70% of patients with knee OA. The major disability encountered was the inability to squat (Hawker et al., 2008).

Other studies demonstrated that, in United States the prevalence of radiographic knee OA in adults ages 60 and older is 42.1% in women and 31.2% in men. In Japanese patients 60-69 years of age the prevalence of radiographic knee OA is 57.1% in women and 35.2% in men. This is not surprising considering that females have a higher risk of developing knee OA and functional disabilities compared to males. OA is particularly disabling in weight bearing joints, such as knees and hips. Eventually, pain, stiffness and decreased range of motion that lead to a loss of functional independence in daily tasks such as rising from a chair, climbing stairs, during squatting and walking (Debi et al., 2009).Knee Osteoarthritis (OA) is the most common type of joint disease and prevalence of both radio-graphically evident and symptomatic. The female's percentage having higher prevalence than male's percentage (11.4% vs. 6.8%).The etiology of OA is related to repetitive mechanical loads and aging. Recent studies that have separated the etiological factors into three main sub-groups: sex, body mass, and anatomy. The clinical manifestations are joint pain, joint stiffness, decreased range of joint motion, muscle weakness of the quadriceps and alterations in proprioception (Hafez et al., 2014).

Knee osteoarthritis (OA) is a major public health problem and causes chronic pain and disability among elderly. It is characterized by several pathological features, including joint space narrowing and osteophytosis. The radiographic prevalence reported that knee OA differs significantly among previous population-based epidemiologic studies, additionally, apart from age, sex, obesity and occupational activities, there are only a few other established risk factors for knee OA (Muraki et al.,2013). At the knee joint, soft tissue changes can include decreases in the strength of the quadriceps and sagital range of motion, in addition to increased soft tissue contracture. Collectively these changes produce the typical clinical image of joint pain; worsening symptoms with activity and weight bearing, and stiffness develop. These facilitate the limitation of physical function and progressively develop the disability (Pollard et al., 2008).

The most observable thing about OA is that it increases in frequency with age. This does not mean that OA is an expression of senescence. Cartilage destruction shows that diminished cellularity, loss of elasticity, structural changes and a decrease in breaking with advancing years. These factors may well predispose to OA, but it is significant that the progressive changes which are associated with clinical and radiological deterioration are restricted to certain joints and to specific areas of those joints, while other areas shown that there are little or no progression with age. Pathogenetically, knee OA is characterized by structural changes occur around the knee joint. The structural changes are the loss of cartilage and the osteophyte formation. These changes are easily demonstrated radio graphically, and objective measures of disease severity are based on the amount of joint space narrowing and the presence of osteophytes (Solomon et al., 2010).

The loss of proteoglycans and collagen results in diminished cartilage stiffness. Consequently, the chondrocytes increase the synthesis of cartilage proteins, the destruction of components in the extracellular matrix accelerates and the thickness of cartilage may yet increase. During that time, calcified cartilage and subchondral bone become thicker in a response to the increased formation and desorption of the subchondral bone. According to this theory, subsequent remodeling increases the stiffness and thickness of the subchondral bone in an attempt to diminish impact forces. Consequently, the overlying cartilage may become overloaded and break down resulting in cartilage degeneration and loss (Hafez et al., 2014).

Primary or idiopathic OA is unknown etiology. This type of OA is a chronic degenerative disorder related to but not caused by aging. As a person ages, the water content of the cartilage decreases as a result of a reduced proteoglycan content, thus causing the cartilage to be less rigid. Without the protective effects of the proteoglycans, the collagen fibers of the cartilage can become vulnerable to degradation and thus exacerbate the degeneration. Inflammation of the surrounding joint capsule can also occur, though often mild (compared to that which occurs in rheumatoid arthritis). This can happen as breakdown products from the cartilage are released into the synovial space, and the cells lining the joint attempt to remove them. New bone outgrowth, called "spurs" or osteophyte formation, can form on the margins of the joints, possibly in an attempt to improve the similarity of the articular

cartilage surfaces. These bone changes, together with the inflammation, can be both painful and devastating (Juhakoski et al., 2008).

Secondary type of OA is caused by other factors but the resulting pathology is the same as for primary OA, such factors are congenital joint disorders, Diabetes, Inflammatory diseases (such as Perthes' disease, Lyme disease), and all chronic forms of arthritis (e.g. costochondritis, gout, and rheumatoid arthritis). In gout, uric acid crystals cause the cartilage to degenerate at a faster pace, Injury to joints, as a result of an accident, Septic arthritis (a infection of a joint), Ligamentous deterioration or instability may be a factor, Marfan syndrome, Obesity, Alkaptonuria (Hassett et al., 2006). Another classifications are among all Osteoarthritis DIP joints affects in 40% case, PIP 15% case, CMC 30% case, Knee joint affects in 30-40% case and Hip joint affects in 10% cases (Staab et al., 2014).

The etiology of OA remains unknown, primary osteoarthritis is more nebulous. Although primary osteoarthritis is related to the aging process and typically occurs in older individuals, in the broadest sense of the term, it is an idiopathic experience, occurring in previously intact joints and having no apparent initiating factor. In most of the cases osteoarthritis have no known cause and referred to as primary osteoarthritis. This is typically found in women of menopausal age who have multiply joint involvements often of knees, hands and hips. When the cause of the osteoarthritis is known then the condition is referred to as a secondary osteoarthritis. Secondary OA estimated to account for 80% of osteoarthritis. In Inflammatory osteoarthritis, obvious inflammation present in many joints (Torres et al., 2006).

Classification of osteoarthritis is various and often dependent on several factors, there is clear evidence for major risk factors, such as age, obesity, joint trauma, and heavy work load. The risk factors can be divided into systemic factors (e.g. age, gender, genetics, and overweight) and local biomechanical factors, such as joint injury and malalignment, overweight, and muscle weakness. Abnormal mechanical loading in various activities or during heavy work may activate the biochemical cascade that leads to joint degeneration and pain, but also even in normal mechanical loading if the cartilage is impaired . Aging is the most significant risk factor for knee OA (Hafez et al, 2014).

OA of the knee is a complex multi-factorial disease. Risk factors are broadly divisible into those that are constitutional or genetic and those that are local and driven by biomechanical elements, such as joint usage. As incidence of knee OA is expected to rise as the proportion of elderly population continues to increase and knee OA has a significant impact on activities of daily living. Several epidemiological studies in Western countries have investigated risk factors of knee OA, finding a reliable association between the incidence and progression of knee OA and age, obesity, history of knee injury, occupational physical demands, bone density, physical activity, and regular sport activities (Seidler et al., 2008).

The expected history of osteoarthritis of the knee is highly changeable, with the disease improving in some patients, remaining stable in others, and gradually worsening in others. Osteoarthritis is a leading cause of impaired mobility in the elderly. Many persons with knee pain have limitations in function that prevent them from engaging in their usual activities (Mounach et al., 2008). It has an association with certain occupational activities, which have been previously, associated with knee OA, meniscal tears and some genetic and systemic factor which responsible for knee OA (Seidler et al., 2008). Pathology of OA is multi-factorial and pathologic changes in the late stages of OA include softening, ulceration, and focal disintegration of the articular cartilage; synovial inflammation can occur also (Neogi, 2013). Local inflammation in the synovium and the cartilage may contribute to pain and joint damage. Osteoarthritis affects all structures within a joint with capsular stretching and weakness of periarticular muscles(Williams et al., 2010).

There is some evidence of neuromuscular impairments of the musculature surrounding the knee joint such as muscle weakness, imbalance between the knee flexors and extensors, motor unit inhibition and proprioceptive deficits for those with knee OA. It is unclear whether the deficits are the result of the disease process or a risk factor contributing to disease progression. Malalignment is responsible for structural changes of the joint, since it increases further the degree of focal loading increasing the physiological range creating a vicious cycle of joint damage across the joint compartments that eventually can lead to joint degeneration and gradually joint become failure (Nicki et al., 2010).

Osteoarthritis of the Knee is more important not only for its high prevalence rate which compared with other types of OA but also for its presentation at earlier age groups predominantly in younger age groups of obese women. The prevalence of knee OA increases by age and further increase with longer lifetime and higher average mass of the population. Pain and other symptoms of OA may have a profound effect on quality of life affecting both physical function and psychological parameters. Knee OA is not a localized disease of cartilage alone but is considered as a chronic disease of the whole joint including articular cartilage, meniscus, ligament, and peri-articular muscle that may result from multiple patho-physiological mechanisms. It is painful and disabling disease that affects particularly in elderly population (Heidari, 2011).

Knee pain is usual presenting symptom, limited morning stiffness, and functional limitations are the three symptoms that are recommended for the diagnosis of knee OA. In addition crepitus, swelling may be constant or intermittent, restriction of joint movement and bony enlargements are also very positive for diagnosis of knee OA. Pain is the most common symptom in knee OA, a leading cause of chronic disability, and a key source of the disability attributable to OA (Guillemin et al., 2011). Pain can be acute or chronic. Acute pain- lasts a short time, or is expected to be over soon. Chronic pain- may be defined as pain that lasts beyond the healing of an injury, continues for a period of several months. Knee OA pain typically aggravates by exertion and relieves by rest. In the presence of the above signs and symptoms are the probabilities of having radiographic knee OA increases to 99%. In advanced cases synovities may appear and leads to pain at rest or night. Short duration of stiffness is common, characteristically it occurs after periods of inactivity, but with time it becomes progressive and constant. OA mainly targets the patello-femoral and medial tibio-femoral compartments of the knee. Most knees OA, particularly in women, is bilateral and symmetrical (Astephen et al., 2008).

Tenderness to palpation of involved joints may be evident in physical examination. Joint effusions may be present, which typically exhibit a mild pleocytosis, normal viscosity, and moderately elevated protein, sometimes synovial thickening or osteophytes may be felt. Crepitus during joint motion or walking is a common signs of OA of the knee. In advanced cases, malalignment may also visible (Heidari, 2011). Trauma is a more important risk factor in men and may result in unilateral OA. OA

knee pain is usually localized to the anterior or medial aspect of the knee and upper tibia. Patello-femoral pain is usually worse going to movement occurs, up and down stairs or inclines. Posterior knee pain suggests a complicating popliteal 'cyst'. Prolonged walking, rising from a chair, getting in or out of a car, or bending to put on shoes and socks may be difficult. A jerky, asymmetric antalgic gait (less time weightbearing on the affected side) present in the people with knee OA. A varus less commonly valgus and/or fixed flexion deformity are seen among the knee OA patient. Muscle weakness and wasting is present at the quadriceps muscle. Sometimes coarse crepitus with restricted flexion/extension at the knee. Bony swelling present at the knee joint line. Pain is around & through the joint. Pain may refer to the anterior aspect of the thigh or down to the ankle. Muscle spasm may present in hamstring so that flexion deformity present in most of the cases. Knee joint enlarged and Quadriceps muscle atrophy occurs due to less activity by the affected limb (Moore et al., 2013).

Diagnosis of osteoarthritis focuses on two major goals. When diagnosing osteoarthritis, 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. Accurate diagnosis of osteoarthritis is necessary so that appropriate treatment options can be considered. Although the diagnosis of knee OA in the most cases can be made by the clinical findings and physical examination, on the other hand, identification of joint damages are necessary for both diagnostic confirmation as well as subchondral bone marrow abnormalities determined by MRI have recently been shown to be predictors of radiographic progression in patients with knee OA. Larger levels of structural changes at earlier stage can be revealed by MRI (Heidari, 2011).Although MRI (magnetic resonance imaging) is a more sensitive imaging system, it is used less often than x-rays due to cost and availability. MRI scan shows cartilage, bone, and ligaments. Knee OA can be diagnosed by radiographic, clinical, or based on a combination of two classification criteria. The radiographic knee OA depends on the radiographic changes. The radiographic features in knee OA are joint space narrowing, the osteophyte formation and possibly indication of bone destruction. Clinical knee OA relies on clinical findings, subjective symptoms, laboratory results

and case records. The combined clinical criteria and radiographic have been suggested for use when diagnosing knee OA (Altman & Gold, 2007).

The main goals in treatment of knee OA are to control and relieve pain, to improve and maintain physical function as well as to prevent the progression of the disease condition. The treatment options given to the individual varies and is designed specifically for that individual based on the stage and severity of osteoarthritis. The probable complications of osteoarthritis include decreased ability to walk and perform daily activities along with those associated with long-term use of medications or surgery (Simic et al., 2011).

Knee osteoarthritis (OA) is a major cause of pain and physical disability. In clinically, knee OA is defined by the presence of both pain and radiographic joint degeneration and pain is usually attributed to tissue damage. Walking is a planned and controlled but highly autonomous motor activity. During walking while changes in the vertical position of the body's centre of mass and control the gravitational potential energy of the body and accompanied by another changes of the kinetic energy needed to produce the motion (Blagojevicy et al., 2010). Biometric characteristics can be divided in two main classes. One of physiological and another is behavioral (Hak et al., 2012). Gait is determined by the physical characteristics of each individual that is unique. It is developing behavioral biometric indication that pertains to the use of an individual's walking style, typically used to determine or validate identity (Sharmila & Kirubakaran, 2010).

Osteoarthritic disease is increasing day by day in the world, so the prevention of osteoarthritis is important and necessary. Maintaining appropriate body weight may be the single most important factor in preventing osteoarthritis from occurring in weight bearing joints **(**Srikanth et al., 2005). Osteoarthritis has three strong risk factors, these are-excessive musculoskeletal loading, high body mass index and previous knee injury, in which prevention may work. One study showed that avoiding squatting and kneeling and carrying heavy loads during work have been associated with a reduction of 15-30% in the prevalence of osteoarthritis in men. Another study showed a significant exposure-response relationship between symptomatic knee osteoarthritis and squatting and kneeling. Overweight is a risk factor for knee

osteoarthritis, but weight reduction is not only the symptoms and progression of osteoarthritis, and also the risk of acquiring osteoarthritis (Felson, 2006).

Treatment of knee arthritis should begin with the most basic steps and progress to the more involved. The management of osteoarthritis depends on the joint involvement, the stage of the disorder, the severity of the symptoms, age of the patient and his or her functional needs (Juhakoski et al., 2008). The major goals of physiotherapy are to educate the patient, caregivers and relatives, about relieve symptoms such as pain and stiffness, preserve joint motion and function by limiting disease progression, strengthen weak muscles related to the arthritic joint, encourage correct function, restore and maintain function and minimize disability. Some anti-Inflammatory Medications these are anti-inflammatory pain medications (NSAIDs) are prescription and nonprescription drugs that help treat pain and inflammation; Cortisone Injections may help to decrease inflammation and reduce pain within a joint. Several epidemiologic studies suggest that estrogen replacement therapy reduce the risk of knee and hip osteoarthritis. Similar studies suggest that maintaining normal vitamin D levels may reduce the occurrence and progression of osteoarthritis **(**Srikanth et al., 2005).

During the acute phase treatment should be continued with TENS, ultrasound, short-wave diathermy, hydrotherapy, cryotheraputic and during the chronic phase deep heating should be introduced. Exercise regimen for OA of knee strong isometric exercise for quadriceps and hamstring is necessary for the patient with knee OA. In case of active ROM exercises patient can easily perform and it improve the joint range of motion at the knee, with the improvement of joint range of motion. The first of the stance phases, initial contact and loading response that occurring during weight acceptance (Fu et al., 2014). The final phase of the stance is a pre-swing, when limb starts the forward movement (Perrot et al., 2008). The forward movement continues through the swing phases and during initial swing phase, the leg is accelerated forward by knee and hip flexion, the ankle joint is dorsiflexed. In mid swing, the swinging leg is aligned with the stance limb. The foot is prepared for ground contact in the terminal swing with the help of eccentric activity of hamstrings (Henriksen et al., 2014).

Stairing is the same basic principles as level walking with stance and swing phases. Patients of knee OA frequently describe that there have feel pain and difficulties during stair climbing. Stair ambulation performance is often used as a measure of function in OA patients (Stratford et al., 2006). Males and females with knee OA have different gait patterns that are expressed in kinematic and kinetic parameters. Gender differences exist in the knee flexion angle, in the knee external moments (sagital, frontal and transverse plane) and in the knee internal moments (sagital and transverse plane) (Debi et al., 2009).

The patients with knee OA study found that women have a 1.8 times greater risk of developing OA than men (Felson, 2006). Knee arthritis is more prevalent among women than men at all ages. These gender differences are most prominent when OA affects the knee. For all grades of radiographic severity of OA that reported in knee pain ratio is more women than men. Among those over age 65 years, the prevalence of symptomatic knee osteoarthritis in women is twice rate in men. One study found that female gender is a significant risk factor for knee OA and demonstrated that lower maximum knee internal extension moments both during stair ascent and descent. Female OA subjects exhibited a greater peak knee extension moment as well as more knee flexion emphasizing the influence of gender (Protopapadaki et al., 2007).

Individuals with OA in the lower extremities demonstrate reduced walking speed/cadence, increased base of support and decreased motion and moments in relation to healthy subjects (Farrokhi et al., 2013). Maximum studies examine gait in adults with knee OA, because knee OA is a metabolically active, dynamic disease that includes both destruction and repair mechanisms that may be triggered by mechanical and biochemical insults. Knee is the large weight bearing joint, and carry load during functional activity and variation on gait pattern. In past decade, gait analysis has revealed biomechanical characteristics of knee OA as mechanical factors such as dynamic joint loading have been implicated in knee OA pathomechanics, but their role in disease progression is unclear (Perrot et al., 2008). A better understanding of gait will be useful for quantifying the pathomechanics of patients with knee OA. These patients experience pain and thus may compensate to minimize joint loading and resultant pain (Protopapadaki et al., 2007).

Patients with knee OA report pain and difficulty with functional activities such as prolonged sitting, patello-femoral movement, ascending and descending stairs, walking, squatting, kneeling, rising from sitting or sitting from rising and getting in and out of a car. Eventually these limitations lead to a loss of functional independence and reduced quality of life (Stratford et al., 2006).

Several pain characteristics with knee OA have been reported by this study. However, only a few investigators have attempted to capture how gait changes related to disease progression, focusing primarily on knee adduction moment and in a few cases (Henriksen et al., 2010). Patients with knee OA demonstrated that difficulty with patello-femoral movement, leg length discrepancy, leg external rotation, arch position, ascending and descending stairs, steps per minute which vary on severity of knee pain. One study found that correlation between SLS (single leg support) and self-reported knee OA symptoms are of −0.5 and −0.53 between SLS and WOMAC pain and WOMAC function (Woolacott et al., 2012). Latest studies have reported an association between the level of symptoms such as pain and functional limitation of knee OA patients. Elbaz et al. have published a new objective functional classification of patients with knee OA which is based on the patient's ability to bear single loads on one knee while the contralateral leg swings forward (single limb support). This new classification is thought to give a clearer description of the patient's functional condition than radiographic findings, considering the knowledge that the correlation between symptoms and radiographic changes is poor (Elbaz,et al. 2014).

Knee OA Patients have often complain of pain in specific locations of the knee, medial compartment pain is the most prevalent location than lateral compartment pain with an estimated 75% of patients complaining of pain in this location (Debi et al., 2009). The medial compartment of the tibio-femoral joint carries a 2.5 times greater load than other compartments during walking showing variation in gait. The knee rotational moment occurred greater during stair ascent and lower during stair descent (Protopapadaki et al., 2007). During walking highest plantar pressures can be measured beneath the heel, forefoot and hallux, whereas lowest pressures exist beneath the midfoot and lateral toes. At the beginning and the end of stance phase, the loading of heel and forefoot are largest (Perrot et al., 2008). Foot arch are not able to distinguish pressures directed to the different parts of the soles during gait cycle. Physical function varies on many physiological parameters including muscle strength,

balance mechanisms, range of motion, sensory input from proprioception, visual and vestibular systems, and higher cortical function (Van Dijk et al., 2006).

Many study quantified that there is some evidence of exercise interventions that improve gait pattern by gait variation and prevent disability, the weight shifting during walking, minimize leg external rotation and improve gait speed and normalize cadence and results to minimize severity of pain (Pang et al., 2015).The impulsive loading, which affects the musculoskeletal system and lower limb joint moments are also higher during stair ambulation than during level walking. The inclination of the stairs can affect the biomechanics of stair ambulation (Protopapadaki et al., 2007). The desirability of training slower or faster than normal gait speeds must be considered in light of potential adverse implications on whole physical function, daily activities, and safety. Gait aids are widely recommended for managing OA. Increased weight transfer towards the medial side of the foot that demonstrated a small reduction in the early-stance phase. Patients with knee OA may have difficulty coordinating and increases in trunk lean during the stance phase of gait and in achieving adequate lean to reduce knee load. Presently, it is unknown how much lean is required to reduce knee load, and future research should aim to determine this (Simic et al., 2011).

Asymmetry in the lower extremity exposes the body to unusual and potentially excessive loads, which has a negative impact on walking and potentially increases the risk of the development of knee OA (Dawson et al., 2005). Arthritis avoids weight bearing on affected side, antalgic gait with stance phase, limitations of patello-femoral movement, Increased or decreased foot arch, leg rotational deformity, difficulty with functional activities and inappropriate device use that results a poor gait pattern, which increases the risk of falls (Jones et al., 2012). Knee osteoarthritis has life time risk for developing estimated as 44.7% and the annual report of US showed that it is 4% per year (Chapple et al., 2011).

CHAPTER- III METHODOLOGY

3.1 Study design

The purpose of the study was to find out the pain characteristics among the knee osteoarthritis patients, attended at CRP. A quantitative cross sectional study design was conducted to accomplish research objectives. This study was conducted to determine the extent of pain characteristics associated with knee osteoarthritis patients.

3.2 Study site

Data was collected from the Musculoskeletal Physiotherapy unit of Centre for the rehabilitation of paralyzed.

3.3 Study population

The study population was the patients with knee osteoarthritis, who attended at CRP musculoskeletal unit of Physiotherapy department to take or continuing treatment.

3.4 Sampling technique

50 participants with knee OA were selected through purposive sampling technique from musculoskeletal Physiotherapy unit of CRP. Participants were selected from CRP because they were easily accessible for the researcher. Purposive sampling targets a particular group of people. The samples were collected on the basis of some inclusion and exclusion criteria.

3.5 Data collection procedure

Researcher took data from the patients (medically diagnosed as knee OA) who came at CRP for take Physiotherapy treatment or continuing their treatment was asked to participate in the study. Researcher developed a structured questionnaire after reviewing literature for asking to the participants. In the questionnaire, participant's demographic information including age, sex, level of education, occupational history including types of job, health history including other injury and osteoarthritis related information was asked.

3.6 Sample size

The actual sample size for this study was calculated as 138. But number of sample was selected 50 maintaining the inclusion and exclusion criteria and within the scarcity of time.

3.7 Inclusion criteria

1. Both male and female were included.
2. Patients with knee osteoarthritiswho were attending in CRP for treatment.
3. Subjects who were willing to participate.

3.8 Exclusion criteria

1. Patients who were medically unstable.
2. Inability to walk without assistive device.
3. Any history of pathological condition (malignancy, heart disease etc).
4. Patients were excluded if they had neurological, vestibular, fracture of the lower extremity, rheumatoid arthritis.

3.9 Data collection tools

The tools that needed for the study were Bengali Consent form and questionnaire and other some necessary materials that were pen, pencil, eraser, clip board,white paper and note book.

Data was analyzed with the software which named Statistical Package for Social Science (SPSS) version 16.0. Data was presented by using the bar graph, pie chart and table.

3.10 Ethical consideration

For conducting this research ethics committee have checked the proposal and allowed to carry out the research project. The formal permission was taken from the head of the physiotherapy department to collect the data. Consent was obtained by providing each participant a clear description of the study purpose, the procedure involves in the study and also informing them that if they wish they can withdraw themselves any time from the study. Participants were explained about his/her role in the study and it was explained that there is no direct benefit from the study but in future, cases like these may be benefited from it. Participants were also advised that they were free to

decline answering any questions during interview. The necessary information had been kept secure place to also ensure confidentiality. They were also assured that it would not cause any harm. Then they signed the consent form. Whole process of research project was done by following the Bangladesh Medical Research Council (BMRC) guideline and World Health Organization (WHO). The proposal dissertation including methodology was presented to the Institutional Review Board (IRB).

CHAPTER-IV RESULTS

All relevant information was analyzed by SPSS v.16 software.Data was presented by using the bar graph,pie chart and table.

1. Socio-demographic information

1.1Age group of the participants

The study was conducted on 50 participants of knee osteoarthritis. n= 19(38%) in (35-45) age group, n= 11 (22%) in (46-54) age group, n= 18 (36%) in (55-65) age group and n= 2(4%) in (66-80) age group (Table-1).

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Age Group	Number	Percentage (%)
35-45	19	38
46-54	11	22
55-65	18	36
66-80	2	4
Total	50	100

Table-1 Age group of the participants.

1.2 Gender distribution of the participants

Among all the participants, n=35 (70%) was female and n=15 (30%) was male. Result showed that female was more responded by OA than male (Figure-1).

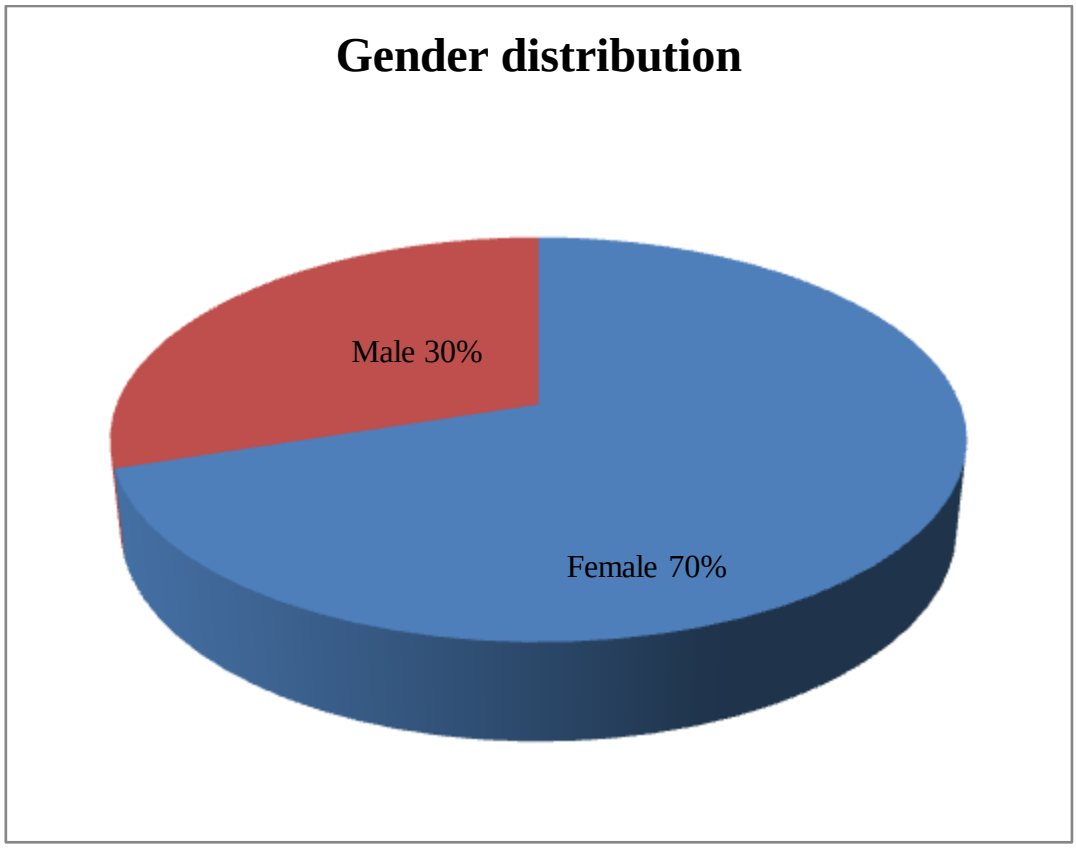

Figure-1 Gender distribution of the Participants.

1.3 Occupation of the participants

Among all the participants, n=8 (16%) was Businessman, n=5(10%) was Unemployed, n=33(66%) was Housewife, n=1(2%) was Teacher and n=3 (6%) was other. Result shows that Housewives were more responded than other occupation, these may be due to long time activity in knee bending position (Figure-2).

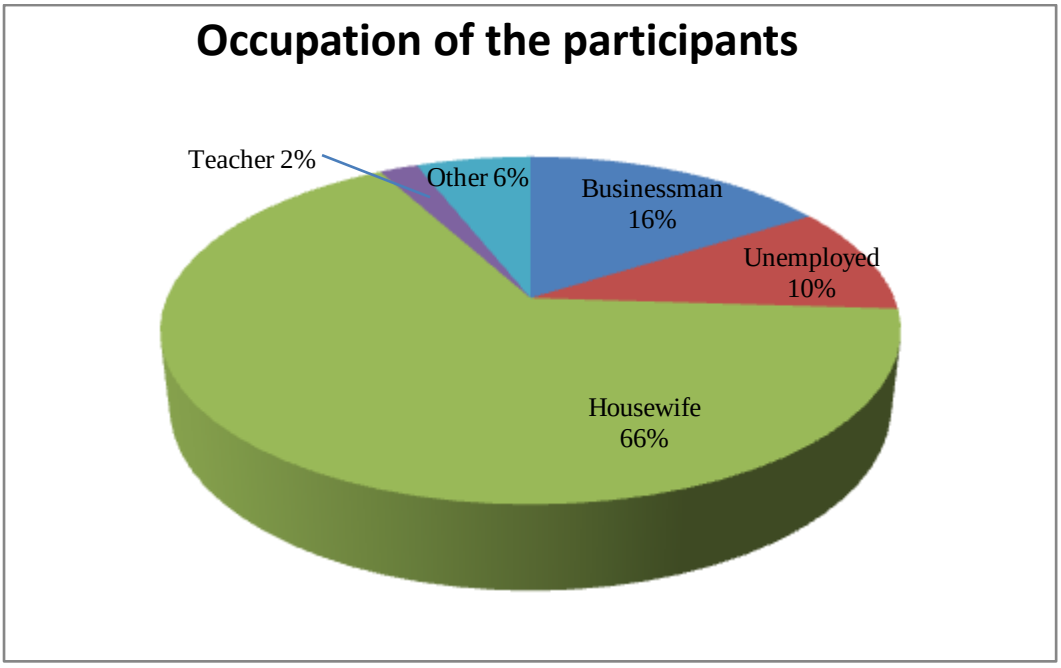

Figure-2 Occupation of the Participants.

2. Other knee Osteoarthritis related information

2.1 Involvement of the Knee joint

Among participants affected by knee OA, n=20 (40.00%) were mostly involved by right knee OA, n=12 (24%) were predominantly involved by left knee OA and n=18 (36%) patients were predominantly involved by both knee OA (Figure-3).

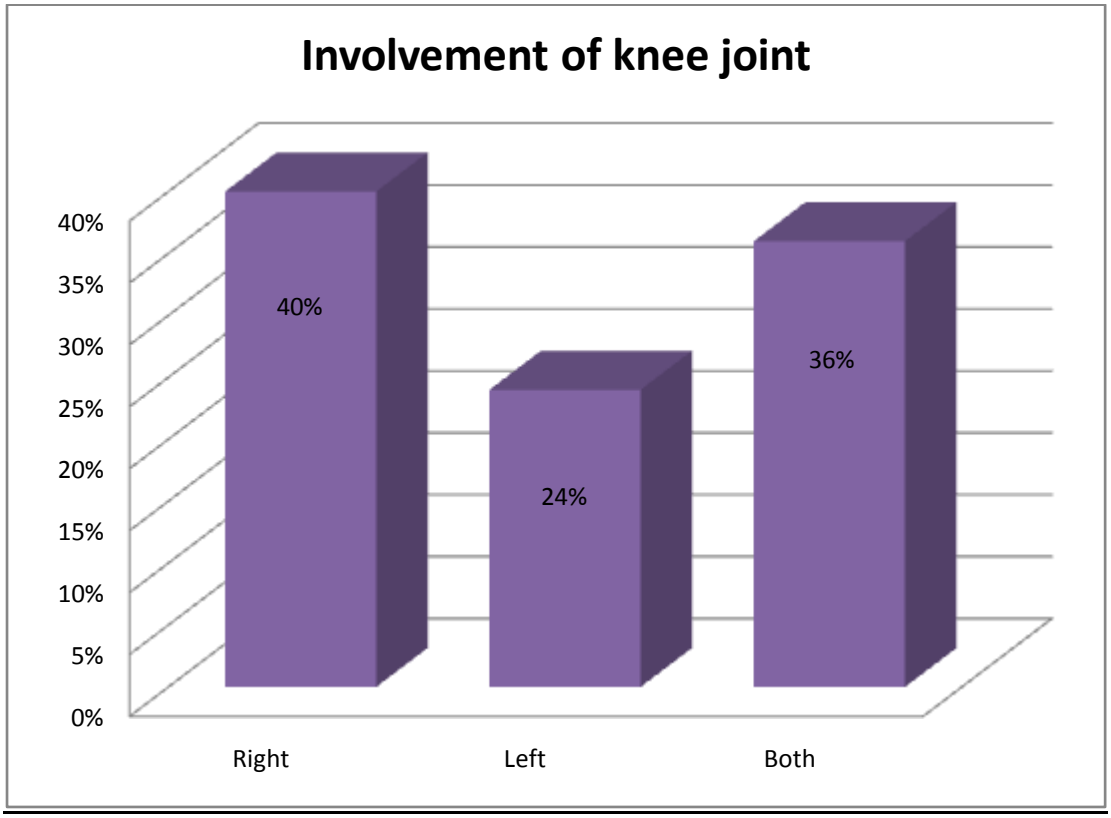

Figure-3 Knee joint involvement of the participants.

2.2 Severity of knee pain at rest

Among the participants, n=5 (10%) patients knee pain was mild, n=31 (62%) patients knee pain was moderate and n=14 (28%) patients knee pain was severe at rest. Patients experienced moderate type of pain at knee in case of knee OA during resting position (Figure-4).

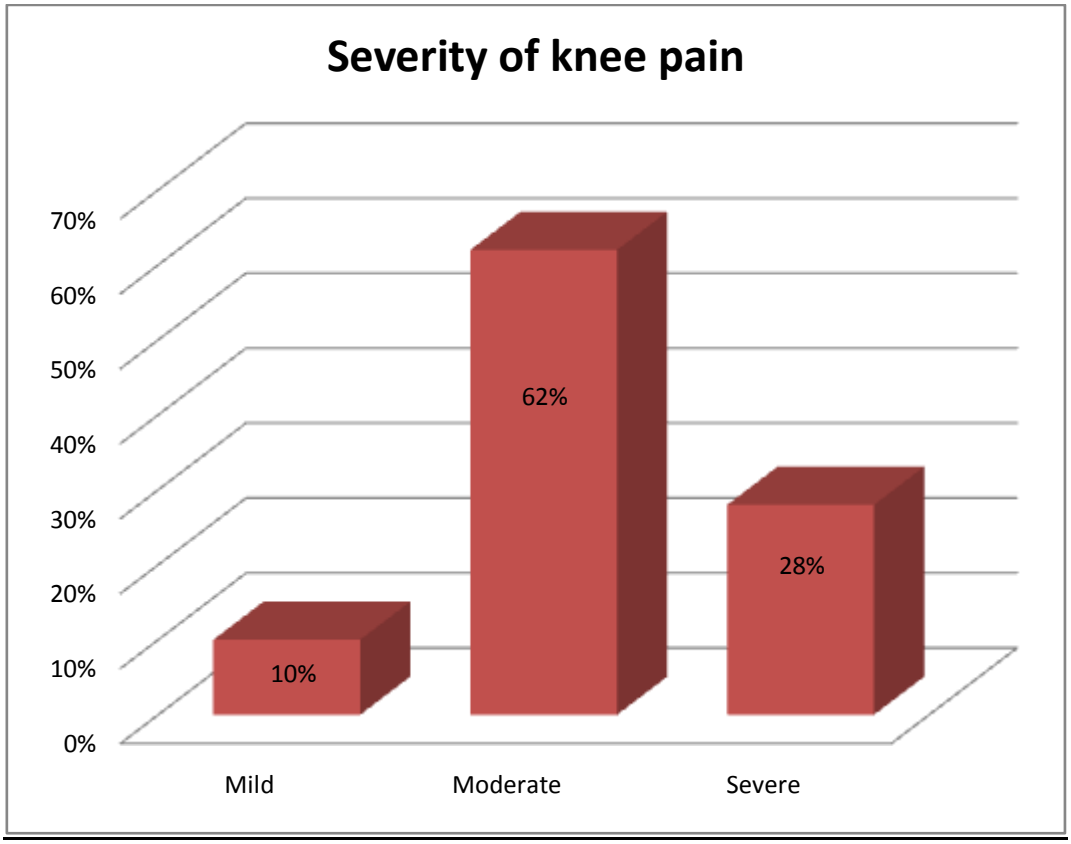

Figure-4 Severity of knee pain of the participants.

2.3 Age group of participants and severity of pain cross tabulation

In the study, it was found that among the 50 participants, 72% (n=36) participants were mild and moderate type of pain and 28% (n=14) were severe type of pain. Among severe type of pain felt participants, 8% (4) were (>60 years) age group, 20% (10) were (<60 years) age group. Among mild and moderate type of pain felt participants, 6% (3) were (>60 years) age group, 66% (33) were (<60 years) age group (Table-2).

Age group	Severity of pain		Total
	severe	Mild &Moderate	
>60 years	4	3	7
<60 years	10	33	43
	14	36	50

Odds= 132/30

= 4.4

95%CI of Odd ratio= 4.4

= 95% CI (0.8402, 23.0428).

The result of an odd ratio was interpreted as follows: pain severity in patients (>60 years) age group was 4.4 times more often than (<60 years) age group patients. But there had no association between age group of participants and severity of pain.

Table-2 Age group of participants and severity of pain cross tabulation.

2.4 Gender distribution of the participants and severities of pain cross tabulation

In these study, it was found that among the 50 participants, 62% (n=31) participants were mild and moderate type of pain and 28% (n=14) were severe type of pain. Among mild and moderate type of pain felt participants, 50% (25) were female and 22% (11) were male. Among severe type of pain felt participants, 20% (10) were female and 8% (4) were male (Table-3).

Gender distribution of the participants	**Severity of pain**		**Total**
	Severe	**Mild &Moderate**	
Female	**10**	**25**	**35**
Male	**4**	**11**	**15**
Total	**14**	**36**	**50**

Odds = 110/100

= 1.1

95% CI of Odd ratio = 1.1

= 95% CI (0.2825, 4.2824).

The result of an odd ratio was interpreted as follows: pain severity in patients with female was 1.1 times more often than male patients. But there had no association between gender distribution of participants and severity of pain.

Table-3 Gender distribution of participants and severity of pain cross tabulation.

2.5 Gender distribution of the participants and Pain in ascending and descending staring Cross tabulation

In study it was found that among the 50 participants, 70% (n=35) participants were Female and among 30% (15) were Male whose felt pain during ascending and descending stairing (Table-4).

Gender distribution of the participants	**Pain in ascending and descending staring**	**Total**
	Yes	
Female	35	35
Male	15	15
Total	**50**	**50**

Table-4 Gender distribution of participants and Pain in ascending and descending stairing cross tabulation.

2.6 Range of motion of knee

Among the participants, n=25 (50%) patients knee ROM had presented full ROM (flexion, extension), n=4 (8%) patients knee unable to perform ROM and patients, n=21 (42%) knee ROM had limited (Figure-5).

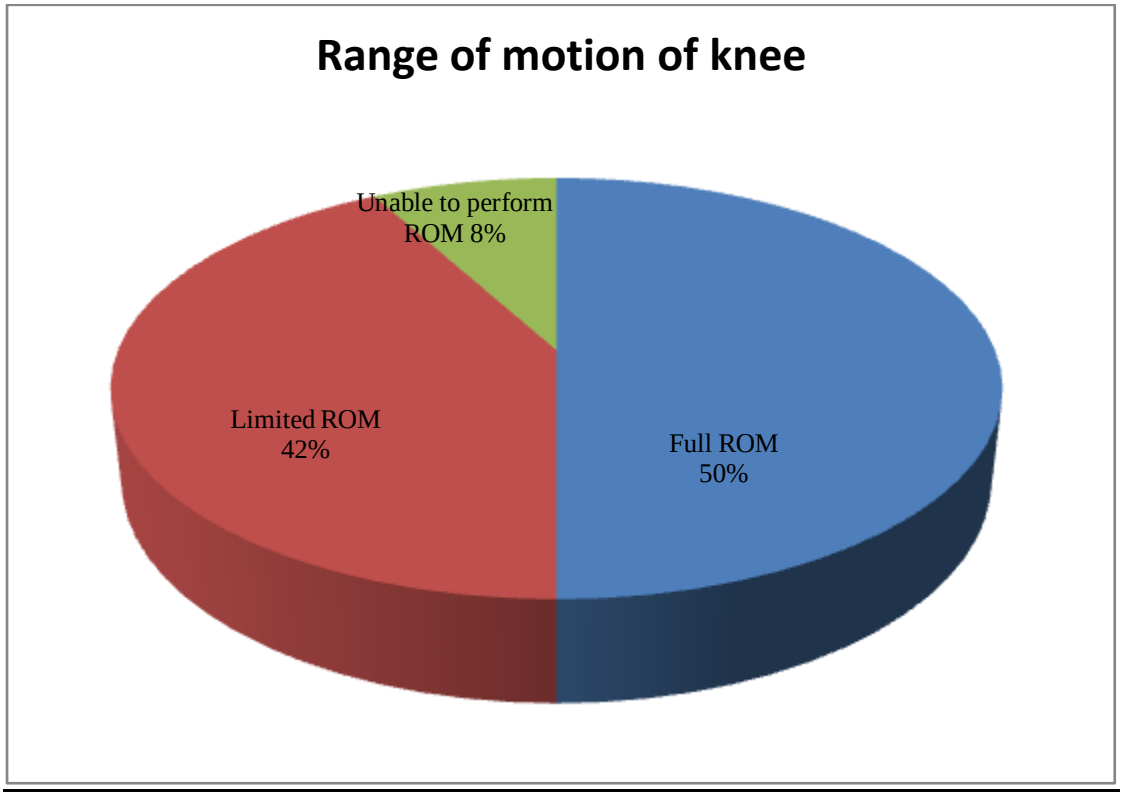

Figure-5 Range of motion of knee of the participants.

2.7 Pain during rising from sitting

Among the participants, n= 46 (92%) patients felt pain during rising from sitting and n= 4 (8%) patients did not felt pain during rising from sitting (Figure-6).

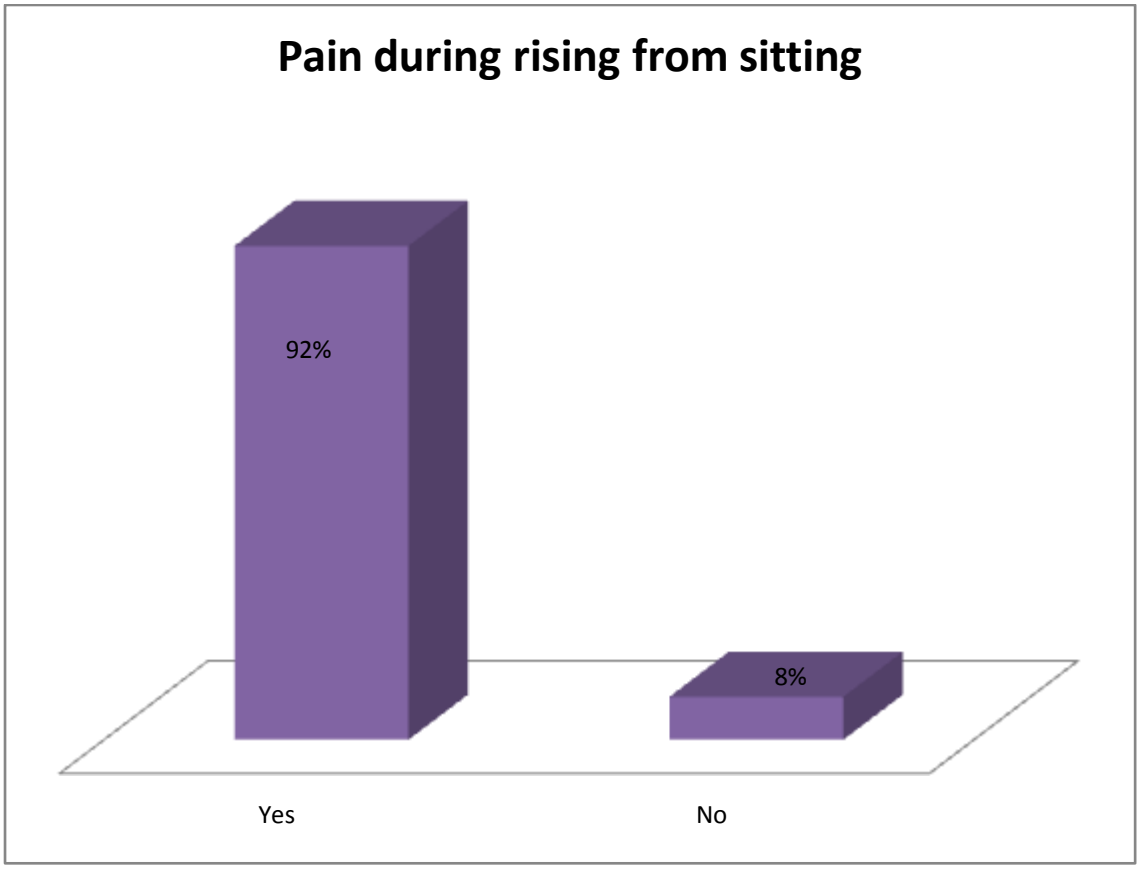

Figure-6 pain during rising from sitting of the participants.

2.8 Pain during rising from sitting and ROM of knee cross tabulation

In these study, it was found that among the 50 participants, 50% (n=25) participants were Limited and unable to perform ROM and 50% (n=25) were Full ROM. Among Limited & unable to perform ROM participants, 48% (24)whose pain presented during rising from sitting and 2% (1) whose no pain presented during rising from sitting. Among Full ROM participants, 44% (22) whose pain presented during rising from sitting and 6% (3) whose no pain presented during rising from sitting (Table-5).

Pain during rising from sitting	ROM of knee		Total
	Full ROM	Limited & unable to perform ROM	
Yes	22	24	46
No	3	1	4
	25	25	50

Odds = 22/72

= 0.3056

95% CI of Odd ratio = 0.3056

= 95% CI (0.0296, 3.1593).

The result of an odd ratio was interpreted as follows: pain was presented during rising from sitting in patients with Full ROM of knee whose was 0.3056 times more often than whose had no pain presented during rising from sitting in patients with Full ROM of knee.

Table-5 Pain during rising from sitting and ROM of knee cross tabulation.

2.9 Difficulty in walking

Among the participants, n= 49 (98%) patients felt difficulty in walking and n=1 (2%) patient felt no difficulty in walking (Figure-7).

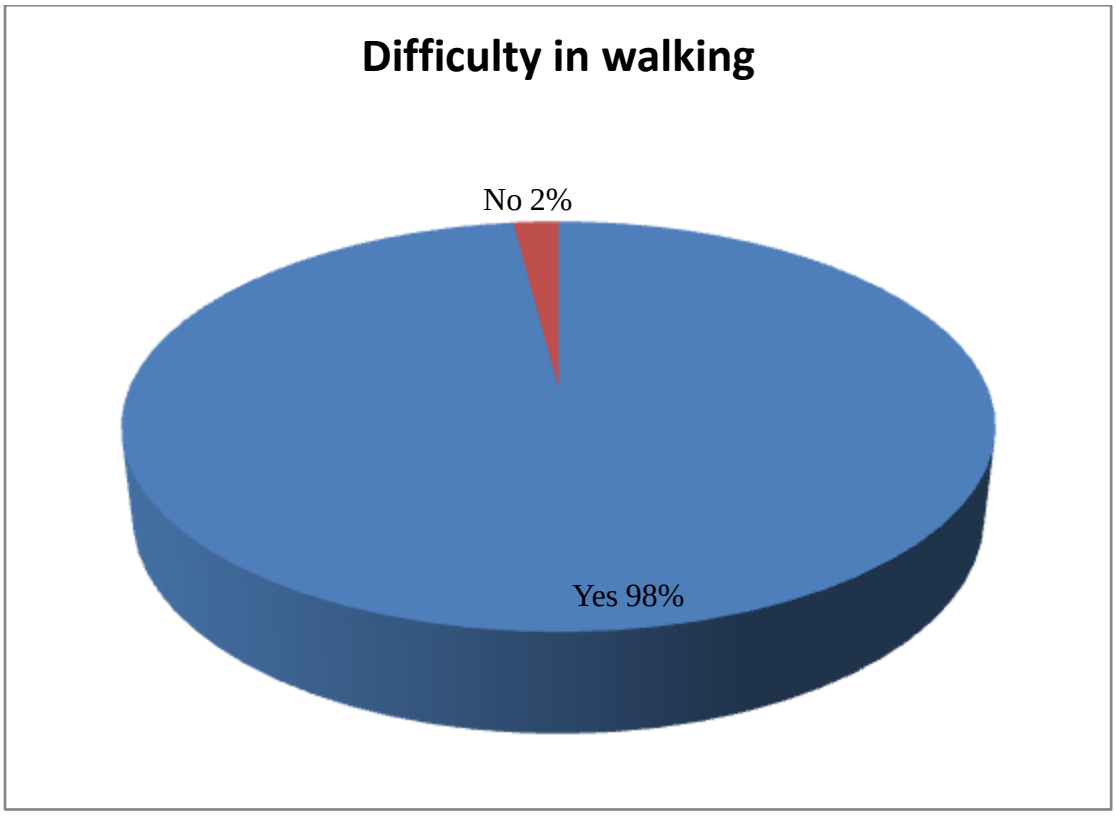

Figure-7 Difficulty in walking of the participants.

2.10 Pain during staring

Among the participants, n= 50 (100%) patients felt pain during ascending and descending stairing and n= 0 (0%) patients did not felt pain during ascending and descending stairing (Figure-8).

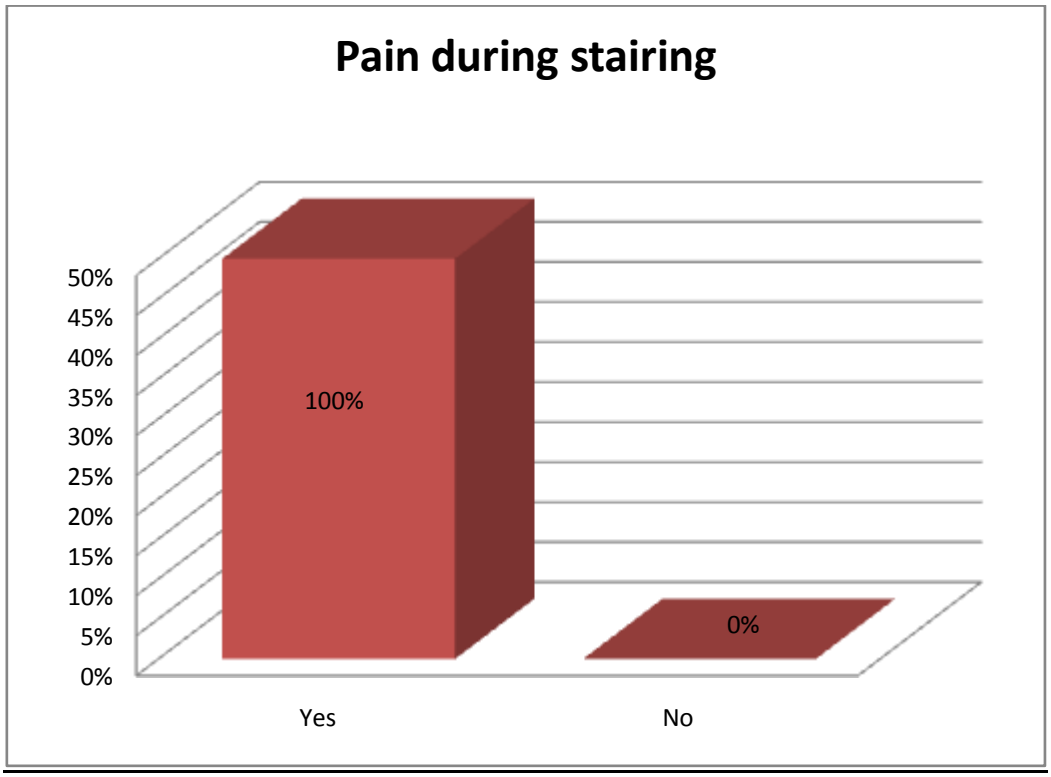

Figure-8 Pain during staring of the participants.

2.11 Pain during squatting

Among the participants, n= 50 (100%) patients felt pain during squatting and n= 0 (0%) patients did not felt pain during squatting (Figure-9).

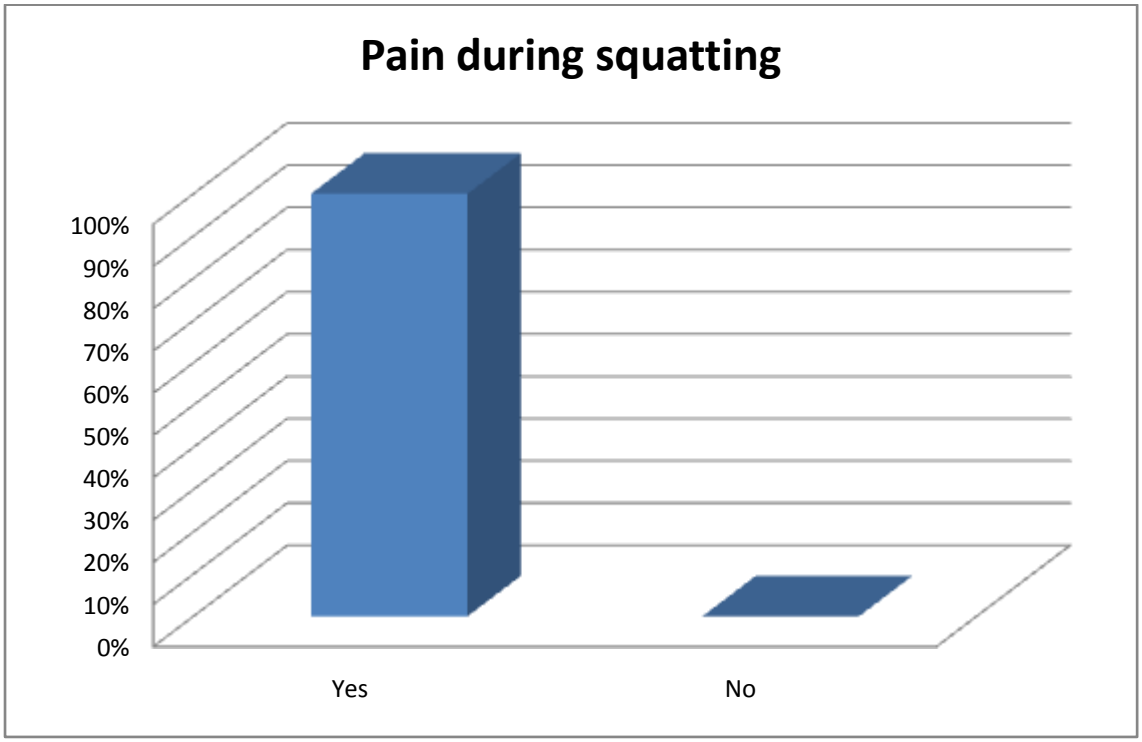

Figure-9 Pain during squatting of the participants.

CHAPTER -V DISCUSSION

The main goal of the study was to examine the pain characteristics among the knee OA patients. A greater understanding about pain severity among knee osteoarthritis patients and given information, when pain increased or relieved and which activities may increase pain. Several reports have suggested that the issue of knee OA disease severity which variation on movement and gait pattern. In this study, the researcher found that male-female ratio of those participants who have received Physiotherapy treatment for osteoarthritis from CRP Musculoskeletal unit of physiotherapy department. This data showed that most of the osteoarthritis patients were female who had come to take physiotherapy at CRP Musculoskeletal unit of physiotherapy department. This study found that females (70%) are predominantly higher than males (30%). One study mentioned that, female gender is a significant risk factor for OA and prevalence is higher in females than male. In United States a study about epidemiology of OA showed that the age standardized prevalence of radiographic knee OA in adults 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, approximately 37.00% of participants age >60 years or older had radiographic knee OA (Zhang et al., 2007). In the study, n=33 (66%) patients were housewife that means housewife are mostly affected by knee OA, these may be due to long time activity in knee bending position according to our culture. In this study, among participants exaggerated by knee OA, n=20 (40.00%) was involved by right knee OA, n=12 (24%) was involved by left knee OA and n=18 (36%) patients was involved by both knee OA. Participants n=4 (8%) affected by above knee OA pain, n=20 (40%) was affected by below knee OA pain and n=26 (52%) was affected by around knee OA pain.

Gait pattern variation and functional limitation occurs due to severity of knee pain or pain status. In these study, n=5 (10%) patients felt mild pain, n=31 (62%) patients felt moderate pain and n=14 (28%) patients felt severe pain at resting position. Among the participants, n=25 (50%) patients knee ROM had presented full ROM, n=4 (8%) patients knee ROM had more restricted and patients, n=21 (42%) knee

ROM had limited. The study also showed that patients, n= 46 (92%) felt pain during rising from sitting and n= 4 (8%) felt no pain during rising from sitting. During ascending and descending stairing and squatting, patients felt pain that results gait variation may occurred. In these study, founded that the correlation between age group of participants and severity of pain, among the 50 participants, there 72% (n=36) participants were mild and moderate type of knee pain and 28% (n=14) were severe type of knee pain. Among severe type of pain felt participants, 8% (4) were (>60 years) age group, 20% (10) were (<60 years) age group. Among mild and moderate type of pain felt participants, 6% (3) were (>60 years) age group, 66% (33) were (<60 years) age group and an Odds ratio was interpreted as, pain severity in patients (>60 years) age groups were more often than (<60 years) age groups patients. Found the association between gender distribution of participants and severity of pain among the knee OA patients and also correlation between gender distribution of the participants and pain in staring, then resulted that female were more responded than male.

In any research some limitation may exist, 100% accuracy will not be possible. Regarding this study, there were some limitations or barriers to consider the result of the study as below:

The first limitation of this study was small sample size. It was taken only 50 samples. This study has provided for the first time data on the pain characteristics among the knee osteoarthritis patients. No research has been done before on this topic. So there was little evidence to support the result of this project in the context in Bangladesh.
Another major limitation was time. The time period was very limited to conduct the research project on this topic. The questionnaires took approximately 20 to 25 minutes to complete. Time taken to complete the questionnaires was affected by factors such as explanation, asking relevant questions, there are brief explanations etc. As the study period was short so the adequate number of sample could not arrange for the study.

CHAPTER-VI CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Osteoarthritis is more prevalent among women than among men at all ages. These gender differences are most prominent when OA affects the knee. Gender differences and effect of bilateral or unilateral or both knees OA that depends on patients individuals. In study, there found that more responded women than men in report of knee pain. From the study it can be concluded that the most vulnerable age range is 50 to 65 for knee OA. This study has characterized by the feature of pain severity of knee OA patients. Household and bending activities are aggravating factors to develop knee OA and housewife are more affected group among all occupation. Past history of trauma and positive family history are the causative factors to develop knee OA. Health care provision in Bangladesh is still to be realistic in terms of ensure benefit for the people suffering from non-communicable disease including OA. If the patients receive physiotherapy regularly and maintain therapeutic activities at their home then 80% symptoms will be subsided.

If general people are aware about the effectiveness of physiotherapy then more people will come to receive physiotherapy in the early stage of the disease. It will be always helpful to other health care professionals to understand the importance of physiotherapy for osteoarthritis and will also ensure a good referral system. So government should aware the people about the importance physiotherapy for patient with osteoarthritis. Clearly we need programs aimed at decreasing or minimizing pain contributing factors that helps to prevent knee osteoarthritis and also helps to reduce pain in knee OA patients and controlling the musculoskeletal disorder.

6.2 Recommendations

Knee osteoarthritis patients are likely to be an upcoming burden for Bangladesh, as like other countries. For this reason, it is important to develop evidence based research of physiotherapy practice in this area. Physiotherapist's practice which is evidence based in all aspect of health care. There are few studies on musculoskeletal area in the knee region. These cannot cover all aspect of the vast area. So, it is recommended that the next generation of physiotherapy members will continue study regarding this area with large sample size and participants from different districts of Bangladesh. Conduct research on other musculoskeletal problems on knee area where physiotherapist can work. So it is very important to conduct such type research in this area. The duration of the study was short, so in future wider time would be taken for conducting the study.

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APPENDIX

মৌখিক অনুমতি পত্র

(অংশগ্রহনকারীকে পড়ে শোনাতে হবে)

আসসালামু আলাইকুম / নমশকার,

আমার নাম, মোসাঃ নাজনিন সুলতানা, আমি এই গবেষনা প্রকল্পটি বাংলাদেশ হেল্‌থ প্রফেসনস ইনস্টিটিউট (বিআইচপিআই)- এ পরিচালনা করছি যা আমার ৪র্থ বর্ষ বি এস সি ইন ফিজিওথেরাপি কোর্সের অধিভূক্ত। আমার গবেষণার শিরোনাম হল "সাভার, সি আর পি-তে উপস্থিত হওয়া হাঁটুর অষ্টিওআর্থারাইটিস রোগীর ব্যথার বৈশিষ্ট্য"। আমি এক্ষেত্রে কিছু ব্যক্তিগত এবং আনুষঙ্গিক তথ্য, আপনার হাঁটুর অষ্টিওআর্থারাইটিস এবং হাঁটার বৈশিষ্ট্য সম্পর্কে জানতে চাচ্ছি, যা আনুমানিক ২০-২৫ মিনিট সময় নিবে।

আমি আপনাকে অবগত করছি যে, এটা আমার অধ্যয়নের অংশ এবং অন্য কোন উদ্দেশ্যে ব্যবহার হবে না। গবেষক সরাসরি এই অধ্যয়নের সাথে সম্পর্কিত নয়। তাই এই গবেষনায় আপনার বর্তমান এবং ভবিষ্যৎ চিকিৎসায় কোন প্রভাব ফেলবে না। আপনি যেসব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং আপনার প্রতিবেদনের ঘটনাপ্রবাহে এটা নিশ্চিত করা হবে যে, এর উৎস অপ্রকাশিত থাকবে।

এই অধ্যয়নে আপনার অংশগ্রহন ঐচ্ছিক এবং আপনি যে কোন সময় এই অধ্যয়ন থেকে কোন নেতিবাচক ফলাফল ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন। সাক্ষাৎকারের সময় কোন প্রশ্ন পছন্দ না হলে উত্তর না দেওয়ার অথবা না দিতে চাওয়ার অধিকারও আপনার আছে।

এই অধ্যয়নে অংশগ্রহণকারী হিসেবে আপনার যদি কোন প্রশ্ন থাকে তাহলে আপনি আমাকে বা নাসিরুল ইসলাম, সহকারী অধ্যাপক এবং কোর্স কো-অরডিনেটর, এম এস সি ইন রিহাব সাইন্স, বিএইচপিআই, সিআরপি, সাভার, ঢাকা এ যোগাযোগ করতে পারেন।

সাক্ষাৎকার শুরু করার আগে আপনার কি কোন প্রশ্ন আছে?

আমি আপনার অনুমতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি।

হ্যাঁ ☐

না ☐

অংশগ্রহণকারীর স্বাক্ষর ----------

সাক্ষাৎগ্রহনকারীর স্বাক্ষর ----------

Verbal Consent Statement

(Please read out to the participants)

Assalamualaikum/Namasker,

My name is MST. Najnin Sultana, I am conducting this study as a part of my academic work of B. Sc. in Physiotherapy under Bangladesh Health Professions Institute (BHPI), which is affiliated to University of Dhaka. My study title is "Pain characteristics among the Knee Osteoarthritis Patients, attended at CRP". I would like to know about some personal and other related information regarding Osteoarthritis. You will need to answer some questions which are mentioned in this form. It will take approximately 20-25 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 (Musculoskeletal), so your participation in the research will have no impact on your present or future treatment in this area (Musculoskeletal). All information provided by you will keep in a locker as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous and also all information will be destroyed after completion of the study.

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 and/or Nasirul Islam, Associate Professor and course coordinator, M.Sc. in Rehabilitation Science BHPI, CRP, Savar, Dhaka.

Do you have any questions before I start?

Yes / No

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

Yes ☐

No ☐

Signature of the Participant _____

Signature of the Interviewer _____

“সাভার ,সি আর পি-তে উপস্থিত হওয়া হাঁটুর অষ্টিওআর্থারাইটিস রোগীর ব্যথার বৈশিষ্ট্য”

প্রশ্নাবলীর গঠন

কোডনম্বরঃ

অংশগ্রহণকারির নামঃ

তারিখঃ

অংশ ১ – রোগীর সামাজিক-জনসংখ্যাতাত্তিক প্রশ্ন			
প্রশ্ননং	প্রশ্নসমূহ	উত্তর	কোড
১।	আপনার বয়স জানতে পারি?	বছর	
২।	লিঙ্গ	□ মহিলা □ পুরুষ	০১ ০২
৩।	ঠিকানা ও মোবাইল নম্বরঃ		
৪।	আপনার আবাসিক এলাকা কি?	□ শহর □ গ্রাম	০১ ০২
৫।	আপনার শিক্ষাগত যোগ্যতা?	□ নিরক্ষর □ প্রাইমারি স্কুল পাশ □ এসএসসি পাশ □ এইচএসসি পাশ □ স্নাতক বা এর অধিক	০১ ০২ ০৩ ০৪ ০৫

৬।	আপনার পেশা কি?	□ রিকশাচালক □ কৃষক □ গার্মেন্টসশ্রমিক □ গাড়িচালক □ ব্যবসায়ি □ দিনমজুর □ বেকার □ গৃহিণী □ শিক্ষক □ অন্যান্যঃ	০১ ০২ ০৩ ০৪ ০৫ ০৬ ০৭ ০৮ ০৯ ১০
অংশ ২- রোগী সম্পর্কিত তথ্যাদি			
১।	আপনার দুর্বল পার্শ্ব কোনটি?	□ ডান □ বাম □ উভয়	০১ ০২ ০৩
২।	পূর্বে কখনো আপনার হাঁটুতে আঘাত পেয়েছিলেন?	□ হ্যাঁ □ না	০১ ০২
৩।	কখন থেকে আপনার বাতের ব্যথা?	□ ২ বছরের নিচে □ ২-৫ বছর □ ৫ বছরের উপরে	০১ ০২ ০৩
৪।	কয় হাঁটুতে আপনার বাত?	□ ডান □ বাম □ উভয়	০১ ০২ ০৩
৫।	হাঁটুর নির্দিষ্ট কোন জায়গায় ব্যথা?	□ উপরে □ নিচে □ চারপাশে	০১ ০২ ০৩

৬।	হাঁটুতে ব্যথার ধরন	□ কম □ মাঝারি □ বেশি	০১ ০২ ০৩
৭।	হাঁটুতে কোন স্থান ধরলে ব্যথা অনুভব করেন?	□ ভিতরের দিকে □ বাইরের দিকে □ সমগ্র হাঁটুতে	০১ ০২ ০৩
৮।	হাঁটুতে কোনো ফোলা আছে কি?	□ হ্যাঁ □ না	০১ ০২
৯।	সকালে হাঁটু শক্ত হয়ে যায় কি?	□ হ্যাঁ □ না	০১ ০২
১০।	হাঁটা চলার সময় হাঁটুতে কোনো শব্দ হয় কি?	□ হ্যাঁ □ না	০১ ০২
১১।	হাঁটুর সন্ধিস্থলে চলন ক্ষমতা আছে কি?	□ আছে □ নাই □ কম আছে	০১ ০২ ০৩
১২।	পায়ের দৈর্ঘ্যের মধ্যে কোনো অসামঞ্জস্যতা আছে কি?	□ আছে □ নাই	০১ ০২
১৩।	পা বাইরের দিকে ঘুরে আছে কি?	□ আছে □ নাই	০১ ০২
১৪।	বিশ্রাম অবস্থায় আপনি ব্যথা অনুভব করেন কি?	□ হ্যাঁ □ না	০১ ০২
১৫।	উঠা থেকে বসা বা বসা থেকে উঠার সময় ব্যথা হয় কি?	□ হ্যাঁ □ না	০১ ০২
১৬।	হাঁটার সময় কোনো সমস্যা হয় কি?	□ হ্যাঁ □ না	০১ ০২

১৭।	সিঁড়িতে উঠা-নামার সময় ব্যথা অনুভূত হয় কি?	□ হ্যাঁ □ না	০১ ০২
১৮।	ভারী কিছু বহনের সময় হাঁটুতে ব্যথা অনুভূত হয় কি?	□ হ্যাঁ □ না	০১ ০২
১৯।	হাঁটু ভাঁজ করতে (টয়লেটে বসা) আপনি ব্যথা অনুভব করেন কি?	□ হ্যাঁ □ না	০১ ০২
২০।	আপনার হাঁটুতে কি কোনো অস্রোপাচার হয়েছিলো?	□ হ্যাঁ □ না	০১ ০২
২১।	পায়ের পাতাটা কেমন?	□ উপরের দিকে □ নিচের দিকে □ স্বাভাবিক	০১ ০২ ০৩
২২।	আপনি প্রতি মিনিটে কয় ধাপ যেতে পারেন?	□ ১০০ এর নিচে □ ১০১-১৩১ □ ১৩১ এর উপরে	০১ ০২ ০৩
২৩।	হাঁটু রক্ষার জন্য কি আপনি কোনো যন্ত্র (ডিভাইস) ব্যবহার করেন?	□ হ্যাঁ □ না	০১ ০২

গবেষকের স্বাক্ষরঃ

“Pain characteristics among the Knee Osteoarthritis Patients, attended at CRP”.

Questionnaire Form

Code no:

Name of participant:

Date:

Part I : Patient’s Socio-demographic Information			
QN	Questions	Responses	Code
1	May I know your age please?	Years	
2	Sex:	□ Female □ Male	01 02
3	Address and Contact number:		
4.	Your residential area?	□ Urban □ Rural	01 02
5.	What is your education?	□ Illiterate □ Primary education □ Secondary education □ Higher secondaryeducation □ Bachelor orabove	01 02 03 04 05
6.	What is your profession (Occupation)?	□ Rickshaw puller □ Agriculture □ Factory/garments worker □ Driver □ Businessman □ Day laborer □ Unemployed □ Housewife □ Teacher □ Other (Specify):	01 02 03 04 05 06 07 08 09 10

Part-II: Participant related Information			
1.	What is your dominant side?	□ Right □ Left □ Both	01 02 03
2.	Do you have any past history of trauma at the knee?	□ Yes □ No	01 02
3.	Onset of arthritis?	□<2yrs □ 2-5 yrs □ >5yrs	01 02 03
4.	Number of involvement of knee joint?	□ Right □ Left □ Both	01 02 03
5.	Specific location of knee pain?	□ Above □ Below □ Around	01 02 03
6.	Severity of joint pain(knee joint)	□ Mild □ Moderate □ Severe	01 02 03
7.	Local tenderness?	□ Medial □ Lateral □ Entire joint	01 02 03
8.	Knee swelling?	□ Yes □ No	01 02
9.	Morning stiffness?	□ Yes □ No	01 02
10.	Crepitus sound at knee?	□ Yes □ No	01 02
11.	Patello-femoral movement?	□ Present □ Absent □ Less Present	01 02 03

12.	Leg length discrepancy?	□ Present □ Absent	01 02
13.	Leg external rotation?	□ Present □ Absent	01 02
14.	Have you feel pain at rest?	□ Yes □ No	01 02
15.	Pain during rising from sitting or sitting from rising?	□ Yes □ No	01 02
16.	Do you have any difficulty in walking?	□ Yes □ No	01 02
17.	Pain at knee joint during weight bearing?	□ Yes □ No	01 02
18.	Have you feel pain in ascending and descending staring?	□ Yes □ No	01 02
19.	Pain at knee during squatting?	□ Yes □ No	01 02
20.	History of surgery at knee?	□ Yes □ No	01 02
21.	Arches of the foot	□ Increased □ Decreased □ Normal	01 02 03
22.	How many Steps are given per minute?	□ <100 □ 101-131 □ >131	01 02 03
23.	Do you use any assistive device for Knee?	□ Yes □ No	01 02

Signature of researcher……

Permission letter

September 19, 2015

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343.

Through: Head, Department of Physiotherapy, BHPI.

Subject: Seeking permission of data collection to conduct my research project.

Dear Sir,

With due respect and humble submission to state that I am MST. Najnin Sultana, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project titled on **"Characteristics of gait among the Knee Osteoarthritis Patients, Attended at CRP, Savar"** under the supervision of Nasirul Islam, Associate Professor and course coordinator, M.Sc. in Rehabilitation Science BHPI,CRP,Savar,Dhaka. Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. I want to collect data for my research project from the patients of CRP. So, I need permission for data collection from the musculoskeletal department of CRP. 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

MST. Najnin Sultana

MST. Najnin Sulana

4th Professional B.Sc. in Physiotherapy

Roll-33, Session: 2010-2011

Bangladesh Health Professions Institute (BHPI)

CRP, Chapain, Savar, Dhaka-1343.

She may be allowed for data collection.

20/09/15

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

forwarded and recommended

19/09/15

Nasirul Islam, Physiotherapist
Associate Professor
Bangladesh Health Professions Institute (BHPI)
CRP-Chapain, Savar, Dhaka-1343

Approved

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