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## **ASSESSMENT OF FUNCTIONAL STATUS OF PATIENT WITH KNEE OSTEOARTHRITIS**

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We the undersigned certify that we have carefully read & recommend to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

**ASSESSMENT OF FUNCTIONAL STATUS OF PATIENT WITH KNEE OSTEOARTHRITIS**

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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 Physiotherapy, Bangladesh Health Professions Institute.

**Signature:**

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Bachelor of Science in Physiotherapy

(B.Sc. PT) Session: 2016-17

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## List of Acronyms

<b>AAOS</b>	American Academy of Orthopedic Surgeons
<b>ADL</b>	Activity of Daily Living
<b>BHPI</b>	Bangladesh Health Professions Institute
<b>BMRC</b>	Bangladesh Medical and Research Council
<b>COPCORD</b>	Community Oriented Programme for Control of Rheumatic Disease
<b>CRP</b>	Centre for the Rehabilitation of the Paralysed
<b>GBD</b>	Global Burden of Disease
<b>IRB</b>	Institutional Review Board
<b>KOOS</b>	Knee and Osteoarthritis Outcome Score
<b>OA</b>	Osteoarthritis
<b>OARSI</b>	OA Research Society International
<b>ROAD</b>	Research on Osteoarthritis Against Disability
<b>SPSS</b>	Statistical Package for the Social Science
<b>US</b>	Ultrasonography
<b>WHO</b>	World Health Organization

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## Abstract

**Purpose:** To assess the functional status of patient with knee osteoarthritis. **Objectives:** The objectives of the study were to evaluate the assessment of functional status of patient with knee osteoarthritis. **Methods:** A cross-sectional study design was used for the study. The selected study area was conducted in Musculoskeletal Unit of Physiotherapy Department at the Center for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka. Sample was taken by using convenience sampling technique. A structural questionnaire was used for collecting data from the participants. Data was analyzed through Statistical package of Social Science (SPSS) Version 25, Microsoft Office Excel 2019, Microsoft Office word. **Results:** The study was conducted on 115 participants of knee osteoarthritis. In this study most commonly affected age were around (41-50) years 35.7%(n=41). About 53.0%(n=61) female were more affected than 47%(n=54) male. Almost 48.7%(n=56) housewife were more affected. 88.7%(n=102) married, 69.6%(n=80) were nuclear family, 53.9%(n=62) lived in rural areas, 34.8%(n=40) participants got secondary education, 62.6%(n=72) had history of co-morbidity, 48.7%(n=56) had multiple number of co-morbidity. About 34.8%(n=40) participants felt pain daily. Almost 56.5%(n=65) participants felt moderate pain during knee straightening, 52.2%(n=60) participants felt moderate pain during knee banding, 53.9%(n=62) participants felt severe pain during up and down stairs. About 41.7%(n=48) participants felt mild pain during sitting. About 62.6%(n=72) participants felt mild pain during standing. About 57.4%(n=66) participants felt severe difficulty during descending stairs, 56.5%(n=65) participants felt severe difficulty during ascending stairs, 59.1%(n=68) participants felt moderate difficulty during bending to floor/pick up an object, 74.8%(n=86) participants felt mild difficulty during walking on flat surface, 50.4%(n=58) participants felt severe difficulty during getting on/off toilet, 39.1%(n=45) participants felt severe difficulty during heavy domestic duties, 60.0%(n=69) participants felt mild pain during light domestic duties. Almost 48.7%(n=56) participants felt severe difficulty during squatting. Around 44.3%(n=51) participants felt extreme difficulty during kneeling, 35.7% (n=41) was

weekly aware about their knee problem. **Conclusion:** The investigator not found the strong positive association of different variables with Socio-demographic factor because  $p > 0.05$  but association of educational level with stiffness was statistically significant as  $P = 0.054$ , association of living area with Quality of life was statistically significant as  $P = 0.025$ , association of history of co-morbidity with pain statistically significant as  $P = 0.046$ . The important way for prevention of knee osteoarthritis including the modification daily activity for reduces risk factors.

**Key words:** Assessment, Functional status, Knee osteoarthritis.

**Word count:** 11120

### **1.1 Background**

Osteoarthritis is the most common rheumatic disease and a major cause of disability (OA). In the United States, osteoarthritis (OA) is the fourth leading cause of disability (Jahan et al., 2017). The most usually affected appendicular joints are the knees, hips, and hands. Pathology affecting the entire joint, such as cartilage deterioration, bone remodeling, osteophyte production, and synovial inflammation, causes pain, stiffness, edema, and loss of normal joint function (Kolasinski et al., 2020). Because OA is the leading cause of persistent impairment in those over the age of 70, the World Health Organization has designated it as a "priority disease." OA is one of the ten most debilitating diseases in developed countries (Zamri et al., 2019).

Osteoarthritis (OA) is a chronic degenerative knee joint disease characterized by anatomical and/or physiological abnormalities that manifest as joint cartilage degeneration, bone tissue rearrangement, formation of osteophytes, synovial membrane inflammation, joint capsule and ligament damage, and loss of normal function (Kraus et al., 2015).

And 10.20 percent in Bangladesh, respectively. Knee osteoarthritis affects 28.0% of the urban population and 25.0% of the rural population in According to studies, 13.6 percent of Chinese people suffer knee osteoarthritis. It is believed to be 5.78 percent in India Pakistan, according to a study (Haque, 2015).

Knee osteoarthritis is one of Bangladesh's most common debilitating disorders, affecting both men and women (Connor, 2007). In Bangladesh, ten percent of people have knee osteoarthritis (Radha & Gangadhar, 2015). In Bangladesh, certain ethnic groups are more affected by osteoarthritis than others. Osteoarthritis is becoming more common among ethnic groups in this country. Approximately 89.6% of participants were found to be free of osteoarthritis, whereas 10.4% were diagnosed with the disease. 72.7 percent, 15.1

percent, 6.5 percent, and 5.7 percent of the participants were Chakma, Marma, Tripura, and Tanchyanga, respectively (Haque et al., 2016).

The most frequent joint illness among the elderly is osteoarthritis (OA), which causes knee discomfort and a significant disease burden due to disability (Li et al., 2020). These processes result in illness clinical symptoms such as dull aching pain or severe, intermittent knee joint discomfort, crepitation, edema, and stiffness (Varzaityte et al., 2019).

As OA progresses, patients' physical activity is limited by severe joint soreness. The majority of this disability burden is due to hip or knee involvement. The Asian region is increasingly aging, and OA is intimately linked to aging. Furthermore, OA has been associated to a high level of physical occupational activity, which is a requirement for many people living in developing countries' rural areas (Jahan et al., 2017). With the concept that aging joint tissues collect increased wear and tear from loading, the growth in life expectancy in the United States from the early twentieth century is thought to have led to high incidence of knee OA among the elderly (Wallace et al., 2017).

As people get older, OA becomes more common, and women are more likely to be impacted than men (Haque, 2015). Symptomatic osteoarthritis affects 9.6% of men and 18.0% of women over the age of 60 worldwide, according to the World Health Organization. Approximately 80% of people with osteoarthritis will have movement restrictions, and 25% will be unable to carry out their everyday activities (Zamri et al., 2019). Around 5% of persons over the age of 26 and 17% of people over the age of 45 have symptomatic knee osteoarthritis (OA), which can cause disability and raise the risk of disability due to abnormal physical circumstances (Plotnikoff et al., 2015).

Knee pain was reported by more than half of persons aged 50 and up, with a quarter reporting severe and disabling knee pain. Knee discomfort can cause a severe and long-term impairment in one's capacity to perform daily tasks (Fernandez-Lopez et al., 2008). Because of the high prevalence of knee OA and its impact on physical performance and quality of life, developing preventative strategies should be a top priority for public health (Blagojevic et al., 2010).

Knee OA pain is a leading cause of activity restriction, functional impairment, and lowered health-related quality of life. Because not only is hyaline articular cartilage destroyed in patients with OA, but also bony remodel occurs, the specific reason of knee osteoarthritis discomfort is unknown. Other components in the knee, such as the joint capsule, periosteum, and ligament and muscle insertion sites, are influenced by pain fibers. Laxity of the ligaments and lesions in the bone marrow develop in some people with synovitis, which could indicate bone damage. Localized cartilage loss can raise focal stress across the joint, resulting in even more cartilage loss. When there is a considerable area of cartilage loss or bone remodeling, the joint tilts and malalignment develops. The main risk factor for structural degradation of the joint is misalignment, as it raises the degree of focal loads, causing joint damage and eventually joint collapse. Local inflammation in the cartilage and synovium can cause pain and joint deterioration, and this is a common cause of knee discomfort (Solomon et al., 2010).

Knee osteoarthritis has a prevalence of 7-25 percent in adults over the age of 55, with more than 70 percent of sufferers experiencing pain and restrictions in daily activities. Immobility and falls are the most common causes of balance and gait issues, which significantly reduce quality of life (Jahn et al., 2010). Because walking limitations develop with age, at least 20% of older persons require the assistance of another person or use special equipment to walk (Alexander et al., 2005).

Walking is a frequent day-to-day utilitarian activity. This study provides useful information on the pain characteristics of knee OA patients. Because independent ambulation is necessary for community reintegration and social interaction, as well as reducing his impairment, the patient's capacity to walk is a crucial determinant of whether or not he will return to his previous level of activity (Connelly et al., 2015).



## **1.2 Rationale**

OA is the most common type of arthritis, affecting 10% of the global population aged 60 and higher. This disorder causes joint discomfort, stiffness, and functional restrictions. The knees, hands, hips, and feet are the most commonly affected joints, but it can also affect the shoulder and spine joints. When compared to the other major causes of disability, the Global Burden of Disease (GBD) study (2015) found that OA and diabetes had the greatest rise in years spent disabled. Apart from age, there is much of evidence from mostly North American or European cohorts that obesity or heavy occupational physical activity, such as what many people in rural Asian communities undertake, are clear risk factors for symptomatic knee and hip OA.

Knee osteoarthritis (OA) is a frequent and serious health issue that affects the elderly in the majority of developed nations and leads to persistent pain and disability. It is a frequent cause of disability in older individuals and is linked to mobility impairment, limitations on daily tasks, and a decrease in physical function. In Bangladesh, OA is a common musculoskeletal illness that is closely related to physiotherapy. Numerous studies have shown that the incidence of knee osteoarthritis is rising daily. Despite the fact that various studies on knee osteoarthritis have been conducted around the world.

Due to a lack of awareness, the number of people suffering from knee osteoarthritis is on the rise. It impacts a great number of people, making them burdens for themselves and having a destructive impact on their families, society, and the entire country. Physiotherapist skills may be established through research in this field, which can serve as a foundation for expanding the profession in this country. As a result, the researcher wanted to perform a study for Bangladeshi people called "Assessment of functional status of patients with knee osteoarthritis." Other health professionals will gain update information on knee osteoarthritis assessment. The general public will benefited from this knowledge as well.

### **1.3 Research Question**

What is the functional status of patient with knee osteoarthritis?

## **1.4 Aim of the study**

To assess the functional status of patient with knee osteoarthritis.

## **1.5 Objective of the study**

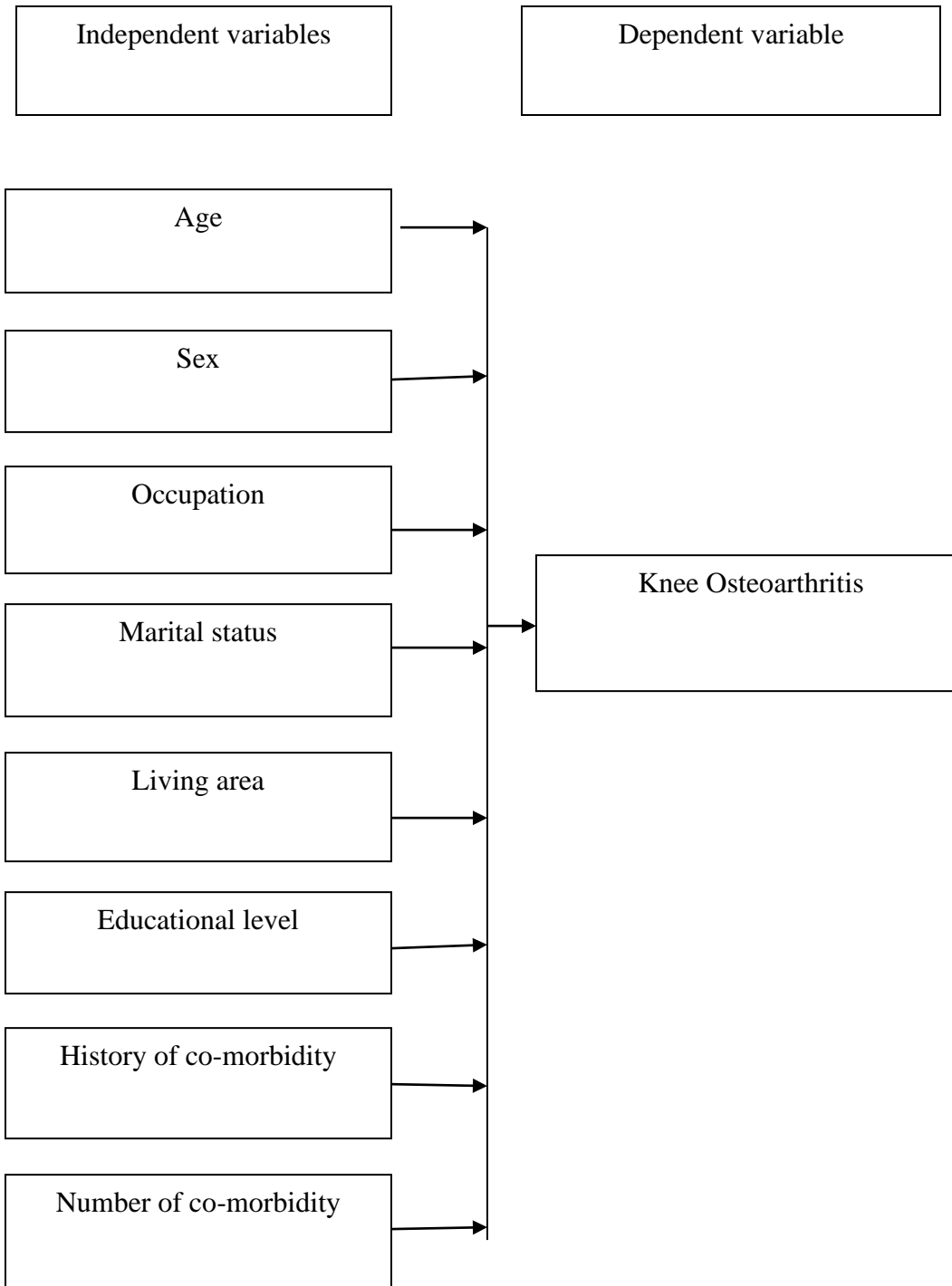
### **1.5.1 General objective**

- To evaluate the assessment of functional status of patient with knee osteoarthritis.

### **1.5.2 Specific objective**

- To determine socio-demographic characteristics of patient with knee Osteoarthritis.
- To explore the severity of pain during most common functional position of patients with knee osteoarthritis.
- To identify the difficulty of functional and daily living activities of patient with knee osteoarthritis.
- To find out the association of different variables with Socio-demographic factor.

## 1.6 Conceptual Framework



## **1.7 Operational definition**

### **Knee Osteoarthritis**

Non-inflammatory chronic degenerative disease of the knee joint characterized by pain in the knee that blocks normal synchronous movement, posing a barrier to performing daily activities properly, as well as abnormal motion pathways that cause stress concentrations in the joint, resulting in articular cartilage changes and a reduction in joint range of motion.

### **Functional Status**

At home or in the community, functional status refers to the ability to physically undertake activities such as self-care, mobility, and independence. The assessment of a person's capacity to carry out activities of daily living on their own is their functional status. Functional status can be used to evaluate how severe a person's disability is.

### **Assessment**

A method of learning about a patient's condition in healthcare. A full medical history, medical tests, a physical exam, a test of learning skills, tests to see if the patient is capable of performing daily duties, a mental health evaluation, and a study of social support and community resources accessible to the patient are all examples of this.

The term "osteoarthritis" is derived from the Greek words "osteo" which means "of the bone," "arthro" which means "joint," and "itis" which means inflammation. However, the term "itis" is a misnomer because inflammation is not a visible aspect of the condition (Williams et al., 2010). Osteoarthritis is a chronic degenerative disease characterized by acute inflammation that worsens with age and is a primary source of pain and disability. Osteoarthritis of the knee is a condition that involves cartilage destruction, new bone development, and subchondral bone thickening. Its severity of cartilage loss and bony structural change is determined by the degree of cartilage loss. The consequences of degenerative processes such as joint space narrowing, subchondral sclerosis, and osteophyte formation can be seen on x-ray findings, which has historically been the cornerstone of diagnosis (Cibere et al., 2010).

Osteoarthritis is a bone and joint cartilage inflammation disease in which all tissues of the joint undergo pathologic changes, often in concert, and is the most common arthritis in the aged. OA is renowned for lowering quality of life, which is evaluated by Disability, in addition to significant morbidity. Years of Adjusted Life and Years of Disability In 2010, the global burden of disease study ranked OA as the eleventh leading cause of years spent disabled around the world. In women, it is the fourth most prevalent predictor of health problems, and in men, it is the ninth most common predictor. Primary and secondary OA are the two types of OA. Primary osteoarthritis has no known origin and is usually caused by the aging process, but secondary OA is caused by injuries sustained during squatting or kneeling. Knees, hips, lower spine region, and fingers are the most usually affected joints, but it can also affect the hands and feet. Osteoarthritis is caused by advancing age, female sex, obesity, sedentary lifestyles, no or minimal physical activity, and incorrect eating choices. Grating sounds during joint movement, swelling and soreness of joints, and reduced range of motion are common complaints. Apart from the physical symptoms, it causes mental anguish owing to the disruption of regular tasks. Joint pain symptoms are sometimes overlooked for years, especially by women, who associate it with heavy physical labor during home duties. Health care is frequently sought only when physical

activity is hampered, and pain relief is usually the only symptom that prompts people to seek medical help (Bala et al., 2020).

Osteoarthritis (OA) is a chronic illness characterized by cartilage degeneration, subchondral bone sclerosis, and arthritic bone hyperplasia in various regions of the body. Knee OA, the most common type of OA, is the 11th leading cause of worldwide disability and the 38th leading cause of disability adjusted life years. Prior joint injury, weight, sex, and anatomical factors relating to joint form and alignment are all possible contributors to the development of knee OA. Knee OA has no cure, thus treatment is focused on symptom reduction. The current impact of OA on society is enormous. Knee OA is responsible with significant lifetime quality-adjusted life year losses in New Zealand people, with a lifetime risk of 13.83 percent. The most often used case definitions are symptomatic OA, radiographic OA, and self-reported OA (Li et al., 2020).

OA is a significant public health issue. The World Health Organization has categorized it as the fastest-growing major health disease and the second-leading cause of disability (WHO). According to the WHO Scientific Group on Rheumatic Diseases, 10% of the world's population aged 60 and up suffers from serious clinical difficulties related to OA. Although the etiology of OA is unknown, some elements are thought to be determining factors (such as aging, obesity, inflammation, trauma, joint overuse, metabolic disorders, heredity, and so on). Physical activity, nutrition, and pharmacological therapy have all been used in the treatment of OA. OA most commonly affects the knee, lumbar, cervical, hand, and hip joints, and because of the higher knee's vulnerability to direct (knocked) and indirect (twisted) trauma, as well as the high load sustained by this joint, the knee is the most commonly afflicted and researched joint by OA. As the burden of osteoarthritis has grown, research on OA prevention, therapies, and management has become increasingly important. The American Academy of Orthopaedic Surgeons (AAOS) developed a treatment guideline for knee OA in 2013 to provide recommendations based on evidence-based medicine findings. The OA Research Society International (OARSI) updated their evidence-based, consensus recommendations for treating OA of the hip and knee joints in 2012 (Sun et al., 2019).

People with OA are more likely than the general population to have concomitant chronic diseases, which complicates patient management and professional practice. Individuals and health-care systems alike suffer from the high prevalence of OA, which has a significant influence on quality of life and health-care expenses. When compared to the general population, studies show that patients with OA have a worse quality of life and have two to three times greater yearly health care costs per person (Liu et al., 2020).

Women are more likely than males to develop knee arthritis at any age. When OA affects the knee, these gender differences are particularly noticeable. Women outnumber males in all grades of radiographic severity of OA reported in knee pain. Women have twice the rate of men in those over 65 years old with symptomatic knee osteoarthritis. In one study, female gender was revealed to be a major risk factor for knee OA, with decreased maximum knee internal extension moments during both stair ascent and descent. Female OA patients had a higher peak knee extension moment and more knee flexion, highlighting the gender difference (Protopapadaki et al.,2007).

Knee OA is responsible for more than 80% of the disease's entire burden, affecting at least 19% of American people aged 45 and up. Although substantial data suggests that mechanical loads and inflammation promote joint tissue disintegration, the deeper underlying causes of knee OA's high incidence remain unknown and poorly investigated, hampering efforts to prevent and cure the illness. However, two recent public health trends are often thought to be important causes. First, because the prevalence of knee OA rises with age, it is thought that the rise in life expectancy in the United States since the early twentieth century has resulted in high levels of knee OA among the elderly, with the assumption that as people age, their senescing joint tissues accumulate more wear and tear from loading. Second, obesity has become widespread in recent decades in the United States, and it is a well-known risk factor for knee OA (Wallace et al., 2017).

People with knee osteoarthritis (OA) seek medical help for a variety of reasons, but the causes of pain are complex, and radiographs, which are the gold standard for clinical imaging in OA, are frequently out of sync with symptoms. The significance of the synovium in painful OA has gotten a lot of attention in recent years. Clinical effusions and capsular thickening can be clinically obvious in some joints with knee OA, though



not as florid or widespread as the inflammation seen in rheumatoid arthritis. They are more frequently observed with sensitive techniques such as ultrasonography (US) and MRI<sup>3e10</sup>. Many consider synovial alterations in OA to be a subsequent response to cartilage degradation<sup>11</sup>, but others argue that they are a key driver of OA and may be partially responsible for pain and disease progression (Hall et al, 2014). The menisci play a variety of roles in the knee joint complex, including improving femoro-tibial contact congruity and stability, mechanical shock absorption and loadsharing, facilitating limited rotation via meniscotibial translation, and generating proprioceptive feedback via internal mechanoreceptors. Collagen fibrils are generally orientated in a circumferential pattern to resist tensile hoop stresses during loading, and menisci are made up of about 75% collagen by dry weight. Meniscal mobility, notably outward "extrusion" under stress, is restricted by a network of meniscotibial, meniscofemoral, and peripheral capsular attachments (Coke et al, 2013).

The predicted course of osteoarthritis of the knee is widely variable, with some patients' illness improving, some remaining constant, and others steadily worsening. Osteoarthritis is the most common cause of mobility loss in the elderly. Many people with knee discomfort have functional restrictions that hinder them from doing their regular activities (Mounach et al., 2008). It is linked to specific occupational activities that have previously been linked to knee OA, meniscal tears, and some hereditary and systemic factors that cause knee OA (Seidler et al., 2008). The pathology of OA is multifactorial, and pathologic alterations in the late stages of OA include articular cartilage weakening, ulceration, and localized disintegration; synovial inflammation can also develop (Neogi, 2013). Pain and joint deterioration may be caused by local inflammation in the synovium and cartilage. With capsular stretching and periarticular muscular weakness, osteoarthritis affects all structures within a joint (Williams et al., 2010).

Pain and trouble with functional tasks such as extended sitting, patello-femoral mobility, ascending and descending stairs, walking, squatting, kneeling, rising from sitting or sitting from rising, and getting in and out of a car are reported by patients with knee OA. These constraints eventually result in a loss of functional independence and a lower quality of life (Stratford et al., 2006). The Lithuanian Knee Injury and Osteoarthritis

Outcome Score (KOOS) has been verified and adopted (Mapi research institute 2007). It is a subjective way of determining the functional status and quality of life of the knee joint. Symptoms, stiffness, discomfort, mobility, everyday life and mobility, sports and leisure activities are the five subscales. During stage I (before treatment), stage II (after treatment), and stage III (one month after treatment), the questionnaire was utilized to examine respondents from all participants (Varzaityte et al., 2019).

Knee OA Patients frequently complain of discomfort in specific areas of the knee; medial compartment pain is more common than lateral compartment pain, with an estimated 75% of patients reporting pain in this area (Debi et al., 2009). During walking, the medial compartment of the tibio-femoral joint bears 2.5 times more weight than the other compartments, indicating gait variance. During stair ascent, the knee rotational moment was larger, and during stair descent, it was lower (Protopapadaki et al., 2007).

Osteoarthritis typically affects the knee joint, and it is believed that 10% of adults over the age of 60 have knee osteoarthritis symptoms, resulting in significant pain and physical disability. Exercise therapy has been shown to improve pain and physical function in knee osteoarthritis patients without the usual and often dangerous adverse effects associated with pharmaceutical and surgical treatments. As a result, exercise is recommended in all therapeutic guidelines worldwide and is considered the cornerstone of conservative therapy (Chang et al., 2015).

The cause of OA is uncertain, while the cause of primary osteoarthritis is less clear. Although primary osteoarthritis is linked to the aging process and most commonly affects older people, in the broadest sense, it is an idiopathic condition that affects previously healthy joints with no apparent cause. Osteoarthritis has no known etiology in the majority of cases, and is referred to as primary osteoarthritis (Torres et al., 2006).

The cause of primary or idiopathic OA is unknown. This form of OA is a degenerative disease that is caused by aging but not caused by it. The water content of cartilage reduces as a person ages due to a decrease in proteoglycan content, making the cartilage less stiff. The collagen fibers of cartilage can become prone to disintegration without the protective actions of proteoglycans, accelerating degeneration. Inflammation of the joint

capsule can also occur, though it is usually moderate (compared to that which occurs in rheumatoid arthritis). This can happen when cartilage breakdown products leak into the synovial area and the cells lining the joint try to eliminate them. On the edges of the joints, new bone protrusion called "spurs" or osteophyte development might arise, probably in an attempt to increase the similarity of the articular 11 cartilage surfaces. These changes in the bones, together with the inflammation, can be both painful and fatal (Juhakoski et al., 2008).

People with knee osteoarthritis (OA) seek medical assistance for a number of reasons, but the causes of pain are complex, and radiographs, the gold standard for clinical imaging in OA, are frequently out of sync with symptoms. Many people believe that synovial changes in OA are a reaction to cartilage deterioration, but others believe they are a fundamental cause of OA and may be partially responsible for pain and disease progression (Hall et al., 2014). During the physical examination, the doctor will check for any signs and symptoms that are commonly associated with osteoarthritis. Swelling and soreness in the joints will be looked for by the doctor. The range of motion in the joints is limited, and there is visible joint degeneration (i.e., bony growths). X-rays are frequently used in imaging studies to confirm an osteoarthritis diagnosis. X-rays can reveal osteophytes at joint boundaries, joint space constriction, and subchondral bone sclerosis. Subchondral bone is the layer of bone just beneath the cartilage. While magnetic resonance imaging (MRI) is a more sensitive imaging technology, it is not widely used (Silverwood et al., 2015).

Physiotherapy, particularly exercise, has been used to treat knee osteoarthritis for than a century and is the second most commonly prescribed treatment after oral medication. (McCarthy et al., 2004). Patella mobilization has been demonstrated to reduce pain and increase functional capacity, with results consistent across all pain measurements (Michael et al., 2010).

The prevalence of either knee pain or knee OA is clear from the COPCORD studies completed to date in the Asian region and providing estimates of knee pain or knee OA, especially given that the cohorts are fairly young, usually 15 years or older, with a mean age mostly between 30 and 39 years.<sup>10–24</sup> The COPCORD studies that provide age and

gender-adjusted prevalence estimates show that prevalence rises with age and is higher among women. Due to certain discrepancies in the screening pain questionnaire terminology and survey methods, as well as the often dissimilar age stratifications given, it is difficult to compare prevalence figures amongst the COPCORD studies.

The COPCORD investigations in India, Bangladesh, and Pakistan each gathered data from multiple communities with the goal of detecting rural–urban or affluent–poor inequalities. One set of researchers performed two big surveys in India and published data from these two communities adjusted to the 2001 Indian population census. In this adjusted comparison, the rural (13.7%) community had a considerably greater prevalence of knee discomfort than the urban (6.0%) community (Fransen et al., 2011).

Female gender is also a substantial risk factor for knee OA, according to another study, probably due to muscle strength compensating for mechanical stress. Because men have greater muscle strength than women, muscle strength participation may compensate for the mechanical stress on the joint, minimizing the risk of illness in men. Knee osteoarthritis is one of Bangladesh's most common debilitating disorders, affecting both men and women (Connor, 2007).

Age, female gender, obesity, a history of knee surgery or substantial damage, or having an activity that requires heavy lifting, kneeling, or squatting have all been evaluated as risk factors for knee OA in Caucasian populations living in high-income countries. 4,35 In Asia's poor and middle-income countries, epidemiological research on chronic musculoskeletal diseases has been limited. While some risk factor findings from high-income nations can be extrapolated to low- and middle-income countries, there are likely to be significant demographic and environmental variables influencing the start and course of OA in these locations. The probable lower, though increasing, prevalence of obesity, higher proportion of the population in occupations requiring heavy physical labor, squatting, kneeling, and climbing, less access to healthcare and social welfare services, cultural variation in pain perception, and linguistic variation in pain definition and classification are all cultural differences of particular importance. 36, 37 the recent creation of a questionnaire identifying risk factor profiles particular to the Asia-Pacific area was prompted by the recognition of possible demographic and environmental

differences. 38 Religious activities (prayer and other sitting religious worships); squatting; length of heavy physical activity; kind of toilet; and sitting on the floor are all included in the proposed questionnaire (criss-cross, lotus or applesauce, for home activities).

An analysis of the ROAD research, conducted in Japan 40, found that professions requiring more than 2 hours of squatting or kneeling per day were linked to a two-fold increased incidence of moderate to severe radiographic knee OA (Kellgren Lawrence grade 3). Prolonged squatting at 25 years of age (> 1 hour per day) was a prevalent practice and was found to be a substantial risk factor for OA of the tibio-femoral joint of the knee in a cohort study conducted among adults aged 60 years or older in Beijing<sup>25</sup>. 40 In this study, persons who reported squatting for more than 3 hours per day had double the risk of tibio-femoral OA as those who reported squatting for less than 30 minutes per day. The researchers found that prolonged squatting was responsible for a significant percentage of the difference in knee OA prevalence between Chinese participants in Beijing and White subjects in the Framingham OA cohort (Fransen et al., 2011).

According to other research, the prevalence of radiographic knee OA in individuals 60 and older in the United States is 42.1 percent in women and 31.2 percent in men. The prevalence of radiographic knee OA in Japanese patients 60-69 years old is 57.1 percent in women and 35.2 percent in men. This is not surprising given that girls are more likely than males to have knee OA and functional limitations. Weight-bearing joints, such as the knees and hips, are particularly vulnerable to OA. Pain, stiffness, and a reduction in range of motion eventually result in a loss of functional independence in daily tasks such as rising from a chair, climbing stairs, squatting, and walking (Debi et al., 2009).

### **3.1 Study Design**

A cross-sectional study design was used for the study.

### **3.2 Study site**

The selected study area was conducted in Musculoskeletal Unit of Physiotherapy Department at the Center for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka. It is the only specialized rehabilitation Centre in Bangladesh. It is a 100 bedded hospital situated in Savar, Dhaka. Founded in 1979, in response to desperate need for services with spinal cord lesion, the Centre for the rehabilitation of the paralyzed (CRP) has evolved into an internationally recognized organization. It focuses on a holistic approach to rehabilitation, recognizing that all aspects of the rehabilitation process are vital for its success including physical rehabilitation, psychological rehabilitation, and economic rehabilitation and planned discharge. Patients come from around the country through referral by different health facilities, health professionals and personal contacts.

### **3.3 Study Population**

A population refers to the entire group of people or subjects that meet the criteria set by the researcher. The study population was knee Osteoarthritis patients who were attending at CRP for treatment.

### **3.4 Sampling technique**

Sample was taken by using convenience sampling technique.

### **3.5 Sample size**

Sampling procedure for cross sectional study done by following equation-

$$n = \frac{Z^2 Pq}{d^2}$$

Where

d is the desired level of precision (i.e. the margin of error).

p is the (estimated) proportion of population which has the attribute in question.

If  $p = 0.5$  now let's say we want 95% confidence, and at least 5% plus or minus precision.

A 95% confidence level gives us Z values of 1.96, per the normal tables, so we get,

Sample size:

$$\begin{aligned} n &= \frac{Z^2 Pq}{d^2} \\ n &= \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2} \\ &= 384.16 \\ &= 384 \end{aligned}$$

The actual sample size for this study was calculated as 384. But number of sample was selected 115 maintaining the inclusion and exclusion criteria and within the scarcity of time.

### **3.6 Inclusion Criteria**

1. Patients with knee osteoarthritis who were attending in CRP for treatment.
2. Both male and female were included.
3. Age:  $\geq 30$  years old.

### **3.7 Exclusion Criteria**

1. Mentally retarded.
2. Person who were not interested to attend the program at the time of data collection.
3. Non co-operative patients.

### **3.8 Data collection procedure**

Data was collected by using English and Bangla version questionnaire through face-to-face interview of the participant.

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. The data collection procedure had been performed after taking the consent of the participants. The researcher collected data from both male and female through individual interviewing. 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.

### **3.9 Measurement tool**

Knee and Osteoarthritis Outcome Score (KOOS).

#### **KOOS Scale:**

The Knee Injury and Osteoarthritis Outcome Score (KOOS) is a questionnaire designed to assess short and long-term patient-relevant outcomes following knee injury. The KOOS is self-administered and assesses five outcomes: pain, symptoms, activities of daily living, sport and recreation function, and knee-related quality of life. The KOOS meets basic criteria of outcome measures and can be used to evaluate the course of knee injury and treatment outcome. The KOOS's five patient-relevant dimensions are scored separately: Pain (nine items); Symptoms (seven items); ADL Function (17 items); Sport



and Recreation Function (five items); Quality of Life (four items). A Likert scale is used and all items have five possible answer options scored from 0 (No problems) to 4 (Extreme problems) and each of the five scores is calculated as the sum of the items included.

### **3.10 Data collection tools**

- Data collection form.
- Consent form.
- Structured questionnaire (Both open ended and close ended questionnaire)
- Pen
- Pencil
- Eraser
- Notebook
- Paper
- Clip board

### **3.11 Data analysis procedure**

Data was analyzed through Statistical package of Social Science (SPSS) Version 25, Microsoft Office Excel 2019, Microsoft Office word. A descriptive and inferential statistical analysis was conducted. The statistical decision was took place according to the nature of the data, objective and expert opinion.

### **3.12 Questionnaire**

The questionnaire was developed under the advice and permission of the supervisor following certain guidelines structured questionnaire (Both open ended and close-ended questionnaire) are used for data collection.

### **3.13 Inform consent**

Written consent was taken from all participants to the completion of the questionnaire. The participants, who were interested to participate in the study, were informed verbally about the topic and purpose of study. They were also informed that each interview can take 10-15 minutes for every participant. The researcher maintained privacy and confidentiality. Written consent was given to all participants. The researcher explained about the detail of research questions and about his or her role in this study. The researcher received a written consent form every participants including signature of participants and career. Participants were assured that they could understand about the consent form and their participation was on voluntary basis. The participants were informed clearly that their information would be kept confidential. Participants were assured that the study would not be harmful for them. The researcher gave the full privacy of participants related information. The participants have the right to withdraw consent and discontinue participants at any time without prejudice. Parents or legal guidance was needed during data collection procedure if minor participants (aged <18 years) were interviewed.

### **3.14 Ethical consideration**

The Research proposal was submitted for approval to the Institutional Review Board of Bangladesh Health Professions Institute (BHPI). Bangladesh Medical Research Council (BMRC) and World Health Organization (WHO) guidelines were also followed. Again before data collection, permission had been taken from the Head of the Physiotherapy Department. Informed consent was taken from all participants. Participants' rights and privileges was ensured. All the participants was informed about the aim and objectives of the study. Maximum confidentiality of data was ensured. No harmful act was taken and the participant can withdraw themselves at any time.

All relevant information was analyzed by SPSS v.25 software. Data was presented by using the bar graph, pie chart and table.

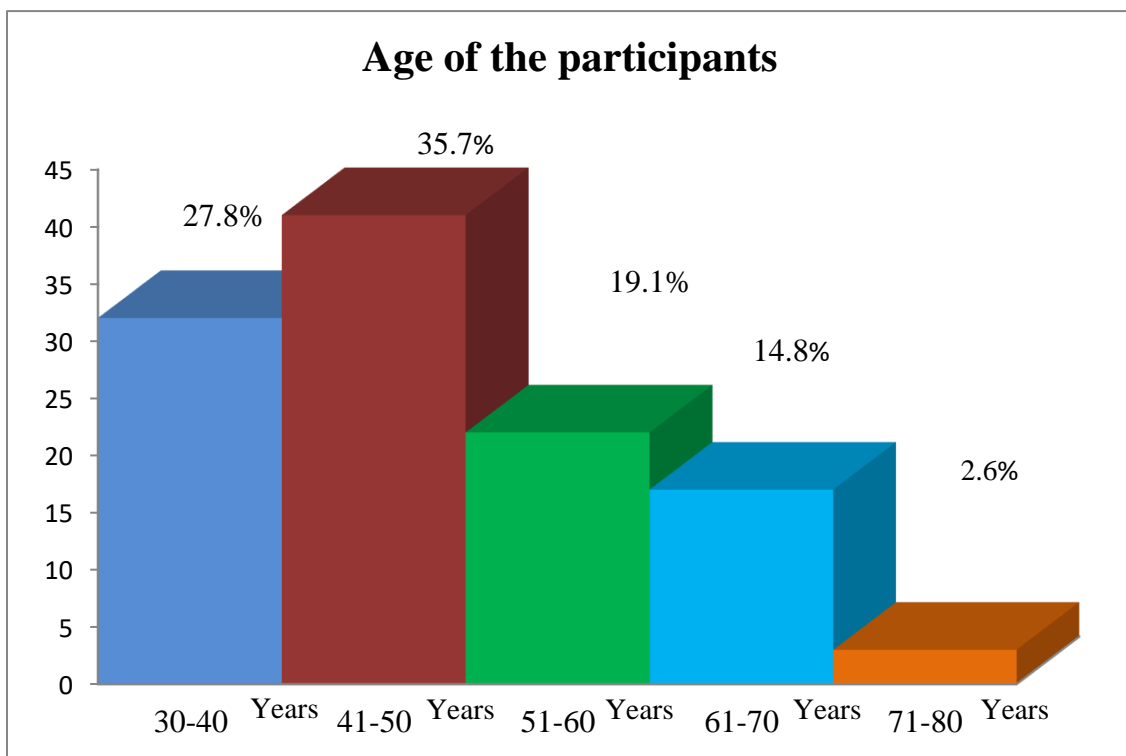
#### 4.1 Table -1: Socio-demographic Information

	Patients(n)	Percentage(%)
<b>Age in category</b>		
30-40 years	32	27.8
41-50 years	41	35.7
51-60 years	22	19.1
61-70 years	17	14.8
71-80 years	3	2.6
<b>Sex</b>		
Male	54	47
Female	61	53
<b>Occupation</b>		
Farmer	5	4.3
Day laborer	8	7
Service holder	18	15.7
Garment /Factory worker	7	6.1
Driver	4	3.5
Businessmen	14	12.2
Unemployed	2	1.7
Housewife	56	48.7
Student	1	0.9
<b>Marital Status</b>		
Unmarried	6	5.2
Married	102	88.7
Widow	7	6.1

<b>Family type</b>		
Nuclear Family	80	69.6
Extended Family	35	30.4
<b>Living area</b>		
Rural	62	53.9
Urban	53	46.1
<b>Education</b>		
Illiterate	8	7.0
Can sign	26	22.6
Primary	17	14.8
Secondary	40	34.8
Higher Secondary	11	9.6
Graduate	6	5.2
Post graduate	7	6.1
<b>Family Monthly income</b>		
<b>Category</b>	40	34.8
5000-10000	26	22.6
10001-20000	49	42.6
>20000		
<b>History of co-morbidity</b>		
Yes	72	62.6
No	43	37.4
<b>Number of co-morbidity</b>		
No	43	37.4
Single	16	13.9
Multiple	56	48.7

### 4.1.1 Age of the participants

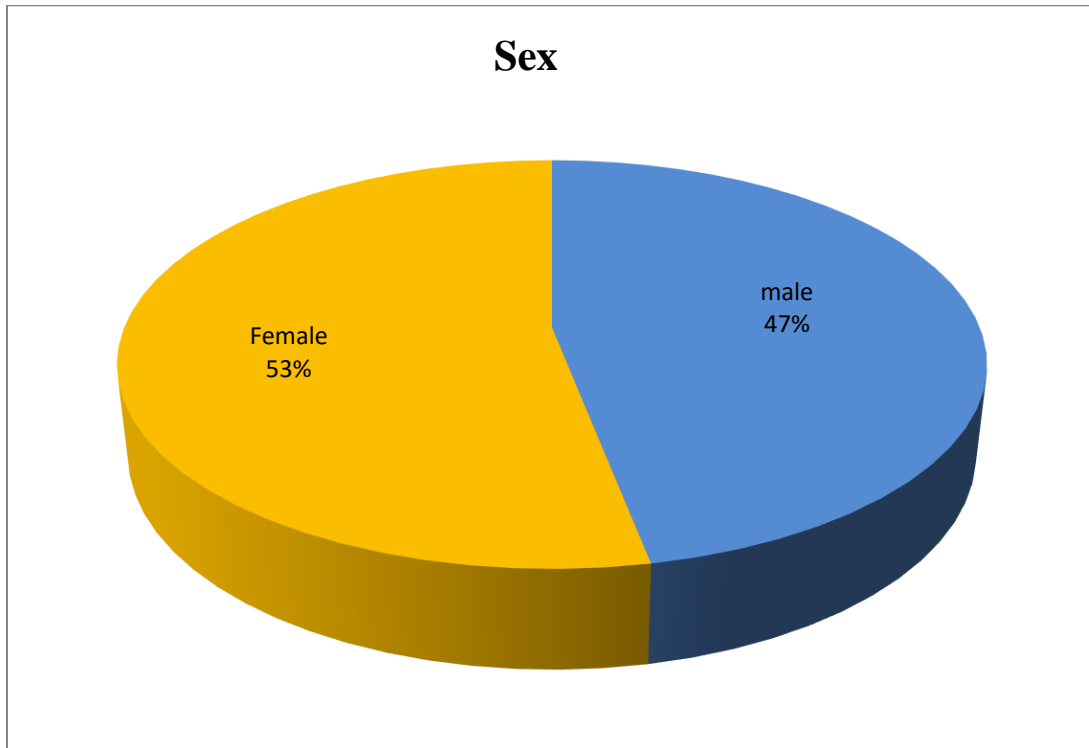
115 patients was participant in this study. In the case of age the most participants was attended from 41-50 age group 35.7% (n=41). Among 115 of the participants 27.8%(n=32) participants were in 30-40 age group,19.1%(n=22) participants were in 51-60 age group,14.8%(n=17) participants were in 61-70 age group,2.6%(n=3) participants were in 71-80 age group. The Mean  $\pm$  SD was 49.22 $\pm$ 11.610.



**Figure 1: Age of the participants**

#### 4.1.2 Sex of the participants

Among 115 participants, the most participants were female. Data showed 53.0%(n=61) was female and 47%(n=54) was male.



**Figure 2: Sex of the participants**

### 4.1.3 Occupation

In this case of educational level of the participants 4.3%(n=5) were farmer,7.0%(n=8) were day laborer,15.7%(n=18) were service holder,6.1%(n=7) were garments worker,3.5%(n=4) were driver,12.2%(n=14) were businessman, 1.7%(n=2) were unemployed, 48.7%(n=56) were housewife, 0.9%(n=1) were students.

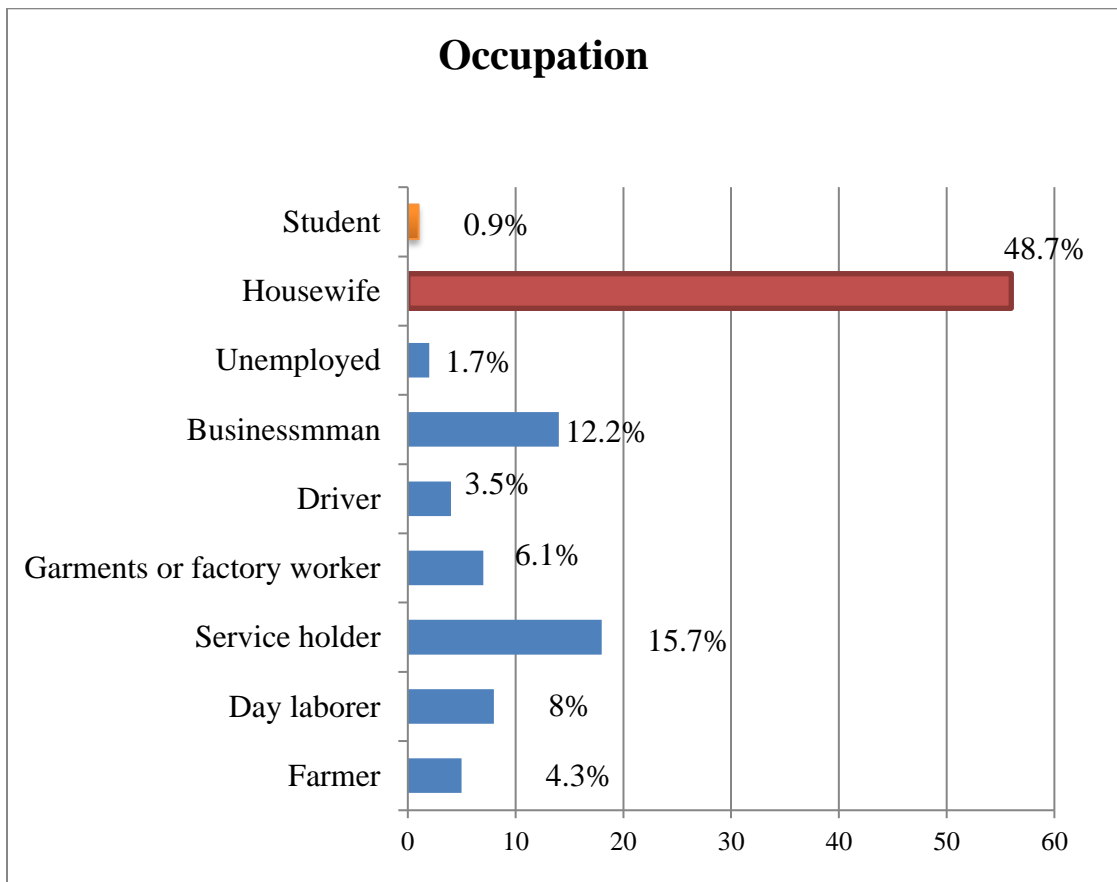
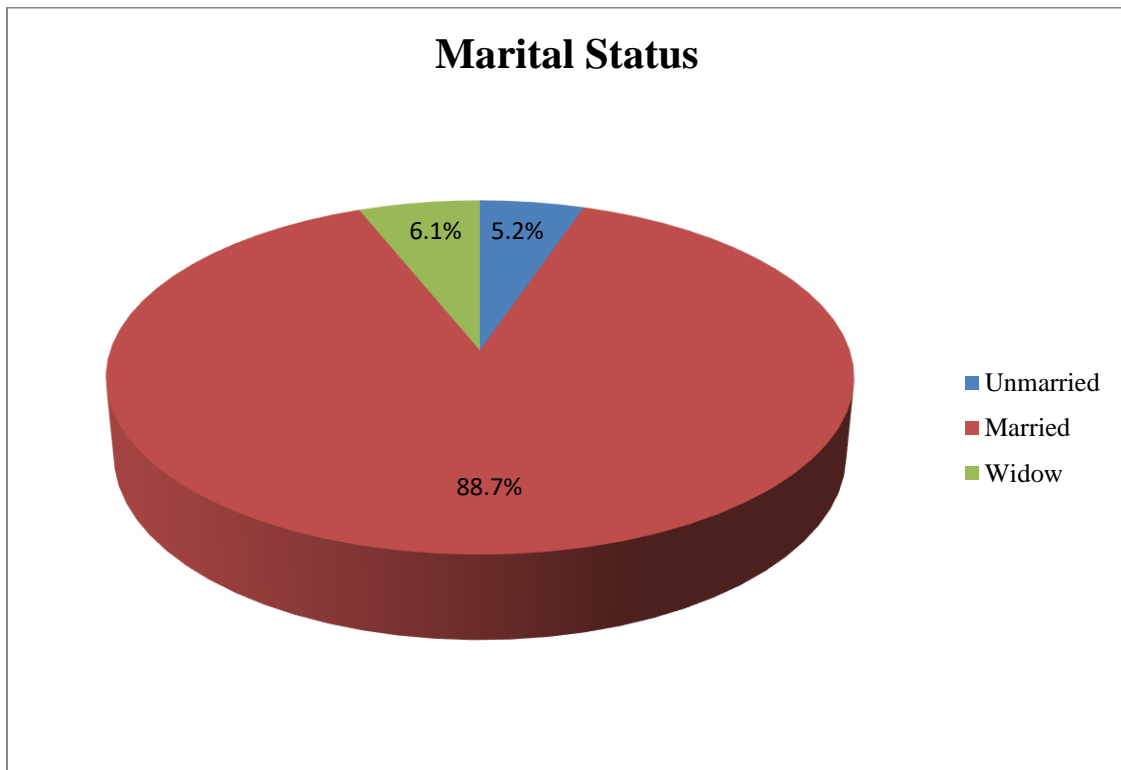


Figure 3: Occupation of the participants

#### 4.1.4 Marital status

Among 115 participants, most participants were married. Data showed that 88.7%(n=102) were married, 5.2%(n=6) were unmarried, 6.1%(n=7) were widow.

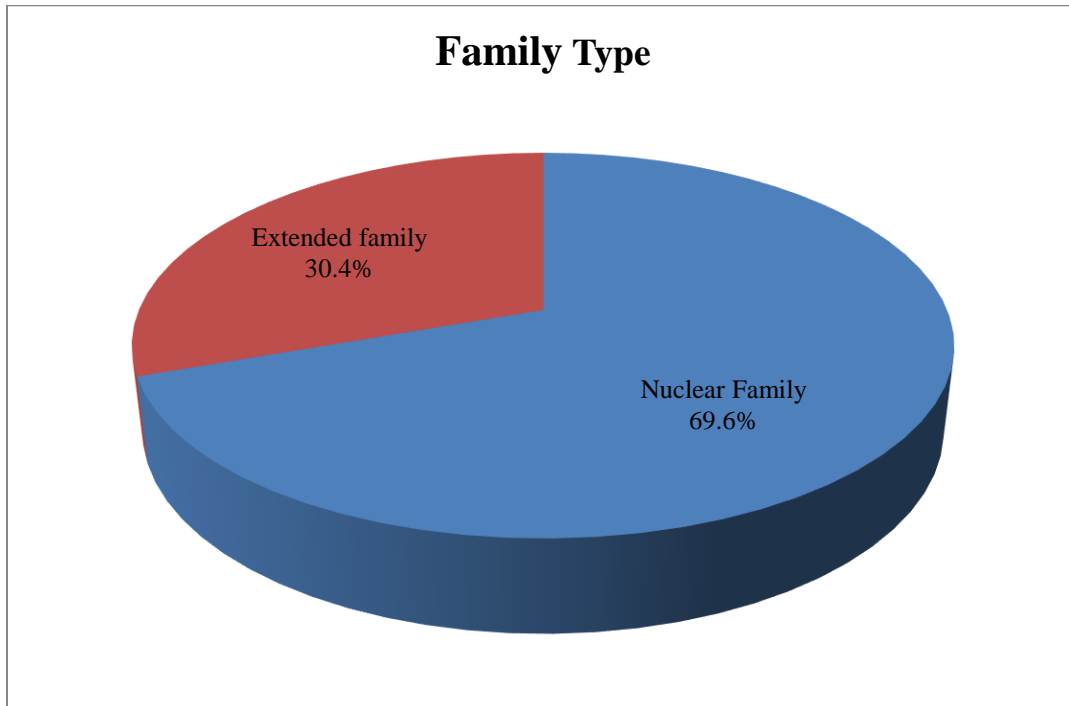


**Figure 4: Marital status of the participants**



#### 4.1.5 Family type

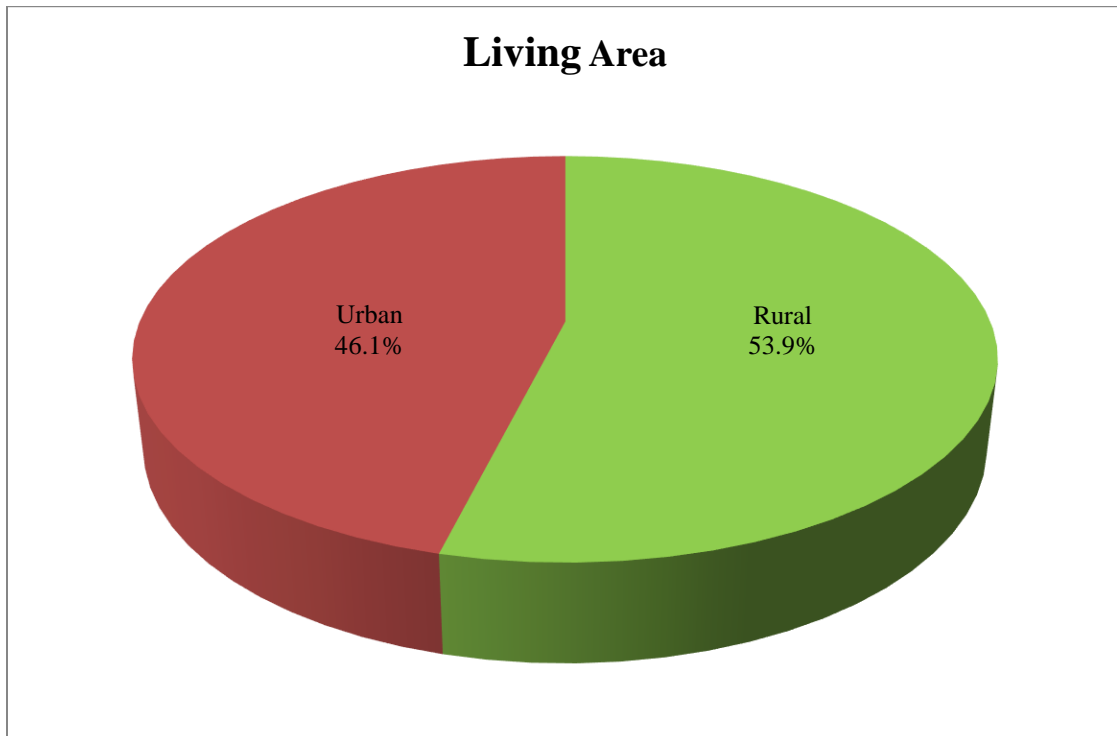
Among 115 participants, most participants were nuclear family. Data showed that 69.6%(n=80) were nuclear family, 30.4%(n=35) were extended family.



**Figure 5: Family type of the participants**

#### 4.1.6 Living area

Among 115 participants 53.9% (n=62) lived in rural areas, 46.1% (n=53) lived in urban areas.



**Figure 6: Living area of the participants**

#### 4.1.7 Educational qualification

In this case of educational level of the participants 7%(n=8) participants were illiterate, 22.6%(n=26) can sign,14.8%(n=17) participants had primary education, 34.8%(n=40) participants got secondary education,9.6%(n=11) were higher secondary education, 5.2%(n=6) were graduated,6.1%(n=7) were post graduated.

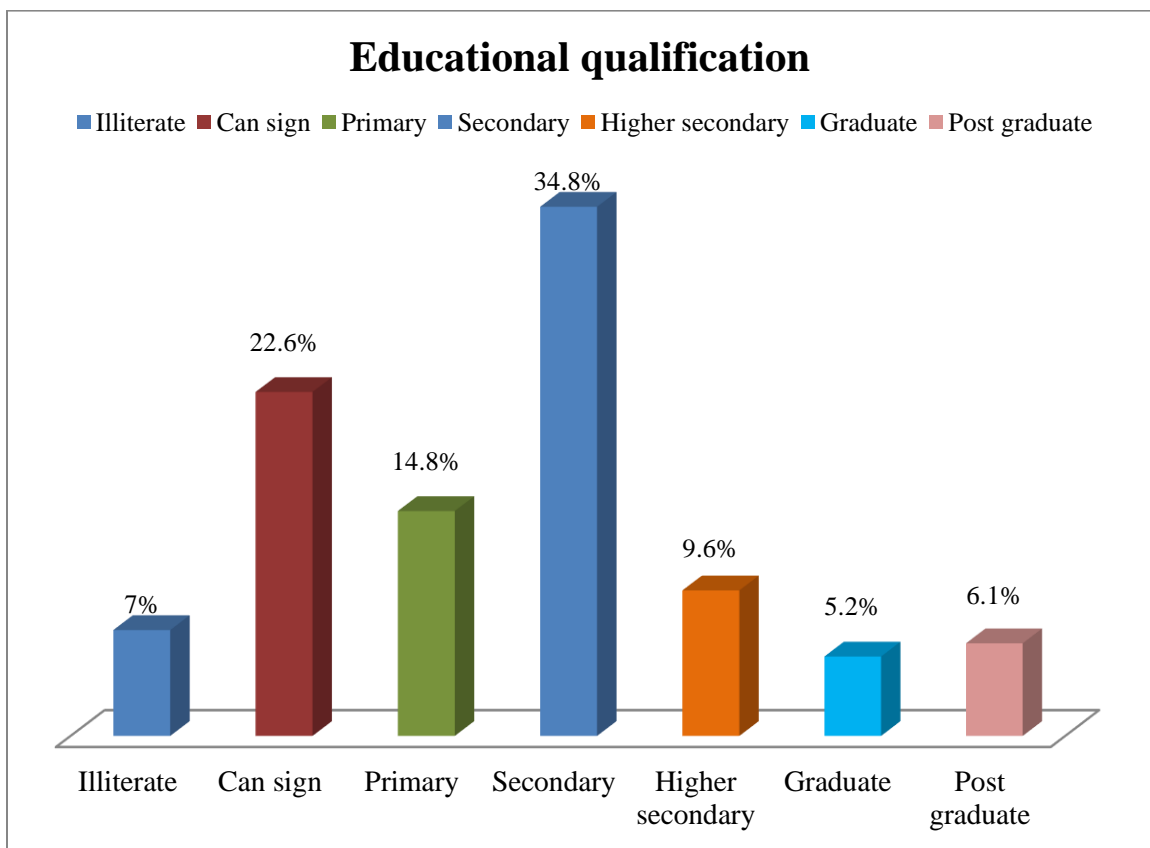
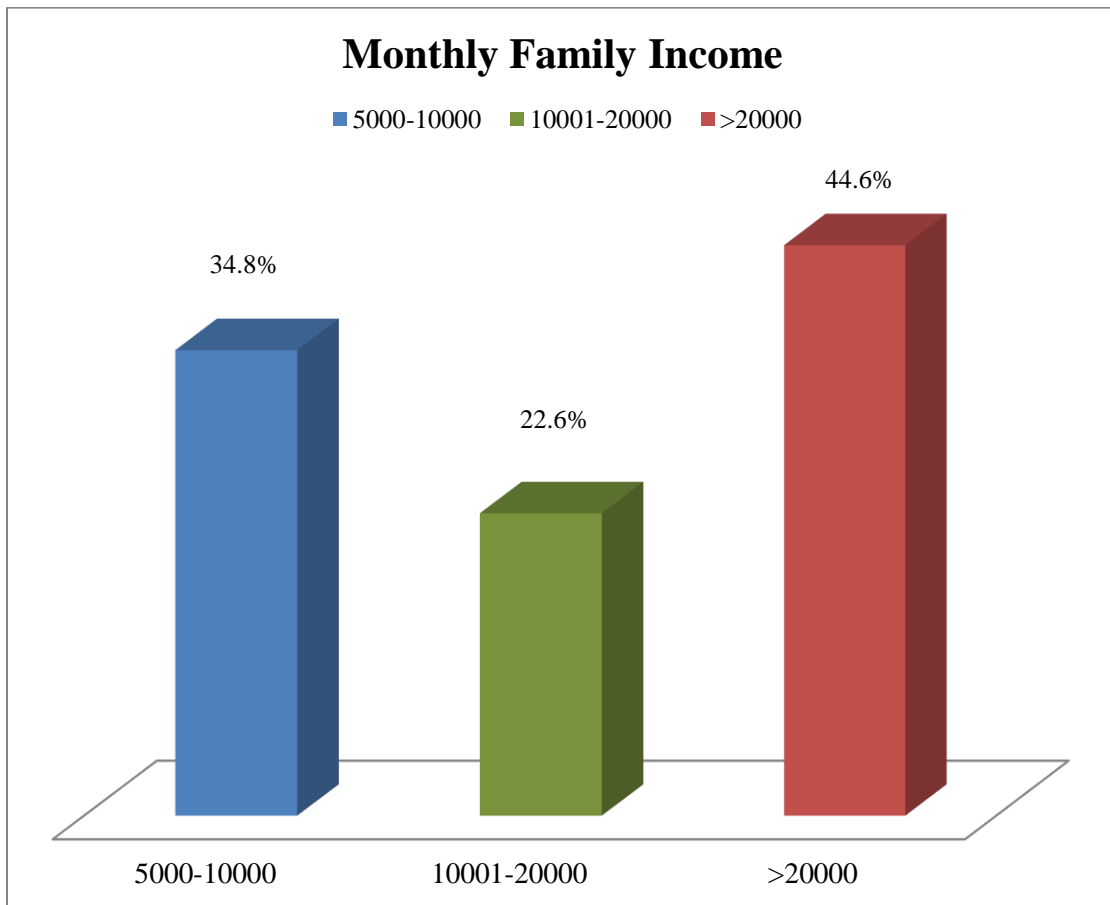


Figure 7: Educational level of the participants

#### 4.1.8 Monthly family income

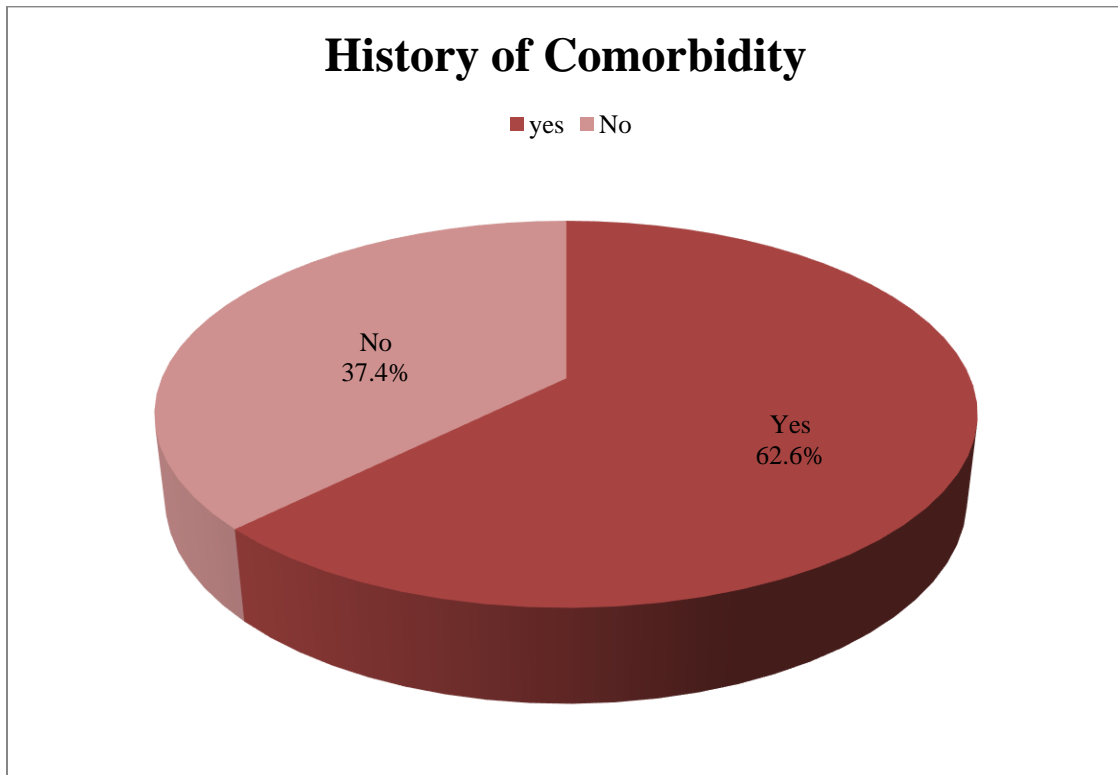
In this case of monthly family income, 5,000-10,000 range family income was 34.8%(n=40),10001-20000 range family income was 22.6%(n=26), More than 20000 range family income was 42.6%(n=49). Mean  $\pm$  SD was 23056.52 $\pm$ 15602.767.



**Figure 8: Monthly family income of the participants**

#### 4.1.9 History of co-morbidity

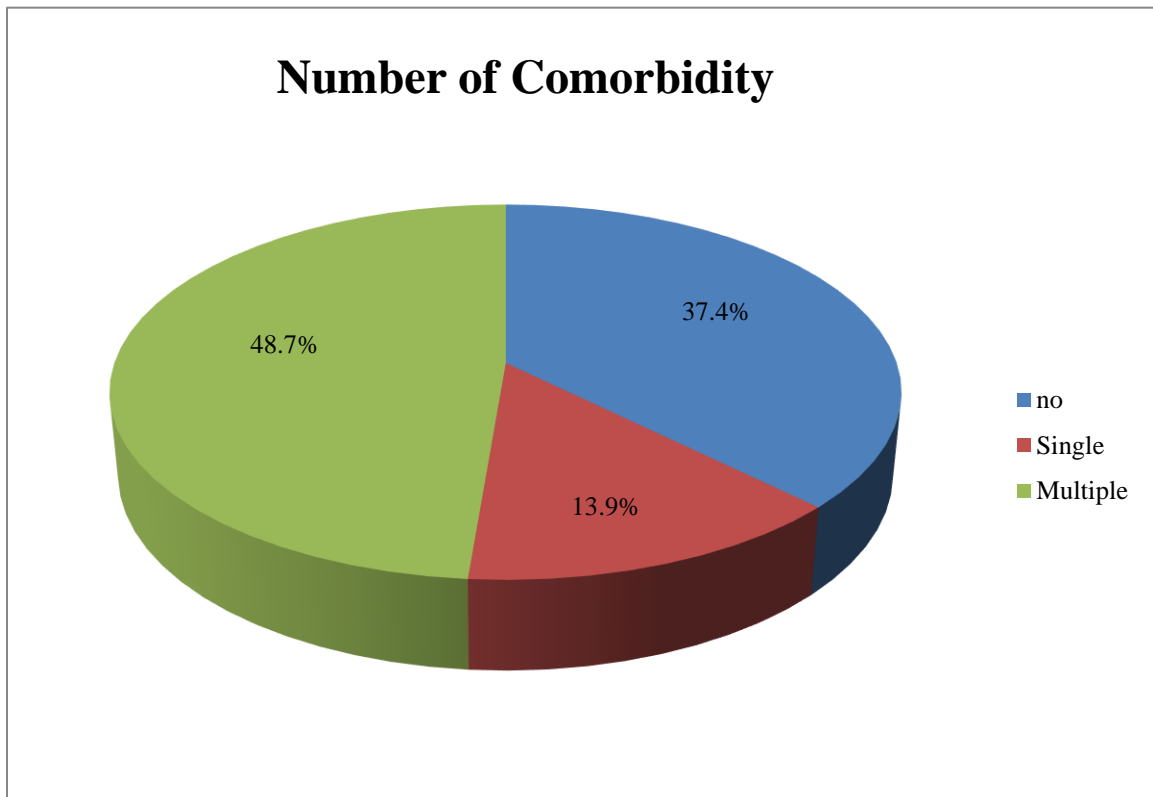
Among 115 participants, most participants had history of co-morbidity. Data showed that 62.6%(n=72) had history of co-morbidity,37.4%(n=43) had no history of co-morbidity.



**Figure 9: History of co-morbidity of the participants**

#### 4.1.10 Number of co-morbidity

Among 115 participants, most participants had multiple number of co-morbidity. Data showed that 48.7%(n=56) had multiple number of co-morbidity ,13.9%(n=16) had single number of co-morbidity, 37.4%(n=43) had no number of co-morbidity.



**Figure 10: Number of co-morbidity of the participants**

**4.2 Table -2: Different variables(Frequency & Percentage)**

<b>Stiffness</b>					
	<b>None n(%)</b>	<b>Mild n(%)</b>	<b>Moderate n(%)</b>	<b>Severe n(%)</b>	<b>Extreme n(%)</b>
How severe is your knee joint stiffness after first wakening in the morning?	4(3.5)	42(36.5)	46(40)	20(17.4)	3(2.6)
How severe is your knee stiffness after sitting, lying or resting later in the day?	3(2.6)	49(42.6)	44(38.3)	18(15.7)	1(0.9)
<b>Pain</b>					
Twisting/pivoting on your knee	18(15.7)	41(35.7)	45(39.1)	7(6.1)	4(3.5)
Straightening knee fully	7(6.1)	16(13.9)	65(56.5)	24(20.9)	3(2.6)
Bending knee fully	3(2.6)	9(7.8)	60(52.2)	30(26.1)	13(11.3)
Walking on flat surface	11(9.6)	81(70.4)	21(18.3)	2(1.7)	
Going up or down stairs		7(6.1)	33(28.7)	62(53.9)	13(11.3)
At night while in bed	24(20.9)	56(48.7)	25(21.7)	5(4.3)	5(4.3)
Sitting or lying	21(18.3)	21(18.3)	31(27.0)	15(13.0)	
Standing upright	9(7.8)	72(62.6)	30(26.1)	2(1.7)	2(1.7)
<b>Function, daily living</b>					
Descending stairs	1(0.9)	7(6.1)	26(22.6)	66(57.4)	15(13.0)
Ascending stairs		4(3.5)	26(22.6)	65(56.5)	20(17.4)
Rising from sitting	2(1.7)	29(25.2)	39(33.9)	41(35.7)	4(3.5)
Standing	13(11.3)	64(55.7)	33(28.7)	5(4.3)	

Bending to floor/pick up an object	1(0.9)	10(8.7)	68(59.1)	28(24.3)	8(7.0)
Walking on flat surface	12(10.4)	86(74.8)	16(13.9)	1(0.9)	
Getting in/out of car	2(1.7)	12(10.4)	42(36.5)	51(44.3)	8(7.0)
Going shopping	5(4.3)	18(15.7)	47(40.9)	39(33.9)	6(5.2)
Putting on socks/stockings	9(7.8)	32(27.8)	41(35.7)	24(20.9)	9(7.8)
Rising from bed	8(7.0)	47(40.9)	39(33.9)	21(18.3)	
Taking off socks/stockings	10(8.7)	33(28.7)	47(40.9)	17(14.8)	8(7.0)
Lying in bed (turning over, maintaining knee position)	27(23.5)	10(60.9)	13(11.3)	5(4.3)	
Getting in/out of bath	26(22.6)	68(59.1)	17(14.8)	4(3.5)	
Sitting	8(7.0)	40(34.8)	46(40.0)	21(18.30)	
Getting on/off toilet		16(13.9)	20(17.4)	58(50.4)	21(18.3)
Heavy domestic duties (moving heavy boxes, scrubbing floors, etc)	1(0.9)	1(0.9)	40(34.8)	45(39.1)	20(17.4)
Light domestic duties (cooking, dusting, etc)	4(3.5)	69(60.0)	30(26.1)	10(8.7)	2(1.7)
<b>Function, sports and recreational activities</b>					
Squatting	2(1.7)	3(2.6)	21(18.3)	56(48.7)	33(28.7)
Running		3(2.6)	8(7)	62(53.9)	42(36.5)
Jumping	2(1.7)	1(0.9)	12(10.4)	61(53.0)	39(33.9)
Twisting/pivoting on your injured knee	16(13.9)	38(33.0)	40(34.8)	14(12.2)	7(6.1)
Kneeling		7(6.1)	28(24.3)	51(44.3)	29(25.2)



<b>Quality of Life</b>					
Have you modified your life style to avoid		37(32.2)	54(47.0)	16(13.9)	8(7.0)
How much are you troubled with lack of confidence in your knee?		1(0.9)	17(14.8)	55(47.8)	36(31.3)
In general, how much difficulty do you have with your knee?		5(4.3)	58(50.4)	41(35.7)	11(9.6)

<b>Symptoms during the last weeks</b>					
	<b>Never n(%)</b>	<b>Rarely n(%)</b>	<b>Sometimes n(%)</b>	<b>Often n(%)</b>	<b>Always n(%)</b>
Do you have swelling in your knee?	27(23.5)	26(22.6)	38(33.0)	21(18.3)	3(2.6)
Do you feel grinding, hear clicking or any other type of noise when your knee moves?	10(8.7)	27(23.5)	44(38.3)	22(19.1)	12(10.4)
Does your knee catch or hang up when moving?	22(19.1)	36(31.3)	29(25.2)	17(14.8)	
Can you straighten your knee fully?	4(3.5)	4(3.5)	24(20.9)	46(40.0)	37(32.2)
Can you bend your knee fully?	4(3.5)	16(13.9)	23(20.0)	40(34.8)	32(27.8)

#### 4.2.1 Pain during straightening knee fully

Among the 115 participants 6.1% (n=7) patients felt no pain, 13.9% (n=16) felt mild pain, 56.5% (n=65) felt moderate pain, 20.9% (n=24) felt severe pain and 2.6% (n=3) felt extreme pain during straightening knee fully.

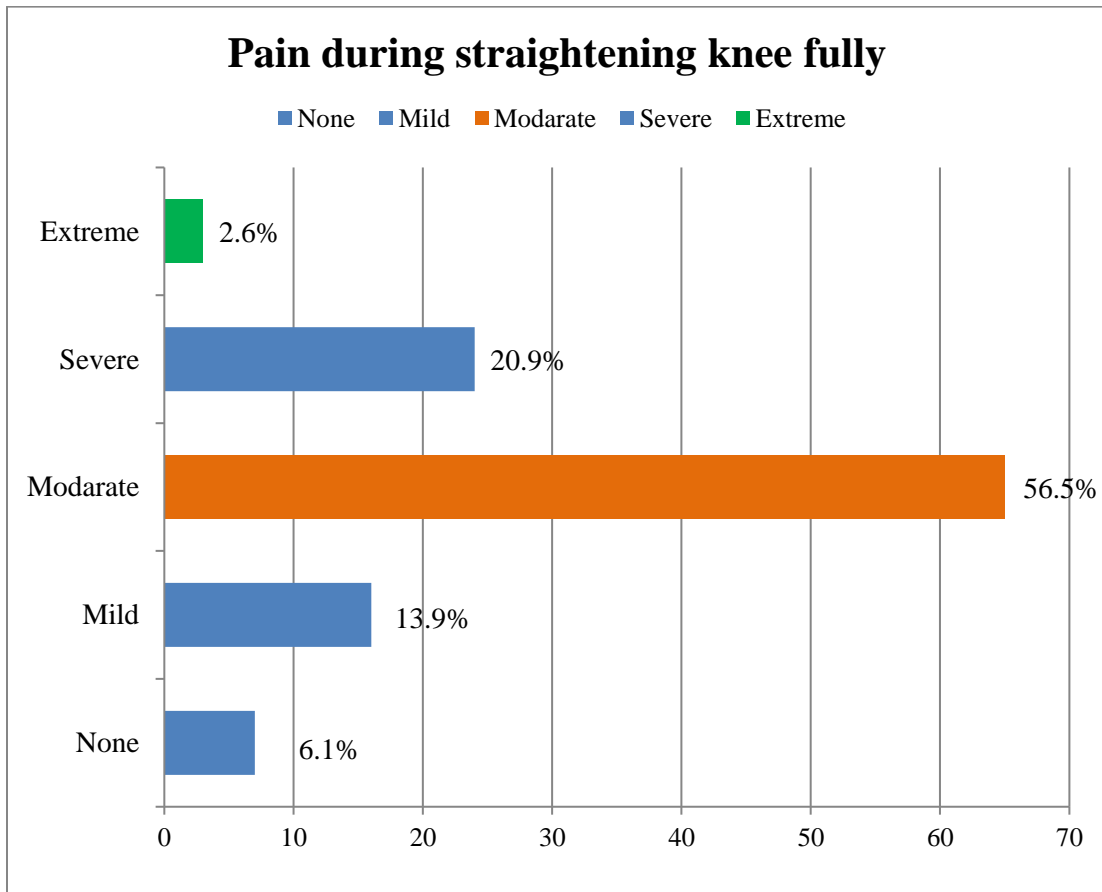
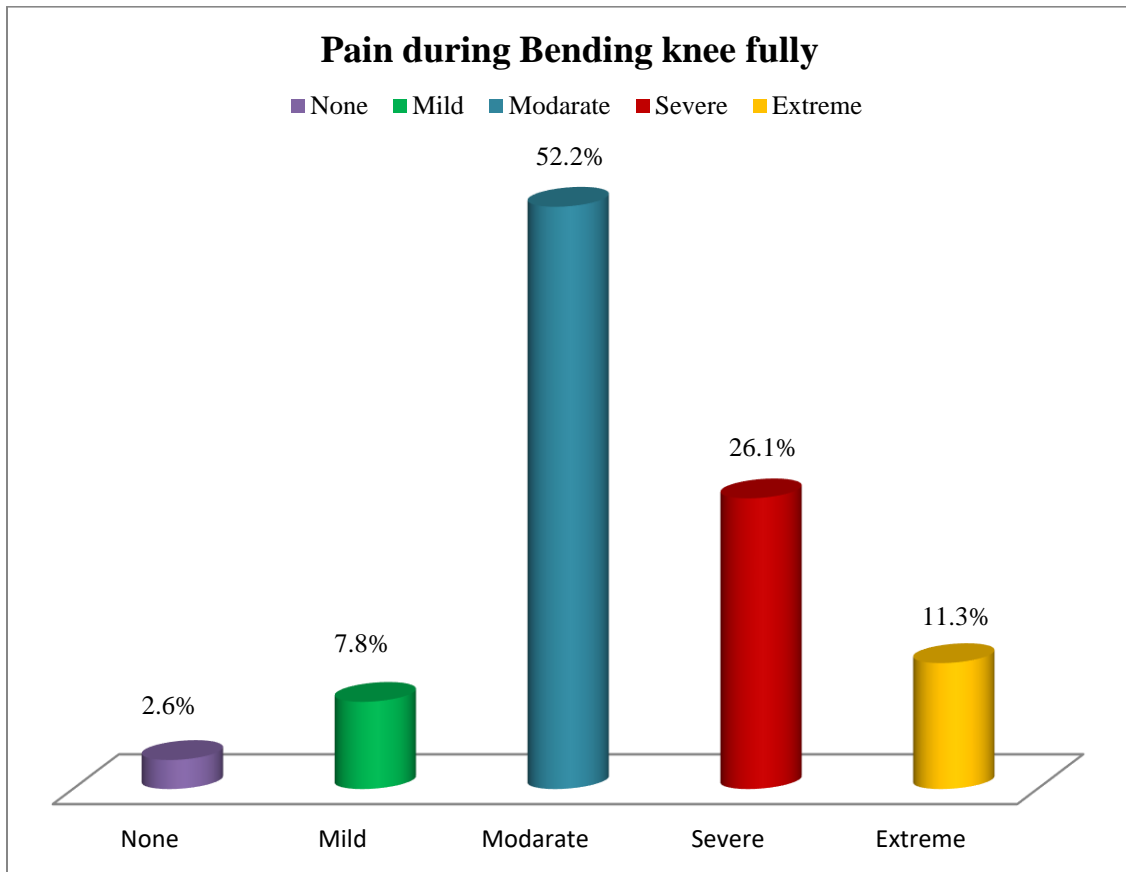


Figure 11: Pain during straightening knee fully

#### 4.2.2 Pain during Bending knee fully

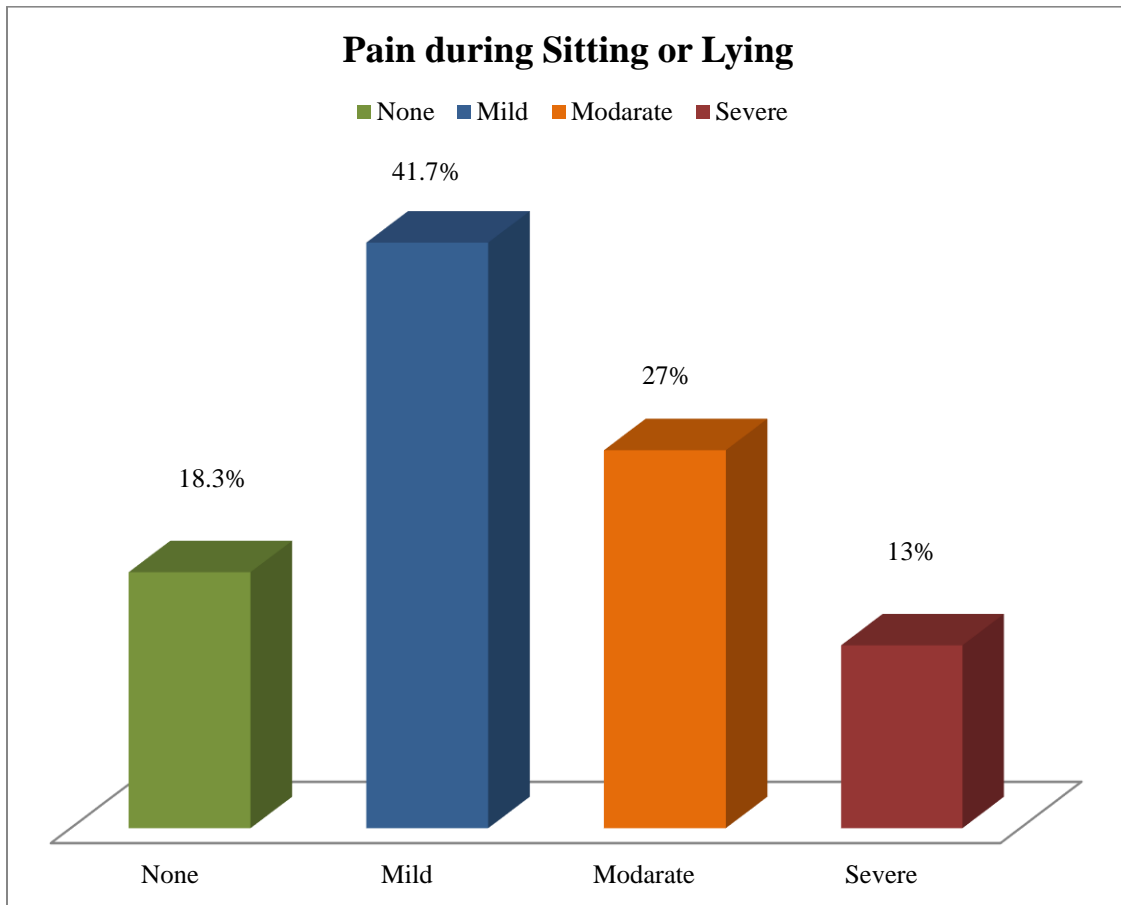
Among the 115 participants 2.6%(n=3) patients felt no pain, 7.8%(n=9) felt mild pain, 52.2% (n=60) felt moderate pain, 26.1%(n=30) felt severe pain and 11.3%(n=13) felt extreme pain during bending knee fully.



**Figure 12: Pain during Bending knee fully**

### 4.2.3 Pain during Sitting or Lying

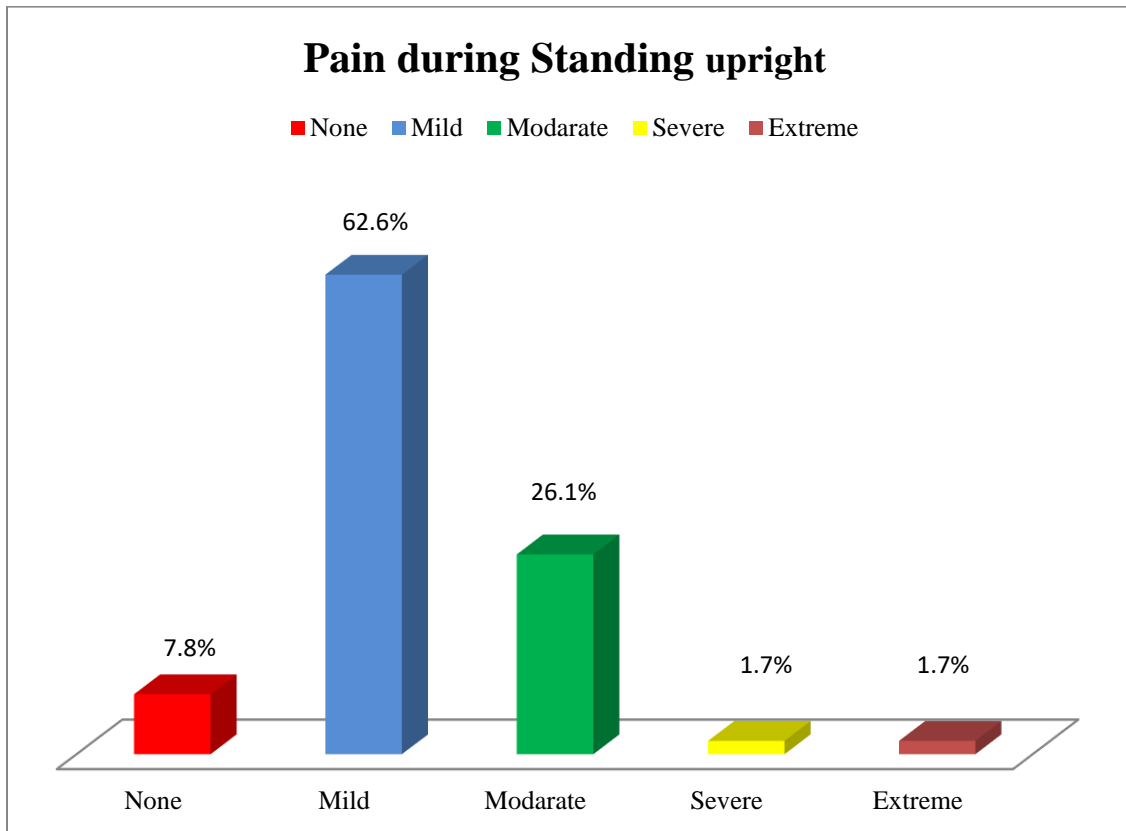
Among the 115 participants 18.3%(n=21) patients felt no pain, 41.7%(n=48) felt mild pain, 27.0% (n=31) felt moderate pain, 13.0%(n=15) felt severe pain during sitting or lying.



**Figure 13: Pain during Sitting or Lying**

#### 4.2.4 Pain during Standing upright

Among the 115 participants 7.8%(n=9) patients felt no pain, 62.6%(n=72) felt mild pain, 26.1% (n=30) felt moderate pain, 1.7%(n=2) felt severe pain and 1.7%(n=2) felt extreme pain during standing upright.



**Figure 14: Pain during Standing upright**

#### 4.2.5 Difficulty of functional and daily living activities:

##### 4.2.6 Descending stairs

Among the 115 participants 0.9%(n=1) patients felt no difficulty, 6.1%(n=7) felt mild difficulty, 22.6% (n=26) felt moderate difficulty, 57.4%(n=66) felt severe difficulty and 13.0%(n=15) felt extreme difficulty during descending stairs.

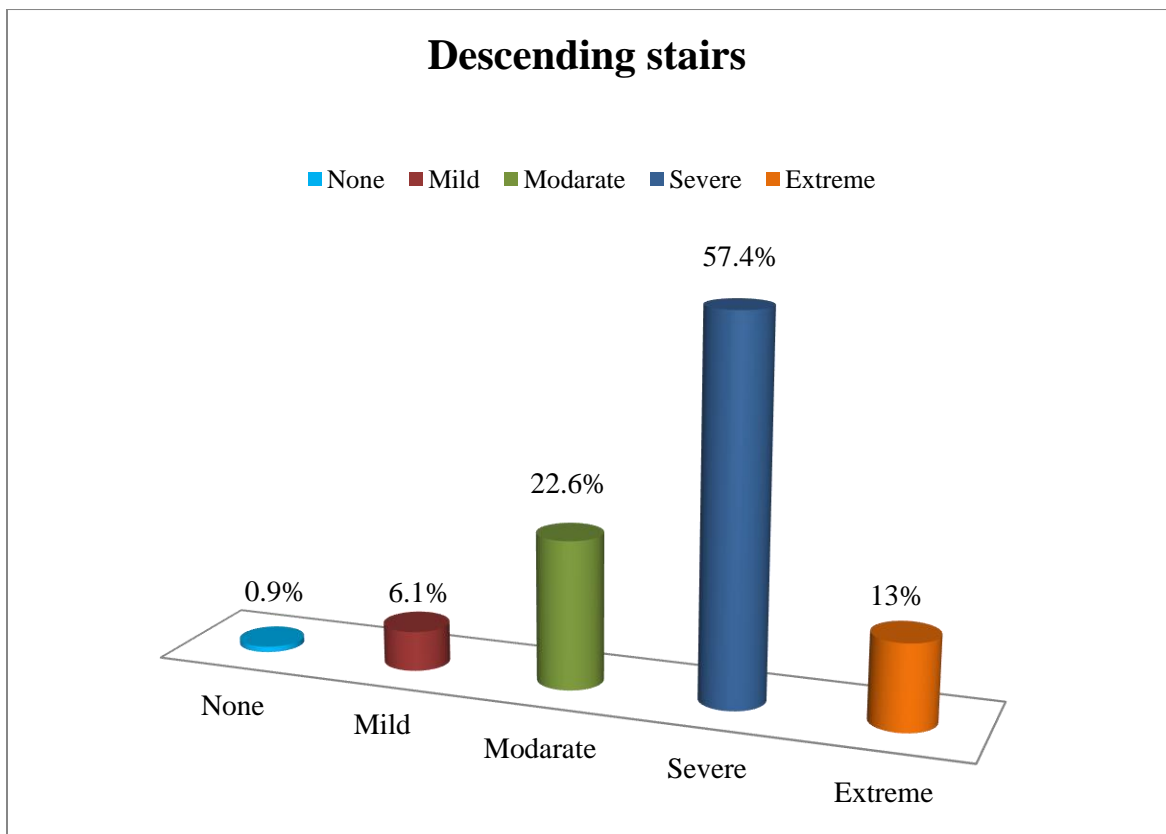
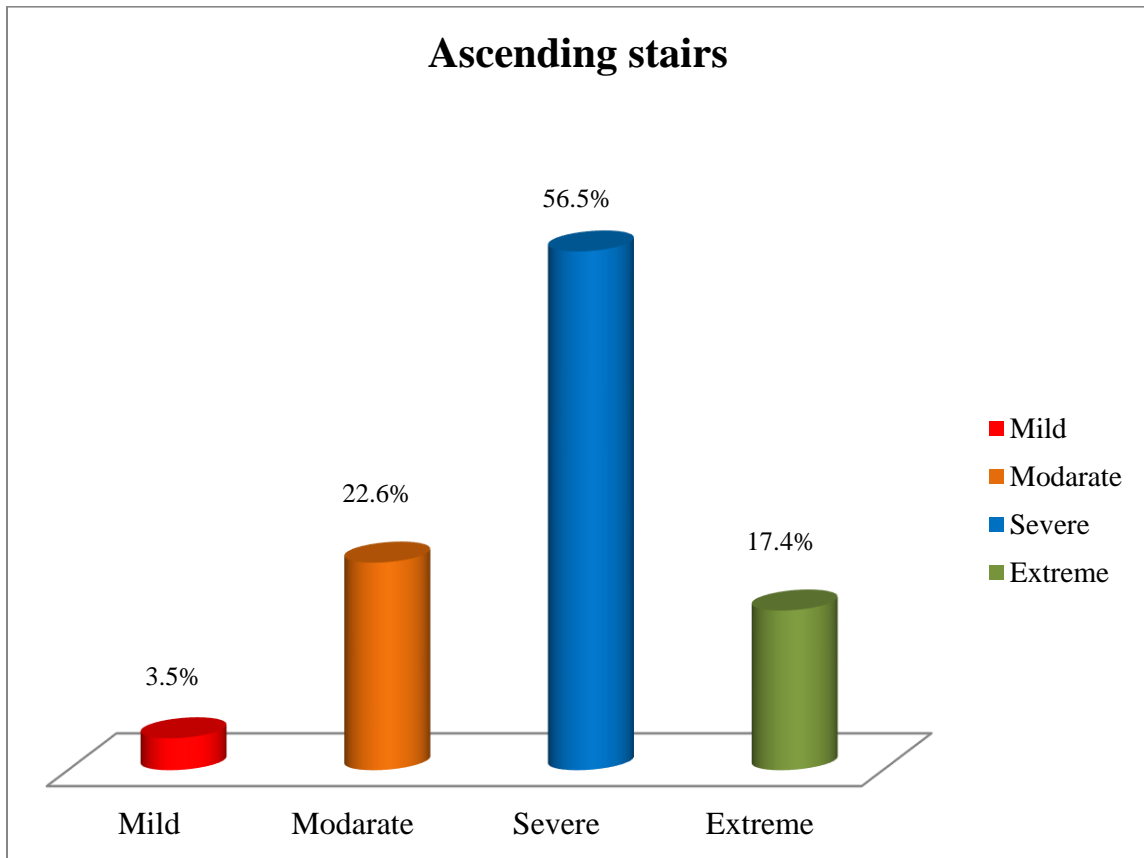


Figure 15: Difficulty during descending stairs

#### 4.2.7 Ascending stairs

Among the 115 participants 3.5%(n=4) felt mild difficulty, 22.6% (n=26) felt moderate difficulty, 56.5%(n=65) felt severe difficulty and 17.4%(n=20) felt extreme difficulty during ascending stairs.



**Figure 16: Difficulty during ascending stairs**

#### 4.2.8 Rising from sitting

Among the 115 participants 1.7%(n=2) patients felt no difficulty, 25.2%(n=29) felt mild difficulty, 33.9% (n=39) felt moderate difficulty, 35.7%(n=41) felt severe difficulty and 3.5%(n=4) felt extreme difficulty during Rising from sitting .

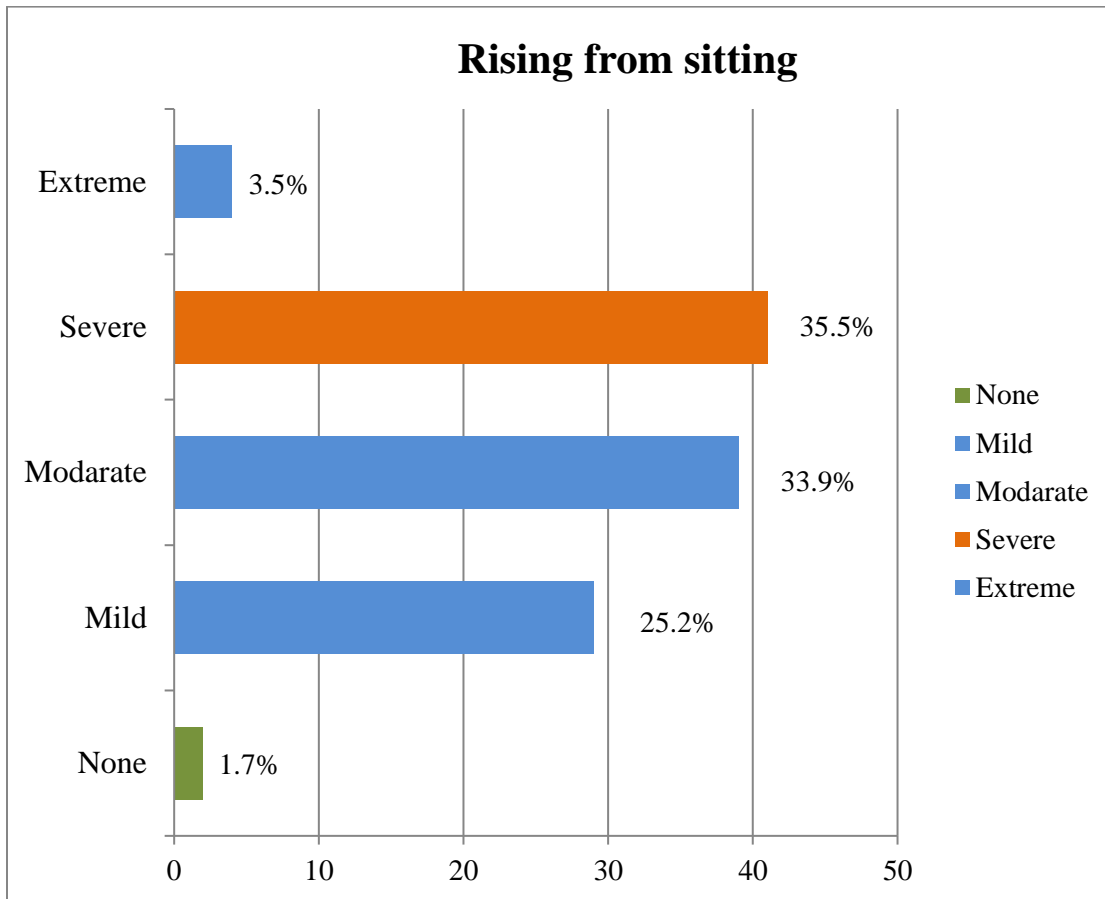
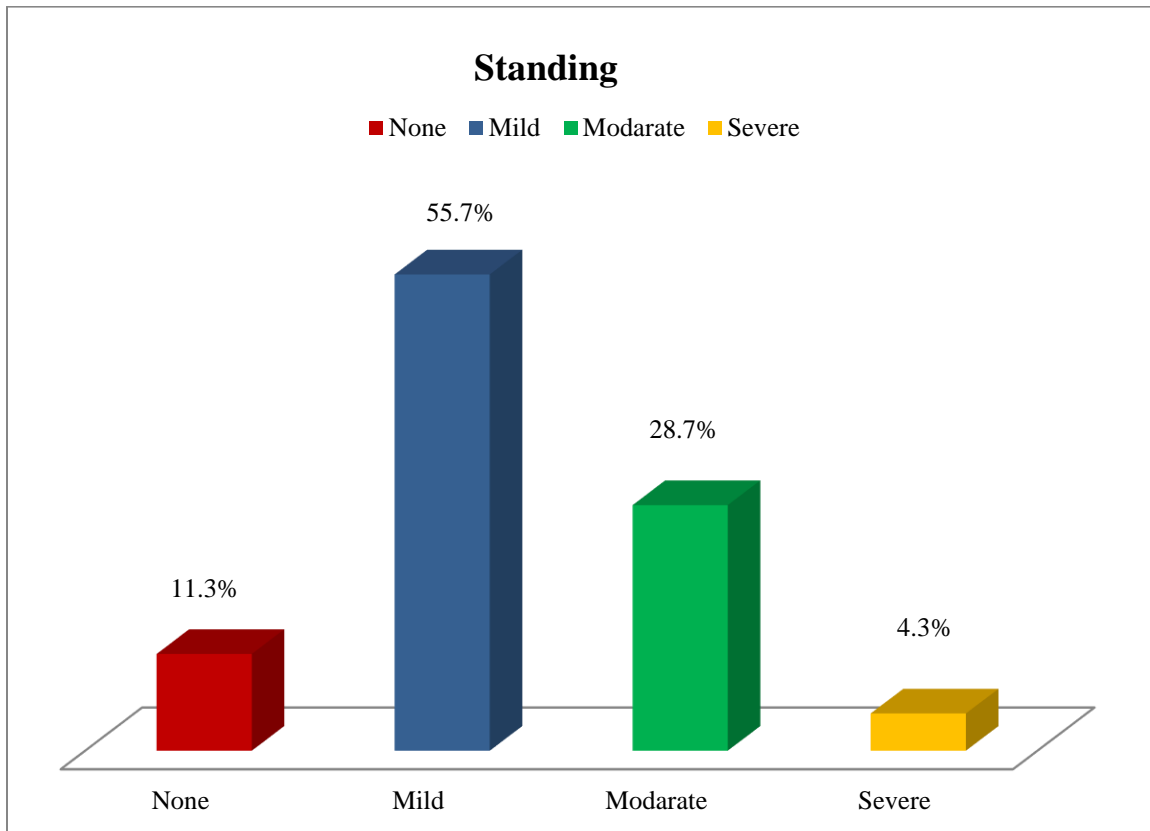


Figure 17: Difficulty during Rising from sitting



### 4.2.9 Standing

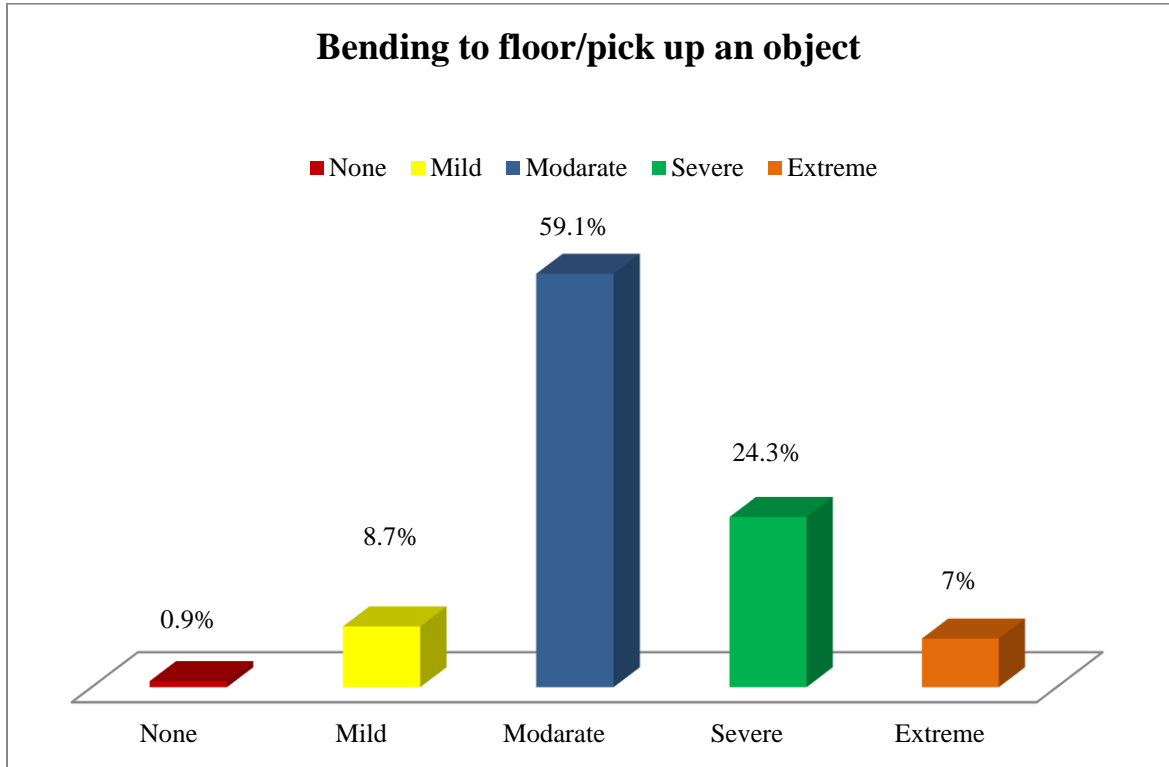
Among the 115 participants 11.3%(n=13) patients felt no difficulty, 55.7%(n=64) felt mild difficulty, 28.7% (n=33) felt moderate difficulty, 4.3%(n=5) felt severe difficulty during standing.



**Figure 18: Difficulty during standing**

#### 4.2.10 Bending to floor/pick up an object

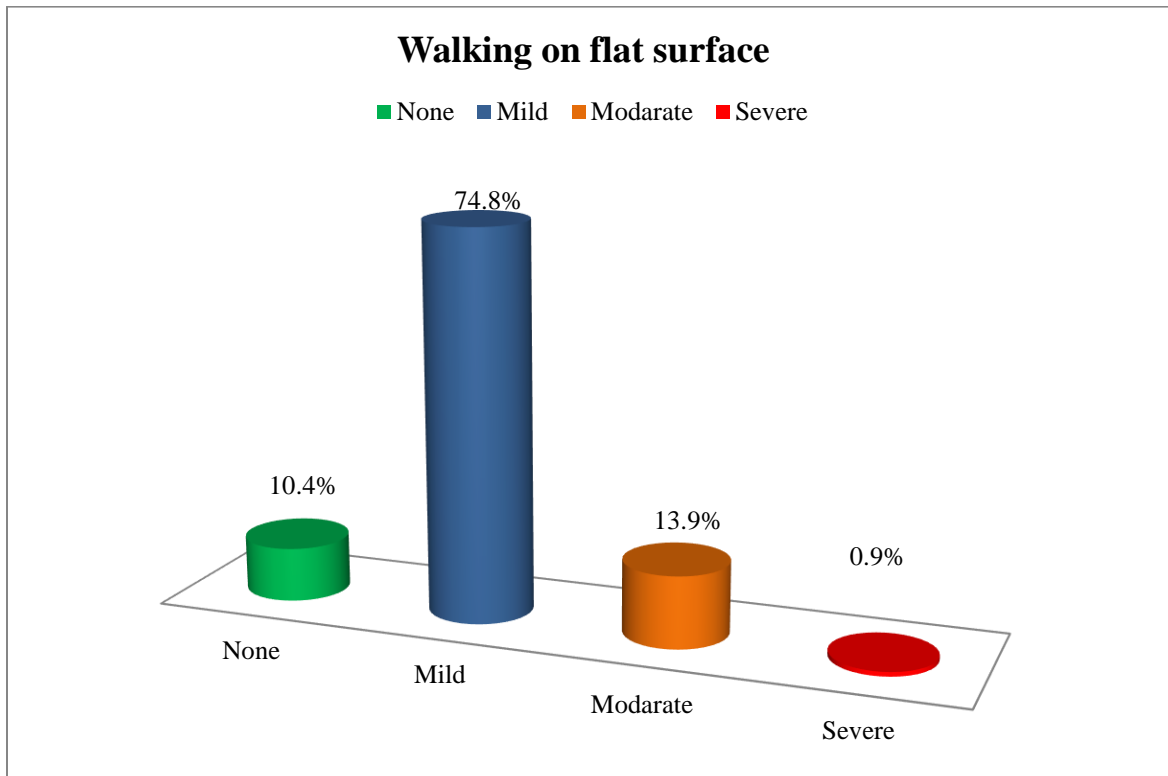
Among the 115 participants 0.9%(n=1) patients felt no difficulty, 8.7%(n=10) felt mild difficulty, 59.1% (n=68) felt moderate difficulty, 24.3%(n=28) felt severe difficulty and 7.0%(n=8) felt extreme difficulty during Bending to floor/pick up an object.



**Figure 19: Difficulty during Bending to floor/pick up an object**

#### 4.2.11 Walking on flat surface

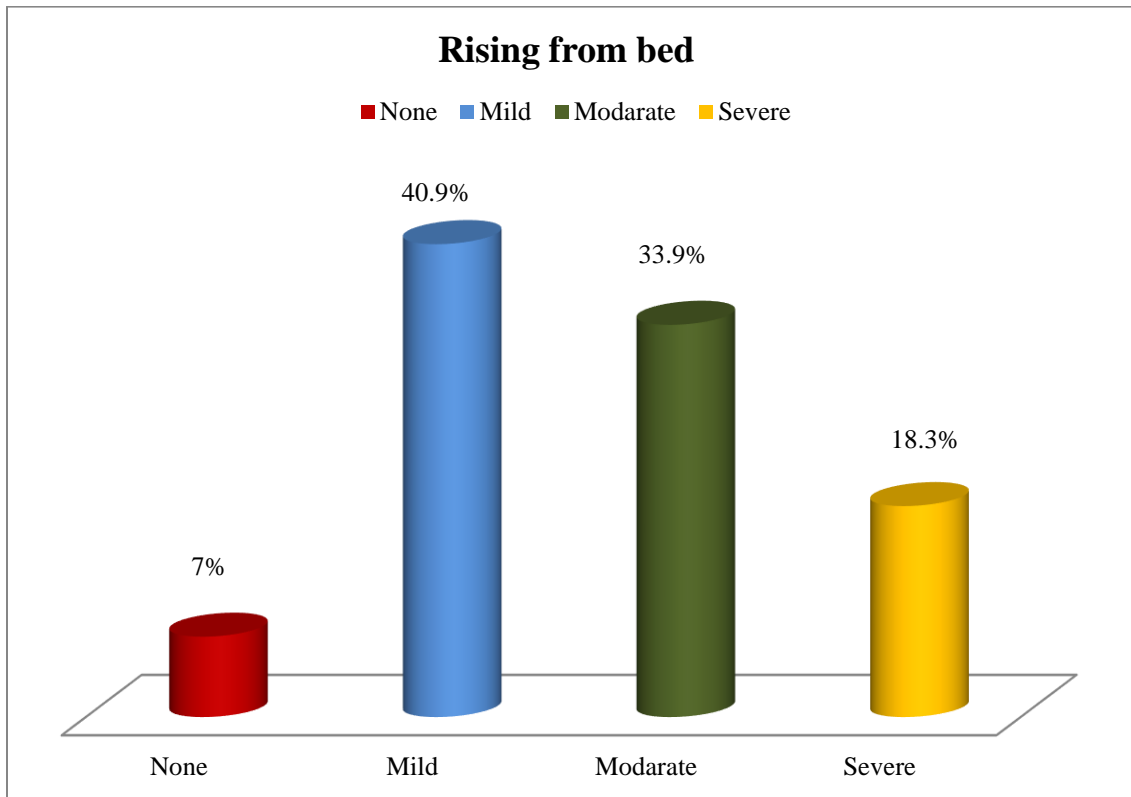
Among the 115 participants 10.4%(n=12) patients felt no difficulty, 74.8%(n=86) felt mild difficulty, 13.9% (n=16) felt moderate difficulty, 0,9%(n=1) felt severe difficulty during Walking on flat surface.



**Figure 20: Difficulty during Walking on flat surface**

#### 4.2.12 Rising from bed

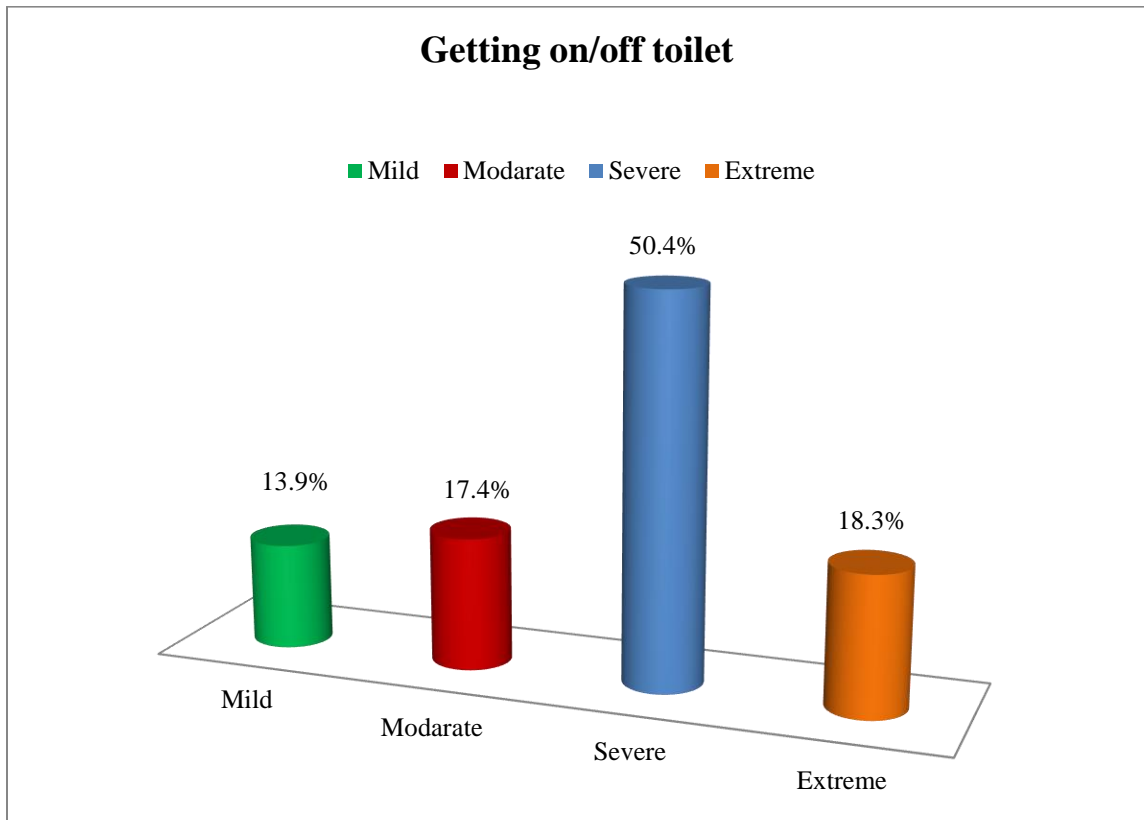
Among the 115 participants 7.0%(n=8) patients felt no difficulty, 40.9%(n=47) felt mild difficulty, 33.9% (n=39) felt moderate difficulty, 18.3%(n=21) felt severe difficulty during Rising from bed .



**Figure 21: Difficulty during Rising from bed**

#### 4.2.13 Getting on/off toilet

Among the 115 participants 13.9%(n=16) felt mild difficulty, 17.4% (n=20) felt moderate difficulty, 50.4%(n=58) felt severe difficulty and 18.3%(n=21) felt extreme difficulty during Getting on/off toilet.



**Figure 22: Difficulty during Getting on/off toilet.**

#### 4.2.14 Heavy domestic duties (moving heavy boxes, scrubbing floors, etc)

Among the 115 participants 0.9%(n=1) patients felt no difficulty, 7.8%(n=9) felt mild difficulty, 34.8% (n=40) felt moderate difficulty, 39.1%(n=45) felt severe difficulty and 17.4%(n=20) felt extreme difficulty during heavy domestic duties (moving heavy boxes, scrubbing floors, etc).

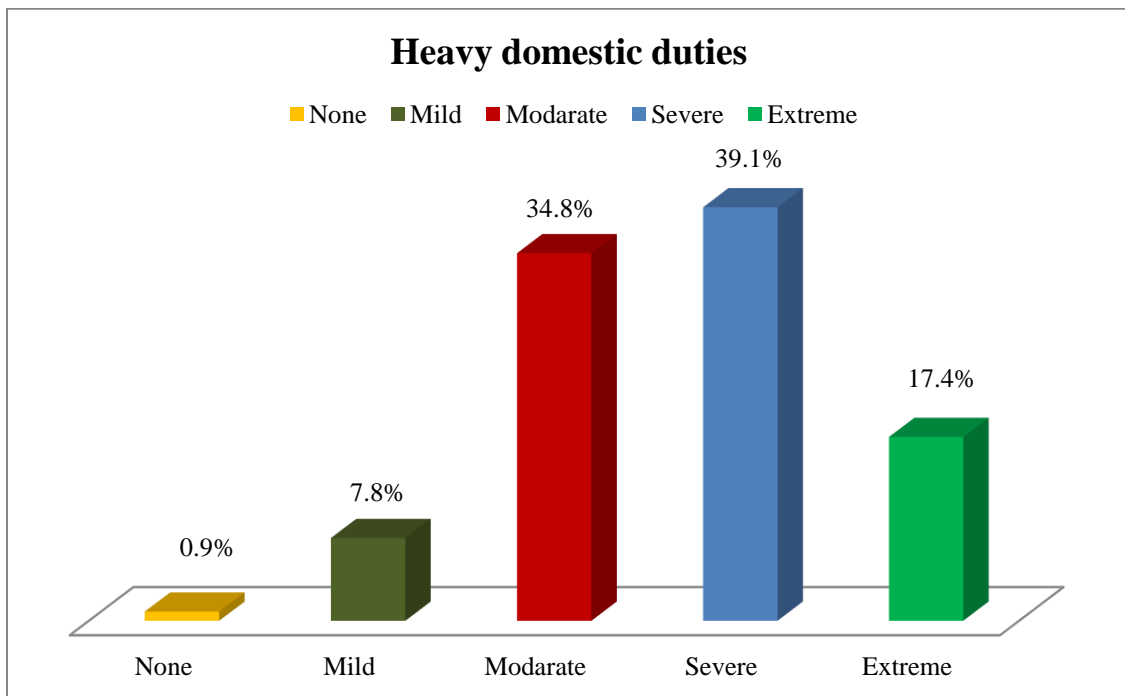
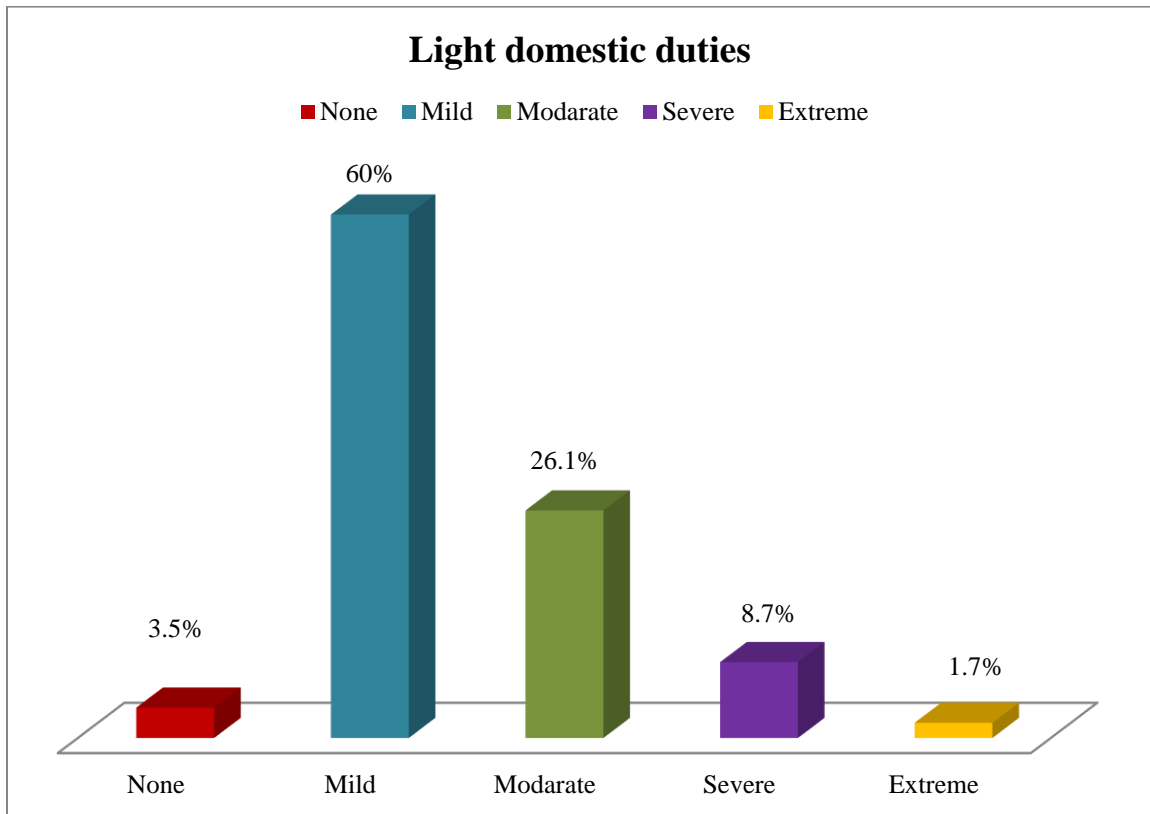


Figure 23: Difficulty during heavy domestic duties

#### 4.2.15 Light domestic duties (cooking, dusting, etc)

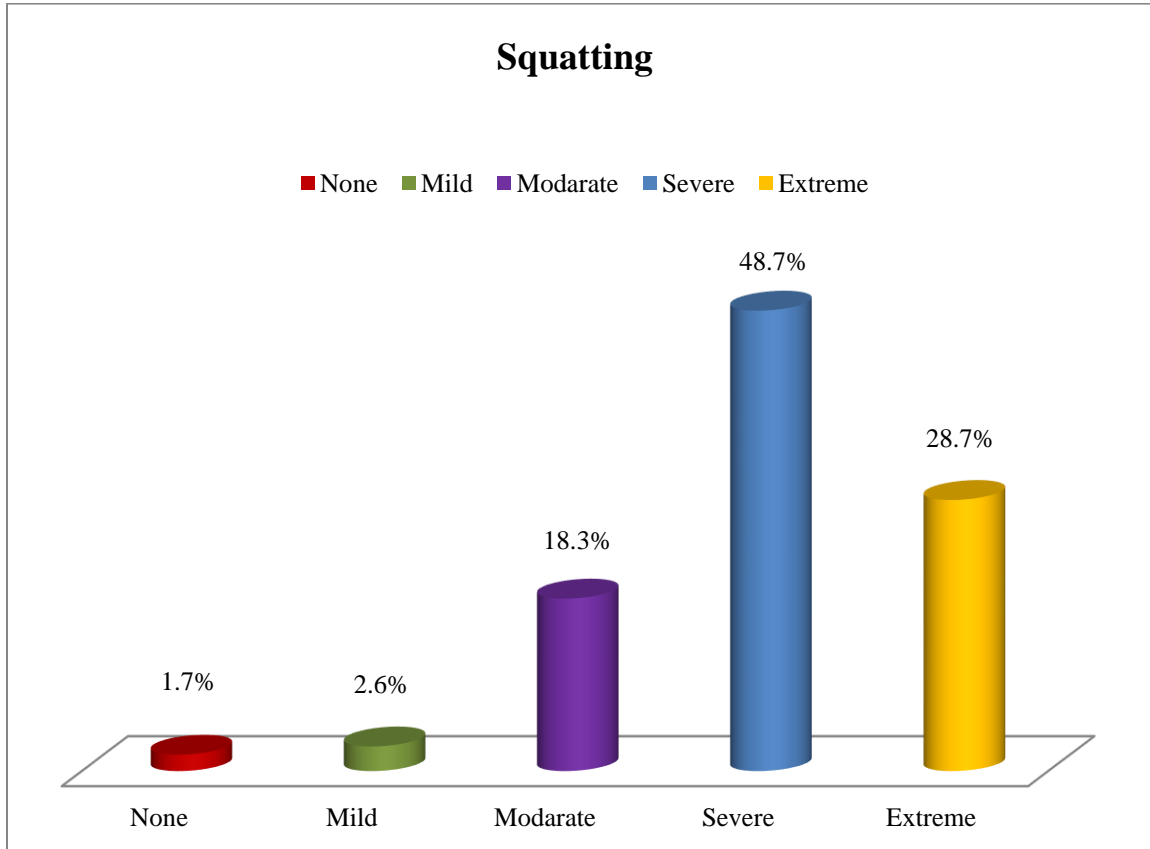
Among the 115 participants 3.5%(n=4) patients felt no difficulty, 60.0%(n=69) felt mild difficulty, 26.1% (n=30) felt moderate difficulty, 8.7%(n=10) felt severe difficulty and 1.7%(n=2) felt extreme difficulty during Light domestic duties (cooking, dusting, etc) .



**Figure 24: Difficulty during Light domestic duties**

#### 4.2.16 Squatting

Among the 115 participants 1.7%(n=2) patients felt no difficulty, 2.6%(n=3) felt mild difficulty, 18.3% (n=21) felt moderate difficulty, 48.7%(n=56) felt severe difficulty and 28.7%(n=33) felt extreme difficulty during squatting.

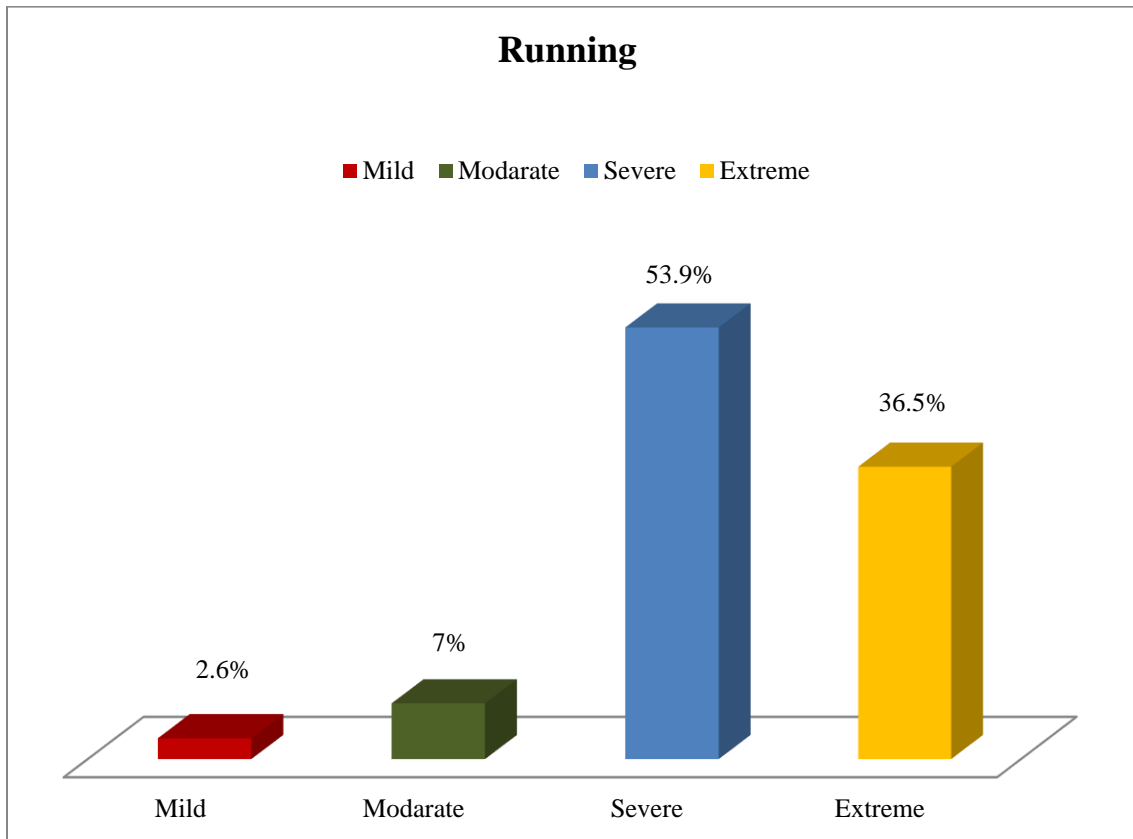


**Figure 25: Difficulty during squatting.**



#### 4.2.17 Running

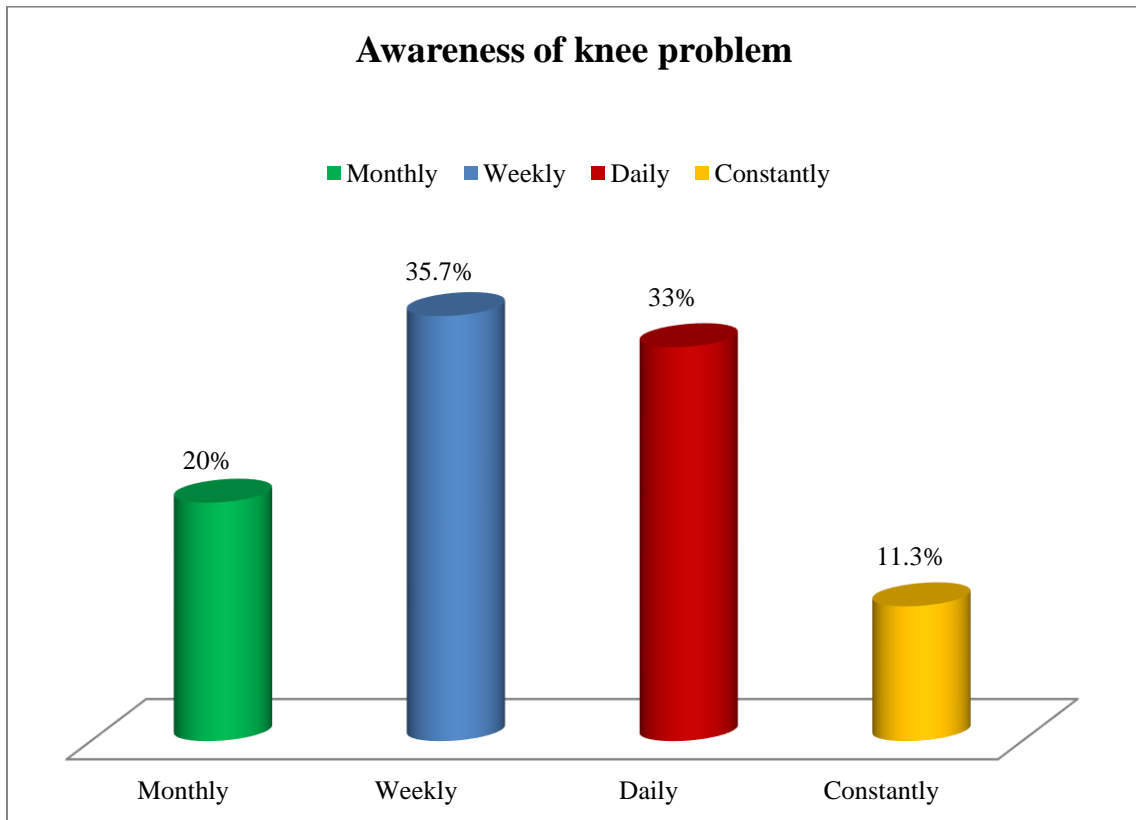
Among the 115 participants 2.6%(n=3) felt mild difficulty, 7.0% (n=8) felt moderate difficulty, 53.9%(n=62) felt severe difficulty and 36.5%(n=42) felt extreme difficulty during running.



. Figure 26: Extreme difficulty during running

#### 4.2.18 How often are you aware of your knee problem?

Among the 115 participants 20.0%(n=23) was monthly aware, 35.7% (n=41) was weekly aware, 33.0%(n=38) was daily aware and 11.3%(n=13) was constantly aware about their knee problem.



**Figure 27: Awareness of knee problem**

#### 4.2.19 In general, how much difficulty do you have with your knee?

Among the 115 participants 4.3%(n=5) felt mild difficulty, 50.4% (n=58) felt moderate difficulty, 35.7%(n=41) felt severe difficulty and 9.6%(n=11) felt extreme difficulty with their knee.

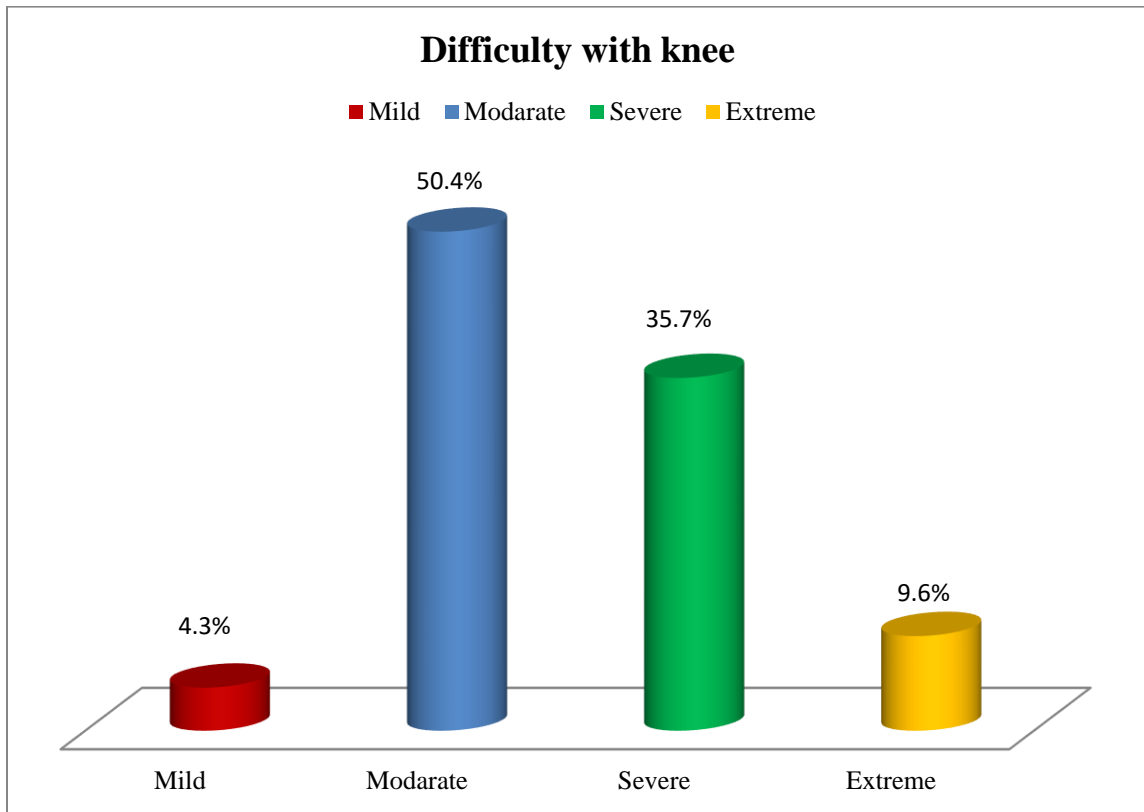


Figure 28: In general difficulty with knee

### 4.3 Association of different variables with Socio-demographic factors

#### 4.3.1 Table-3 Association of age with different variables:

Test: **One Way ANOVA**

Variables		N	Mean±SE	F	P Value
Symptoms	30-40	32	10.69±0.42	1.263	0.289
	41-50	41	10.71±0.57		
	51-60	22	10.64±0.42		
	61-70	17	12.00±0.87		
	71-80	3	8.00±3.05		
Stiffness	30-40	32	3.28±0.221	0.926	0.451
	41-50	41	3.59±0.237		
	51-60	22	3.23±0.354		
	61-70	17	4.00±0.332		
	71-80	3	3.33±0.667		
Pain	30-40	32	15.78±0.784	0.826	0.511
	41-50	41	16.34±0.831		
	51-60	22	15.55±1.197		
	61-70	17	18.12±0.988		
	71-80	3	17.33±0.459		
Function	30-40	32	32.50±1.434	1.027	0.397
	41-50	41	32.66±1.723		
	51-60	22	31.32±1.958		
	61-70	17	36.82±2.073		
	71-80	3	29.00±3.000		
Sports	30-40	32	13.94±0.414	0.362	0.835
	41-50	41	13.88±0.494		
	51-60	22	13.45±0.821		
	61-70	17	14.47±0.723		
	71-80	3	15.00±0.000		
Quality	30-40	32	9.16±0.399	0.703	0.591
	41-50	41	9.12±0.378		
	51-60	22	8.95±0.481		
	61-70	17	9.29±0.476		
	71-80	3	7.00±0.000		

Level of significance: P<0.05

## **Symptoms**

Above table show that among 115 participants age group between 61-70 had Mean±SE 12.00±0.87 which is the highest among the others groups, 71-80 had Mean±SE 8.00±3.05 which is the lowest age group. Age group was statistically not significant as  $P=.289$  &  $F=1.263$ .

## **Stiffness**

Above table show that age group was statistically not significant as  $P=0.451$  &  $F=0.926$ . Among 115 participants age group between 61-70 had Mean±SE 4.00±0.332 which is the highest among the others groups, 71-80 had Mean±SE 3.33±0.667 which is the lowest age group.

## **Pain**

Above table show that among 115 participants age group between 61-70 had Mean±SE 18.12±0.988 which is the highest among the others groups, 51-60 had Mean±SE 15.55±1.197 which is the lowest age group. Age group was statistically not significant as  $P=0.511$  &  $F=0.826$ .

## **Function & Daily living**

Above table show that among 115 participants age group between 61-70 had Mean±SE 36.82±2.073 which is the highest among the others groups, 71-80 had Mean±SE 29.00±3.000 which is the lowest age group. Age group was statistically not significant as  $P=0.397$  &  $F=1.027$ .

## **Sports and recreational activities**

Above table show that age group was statistically not significant as  $P=0.835$  &  $F=0.362$ . Among 115 participants age group between 71-80 had Mean±SE 15.00±0.000 which is the highest among the others groups, 51-60 had Mean±SE 13.45±0.821 which is the lowest age group.

### **Quality of life**

Above table show that age group was statistically not significant as  $P=0.591$  &  $F=0.703$ . Among 115 participants age group between 61-70 had  $\text{Mean}\pm\text{SE } 9.29\pm 0.476$  which is the highest among the others groups, 71-80 had  $\text{Mean}\pm\text{SE } 7.00\pm 0.000$  which is the lowest age group.

#### 4.3.2 Table-4: Association of sex with different variables:

**Test: Independent t-test**

<b>Variables</b>		<b>t value</b>	<b>Df</b>	<b>P Value</b>
Symptoms	Male	0.020	113	0.984
	Female			
Stiffness	Male	0.682	113	0.497
	Female			
Pain	Male	0.658	113	0.512
	Female			
Function	Male	0.263	113	0.793
	Female			
Sports	Male	0.015	113	0.988
	Female			
Quality	Male	0.311	113	0.756
	Female			

Level of significance:  $P < 0.05$

Association of sex with Symptoms, Stiffness, Pain, Function and daily living, Sports and recreational activities , Quality of life was examined using Independent t- test. Symptoms  $p=0.984$ , Stiffness  $p=0.497$ , Pain  $p=0.512$ , Function and daily living  $p=0.793$ , Sports and recreational activities  $p=0.988$ , Quality of life  $p=0.756$  was statistically not significant because  $p$  value  $>0.05$ .

### 4.3.3 Table-5: Association of occupation with different variables:

Test: **One Way ANOVA**

	<b>Variables</b>	<b>N</b>	<b>Mean±SE</b>	<b>F</b>	<b>P Value</b>
Symptoms	Farmer	5	11.80±1.068	0.824	0.583
	Day laborer	8	9.75±0.773		
	Service holder	18	11.61±0.737		
	Garments or factory worker	7	11.14±0.738		
	Driver	4	9.50±2.598		
	Businessmman	14	9.57±0.924		
	Unemployed	2	13.00±1.000		
	Housewife	57	10.88±0.432		
Stiffness	Farmer	5	3.20±0.583	0.786	0.616
	Day laborer	8	4.13±0.515		
	Service holder	18	2.94±0.249		
	Garments or factory worker	7	3.71±0.644		
	Driver	4	3.75±0.629		
	Businessman	14	3.21±0.422		
	Unemployed	2	4.50±0.500		
	Housewife	56	3.57±0.205		
	Student	1	4.00		
Pain	Farmer	5	16.40±1.691	0.566	0.803
	Day laborer	8	17.13±1.368		
	Service holder	18	14.61±1.055		
	Garments or factory worker	7	15.86±2.230		
	Driver	4	15.25±2.016		
	Businessman	14	16.36±1.470		
	Unemployed	2	20.50±2.500		
	Housewife	56	16.68±0.694		
	Student	1	19.00		



Function	Farmer	5	35.40±3.187	0.752	0.645
	Day laborer	8	37.00±2.171		
	Service holder	18	30.22±2.319		
	Garments or factory worker	7	33.29±4.960		
	Driver	4	29.75±2.287		
	Businessmman	14	31.86±2.438		
	Unemployed	2	42.50±1.500		
	Housewife	56	32.93±1.327		
	Student	1	37.00		
Sports	Farmer	5	13.80±0.735	0.659	0.726
	Day laborer	8	13.88±0.666		
	Service holder	18	12.94±0.739		
	Garments or factory worker	7	14.29±1.248		
	Driver	4	15.75±0.854		
	Businessmman	14	14.71±0.916		
	Unemployed	2	15.50±2.500		
	Housewife	56	13.88±0.421		
	Student	1	12.00		
Quality	Farmer	5	9.80±0.860	0.511	0.846
	Day laborer	8	9.50±0.463		
	Service holder	18	9.33±0.471		
	Garments or factory worker	7	8.57±0.812		
	Driver	4	7.50±0.645		
	Businessmman	14	8.64±0.589		
	Unemployed	2	9.50±1.500		
	Housewife	56	9.14±0.341		
	Student	1	8.00		

Level of significance:  $P < 0.05$

### Symptoms

Above table show that occupational group was statistically not significant as  $P=0.583$  &  $F=0.824$ . Among 115 participants Unemployed had Mean±SE 13.00±1.000 which is the highest than other group, Driver had Mean±SE 9.50±2.598 which is the lowest occupational group.

### **Stiffness**

Above table show that occupational group was statistically not significant as  $P=0.616$  &  $F=0.786$ . Among 115 participants Unemployed had Mean $\pm$ SE 4.50 $\pm$ 0.500 which is the highest than other group, Driver had Mean $\pm$ SE 3.75 $\pm$ 0.629 which is the lowest occupational group.

### **Pain**

Above table show that occupational group was statistically not significant as  $P=0.803$  &  $F=0.566$ . Among 115 participants Unemployed had Mean $\pm$ SE 20.50 $\pm$ 2.500 which is the highest than other group, Service holder had Mean $\pm$ SE 14.61 $\pm$ 1.055 which is the lowest occupational group.

### **Function and daily living**

Among 115 participants Unemployed had Mean $\pm$ SE 42.50 $\pm$ 1.500 which is the highest than other group; Driver had Mean $\pm$ SE 29.75 $\pm$ 2.287 which is the lowest occupational group. Above table show that occupational group was statistically not significant as  $P=0.645$  &  $F=0.752$ .

### **Sports and recreational activities**

Among 115 participants Driver had Mean $\pm$ SE 15.75 $\pm$ 0.854 which is the highest than other group, Service holder had Mean $\pm$ SE 12.94 $\pm$ 0.739 which is the lowest occupational group. Above table show that occupational group was statistically not significant as  $P=0.726$  &  $F=0.659$ .

### **Quality of life**

Above table show that occupational group was statistically not significant as  $P=0.846$  &  $F=0.511$ . Among 115 participants Farmer had Mean $\pm$ SE 9.80 $\pm$ 0.860 which is the highest than other group; Driver had Mean $\pm$ SE 7.50 $\pm$ 0.645 which is the lowest occupational group.

#### 4.3.4 Table-6: Association of Marital status with different variables:

Test: One Way ANOVA

	<b>Variables</b>	<b>N</b>	<b>Mean±SE</b>	<b>F</b>	<b>P Value</b>
Symptoms	Unmarried	6	11.33±0.882	0.089	0.915
	Married	102	10.77±0.316		
	Widow	7	10.86±1.317		
Stiffness	Unmarried	6	4.00±0.258	1.239	0.294
	Married	102	3.41±0.147		
	Widow	7	4.14±0.459		
Pain	Unmarried	6	17.33±1.520	0.520	0.596
	Married	102	16.16±0.498		
	Widow	7	17.86±1.639		
Function	Unmarried	6	37.50±0.2.202	0.844	0.433
	Married	102	32.52±0.957		
	Widow	7	34.14±3.575		
Sports	Unmarried	6	13.67±1.333	0.071	0.932
	Married	102	13.92±0.296		
	Widow	7	14.29±1.358		
Quality	Unmarried	6	8.17±0.792	1.026	0.362
	Married	102	9.18±0.220		
	Widow	7	8.29±1.063		

Level of significance:  $P < 0.05$

### **Symptoms**

Among 115 participants Unmarried had Mean±SE 11.33±0.882 which is the highest than other group, Married had Mean±SE 10.77±0.316 which is the lowest Marital group. Above table show that Marital status was statistically not significant as P=0.915& F=0.089.

### **Stiffness**

Among 115 participants Widow had Mean±SE 4.14±0.459 which is the highest than other group, Married had Mean±SE 3.41±0.147 which is the lowest Marital group. Above table show that Marital status was statistically not significant as P=0.294& F=1.239.

### **Pain**

Above table show that Marital status was statistically not significant as P=0.596& F=0.520. Among 115 participants Widow had Mean±SE 17.86±1.639 which is the highest than other group, Married had Mean±SE 16.16±0.498 which is the lowest Marital group.

### **Function and daily living**

Among 115 participants Unmarried had Mean±SE 37.50±0.2.202 which is the highest than other group, Married had Mean±SE 32.52±0.957 which is the lowest Marital group. Above table show that Marital status was statistically not significant as P=0.433& F=0.844.

### **Sports and recreational activities**

Above table show that Marital status was statistically not significant as P=0.932& F=0.071. Among 115 participants Widow had Mean±SE 14.29±1.358 which is the highest than other group, Married had Mean±SE 13.92±0.296 which is the lowest Marital group.

### **Quality of life**

Among 115 participants married had Mean $\pm$ SE 9.18 $\pm$ 0.220 which is the highest than other group, unmarried had Mean $\pm$ SE 8.17 $\pm$ 0.792 which is the lowest Marital group. Above table show that Marital status was statistically not significant as P=0.362& F=1.026.

#### 4.3.5 Table-7: Association of Living area with different variables:

Test: **Independent t-test**

<b>Variables</b>		<b>t value</b>	<b>df</b>	<b>P Value</b>
Symptoms	Rural	1.307	113	0.194
	Urban			
Stiffness	Rural	0.362	113	0.718
	Urban			
Pain	Rural	1.337	113	0.184
	Urban			
Function	Rural	1.235	113	0.219
	Urban			
Sports	Rural	0.413	113	0.680
	Urban			
Quality	Rural	11.41	113	0.025*
	Urban			

Level of significance:  $P < 0.05$

\* Significant

Association of living area with Symptoms, Stiffness, Pain, Function and daily living, Sports and recreational activities , Quality of life was examined using Independent t- test. Symptoms ( $p=0.194$ ), Stiffness ( $p=0.718$ ), Pain ( $p=0.184$ ), Function and daily living ( $p=0.219$ ), Sports and recreational activities ( $p=0.680$ ) was statistically not significant because  $p$  value  $> 0.05$ . Quality of life ( $p=0.025$ ) was statistically significant because  $p$  value  $< 0.05$ .

#### 4.3.6 Table-8: Association of Educational level with different variables:

Test: One Way ANOVA

Level of significance:  $P < 0.05$

Variables		N	Mean±SE	F	P Value
Symptoms	Illiterate	8	10.75±1.532	1.033	0.408
	Can sign	26	11.00±0.457		
	Primary	17	10.18±0.875		
	Secondary	40	11.05±0.472		
	Higher secondary	11	9.09±1.124		
	Graduate	6	12.00±1.506		
	Post graduate	7	12.00±0.873		
Stiffness	Illiterate	8	4.13±0.515	2.061	0.054*
	Can sign	26	3.96±0.238		
	Primary	17	3.53±0.322		
	Secondary	40	3.45±0.235		
	Higher secondary	11	2.36±0.411		
	Graduate	6	3.17±0.654		
	Post graduate	7	3.14±0.634		
Pain	Illiterate	8	18.50±1.648	1.030	0.410
	Can sign	26	17.58±0.851		
	Primary	17	16.59±1.281		
	Secondary	40	15.90±0.779		
	Higher secondary	11	14.55±1.551		
	Graduate	6	14.50±2.527		
	Post graduate	7	15.29±1.835		
Function	Illiterate	8	36.38±3.469	0.953	0.461
	Can sign	26	35.15±1.531		
	Primary	17	33.18±2.233		
	Secondary	40	32.43±1.547		
	Higher secondary	11	28.45±2.986		
	Graduate	6	30.00±5.317		
	Post graduate	7	31.71±3.902		

Sports	Illiterate	8	14.25±1.292	0.851	0.534
	Can sign	26	14.73±0.513		
	Primary	17	13.76±0.705		
	Secondary	40	13.73±0.441		
	Higher secondary	11	13.82±1.135		
	Graduate	6	14.33±1.406		
	Post graduate	7	12.00±1.431		
Quality	Illiterate	8	8.25±0.726	1.085	0.376
	Can sign	26	9.12±0.382		
	Primary	17	8.71±0.491		
	Secondary	40	9.18±0.397		
	Higher secondary	11	8.45±0.743		
	Graduate	6	10.83±0.654		
	Post graduate	7	9.57±0.896		

Level of significance:  $P < 0.05$

\* Significant

### Symptoms

Among 115 participants Graduate had Mean±SE 12.00±1.506 which is the highest than other group, Higher secondary had Mean±SE 9.09±1.124 which is the lowest educational group. Above table show that Educational level was statistically not significant as  $P = 0.408$  &  $F = 1.033$ .

### Stiffness

Above table show that Educational level was statistically significant as  $P = 0.054$  &  $F = 2.061$ . Among 115 participants illiterate had Mean±SE 4.13±0.515 which is the highest than other group, Higher secondary had Mean±SE 14.50±2.527 which is the lowest educational group.



### **Pain**

Among 115 participants illiterate had Mean±SE 18.50±1.648 which is the highest than other group, Graduate had Mean±SE 2.36±0.411 which is the lowest educational group. Above table show that Educational level was statistically not significant as P=0.410& F=1.030.

### **Function and daily living**

Above table show that Educational level was statistically not significant as P=0.461& F=0.953 .Among 115 participants illiterate had Mean±SE 36.38±3.469 which is the highest than other group, Higher secondary had Mean±SE 28.45±2.986 which is the lowest educational group.

### **Sports and recreational activities**

Among 115 participants Can sign had Mean±SE 14.73±0.513 which is the highest than other group, Post graduate had Mean±SE 12.00±1.431 which is the lowest educational group. Above table show that Educational level was statistically not significant as P=0.534& F=0.851.

### **Quality of life**

Above table show that Educational level was statistically not significant as P=0.376& F=1.085. Among 115 participants graduate had Mean±SE 10.83±0.654 which is the highest than other group, Illiterate had Mean±SE 8.25±0.726 which is the lowest educational group.

### 4.3.7 Table-9: Association of History of co-morbidity with different variables:

Test: **Independent t-test**

<b>Variables</b>		<b>t value</b>	<b>df</b>	<b>P Value</b>
Symptoms	Yes	1.432	113	0.155
	No			
Stiffness	Yes	1.328	113	0.187
	No			
Pain	Yes	1.732	113	0.046*
	No			
Function	Yes	1.113	113	0.268
	No			
Sports	Yes	0.766	113	0.445
	No			
Quality	Yes	0.086	113	0.931
	No			

Level of significance:  $P < 0.05$

\* Significant

Association of History of co-morbidity with Symptoms, Stiffness, Pain, Function and daily living, Sports and recreational activities, Quality of life was examined using Independent t- test. Symptoms ( $p=0.155$ ), Stiffness ( $p=0.187$ ), Function and daily living ( $p=0.268$ ), Sports and recreational activities ( $p=0.445$ ), Quality of life ( $p=0.931$ ) was statistically not significant because  $p$  value  $> 0.05$ . Pain ( $p=0.046$ ) was statistically significant because  $p$  value  $< 0.05$ .

**4.3.8 Table-10: Association of Number of co-morbidity with different variables:**

Test: One Way ANOVA

<b>Variables</b>		<b>N</b>	<b>Mean±SE</b>	<b>F</b>	<b>P Value</b>
Symptoms	No	43	11.35±0.444	1.023	0.363
	Single	16	10.56±0.926		
	Multiple	56	10.46±0.466		
Stiffness	No	43	3.26±0.186	1.583	0.210
	Single	16	4.00±0.438		
	Multiple	56	3.52±0.201		
Pain	No	43	15.30±0.654	1.881	0.157
	Single	16	17.88±1.291		
	Multiple	56	16.66±0.698		
Function	No	43	31.60±1.441	0.756	0.472
	Single	16	34.75±2.407		
	Multiple	56	33.32±1.274		
Sports	No	43	13.65±0.431	0.605	0.548
	Single	16	14.63±0.712		
	Multiple	56	13.95±0.430		
Quality	No	43	9.09±0.350	0.136	0.873
	Single	16	9.31±0.506		
	Multiple	56	8.98±0.307		

Level of significance: P<0.05

## **Symptoms**

Above table show that Number of co-morbidity was statistically not significant as  $P=0.363$  &  $F=1.023$  . Among 115 participants no co-morbidity had  $\text{Mean}\pm\text{SE}$   $11.35\pm 0.444$  which is the highest, Multiple co-morbidity had  $\text{Mean}\pm\text{SE}$   $10.46\pm 0.466$  which is the lowest number of co-morbidity.

## **Stiffness**

Among 115 participants single co-morbidity had  $\text{Mean}\pm\text{SE}$   $4.00\pm 0.438$  which is the highest, No co-morbidity had  $\text{Mean}\pm\text{SE}$   $3.26\pm 0.186$  which is the lowest number of co-morbidity. Above table show that Number of co-morbidity was statistically not significant as  $P=0.210$  &  $F=1.583$ .

## **Pain**

Above table show that Number of co-morbidity was statistically not significant as  $P=0.157$  &  $F=1.881$ . Among 115 participants single co-morbidity had  $\text{Mean}\pm\text{SE}$   $17.88\pm 1.291$  which is the highest, No co-morbidity had  $\text{Mean}\pm\text{SE}$   $15.30\pm 0.654$  which is the lowest number of co-morbidity.

## **Function and daily living**

Among 115 participants single co-morbidity had  $\text{Mean}\pm\text{SE}$   $34.75\pm 2.407$  which is the highest, No co-morbidity had  $\text{Mean}\pm\text{SE}$   $31.60\pm 1.441$  which is the lowest number of co-morbidity. Above table show that Number of co-morbidity was statistically not significant as  $P=0.472$  &  $F=0.756$ .

## **Sports and recreational activities**

Above table show that Number of co-morbidity was statistically not significant as  $P=0.548$  &  $F=0.605$ . Among 115 participants single co-morbidity had  $\text{Mean}\pm\text{SE}$   $14.63\pm 0.712$  which is the highest, No co-morbidity had  $\text{Mean}\pm\text{SE}$   $13.65\pm 0.431$  which is the lowest number of co-morbidity.

### **Quality of life**

Above table show that Number of co-morbidity was statistically not significant as  $P=0.873$  &  $F=0.136$ . Among 115 participants single co-morbidity had Mean $\pm$ SE 9.31 $\pm$ 0.506 which is the highest, Multiple co-morbidity had Mean $\pm$ SE 8.98 $\pm$ 0.307 which is the lowest number of co-morbidity.

This is a cross sectional study. The main objective of the study was to assess the functional status of patient with knee osteoarthritis. Convenience sampling was done to select samples. Total 115 data were collected from the knee OA patients.

Among the respondent the highest percentage of the respondents were between 55-59+ years (40.8%) old following by the age between 50-54 years were 25.4%. Out of which there were only 19.7% of 45-49 years old, 14.1% of the respondents were of the age group 40-44 years. Out of 71 respondents, 27(38.0%) have knee osteoarthritis (Khanum, 2021). (Liu et al., 2020) found that ages ranged from 18–44, 45–64, > 65. The mean age of the subjects was 64.6(11.4) years. In this study data showed that 41 participants were between 41-50 years, 32 were between 30-40 years, 22 were between years 51-60 years, 17 were between years 61-70 years, 3 were between years 71-80 years. Out of the participant the mean age of the participants was  $49.22 \pm 11.610$  years. Minimum range were between 71-80 years and maximum range were between 41-50 years. In percentage around 35.7% participants were between 41-50 years, about 27.8% were between 30-40 years, about 19.1% were between 51-60 years, 14.8% were between 61-70 years, 2.6% were between 71-80 years.

(Varzaityte et al., 2019) found that the majority of the subjects was females 87.0%, males constituted 13.0%. In this study data showed that 53.0%(n=61) was female and 47%(n=54) was male. Female were predominantly higher than male. Out of 71 respondent, 41(57.7%) were female and 30(42.3%) were males (Khanum, 2021).

In this case of occupational level of the participants 4.3%(n=5) were farmer, 7.0%(n=8) were day laborer, 15.7%(n=18) were service holder, 6.1%(n=7) were garments worker, 3.5%(n=4) were driver, 12.2%(n=14) were businessman, 1.7%(n=2) were unemployed, 48.7%(n=56) were housewife, 0.9%(n=1) were students. Among 115 participants, most participants were married. Data showed that 88.7%(n=102) were married, 5.2%(n=6) were unmarried, 6.1%(n=7) were widow, 69.6%(n=80) were nuclear family, 30.4%(n=35) were extended family, 53.9%(n=62) lived in rural areas, 46.1%(n=53) lived

in urban areas. Rural people are more affected by knee OA than urban people. Among 359,638 OA cases in 2013, approximately 60% of people resided in Metro and Urban areas, compared to 2% in Rural Remote areas (Liu et al., 2020).

Among 115 participants, 7%(n=8) were illiterate, 22.6%(n=26) can sign, 14.8%(n=17) participants had primary education, 34.8%(n=40) participants got secondary education, 9.6%(n=11) were higher secondary education, 5.2%(n=6) were graduated, 6.1%(n=7) were post graduated. Here, most of the patients are not properly educated. So, levels of consciousness of these people are very low. They have not enough knowledge about knee OA. So, they suffer from knee OA most.

(Liu et al., 2020) found that the population with 1 co-morbidity condition accounted for one third of the total OA population (33.6%), which is 2.5 and 6.9 times as many as those with 2 co-morbidities (13.3%) and those with 3+ co-morbidities (4.9%), respectively. Among the population of OA with 1 co-morbidity, hypertension is the most frequent condition (13%), followed by depression (10.6%) and COPD (7.1%). Approximately 60% of people with any co-morbidities resided in the Metro and Urban areas, while the proportion of people residing in Remote Rural areas ranged from 2 to 4% among co-morbidity groups. In this study data showed that most participants had history of co-morbidity, 62.6%(n=72) had history of co-morbidity, 37.4%(n=43) had no history of co-morbidity, 48.7%(n=56) had multiple number of co-morbidity , 13.9%(n=16) had single number of co-morbidity, 37.4%(n=43) had no number of co-morbidity.

Among 115 participants, 27(23.5%) participants never had swelling, 26(22.6%) participants rarely had swelling, 38(33%) participants had swelling sometimes, 21(18.3%) participants often had swelling and 3(2.6%) participants had always swelling, 4(3.5%) never had stiffness, 42(36.5%) had mild stiffness, 46(40%) had moderate stiffness, 20(17.4%) had severe stiffness, 3(2.6%) had extreme stiffness.

Most of the OA patients feeling pain always. Only half of patients with radiographic knee OA reported knee pain (Dahaghin, 2005).In this study data showed that 40(34.8%) had daily pain, 33(28.7%) had always pain, 32(27.8%) had weekly pain, 10(8.7%) had monthly pain. Among 115 participants, 6.1%( n=7) patients felt no pain 13.9% (n=16) felt mild pain, 56.5% (n=65) felt moderate pain, 20.9% (n=24) felt severe pain and 2.6% (n=3) felt extreme pain during straightening knee fully. In this case 2.6%(n=3) patients

felt no pain, 7.8%(n=9) felt mild pain, 52.2% (n=60) felt moderate pain, 26.1%(n=30) felt severe pain and 11.3%(n=13) felt extreme pain during bending knee fully. The investigator found that, 1.122 times more possible chance to occur knee osteoarthritis due to Sustained knee bending (Schram et al., 2019).

In this study data showed that 18.3%(n=21) patients felt no pain, 41.7%(n=48) felt mild pain, 27.0% (n=31) felt moderate pain, 13.0%(n=15) felt severe pain during sitting or lying. Among the 115 participants 7.8%(n=9) patients felt no pain, 62.6%(n=72) felt mild pain, 26.1% (n=30) felt moderate pain, 1.7%(n=2) felt severe pain and 1.7%(n=2) felt extreme pain during standing upright. In this case 0.9%(n=1) patients felt no difficulty, 6.1%(n=7) felt mild difficulty, 22.6% (n=26) felt moderate difficulty, 57.4%(n=66) felt severe difficulty and 13.0%(n=15) felt extreme difficulty during descending stairs, 3.5%(n=4) felt mild difficulty, 22.6% (n=26) felt moderate difficulty, 56.5%(n=65) felt severe difficulty and 17.4%(n=20) felt extreme difficulty during ascending stairs. (Schram et al., 2019) found that ascending and descending stairs frequently is a risk for developing knee osteoarthritis and only limited evidence existed to suggest stair climbing was a risk factor for knee OA.

Among the 115 participants 1.7%(n=2) patients felt no difficulty, 25.2%(n=29) felt mild difficulty, 33.9% (n=39) felt moderate difficulty, 35.7%(n=41) felt severe difficulty and 3.5%(n=4) felt extreme difficulty during Rising from sitting , 11.3%(n=13) patients felt no difficulty, 55.7%(n=64) felt mild difficulty, 28.7% (n=33) felt moderate difficulty, 4.3%(n=5) felt severe difficulty during standing. (Schram et al., 2019) stated that, prolong standing in occupation or recreational activities are a factor of knee osteoarthritis.

In this study 0.9%(n=1) patients felt no difficulty, 8.7%(n=10) felt mild difficulty, 59.1% (n=68) felt moderate difficulty, 24.3%(n=28) felt severe difficulty and 7.0%(n=8) felt extreme difficulty during Bending to floor/pick up an object, 10.4%(n=12) patients felt no difficulty, 74.8%(n=86) felt mild difficulty, 13.9% (n=16) felt moderate difficulty, 0.9%(n=1) felt severe difficulty during Walking on flat surface, 7.0%(n=8) patients felt no difficulty, 40.9%(n=47) felt mild difficulty, 33.9% (n=39) felt moderate difficulty, 18.3%(n=21) felt severe difficulty during Rising from bed , 13.9%(n=16) felt mild



difficulty, 17.4% (n=20) felt moderate difficulty, 50.4%(n=58) felt severe difficulty and 18.3%(n=21) felt extreme difficulty during Getting on/off toilet, 0.9%(n=1) patients felt no difficulty, 7.8%(n=9) felt mild difficulty, 34.8% (n=40) felt moderate difficulty, 39.1%(n=45) felt severe difficulty and 17.4%(n=20) felt extreme difficulty during heavy domestic duties (moving heavy boxes, scrubbing floors, etc), 3.5%(n=4) patients felt no difficulty, 60.0%(n=69) felt mild difficulty, 26.1% (n=30) felt moderate difficulty, 8.7%(n=10) felt severe difficulty and 1.7%(n=2) felt extreme difficulty during Light domestic duties (cooking, dusting, etc) , 1.7%(n=2) patients felt no difficulty, 2.6%(n=3) felt mild difficulty, 18.3% (n=21) felt moderate difficulty, 48.7%(n=56) felt severe difficulty and 28.7%(n=33) felt extreme difficulty during squatting. The study explored the interaction of occupational heavy lifting with concurrent kneeling or squatting in relation to the development of knee OA and found exposure to the two factors together (heavy lifting with either kneeling or squatting) increased the risk of developing knee OA. The study also concluded that kneeling and squatting are causally associated with an increased risk of developing OA of the knee. They estimated that occupations which required frequent or prolonged kneeling or squatting doubled the risk of people developing OA of the knee when compared to the risk observed in the general population (Schram et al., 2019).

Among the 115 participants 4.3%(n=5) felt mild difficulty, 50.4% (n=58) felt moderate difficulty, 35.7%(n=41) felt severe difficulty and 9.6%(n=11) felt extreme difficulty with their knee and 20.0%(n=23) was monthly aware, 35.7% (n=41) was weekly aware, 33.0%(n=38) was daily aware and 11.3%(n=13) was constantly aware about their knee problem.

In this study data showed that the association of different variables with Socio-demographic factor. In this research association of age, sex, occupation, marital status and number of co-morbidity with Symptoms, Stiffness, Pain, Function and daily living, Sports and recreational activities, Quality of life was statistically not significant because the  $p > 0.05$ . Association of educational level with stiffness was statistically significant as  $P = 0.054$ , association of living area with Quality of life was statistically significant as  $P = 0.025$ , association of history of co-morbidity with pain statistically significant as

P=0.046. There is also limited evidence for a lack of association between future functional status in the first 3 years of follow-up and the following prognostic factors: alignment, sex, physical activity, role functioning, co-morbidity, marital status, severity of OA, and presence of bilateral OA. Radiologic changes were studied as a prognostic factor of future functional status in 2 high-quality studies. Of these 2, one study observed that more severe joint space narrowing increased the risk of functional deterioration. The other study found no association between radiologic changes and future functional status. Therefore, conflicting evidence is provided for an association between radiologic changes and future functional status in the first 3 years of follow-up. No high-quality studies were found on the association of prognostic factors and future functional status that followed patients for >3 years. Thus, no evidence was provided (Van et al., 2006).

## **5.1 Limitation of the study**

Despite the researcher's best effort, there were limitations and obstructions in the current study. The following are some of the study's limitations:

- The sample size was too small to generalize the findings.
- The study was conducted during a short period of time, thus all factors related to knee osteoarthritis may have gone unnoticed.
- The research was carried out at a professional rehabilitation center in the country. Many individuals who have knee osteoarthritis do not come to CRP for treatment. As a result, the findings of this study cannot be applied to the entire Bangladesh.
- The study's time and resources were limited.

### 6.1 Conclusion

At all ages, women are more likely than men to suffer from osteoarthritis. When OA affects the knee, these gender differences are especially noticeable. There were 115 people in this study. The purpose of this study was to determine how to assess the functional status of patients with knee osteoarthritis using socio-demographic and socio-economic variables, as well as painful knee swelling, heavy activity, stair climbing, sitting on the floor for home activities, prolonged standing, knee bending, squatting, and kneeling. According to the findings, the age group 41 to 50 is the most susceptible to knee OA. Household and bending tasks are aggravating factors in the development of knee OA, and among all occupations, housewives are the most affected. The researcher did not discover a strong positive relationship of different variables with socio-demographic factors. The change of everyday activity to lower risk factors is an important method to prevent knee osteoarthritis. The researcher recommended that taking care of one's posture at work could help to lower the incidence of knee osteoarthritis. Maintain the proper working position during daily living activities and fix the home's bad ergonomics design to lower the risk of knee osteoarthritis, as investigators discovered that squatting for toileting is one of the study's risk factors for knee osteoarthritis. In terms of ensuring benefit for persons suffering from non-communicable diseases such as knee OA, health care provision in Bangladesh is still a work in progress. Patients who receive regular physiotherapy and continue therapeutic activities at home will see a reduction in their symptoms and an improvement in their quality of life of 80 percent.

## **6.2 Recommendation**

As in other nations, people with knee osteoarthritis are likely to become a growing burden in Bangladesh. In many aspects of health care, physiotherapists' practice is evidence-based. As a result, evidence-based physiotherapy practice research in this area is essential. Only a few researches have been done on the musculoskeletal system in the knee. These can't possibly cover every part of the massive area. As a result, it is suggested that the future generation of physiotherapy members conduct research in this field with a big sample size and individuals from various Bangladeshi districts. The study's duration was limited the researcher suggested that a longer study be conducted to ensure that the findings were more reliable. Conduct research on various musculoskeletal issues that can be managed by a physiotherapist in the knee area. So it is very important to conduct such type research in this field.

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**Inform consent**

Assalamu Alaikum,

I am Somaia Islam, 4th year BSc in physiotherapy student. I am conducting this thesis as per the requirement of my study module. The Thesis titled “**Assessment of functional status of patient with knee osteoarthritis**” by ethics committee.

The study aim is to Assess the functional status of patient with knee osteoarthritis by ethics committee. To find out that I need to ask several questions to the participants. The entire session will take approximately 40-50 minutes.

I would like to also inform you that this is a purely academic study and will not be used for any other purpose. Your participation in the research will have no impact on your present or future treatment. All information provided by you will be kept confidential and in the event of any report or publication, it will be ensured that the source of information remains secret.

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

Your participation will be voluntary therefore any type of remuneration will not be provided. No additional intervention will be provided.

If you have any queries about the study you may contact me mob no- and/or my research supervisor, Md. Shofiqul Islam, Associate professor & Head, Department of Physiotherapy, Bangladesh Health Professions Institute (BHPI), CRP-Savar, Dhaka-1343.

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

Yes / No

Signature and date of the Participant .....

Signature and date of the Interviewer .....

Signature and date of the Researcher .....

## APPENDIX-B

### সম্মতি পত্র

( অংশগ্রহনকারীকে পড়ে শোনাতে হবে )

আসালামুআলাইকুম/নমস্কার,

আমার নাম সুমাইয়া ইসলাম, আমি এই গবেষণা প্রকল্পটি বাংলাদেশ হেলথ প্রফেসন ইনস্টিটিউট (বি এইচ পি আই ) এ পরিচালনা করছি যা আমার ৪র্থ বর্ষ বি এস সি ইন ফিজিওথেরাপী কোর্সের অধিভুক্ত। আমার গবেষণার শিরোনাম " হাটু অস্টিওআর্থারাইটিস রোগীর কার্যকরী অবস্থা মূল্যায়ন " আমি এক্ষেত্রে আপনার কিছু ব্যক্তিগত এবং আনুষঙ্গিক প্রশ্ন হাটুর অস্টিওআর্থারাইটিস সম্পর্কে করতে চাচ্ছি। এতে আনুমানিক ৩০-৪০ মিনিট সময় নিবো।

আমি আপনাকে অনুগত করছি যে,এটা আমার অধ্যয়নের অংশ এবং যা অন্যকোন উদ্দেশ্যে ব্যবহার হবে না।গবেষক সরাসরি এই অস্টিওআর্থারাইটিস অধ্যয়নের সাথে অন্তর্ভুক্ত নয়।তাই এই গবেষণায় আপনার অংশগ্রহণ বর্তমান ও ভবিষ্যৎ চিকিৎসায় কোন প্রকার প্রভাব ফেলবেনা। আপনি যে সব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং আপনার প্রতিবেদনের ঘটনা প্রবাহে এটা নিশ্চিত করা হবে যে এই তথ্যের উৎস অপ্রকাশিত থাকবে।

এই অধ্যয়নে আপনার অংশগ্রহন স্বেচ্ছাপ্রণোদিত এবং আপনি যে কোন সময় এই অধ্যয়ন থেকে কোন নেতিবাচক ফলাফল ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন। এছাড়াও কোন নির্দিষ্ট প্রশ্ন অপছন্দ হলে উত্তর না দেয়ার এবং সাক্ষাৎকারের সময় কোন উত্তর না দিতে চাওয়ার অধিকারও আপনার আছে।

এই অধ্যয়নে অংশগ্রহনকারী হিসেবে যদি আপনার কোন প্রশ্ন থাকে তাহলে আপনি আমাকে অথবা /এবং মোঃ সফিকুল ইসলাম, সহযোগী অধ্যাপক এবং ফিজিওথেরাপি বিভাগের প্রধান ,সিআরপি, সাভার ,ঢাকা- ১৩৪৩-তে যোগাযোগ করতে পারেন।

সাক্ষাৎকার শুরু করার আগে আপনার কি কোন প্রশ্ন আছে?

আমি আপনার অনুমতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি।

হ্যাঁ...

না...

১। অংশগ্রহনকারীর স্বাক্ষর.....।

২।সাক্ষাৎগ্রহনকারীর স্বাক্ষর.....

**APPENDIX-C**

**Title: “Assessment of functional status of patient with knee osteoarthritis”  
Questionnaire**

**Personal details**

Questions	Response
<b>1.Patient Id no. :</b>	
<b>2.Name of Participant:</b>	
<b>3.Address:</b>	Village..... Police Station..... District..... Other .....
<b>4.Contact number:</b>	
<b>5.Date of interview:</b>	

**Socio-demographic information:**

Questions	Responses
<b>6.Age:</b>	.... Years
<b>7.Sex:</b>	1. Male 2. Female
<b>8.Occupation:</b>	1. Farmer 2. Day laborer 3. Service holder 4. Garments/ Factory worker 5. Driver 6. Businessman 7. Unemployed 8. Housewife 9. Student 10. Other (Specify).....

<b>9.Marital status:</b>	<ol style="list-style-type: none"> <li>1. Married</li> <li>2. Unmarried</li> <li>3. Widow</li> <li>4. Divorce</li> <li>5. Separated</li> </ol>
<b>10.Family type:</b>	<ol style="list-style-type: none"> <li>1. Nuclear family</li> <li>2. Extended family</li> </ol>
<b>11.Living area</b>	<ol style="list-style-type: none"> <li>1. Rural</li> <li>2. Urban</li> </ol>
<b>12.Educational qualification :</b>	<ol style="list-style-type: none"> <li>1. Illiterate</li> <li>2. Primary</li> <li>3. Secondary</li> <li>4. Higher secondary</li> <li>5. Graduate</li> <li>6. Post Graduate</li> </ol>
<b>13.Monthly income:</b>	<p>..... Taka</p> <div style="border: 1px solid black; width: 150px; height: 20px; margin-left: 20px;"></div>
<b>14.History of comorbidity</b>	
<b>15.Number of comorbidity</b>	

### Symptoms during the last weeks

<b>1.1 Do you have swelling in your knee?</b>	<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely</li> <li>3. Sometimes</li> <li>4. Often</li> <li>5. Always</li> </ol>
<b>1.2 Do you feel grinding, hear clicking or any other type of noise when your knee moves?</b>	<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely</li> <li>3. Sometimes</li> <li>4. Often</li> <li>5. Always</li> </ol>
<b>1.3 Does your knee catch or hang up when moving?</b>	<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely</li> <li>3. Sometimes</li> <li>4. Often</li> <li>5. Always</li> </ol>

<b>1.4 Can you straighten your knee fully?</b>	<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely</li> <li>3. Sometimes</li> <li>4. Often</li> <li>5. Always</li> </ol>
<b>1.5 Can you bend your knee fully?</b>	<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Rarely</li> <li>3. Sometimes</li> <li>4. Often</li> <li>5. Always</li> </ol>

### **Stiffness**

The following questions concern the amount of joint stiffness you have experienced during the last week in your knee. Stiffness is a sensation of restriction or slowness in the ease with which you move your knee joint.

<b>1.6 How severe is your knee joint stiffness after first wakening in the morning?</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.7 How severe is your knee stiffness after sitting, lying or resting later in the day?</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>

### **Pain**

<b>1.8 How often do you experience knee pain?</b>	<ol style="list-style-type: none"> <li>1. Never</li> <li>2. Monthly</li> <li>3. Weekly</li> <li>4. Daily</li> <li>5. Always</li> </ol>
---	--

**What amount of knee pain have you experienced the last week during the following activities?**

<b>1.9 Twisting/pivoting on your knee</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> </ol>
---	---



	<ol style="list-style-type: none"> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.10 Straightening knee fully</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.11 Bending knee fully</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.12 Walking on flat surface</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.13 Going up or down stairs</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.14 At night while in bed</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.15 Sitting or lying</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.16 Standing upright</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>

### **Function, daily living**

The following questions concern your physical function. By this we mean your ability to move around and to look after yourself. For each of the following activities please indicate the degree of difficulty you have experienced in the last week due to your knee.

<b>1.17 Descending stairs</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.18 Ascending stairs</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>

**For each of the following activities please indicate the degree of difficulty you have experienced in the last week due to your knee.**

<b>1.19 Rising from sitting</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.20 Standing</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.21 Bending to floor/pick up an object</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.22 Walking on flat surface</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.23 Getting in/out of car</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.24 Going shopping</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> </ol>

	<ol style="list-style-type: none"> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.25 Putting on socks/stockings</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.26 Rising from bed</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.27 Taking off socks/stockings</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.28 Lying in bed (turning over, maintaining knee position)</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.29 Getting in/out of bath</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.30 Sitting</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.31 Getting on/off toilet</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>

**For each of the following activities please indicate the degree of difficulty you have experienced in the last week due to your knee**

<b>1.32 Heavy domestic duties (moving heavy boxes, scrubbing floors, etc)</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.33 Light domestic duties (cooking, dusting, etc)</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>

### **Function, sports and recreational activities**

The following questions concern your physical function when being active on a higher level. The questions should be answered thinking of what degree of difficulty you have experienced during the last week due to your knee.

<b>1.34 Squatting</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.35 Running</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.36 Jumping</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.37 Twisting/pivoting on your injured knee</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>
<b>1.38 Kneeling</b>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Mild</li> <li>3. Moderate</li> <li>4. Severe</li> <li>5. Extreme</li> </ol>

## Quality of Life

<b>1.39 How often are you aware of your knee problem?</b>	<ol style="list-style-type: none"><li>1. Never</li><li>2. Monthly</li><li>3. Weekly</li><li>4. Daily</li><li>5. Constantly</li></ol>
<b>1.40 Have you modified your life style to avoid potentially damaging activities to your knee?</b>	<ol style="list-style-type: none"><li>1. Not at all</li><li>2. Mildly</li><li>3. Moderately</li><li>4. Severely</li><li>5. Totally</li></ol>
<b>1.41 How much are you troubled with lack of confidence in your knee?</b>	<ol style="list-style-type: none"><li>1. Not at all</li><li>2. Mildly</li><li>3. Moderately</li><li>4. Severely</li><li>5. Extremely</li></ol>
<b>1.42 In general, how much difficulty do you have with your knee?</b>	<ol style="list-style-type: none"><li>1. None</li><li>2. Mild</li><li>3. Moderate</li><li>4. Severe</li><li>5. Extreme</li></ol>

**APENDIX-D**

Title : Assessment of functional status of patient with knee osteoarthritis .

বাংলা প্রশ্নাবলী  
ব্যক্তিগত তথ্যাবলী

১। রোগির আইডি নং	
২। অংশগ্রহনকারীর নামঃ	
৩। ঠিকানাঃ	গ্রাম/বাসা..... উপজেলা .....। ইউনিয়ন.....। ডাকঘর ..... থানা..... জেলা.....। অন্যান্য .....।
৪।মোবাইল নম্বরঃ	
৫।সাক্ষাৎকার গ্রহনের তারিখঃ	

আর্থ-সামাজিক তথ্যাবলী

৬।বয়সঃ	বছর
৭।লিঙ্গঃ	<input type="checkbox"/> ১=পুরুষ <input type="checkbox"/> ২=মহিলা

৮।পেশাঃ	<input type="checkbox"/> ১=কৃষক <input type="checkbox"/> ২=দিন মজুর <input type="checkbox"/> ৩=চাকরিজীবী <input type="checkbox"/> ৪=কারখানা শ্রমিক /গার্মেন্টস <input type="checkbox"/> ৫=গারি চালক <input type="checkbox"/> ৬=ব্যবসায়ী <input type="checkbox"/> ৭=বেকার <input type="checkbox"/> ৮=গৃহিণী <input type="checkbox"/> ৯=ছাত্র <input type="checkbox"/> ১০=অন্যান্য
৯।বৈবাহিক অবস্থাঃ	<input type="checkbox"/> ১=অবিবাহিত <input type="checkbox"/> ২=বিবাহিত <input type="checkbox"/> ৩=বিধবা <input type="checkbox"/> ৪=বিপত্নীক <input type="checkbox"/> ৫=তালাকপ্রাপ্ত <input type="checkbox"/> ৬=আলাদা থাকেন
১০।পরিবারের ধরনঃ	<input type="checkbox"/> ১=একক পরিবার <input type="checkbox"/> ২= যৌথ পরিবার
১১।বসবাসের এলাকাঃ	<input type="checkbox"/> ১=গ্রাম <input type="checkbox"/> ২=শহর
১২।শিক্ষাগত যোগ্যতাঃ	<input type="checkbox"/> ১=নিরক্ষর <input type="checkbox"/> ২=স্বাক্ষর করতে পারে <input type="checkbox"/> ৩=প্রাথমিক <input type="checkbox"/> ৪=মাধ্যমিক <input type="checkbox"/> ৫=এস এস সি <input type="checkbox"/> ৬=এইচ এস সি <input type="checkbox"/> ৭=স্নাতক <input type="checkbox"/> ৮=স্নাতকোত্তর

১৩।পরিবারের মাসিক আয়ঃ	.....টাকা
১৪।একাধিক রোগ একসাথে হওয়ার তথ্যঃ	
১৫। একাধিক রোগের সংখ্যাঃ	

### গত সাপ্তাহে উপসর্গ

১.১।আপনার হাটুতে কি ফোলা আছে ?	১। কখনই নয় ২।কদাচিৎ ৩।কখনও কখনও ৪।প্রায়শই সবসময়
১.২।আপনার হাটু নাড়াচড়া করার সময় আপনি কি নাকাল ,ক্লিক বা অন্য কোন ধরনের শব্দ শুনতে পান?	১। কখনই নয় ২।কদাচিৎ ৩।কখনও কখনও ৪।প্রায়শই সবসময়
১.৩। নাড়াচড়া করার সময় আপনার হাটু ধরে বা বুলে যায়?	১। কখনই নয় ২।কদাচিৎ ৩।কখনও কখনও ৪।প্রায়শই সবসময়
১.৪। আপনি আপনার হাটু পুরোপুরি সোজা করতে পারেন?	১। কখনই নয় ২।কদাচিৎ ৩।কখনও কখনও ৪।প্রায়শই সবসময়
১.৫।আপনি কি আপনার হাটু সম্পূর্ণ ভাজ করতে পারেন?	১। কখনই নয় ২।কদাচিৎ ৩।কখনও কখনও ৪।প্রায়শই সবসময়
১.৬। সকালে ঘুম থেকে ওঠার পর আপনার হাটুর জয়েন্টর শক্ততা কতটা গুরুতর?	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর



	৫।অনেক বেশি
১.৭। দিনের শেষে বসা,শুয়ে বা বিশ্রাম করার পরে আপনার হাঁটু শক্ত হওয়া কতটা গুরুতর?	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.৮।আপনি কি ঘন ঘন হাঁটু ব্যথা অনুভব করেন?	১।কখনও নয় ২।মাসিক ৩।সাপ্তাহিক ৪।দৈনিক সর্বদা
১.৯। আপনার হাঁটুতে মোচড়ানো /পিভটিং	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.১০। হাঁটু পুরোপুরি সোজা করা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.১১। সম্পূর্ণ রূপে হাঁটু ভাজ করা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.১২। সমতল পৃষ্ঠে হাঁটা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.১৩। সিঁড়ি বেয়ে উপরে বা নিচে যাওয়া	১। কিছুই নয় ২।হালকা ৩।মাঝারি

	৪।গুরুতর ৫।অনেক বেশি
১.১৪। রাতে বিছানায় থাকাকালীন	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.১৫।বসে থাকা বা শুয়ে থাকা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.১৬। সোজা হয়ে দাঁড়িয়ে আছেন	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.১৭। সিঁড়ি দিয়ে নামতে	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.১৮। সিঁড়ি দিয়ে উঠতে	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.১৯। বসা থেকে উঠছে	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.২০। দাঁড়িয়ে	১। কিছুই নয়

	২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.২১। মেঝেতে বাঁকানো/কোন বস্তু তোলা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.২২। সমতল পৃষ্ঠে হাটা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.২৩। গাড়িতে উঠা /নামা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.২৪। কেনাকাটা করতে যাচ্ছি	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.২৫। মোজা পরা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.২৬। বিছানা থেকে উঠা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর

	৫।অনেক বেশি
১.২৭। মোজা খুলে ফেলা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.২৮। বিছানায় শুয়ে থাকা (উল্টে যাওয়া,হাটুর অবস্থান বজায় রাখা)	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.২৯। স্নান থেকে বের হওয়া	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.৩০। বসা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.৩১। টয়লেট থেকে বসা/উঠা	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.৩২। ভারী গার্হস্থ্য দায়িত্ব ( ভারী বাক্স সরানো ,মেঝে স্কাবিং , ইত্যাদি )	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি
১.৩৩।হালকা গার্হস্থ্য দায়িত্ব( রান্না,ধুলো, ইত্যাদি)	১। কিছুই নয় ২।হালকা

	৩। মাঝারি ৪। গুরুতর ৫। অনেক বেশি
কাজ, খেলাধুলা, এবং বিনোদনমূলক কার্যক্রম	
১.৩৪। স্কোয়াটিং	১। কিছুই নয় ২। হালকা ৩। মাঝারি ৪। গুরুতর ৫। অনেক বেশি
১.৩৫। দৌড়ানো	১। কিছুই নয় ২। হালকা ৩। মাঝারি ৪। গুরুতর ৫। অনেক বেশি
১.৩৬। লাফানো	১। কিছুই নয় ২। হালকা ৩। মাঝারি ৪। গুরুতর ৫। অনেক বেশি
১.৩৭। আপনার আহত হাঁটুতে মোচড় / পিভটিং	১। কিছুই নয় ২। হালকা ৩। মাঝারি ৪। গুরুতর ৫। অনেক বেশি
১.৩৮। হাঁটু গাড়িয়া বসা	১। কিছুই নয় ২। হালকা ৩। মাঝারি ৪। গুরুতর ৫। অনেক বেশি
জীবনের মানে	
১.৩৯। আপনি কতটা সময় আপনার হাঁটুর সমস্যা নিয়ে সচেতন থাকেন	১। কখনই না ২। মাসিক

	৩। সাপ্তাহিক ৪। দৈনিক ৫।প্রতিনিয়ত
১.৪০। আপনার হাটুতে সম্ভাব্য ক্ষতিকারক কার্যকলাপ এড়াতে আপনি কি আপনার জীবনের ধরন পরিবর্তন করেছেন ?	১। একেবারেই না ২। মৃদুভাবে ৩। পরিমিতভাবে ৪। গুরুতরভাবে ৫। সম্পূর্ণরূপে
১.৪১। আপনার হাটুতে আত্মবিশ্বাসের অভাব নিয়ে আপনি কতটা বিরক্ত?	১। একেবারেই না ২। মৃদুভাবে ৩। পরিমিতভাবে ৪। গুরুতরভাবে ৫। সম্পূর্ণরূপে
১.৪২। সাধারণভাবে, আপনার হাটুতে আপনার কতটা অসুবিধা হয়?	১। কিছুই নয় ২।হালকা ৩।মাঝারি ৪।গুরুতর ৫।অনেক বেশি

## APPENDEX-E



বাংলাদেশ হেল্থ প্রফেশন ইনস্টিটিউট (বিএইচপিআই)  
**Bangladesh Health Professions Institute (BHPI)**  
(The Academic Institute of CRP)

Ref:

CRP/BHPI/IRB/03/2022/582

Date:

06/03/2022

Somaia Islam  
4<sup>th</sup> Year B.Sc. in Physiotherapy  
Session: 2016 – 2017  
BHPI, CRP, Savar, Dhaka- 1343, Bangladesh

**Subject:** Approval of the research project proposal “Assessment of functional status of patient with knee Osteoarthritis” -by ethics committee.

Dear Somaia Islam,  
Congratulations.

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator and Md. Shofiqul Islam as thesis supervisor. The Following documents have been reviewed and approved:

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

The purpose of the study is to assess the functional status of patient with knee osteoarthritis. Should there any interpretation, typos, spelling and grammatical mistakes in the title, it is the responsibilities of the investigator. Since the study involves questionnaire that takes maximum 40-50 minutes and have no likelihood of any harm to the participants, the members of the Ethics committee approved the study to be conducted in the presented form at the meeting held at 09:00 AM on 12 October, 2021 at BHPI (30<sup>th</sup> IRB Meeting).

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

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404

E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd, www.crp-bangladesh.org

## APPENDIX-F

### Permission letter

Date: 21-03-2022

The Head of Department

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343.

**Through:** Head, Department of Physiotherapy, BHPI

**Subject:** Seeking permission for data collection of 4<sup>th</sup> year physiotherapy research project.

Respected Sir,

With due respect and humble submission to state that I am Somaia Islam, student of 4<sup>th</sup> Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project entitled on "Assessment of functional status of patient with knee osteoarthritis" under the supervision of Md. Shofiqul Islam, Associate Professor & Head, department of physiotherapy, CRP, Savar, Dhaka-1343, Bangladesh. 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 Musculoskeletal unit, department of Physiotherapy, CRP, Savar, Dhaka. So, I need permission for data collection from the Musculoskeletal unit of Physiotherapy department of CRP, Savar, Dhaka. I would like to assure that anything of my study will not be harmful for the participants.

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

Yours obediently,

*Somaia Islam*

Somaia Islam

4<sup>th</sup> professional B.Sc. in Physiotherapy

Roll: 11, Session: 2016-17, ID No: 112160333

Bangladesh Health Professions Institute (BHPI)

(An academic Institute of CRP)

CRP, Chapain, Savar, Dhaka-1343.

*Forwarded & Recommended*

*Shofiq*

*21.03.2022*

**Md. Shofiqul Islam**  
Associate Professor & Head  
Department of Physiotherapy  
Bangladesh Health Professions Institute (BHPI)  
CRP, Chapain, Savar, Dhaka-1343

*Approved*

*21/3/22*

**MOHAMMAD ANWAR HOSSAIN**  
Senior Consultant &  
Head of Physiotherapy Dept  
Associate Professor, BHPI  
CRP Savar, Dhaka-1343



APPENDIX-G

The Chairman  
Institutional Review Board (IRB)  
Bangladesh Health Professions Institute (BHPI), CRP  
Savar, Dhaka-1343. Bangladesh

Subject: Application for review and ethical approval.

Dear sir,

With due respect, I am Somaia Islam, student of final year B.Sc. in Physiotherapy program at Bangladesh Health Professions Institute (BHPI) the academic institute of Centre for the Rehabilitation of the Paralysed (CRP) under the Faculty of Medicine, University of Dhaka. As per the course curriculum, I have to conduct a research project entitled "Assessment of functional status of patient with knee Osteoarthritis" under the supervision of Md. Shofiqul Islam, Associate Professor & Head, Department of physiotherapy, BHPI.

The purpose of the study is to assess the functional status of patient with knee osteoarthritis. The study involves face-to-face interview by using questionnaire to explore the functional status of patient with knee osteoarthritis who are attending at CRP hospital in Savar that may take 40-50 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. Related information will be collected from the patients' guide books. Data collectors will receive informed consent from all participants and the collected data will be kept confidential.

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

Sincerely,

*Somaia Islam*

Somaia Islam  
Final Year B.Sc. in Physiotherapy  
Session: 2016 – 2017.  
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

Thesis presentation date: 12th October 2021

*Shofiq*  
Head of Department  
B.Sc. in Physiotherapy, BHPI.  
**Md. Shofiqul Islam**  
Associate Professor & Head  
Department of Physiotherapy  
Bangladesh Health Professions Institute (BHPI)  
CRP, Chapam, Savar, Dhaka-1343

Recommendation from the Supervisor

*Shofiq*

Md. Shofiqul Islam,  
Associate Professor & Head,  
Department of physiotherapy, BHPI.