CHARACTERISTICS OF MUSCULOSKELETAL COMPLAINS AMONG TYPE 2 DIABETIC PATIENTS

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

CHARACTERISTICS OF MUSCULOSKELETAL COMPLAINS AMONG TYPE 2 DIABETIC PATIENTS

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DECLERATION

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

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CONTENTS

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Abbreviations

BHPI:	Bangladesh Health Professions Institute
BIHS:	Bangladesh Institution of Health Sciences
BIRDEM:	Bangladesh Institute of Research and Rehabilitation for Diabetes, Endocrine and Metabolic
BMI:	Body Mass Index
CRP:	Centre for the Rehabilitation of the Paralyzed
DM:	Diabetes Mellitus
HSC:	Higher Secondary School Certificate
IFT:	Interferential therapy
MSCs:	Musculoskeletal Complains
NCDs:	Non Communicable Diseases
SEAR:	South-East Asia Region
SPSS:	Statistical Package for Social Sciences
SSC:	Secondary School Certificate
TENS:	Transcutaneous Electrical Nerve Stimulation
WHO:	World Health Organization

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Abstract

Purpose: Diabetes mellitus is associated with a variety of musculoskeletal problems. In Bangladesh many diabetic mellitus patients are suffering different complications including musculoskeletal problems. This study represents the Characteristics of Musculoskeletal Complains among Type-2 Diabetic patients. *Objective*: This study was aimed to find out the common musculoskeletal complains among diabetic mellitus patient, to know the association of the musculoskeletal complain, behavioural risk factors, treatment compliance with diabetes, to determine the socio demographic characteristics of the study population. *Methodology*: A descriptive type of cross sectional study of 115 participants was conducted. The sample was selected by using purposive sampling technique. Data was collected from the participants through face to face interview. Descriptive statistics was used for data analysis. *Results:* More than half of the participants 61.7% (71) were female and highest number participants, 40.9% (47) were in the age range of 41-50 years. Nearly half of the participants had primary level of education 21.7% (25) followed by 13.9% (16) uneducated. More than half of the participant 55.7% (64) diabetes onset from 0-5 years and 63.5% (73) of participants has controlled diabetes. Most of the participants complain that they have pain in any part of the body and 83.5% (96) suffering this pain from 0-2 years. Among the participants 39.1% (45) have back pain, 37.4% (43) found those were suffering pains in knee, and 28.7% (33) have shoulder pain. *Conclusion:* This study helps to establish a collaborative treatment approach for diabetes mellitus patients and improve the referral system to physiotherapy services in Bangladesh.

CHAPTER-I: INTRODUCTION

Chronic diseases are now the major cause of death and disability worldwide (Ewert et al., 2004). Bangladesh is one of the poorest countries of the world with various health problems. According to World Health Organization (WHO) at present globally non communicable diseases like DM, cardiovascular diseases, chronic pulmonary diseases, cancer are the major cause of human morbidity and mortality. Non communicable diseases (NCDs) are assuming alarming proportions in the south-east Asia region (SEAR).They account the 51% of all deaths and 44% of the disease burden in the region. Therefore NCDs should no longer be regarded as a problem confined to the developed countries and affluent segments of society. In fact they are clearly emerging as a major public health challenges in developing countries of SEAR (World Health Organization, 2009).

DM comprises a group of common metabolic disorders that share the phenotype of hyperglycemia (Braunwald et al., 2001). It is a clinical syndrome occurs due to absolute or relative deficiency of insulin. Lack of insulin affects the metabolism of carbohydrate, protein and fat and causes a significant disturbance of water and electrolyte homeostasis (Haslett et al., 1999). Musculoskeletal problem is one of the most common complications of diabetic mellitus patients. In present world prevalence Diabetes Mellitus 2.8% of the total population and in Bangladesh more than 90% of the all diabetes patients belong to Type 2 diabetes (Kalra et al., 2010). Physiotherapy plays a pivotal role in the management of diabetes mellitus. Exercise is a basis in the management of diabetes, and the physiotherapist holds a place of importance in helping diabetic patients lead a better quality of life (Kalra et al., 2007).

1.1 Background

Not long ago Diabetes was regarded as rare condition but the number of people with diabetes is increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity. The complications of diabetes mellitus are numerous and include involvement of the musculoskeletal system (Wild et al., 2004).

The predicted prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The prevalence of diabetes is higher in men than women, but there are more women with diabetes than men. Diabetes is a multi-system disorder affecting 3 -7% of the adult population in different geographical areas (Ozdirenc et al., 2004). The urban population in developing countries is projected to double between 2000 and 2030. The most important demographic change to diabetes prevalence across the world appears to be the increase in the proportion of people >65 years of age (World Health Organization, 2011). Generally type II diabetes affects populations between 40 and 70 years of age and it is the most common type of the disease (Ozdirenc et al., 2004).

Douloumpakas et al., (2007) estimated that 82.6% among 208 diabetes mellitus patients had degenerative and non-inflammatory type of musculoskeletal abnormalities. Most musculoskeletal complications seem to be associated with the duration of DM and appear in diabetic patients of younger age than their counterparts in the general population. Musculoskeletal disorders in these patients are probably related to the long-term glycaemic control of the diabetes. Physiotherapists play an important role in helping people to overcome disability and pain related to orthopedic, musculoskeletal, neurological and rheumatological illnesses (Kalra et al., 2007). Wild et al., (2004) mentioned that the prevalence rate of diabetes in Bangladesh 3.2 millions ranked in number 10 in worldwide and in 2030 it will be 11.1 million and rank will be 7. About 90% - 95% of all diabetes patients of Bangladesh belong to Type 2 diabetes (Mahtab et al., 2003).

According to World Health Organization (2011) the prevalence of diabetes mellitus in South East Region at a glance in table 1.1

Country	**In 2000**	**In 2030 (Prediction)**
Bangladesh	3,196,000	11,140,000
Bhutan	35,000	109,000
Dem. People's Rep. of Korea	367,000	635,000
India	31,705,000	79,441,000
Indonesia	8,426,000	21,257,000
Maldives	6,000	25,000
Myanmar	543,000	1,330,000
Nepal	436,000	1,328,000
Sri Lanka	653,000	1,537,000
Thailand	1,536,000	2,739,000
Total	46,903,000	119,541,000

Table-1.1: Prevalence of diabetes mellitus in South East Region

1.2 Justification of the study

Diabetes mellitus poses serious health problems both in developed and developing countries. The prevention and control of diabetes in developing countries deserve urgent attention since the disease is expected to double in these countries in the next 20 to 25 years. The problem of diabetes mellitus in Bangladesh is also increased day by day as like as whole world. They are mostly suffers with many types of musculoskeletal problem like as shoulder pain, frozen shoulder, hand syndrome, back pain, neck pain, osteoarthritis, elbow pain, epicondylitis, carpal tunnel syndrome, Dequerven tenosynovities, leg and foot pain, amyotrophy etc(Douloumpaks et al., 2007). But they are not aware about these problems. In Bangladesh this problem is more severe. This study aims to address these problems and design physiotherapy intervention for this diabetic patient with musculoskeletal problem. After completing this study the patients will be benefited because after that they will aware about physiotherapy services. They will also know that they can get helps from physiotherapy.

This study also will be helpful in making physiotherapist to aware about the musculoskeletal problem of diabetic patient. It will assist to make current physiotherapy practice more holistic and effective for the diabetic patient with musculoskeletal problem in Bangladesh. This study might give a clear reflection of the prevalence of musculoskeletal problem arises among the patient with diabetes. Physiotherapy plays a vital role in the management of diabetic patient. So it will also be helpful for physiotherapist in working in this area for delivering treatment service. This study will also be helpful for different organizations working in this area for including physiotherapy service in their program for delivering a comprehensive treatment service. As a result patients become more benefited. Thus the study might create a future prospect of physiotherapy profession in Bangladesh.

1.3 Research Question

What are the characteristics of musculoskeletal complains among type 2 diabetes patient?

1.4 Objectives

1.4.1 General objective

To find out characteristics of musculoskeletal complains among type 2 diabetic patients.

1.4.2 Specific objectives

- To find out the characteristics of musculoskeletal complains among type 2 diabetes.
- To identify type 2 diabetic patient with musculoskeletal complain.
- To know the association of the musculoskeletal complain, behavioural risk factors, treatment compliance with diabetes.
- To determine the socio demographic characteristics of the study population.

1.5 List of variables

Independent Variables	Dependent Variables
Socio Demography • Age, • Sex, • Education, • Occupation, • Current living status. Types of Diagnosis Types of Treatment Behavioral risk factors • Tobacco intake • Alcohol consumption • Betel nut user • Unhealthy diet • Physical inactivity	Musculoskeletal complain

Table-1.5: List of variables

1.6 Operational Definition

1.6.1 Characteristics

Characteristics of musculoskeletal complain mean pain, muscle weakness & wasting, decreased joint range of motion and numbness etc. In case of type 2 diabetic patients also show these characteristics.

1.6.2 Musculoskeletal Problem

A musculoskeletal problem is a condition where a part of musculoskeletal system is injured over time and it occurs when the body part is called on to work harder, stretch farther, impact more directly or otherwise functions at a greater level then it is prepared for. The immediate impact may be minute, but when it occurs repeatedly the constant trauma cause damage. These conditions are often focused on a joint and affect the muscle and bone. However other areas can be strained and their response to that trauma can be an injury (Atijosan et al., 2007).

1.6.3 Diabetes Mellitus & Type 2 DM

Diabetes Mellitus is a chronic disease, which occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces. This leads to an increased concentration of glucose in the blood (hyperglycaemia) (Douloumpakas et al., 2007).

In type 2 diabetes, patients can still produce insulin, but do so relatively inadequately for their body's needs, particularly in the face of insulin resistance as discussed above. In many cases this actually means the pancreas produces larger than normal quantities of insulin. A major feature of type 2 diabetes is a lack of sensitivity to insulin by the cells of the body (Haslett et al., 1999).

CHAPTER-II: LITERATURE REVIEW

Diabetes Mellitus (DM) is a group of metabolic diseases characterized by high blood glucose levels, which result from defects in insulin secretion or action or both. Diabetes mellitus, commonly referred to as diabetes was first identified as a disease associated with sweet urine, and excessive muscle loss in the very old world. Prominent levels of blood glucose lead to spillage of glucose into the urine (Braunwald et al, 2001, p. 2109). Normally, blood glucose levels are tightly controlled by insulin, a hormone produced by the pancreas. Insulin lowers the blood glucose level. When the blood glucose elevates that means after eating food, insulin is released from the pancreas to normalize the glucose level. In patients with diabetes, the absence or insufficient production of insulin causes hyperglycemia. Diabetes is a chronic medical condition, meaning that although it can be controlled, it lasts for a lifetime (Ozdirenc et al., 2003).

Type 1 or Insulin Dependent Diabetes Mellitus (IDDM)**:** In type 1 diabetes, the pancreas undergoes an autoimmune attack by the body itself, and is rendered incapable of making insulin. Abnormal antibodies have been found in the majority of patients with type 1 diabetes. Antibodies are proteins in the blood that are part of the body's immune system. The patient with type 1 diabetes must rely on insulin medication for survival (Garvan Institute of Medical Research, 2010).

Type 2 or Non Insulin Dependent Diabetes Mellitus (NIDDM) or Adult Onset Diabetes Mellitus (AODM): In type 2 diabetes, patients can still produce insulin, but do so relatively inadequately for their body's needs, particularly in the face of insulin resistance as discussed above. In many cases this actually means the pancreas produces larger than normal quantities of insulin. A major feature of type 2 diabetes is a lack of sensitivity to insulin by the cells of the body (Haslett et al., 1999).

Another type of diabetes is gestational diabetes: Diabetes can occur temporarily during pregnancy. Significant hormonal changes during pregnancy can lead to blood sugar elevation in genetically predisposed individuals. Blood sugar elevation during pregnancy is called gestational diabetes and women with gestational diabetes will finally develop type 2 diabetes in later stage of life (Garvan Institute of Medical

Research, 2010). Secondary diabetes may develop when the pancreatic tissue responsible for the production of insulin is destroyed by disease, such as chronic pancreatitis, trauma, or surgical removal of the pancreas. Other forms of diabetes mellitus include congenital diabetes, which is due to genetic defects of insulin secretion, cystic fibrosis-related diabetes, steroid diabetes induced by high doses of glucocorticoids, and several forms of monogenic diabetes (Haslett et al., 1999).

The early symptoms of untreated diabetes are related to elevated blood sugar levels, and loss of glucose in the urine. High amounts of glucose in the urine can cause increased urine output and lead to dehydration. Dehydration causes increased thirst and water consumption. The inability of insulin to perform normally has effects on protein, fat and carbohydrate metabolism. A relative or absolute insulin deficiency eventually leads to weight loss despite an increase in appetite. Some untreated diabetes patients also complain of fatigue, nausea and vomiting. Patients with diabetes are prone to developing infections of the bladder, skin and vaginal areas. Fluctuations in blood glucose levels can lead to blurred vision. Extremely elevated glucose levels can lead to lethargy and coma (Ship, 2003).

In Type 1 diabetes the cells in the pancreas that make insulin are destroyed, causing a severe lack of insulin. This is thought to be the results of the body attacking and destroying its own cells in the pancreas - known as an autoimmune reaction. These include:

- Infection with a specific virus or bacteria;
- Exposure to food-borne chemical toxins; and
- Exposure as a very young infant to cow's milk, where an as yet unidentified component of this triggers the autoimmune reaction in the body (Braunwald et al., 2001, p. 2109) & (Ship, 2003).

Type 2 diabetes is believed to develop when:

- The receptors on cells in the body that normally respond to the action of insulin fail to be stimulated by it - this is known as insulin resistance. In response to this more insulin may be produced, and this over-production exhausts the insulin-manufacturing cells in the pancreas;
- There is simply insufficient insulin available; and

- The insulin that is available may be abnormal and therefore doesn't work properly.

Increase the chances of someone developing Type 2 diabetes:

- Increasing age.
- Obesity.
- Physical inactivity.

Rarer causes of diabetes include:

- Certain medicines.
- Pregnancy (gestational diabetes).
- Any illness or disease that damages the pancreas and affects its ability to produce insulin e.g. pancreatitis (Rehabilitation Research & Training Centre on Spinal Cord Injury, 2007) & (Haslett et al., 1999).

Diet is one of the most important factors triggering diabetes mellitus. Indeed, diabetes mellitus is a condition in which the blood sugar level increases and so, any diet that contains carbohydrates (or more specifically, sugars) in it, are directly responsible for increasing the overall blood sugar level. The following foods are directly responsible for the development and aggravation of diabetes mellitus.

- All foods containing sugar such as jam, jelly, chocolates, desserts, ice cream, candy, etc.
- Honey in all forms.
- Cokes, cola drinks and all such artificially sweetened cold drinks.
- Milk and milk products, including cheese, butter and condensed milk.
- Fruits with high sugar content and their juices.
- Oily foods.
- Alcoholic beverages, including wines.

  (National Center for Chronic Disease Prevention and Health Promotion, 2007).

Diabetes mellitus is a lifestyle disease. It has been observed that this disease is more widespread in the upper classes, since they tend to binge more on unhealthy foods. For this reason, diabetes mellitus is termed as a rich man’s disease. People who migrate to advanced countries stand a higher risk of contracting diabetes mellitus (Centers for Disease Control and Prevention, 2011).

It has been observed that people who lead an inactive lifestyle are more vulnerable to non-insulin dependent diabetes, or diabetes mellitus type 2. Such people have unexercised muscles and tissues, which can affect the overall action of insulin and reduce its capacity in the utilization of glucose. Stress is another very important cause of diabetes mellitus. In some high-risk people, stress can cause malfunctioning of the pancreas, and hence, secretion of insulin. Several reasons can bring on stress and trauma (Centers for Disease Control and Prevention, 2011).

Diabetes mellitus can be originated from outside the body rather than from within. The following are some of the more obvious of these extrinsic factors-

- People who take steroids and other drugs that alter the hormonal balance are very susceptible to diabetes mellitus, as the amount of insulin can be reduced.
- Some people can develop diabetes due to the chemicals contained in certain vegetables such as beans.
- Infections can also cause diabetes mellitus. Some microorganisms can infect the pancreas and reduce its functioning. The insulin dependent diabetes mellitus or the diabetes mellitus type 1 is believed to be caused, among other causes, due to the infection of the Coxsackie virus on the pancreas (Ship, 2003), (Centers for Disease Control and Prevention, 2011).

DM shows a very strong hereditary connection. People who have the human leukocyte antigen (HLA) in their blood, which is obtained from the parents, they have a strong tendency towards developing diabetes mellitus (Ship, 2003). DM can occur in any age. Diabetes mellitus type 2 mostly occurs in the adulthood. It can begin in youth, but its repercussions on the overall health are found in the later stages of life, when the person reaches middle age. Diabetes mellitus type 1 was once called juvenile diabetes because it was found to be prevalent in children and adolescents predominantly (National Center for Chronic Disease Prevention and Health Promotion, 2007).

Easy diagnosis of diabetes Patients has some symptoms such as- polyuria, polydipsia, nocturia, weight loss and also confirmatory random blood glucose level above 200 mg/dl (Andreoli et al., 1997). Diabetes mellitus is characterized by recurrent or

persistent hyperglycemia, and is diagnosed by demonstrating any one of the following:

- Fasting plasma glucose level ≥ 7.0 mmol/L (126 mg/dL).
- Plasma glucose ≥ 11.1 mmol/L (200 mg/dL) two hours after a 75 g oral glucose load as in a glucose tolerance test.
- Symptoms of hyperglycemia and casual plasma glucose ≥ 11.1 mmol/L (200 mg/dL).
- Glycated hemoglobin (Hb A1C) ≥ 6.5% (World Health Organization, 2006) & (Ozdirenc et al., 2003).

A positive result, in the absence of unequivocal hyperglycemia, should be confirmed by a repeat of any of the above-listed methods on a different day. It is preferable to measure a fasting glucose level because of the ease of measurement and the considerable time commitment of formal glucose tolerance testing, which takes two hours to complete and offers no prognostic advantage over the fasting test. According to the current definition, two fasting glucose measurements above 126 mg/dL (7.0 mmol/L) are considered diagnostic for diabetes mellitus (Dewapura, 2009) and (Andreoli et al., 1997).

People with fasting glucose levels from 100 to 125 mg/dL (5.6 to 6.9 mmol/L) are considered to have impaired fasting glucose. Patients with plasma glucose at or above 140 mg/dL (7.8 mmol/L), but not over 200 mg/dL (11.1 mmol/L), two hours after a 75 g oral glucose load are considered to have impaired glucose tolerance. Of these two pre-diabetic states, the latter in particular is a major risk factor for progression to full-blown diabetes mellitus as well as cardiovascular disease (Ship, 2003) and (Braunwald et al., 2001). Disorders of Musculoskeletal system are common conditions seen in diabetic patients particularly in Type 2. It is known that functional capacity is lower in type II diabetic patients by obesity, cardiovascular and musculoskeletal complications (Ozdirenc et al., 2004). Diabetes mellitus affects connective tissues cause's different alterations in periarticular and skeletal systems. Several musculoskeletal disorders of diabetic patient can be divided into three categories:

- Disorders which represent intrinsic complications of diabetes such as limited joint mobility or diabetic cheiroarthropathy, stiff hand syndrome, and diabetic muscular infarction.
- Disorders with an increased incidence among diabetes such as Dupuytren's disease, shoulder capsulities, neuropathic arthropathy, osteopenia mostly found in type1 diabetic patient and Flexor tenosynovitis, septic arthritis, acute proximal neuropathy, proximal motor neuropathy, pyomyositis, the diffuse idiopathic skeletal hyperostosis (DISH) syndrome.
- Disorders for which a possible association with diabetes has been proposed but not proved such as osteoarthritis and the carpal tunnel syndrome (Fazey, 2008) and (Douloumpakas et al., 2007).

The upper extremity complications are known as 'diabetic hand'. Hands are a target for several diabetes related complications. Diabetic cheiroarthropathy, also known as diabetic stiff hand syndrome or limited joint mobility syndrome is found in diabetic patients which is characterized by thick, tight, waxy skin reminiscent of scleroderma. This is patients' inability to press their palms together completely without a gap remaining between opposed palms and fingers. Limited joint range of motion (inability to fully flex or extend the fingers) and sclerosis of tendon sheaths are also seen (Savas et al., 2006).

Flexor tenosynovitis or trigger finger is another frequent diabetic complication, in which patients complain of a catching sensation or locking phenomenon that may be associated with pain in the affected fingers (Cagliero et al., 2002).
Dupuytren's contracture another complication arise among diabetic patients results from a thickening, shortening, and fibrosis of the palmar fascia. Nodule formation along the fascia is seen. Flexion contractures of the fingers may result, usually at the fourth finger, but sometimes involving any of the second through fifth digits (Fitzgibbons and Weiss, 2008).

Carpal tunnel syndrome (CTS) is seen in diabetic patients. Its specific relationship to diabetes is thought to be median nerve entrapment caused by the diabetes-induced connective tissue changes mentioned above (Savas et al., 2006). Carpal tunnel

syndrome is usually diagnosed based on patients' history and clinical findings. Typically, patients complain of burning, Paraesthesia, or sensory loss in the median nerve distribution (the first three fingers as well as the radial half of the fourth finger), also complain of pain in the same area, often with radiation proximally into the forearm and arm and the pain may awaken patients from sleep and is aggravated by activities involving wrist flexion or extension, such as holding a newspaper or book, typing, driving, or using a knife and fork (Fitzgibbons and Weiss, 2008).

Diabetes can affect the shoulder in several ways. The most common musculoskeletal problems among Diabetic patients are adhesive causalities, which are also known as frozen shoulder, shoulder periarthritis, or obliterate bursitis. It is most disabling condition which is characterized by progressive, painful restriction of shoulder movement particularly in external rotation and abduction of shoulder joint, because the thickened joint capsule is closely applied and adherent to the humeral head. So the volume of the glenohumeral joint is considerable reduced (Smith et al., 2003). Calcify periarthritis of the shoulder is also seen in diabetes, where it is roughly three times more common than in people without diabetes. Reflex sympathetic dystrophy, also known as "shoulder-hand syndrome," is seen in diabetic patients. Patients may complain of pain from shoulder to hand in the affected limb. Classical examination findings include swelling of the affected limb/area, skin changes, increased sensitivity to temperature and touch (hyperesthesia), and vasomotor instability. Transient, patchy osteoporosis is also often seen among diabetic patients (Cagliero et al., 2002).

Diabetic Osteoarthropathy also known as Charcot or neuropathic arthropathy is a condition involving destructive, lytic joint changes is seen in both type 1 and type 2 diabetes patients. It is a severe, destructive form of degenerative arthritis resulting from a loss of sensation (brought on by underlying diabetic neuropathy) in the involved joints. It most commonly affects the pedal bones. Loss of sensation leads to inadvertent repeated micro trauma to the joints, which leads to degenerative changes. Depending on the stage and severity of the arthropathy, radiographs can show degenerative changes with subluxation, bone fragments, osteolysis, periosteal reaction, deformity, and/or ankylosis. Diabetic peripheral neuropathy is thought to play the greatest pathogenic role in diabetic osteoarthropathy. Most peripheral neuropathies damage nerves of the limbs; especially the foot on both sides and thus

lead to balance impairment (Ajimsha et al., 2011). Neuropathy results in sensory loss in lower extremities, increased in plantar pressures and fatigue in muscles stimulated by the peroneal and tibial nerves. These all impair gait and thus the physical fitness component of well-being is affected negativity (Ozdirenc et al., 2003). Loss of protective sensation on the plantar surface of the foot is considered the most relevant factors in skin breakdown resulting in diabetic foot ulcerations (Ko et al., 2010). Atrophy of the small muscles responsible for metatarsophalangeal plantar flexion is thought to lead to the development of hammer toes; claw toes (Schie et al., 2004).

Diabetic muscle infarction is a rare condition. This spontaneous infarction, with no history of trauma, tends to affect patients with a long history of poorly controlled diabetes (Smith et al., 2011). It is seen more commonly in patients with insulin-requiring diabetes, and most affected patients have multiple microvascular complications (neuropathy, nephropathy, and retinopathy). The clinical presentation is an acute onset of pain and swelling over days to weeks in the affected muscle groups usually the thigh or calf along with varying degrees of tenderness (Schie et al., 2004). Diffuse idiopathic skeletal hyperostosis is the higher prevalence among diabetic patients than among people without diabetes particularly in type 2 which is characterized by metaplastic calcification of spinal ligaments along with osteophyte formation. However, disc spaces, apophyseal joints, and sacroiliac joints are unaffected. The thoracic spine is most commonly affected. It may be accompanied by a more generalized calcification of other extra-axial ligaments and tendons, as well. Patients complain of stiffness in the neck and back with decreased range of motion. Pain is generally not a prominent symptom (Smith et al., 2011).

Diabetes is not clearly a risk factor for osteoarthritis but literature said that there is an association of early osteoarthritis and diabetes. Both large and small joint osteoarthritis have been reported to be increased in type 2 diabetes. However, osteoarthritis of the weight-bearing joints in the affected type 2 diabetic patients may be related to their obesity and not to the diabetes itself. It is not yet known whether diabetes is a risk factor for osteoarthritis independent of obesity (Person et al., 2004). Diabetic amyotrophy is a disabling illness that is distinct from other forms of diabetic neuropathy which is characterized by muscle weakness, wasting, and diffuse, proximal lower limb muscle pain, and asymmetrical loss of tendon jerks (Kalra et al.,

2007). It typically occurs in older men with type 2 diabetes, and is often associated with weight loss, sometimes as much as 40% of premorbid body mass (Kumar and Clarc, 2002). The exact cause and incidence of diabetic amyotrophy is uncertain. Management consists of stabilizing glycaemic control and physiotherapy. It improves in most of cases but the improvement is gradual and often incomplete. Diabetic amyotrophy is usually associated with times of poor glycaemic control & it resolves in time with careful control of the blood glucose (Smith et al., 2011).

Physiotherapy is an ancient science. It involves with various types of physical treatment techniques such as massage, the use of electrotherapeutic and mechanical agents. Physiotherapists play an important role in helping people to overcome disability and pain related condition such as orthopedic, musculoskeletal, neurological and rheumatological condition and also plays an important role in treatment of secondary complications as neuropathy, arthromyopathy etc found commonly in diabetes patients (Kalra et al., 2007). Physiotherapists, with their knowledge of physiology and anatomy, can suggest specific exercises for people with coexisting complications, cautioning against certain movements that might be detrimental to their health (Physiotherapy Effectiveness Bulletin, 2002).

For example, an isotonic exercise like jogging will benefit a person with high blood pressure and diabetes, but the repeated foot trauma associated with jogging may harm someone with peripheral sensory neuropathy or Charcot foot. Most people with diabetes suffer from musculoskeletal complications (Adeniyi et al., 2010), which might include frozen shoulder, osteoarthritis, different hand syndrome, foot problem, muscle and shoulder problem, in all these conditions, physiotherapy plays a central role in returning people to normal levels of health and well-being (Physiotherapy Effectiveness Bulletin, 2002). The physiotherapist uses a combination of active and passive exercises, and mechanical and electrical aids to improve musculoskeletal and neurological functions. Physiotherapist can play an important role in preventing and managing foot problems. Teaching the importance of correct gait and posture, along with the basic principles of off-loading when required, can prevent or stabilize a number of foot complications. In people with trophic ulcers, which are typical in people with diabetes-related foot problems, the effective use of crutches or foot splints can ensure off-loading and early healing (Ozdirenc et al., 2004). In people who

are unfortunate enough to undergo an amputation, the physiotherapist helps with post-operative pain relief, rehabilitation, limitation of disability, and the optimum use of prostheses. Physiotherapy offers various effective non-pharmacological approaches for pain relief. Transcutaneous electrical nerve stimulation (TENS) involves electrical nerve stimulation through the skin, sending a painless current to specific nerves. The mild electrical current generates heat that serves to relieve stiffness, improve mobility, and relieve pain. Interferential therapy (IFT) uses the strong physiological effects of low frequency electrical stimulation of nerves. TENS and IFT are considered gold-standard therapies for the relief of neuropathic pain, and have proven benefits in the management of painful diabetic neuropathy, oedema and resistant foot ulcers. Ultrasonic therapy and hot wax are useful for specific conditions in people with diabetes (Fazey, 2008).

As the number of people with diabetes continues to rise, and as the existing diabetes population ages, the need for efficient physiotherapy services will continue to grow. In order to improve the health and well-being of all people with diabetes including specialized physiotherapist in the team management of Diabetes Mellitus is one of the imperative concerns (Kalra et al., 2007). Except in the case of type-1 diabetes, which always requires insulin replacement, the way type-2 diabetes is managed may change with adjusting for various factors such as age, ethnicity, smoking, alcohol intake, body mass index (BMI) and exercise. Insulin production decreases because of age-related impairment of pancreatic beta cells. Additionally, insulin resistance increases because of the loss of lean tissue and the accumulation of fat, particularly intra-abdominal fat, and the decreased tissue sensitivity to insulin. Glucose tolerance progressively declines with age, leading to a high prevalence of type-2 diabetes and post challenge hyperglycemia in the older population. Treatment goals for older patients with diabetes vary with the individual, and take into account health status, as well as life expectancy, level of dependence, and willingness to adhere to a treatment regimen (Tiernuy et al., 2002).

CHAPTER-III: METHODOLOGY

3.1 Study Design

This study has done through using cross sectional prospective survey under a quantitative study design. Survey methodology was chosen to meet the study aim as an effective way to collect data.

3.2 Rationale of Choosing the Methodology

The researcher wanted to determine the severity of musculoskeletal complain among the patients with Type 2 diabetes according to the age, sex, socio demography, and musculoskeletal complain like pain, decreased range of motion, muscle wasting, numbness and its effects. A survey is used to describe characteristics of a population and is the way by which the number of population is described on or more variables (age, sex etc.) (Frankel and Wallen, 2000, p. 432).

Samples of this study were the patients in the outdoor, BIHS Hospital, Mirpur, Dhaka. So, a prospective survey is the best for the study because this design involved identifying the group of people which the researcher wants to study and then collecting data from the sample when in a particular services (Hicks, 1999, p. 23). This is a cross sectional prospective survey because data were collected from samples at one point of time and the questions were asked retrospectively on events, sites, and feelings (Bowling, 1998, p. 173). To find out the characteristics of musculoskeletal complain, the researcher asked questions about the patient's feelings and life events. As the researcher wanted to find out the characteristics of musculoskeletal complain- so, a prospective survey study design is fit for conducting the study.

Depoy and Gitlin (1998, p. 120) stated that "*survey research describe parameters of population and predict relationship among these characteristics.*" This study described exactly the same things. Prospective survey is used to describe areas of the topic, to identify present trends and create future opportunity for research (Hicks, 1999, p. 108). The researcher used this method to describe characteristics of musculoskeletal complain among Type 2 diabetes patients, its rate and its severity according to the variables among the patients who were at outdoor, BIHS Hospital.

3.3 Sample Selection

3.3.1 Study site

The study was conducted at outdoor in the Bangladesh Institute of Health Sciences (BIHS) Hospital Mirpur-1, Dhaka. BIHS & Hospital is a component of Health Care Development Project (HCDP) –an enterprise of Diabetic Association of Bangladesh under Bangladesh-Netherland joint cooperation.

3.3.2 Study population

Type 2 diabetes patients at the Bangladesh Institute of Health Sciences (BIHS) Hospital.

3.3.3 Study Period

The study was conducted from March'2011 to February'2012.

3.3.4 Sample size

A sample is a smaller group taken from the population. Sometimes the sample size may be big and sometimes it may be small, depending on the population and the characteristics of the study (Bailey, 1997, p. 121). According to the prevalence of diabetes in BIHS Hospital, estimated sample size 156 (by following $\frac{z^2\ pq}{d^2}$, where z= 1.96, p= 0.07, q= 1-p, d=0.04). But due to time limitation, 115 Type 2 diabetes patients selected as study sample from the BIHS Hospital.

3.3.5 Sampling procedure

The study was conducted by using the purposive sampling methods due to the time limitation and as it was the one of the easiest, cheapest and quicker method of sample selection. The researcher used this procedure, because getting of those samples whose criteria was concerned with the study purpose.

Participants are chosen purposively because the participants have some particular features or characteristics which will enable detailed exploration of the research objectives (Purposive sampling, 2008). 115 subjects were selected for the study according to the inclusion and exclusion criteria, because it was not possible to study the total population within the time.

This method contained some inclusion criteria to select the participant. The researcher can find out the actual snap of the situation that they face in their everyday life.

3.3.6 Inclusion criteria

- The patient with diabetes mellitus in selected hospital (BIHS Hospital, Dhaka).
- Type-2 diabetic patient.
- Both sexes are included.

3.3.7 Exclusion criteria

- Type-1 diabetes mellitus patient (<35 years).
- Patients with any neurological deficits.
- Patient with other pathological evidence.

3.4 Data Collection

3.4.1 Data collection instrument

A structured questionnaire (Appendix 1C) and demographic information chart (Appendix 1B) used as a data collection instrument. In that time some other necessary materials are used like pen, pencil, and white paper and clip board. The English questionnaires were converted into Bengali to ask the participants during interviews. Researcher took permission from each volunteer participant by using a written consent form in Bengali (Appendix 3A) & English (Appendix 3B).

3.4.2 Procedure of data collection

At very beginning researcher clarified that the participant had the right to refuse to answer of any question during completing questionnaire. They could withdraw from the study at any time. Researcher also clarified to all participants about the aim of the study. Participants were ensured that any personal information would not be published anywhere. Researcher took permission from each volunteer participant by using a written consent form. After getting consent from the participants, standard questionnaire was used to identify the musculoskeletal complain and collect demographic information. Questions were asked according to the Bangla format (Appendix 1A).

For conducting the interview, the researcher conducted a face to face interview and asked questions. Physical environment was considered strictly. Stimuli that can distract interviewee were removed to ensure adequate attention of interview. Interviewee were asked questions alone as much as possible with consent as sometimes close relatives can guide answer for them. The researcher built rapport and clarified questions during the interview. Face to face interviews are the most effective way to get full cooperation of the participant in a survey (Fraenkel and Wallen, 2000, p. 436). Face to face interviews are also effective to describe characteristics of a population. Face to face interviews were used to find specific data which describes the population descriptively during discussion. According to the participants' understanding level, sometimes the questions were described in the native language so that the patients can understand the questions perfectly and answer accurately. All the data were collected by the researcher own to avoid the errors.

3.4.3 Field test

Prior to collect data the researcher conducted a field test with three participants in the BIHS Hospital. To make a feasible questionnaire was translated into Bengali. This test was performed to determine any difficulties that are exist in the questionnaires as well as the procedure of data collection. This test also helped the researcher to check the appropriateness of wording as well as ease of understanding of the questions.

3.5 Data analysis

Descriptive statistics was used to analyze data. Descriptive statistics refers methods of describing a set of results in terms of their most interesting characteristics (Hicks, 1999, p. 284). Data were analyzed with the software named Statistical Package for the Social Science (SPSS) version 16.0. The variables were labeled in a list and the researcher established a computer based data definition record file that consist of a list of variables in order. The researcher put the name of the variables in the variable view of SPSS and defined the types, values, decimal, label alignment and measurement level of data. The next step was cleaning new data files to check the inputted data set to ensure that all data had been accurately transcribed from the questionnaire sheet to the SPSS data view. Then the raw data was ready for analysis in SPSS. Data was analyzed by descriptive statistics and calculated as percentages and presented by

using table, bar graph, pie charts etc. Microsoft office Excel 2007 is used to decorating the bar graph and pie charts. The result of this survey was consisted of quantitative data. By this survey a lot of information was collected. All results gave good idea on the characteristics of musculoskeletal complain among Type 2 diabetes patients.

3.6 Ethical consideration

A research proposal was submitted to the local ethical review committee of Bangladesh Health Professions Institute (BHPI) for being approval. At first the researcher was apply for official permission for the study from the authority of BIHS. Then the director of the BIHS permitted to collect data at BIHS Hospital (Appendix 2A). The ethical consideration was making sure by an informed consent letter to the participant. Consent was obtained by providing each participant a clear description of the study purpose, the procedures involved in the study and also informing them that if they wish they can withdraw themselves any time from the study.

Participants were explained about his/her role in the study and it was explained that there is no direct benefit from the study but in future, cases like these may be benefited from it. Participants are also advised that they are free to decline answering any question during the interview. The necessary information had been kept secure place to also ensure confidentiality. They were also assured that it would not cause any harm. Then they signed the consent form.

3.7 Rigor

This study was conducted in systematic way. All the steps of research were followed by the researcher sequentially. During data collection and analysis the researcher avoided influencing the whole process by own perspectives, values and biases. The researcher never influenced the participants by her own perceptions during the data collection. A trustful relationship with participants was always maintained and the documents were kept confidential. Biasness was avoided during data analysis and data was analyzed by following data analysis steps in a systematic scientific way.

3.8 Limitation of the study

There were some situational limitations and barriers while considering the study. Those are as follows:

- ✓ The researcher only questioned a small number of subjects (115 in total) which was very small to generalize the result. This was due to time limitation.
- ✓ This study was only conducted among Type 2 diabetes patients at a specialized hospital in Dhaka. The data cannot therefore be generalized for practice of documentation by all Physiotherapists in Bangladesh.
- ✓ It is only the research ever in this field of practice of Physiotherapist in BHPI, CRP so local resources about documentation were not available for comparison.
- ✓ Although some international literatures were found in this field on the internet accessing this study was not always possible for comparison with the findings of this study.
- ✓ A purposive sampling was used that was not reflective of the wider population under study.
- ✓ Time and resources were limited which have a great deal of impact on the study.

CHAPTER-IV: RESULTS

Data were analyzed by descriptive statistics and calculated as percentages and presented by using bar graphs, pie charts and tables.

4.1 Gender

The pie chart shows that among the 115 participants it was found that 61.7% (71) were female and 38.3% (44) were male.

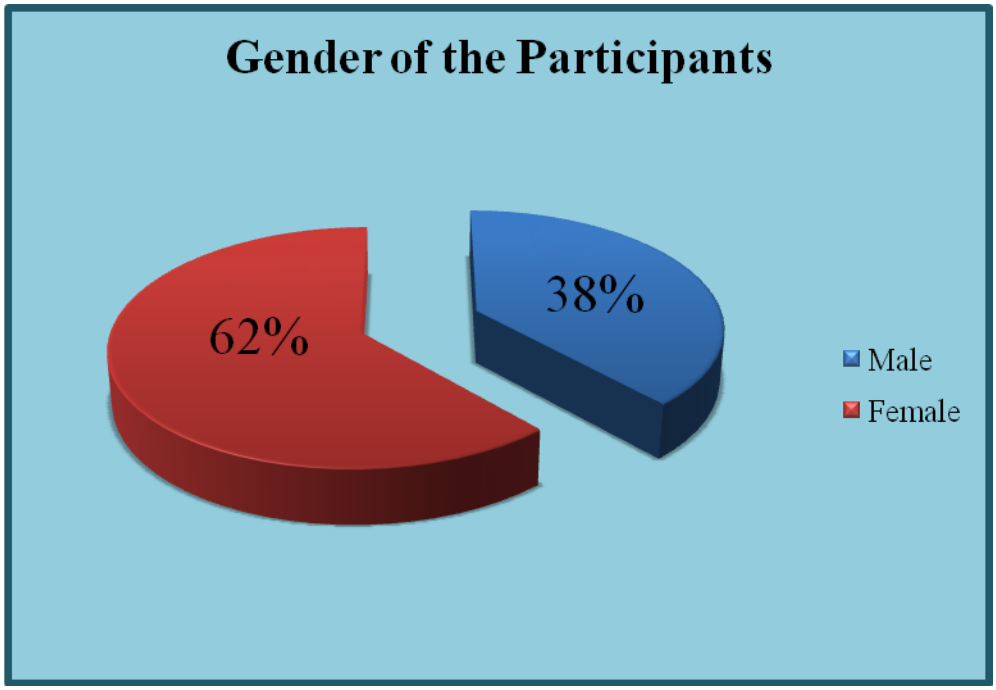

Figure- 4.1: Gender of the Participants

4.2 Age group

The above bar graph shown, among 115 participants the highest number participants, 40.9% (47) were found in the age range of 41-50 years, 33.9% (39) participants were in the age between 51-60 years, 13% (15) participants were found in the age between 30-40 years and only 12% (14) were found in the age range between 61-70 years.

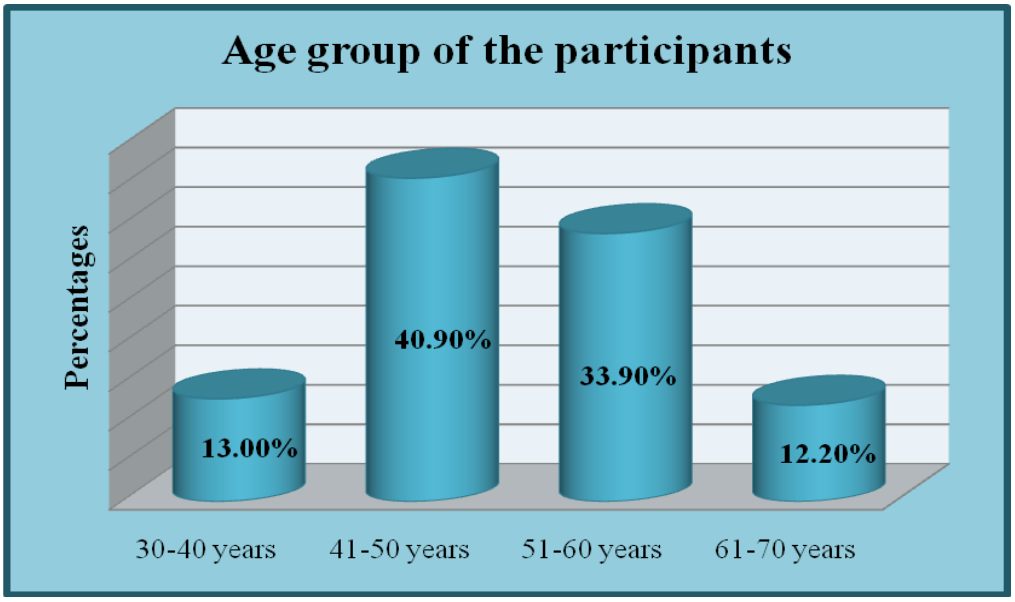

Figure- 4.2: Age group of the participants

4.3 Education

The bar graph shows that the highest number of participants 21.7% (25) is in the primary education level, 20% (23) are passed the H.S.C and 19.1% (22) were completed the graduation and 7% (8) were completed the post graduation. 13.9% (16) of them were found those were not able to read and write. From the bar graph it shows that only 3.5% (4) participant found those were only able to sign their name.

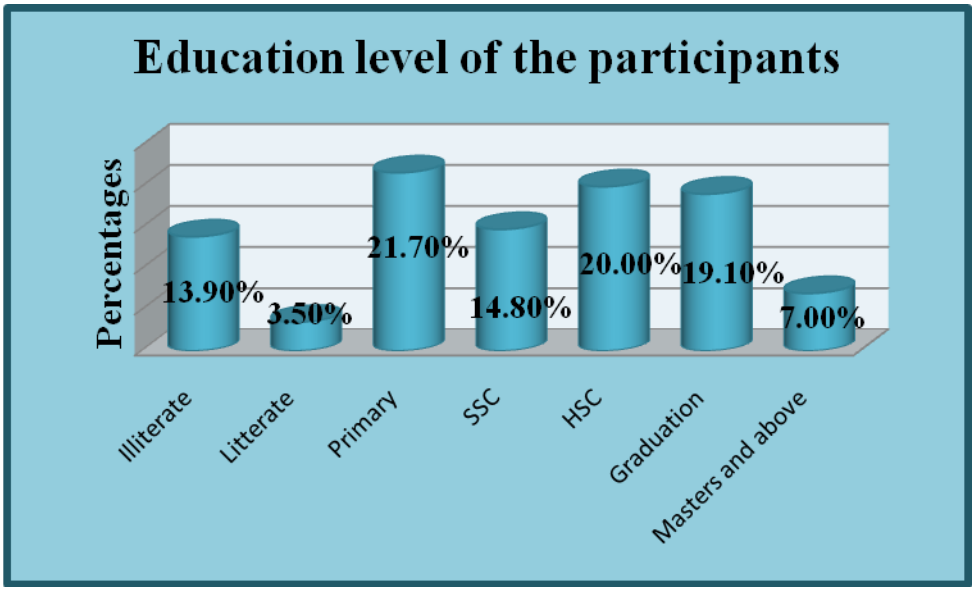

Figure- 4.3: Educational status of the participants

4.4 Occupation

Among the participants a highest number of respondents 43.5% (50) found those are housewife, 33% (38) participant's occupation is service holder, 8.7% (10) respondents are businessman, 7.8% (9) were labour in non agriculture area and only 3.5% (4) participants had found without any job or retired and others professions. In Bangladesh most common occupation is farmer or labour in agriculture sector and from the participants 3.5% (4) are found in this occupation.

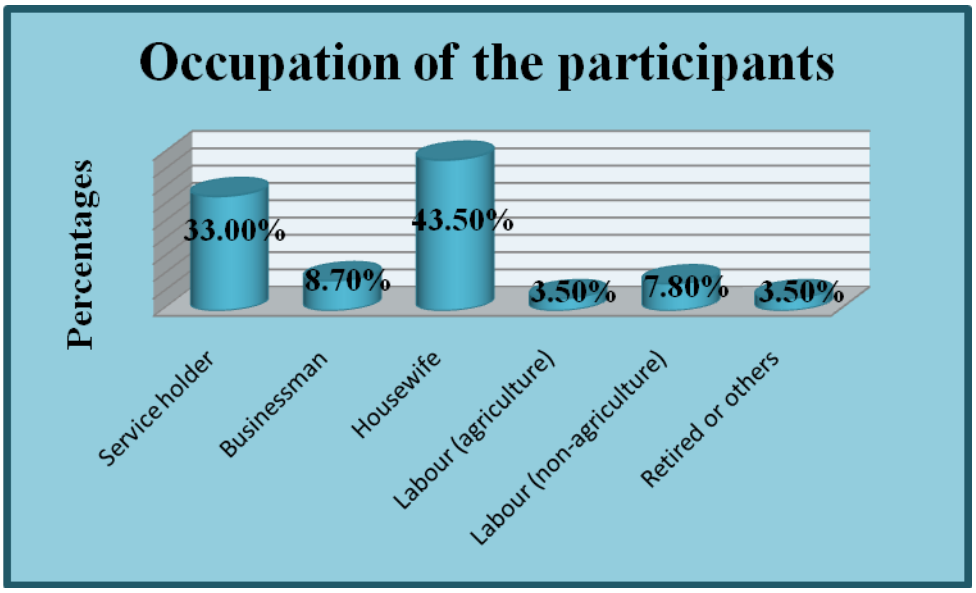

Figure- 4.4: Occupational status of the participants

4.5 Monthly Income

It was found from the participants that a highest number of them 67% (77) those income level is 1000-21000 taka, 25.2% (29) participants earn in the range of 22000-42000 taka, 5.2% (6) respondents earn 43000-63000 taka and 1.7% (2) of them earn equal or more than 85000 taka in a month. Only 0.9% (1) participant found who earn 64000-84000 taka in a month.

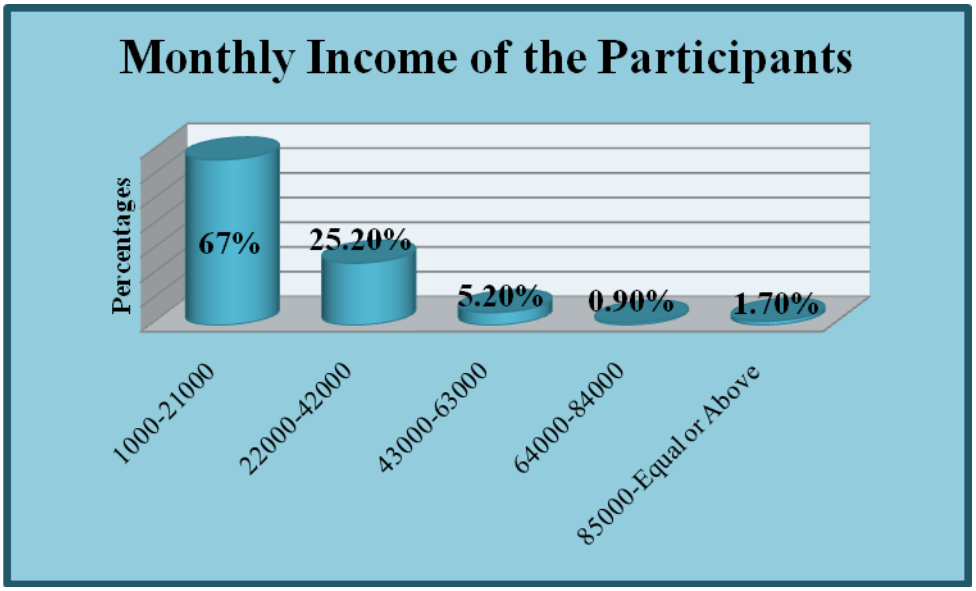

Figure- 4.5: Monthly income of the participants

4.6 Onset time of Diabetes Mellitus

From the 115 participants it was found that the highest numbers of them 55.7% (64) were found those suffered from 0-5 year's age range with diabetes. It was found that a majority number of participants 27.8% (32) are suffered with diabetes from 6-10 years, 8.7% (10) suffered with diabetes from 16-20 years and only 7.8% (9) of the participants found who were suffering with diabetes from 11-15 years.

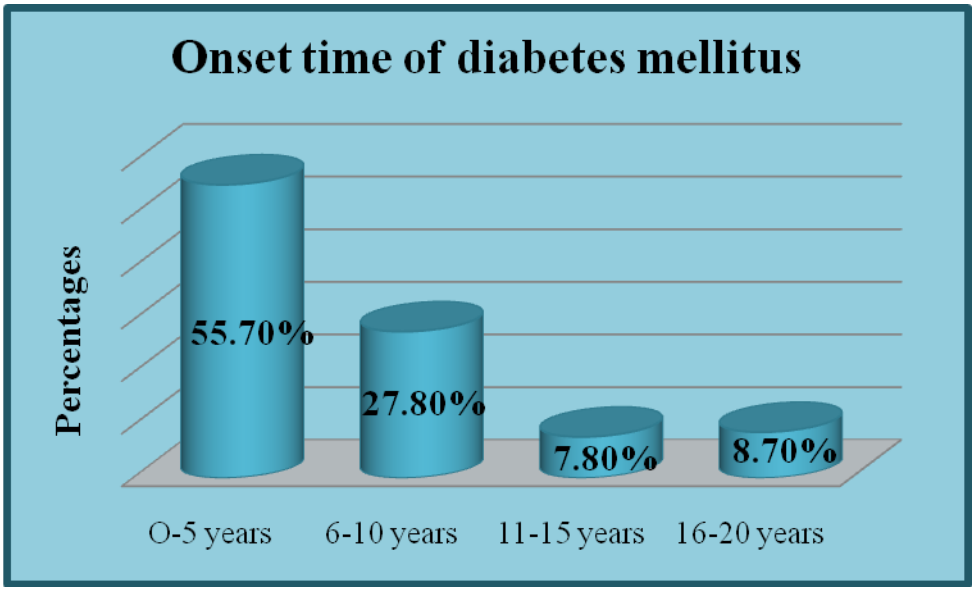

Figure- 4.6: Onset time of the Diabetes Mellitus

4.7 Controlled or uncontrolled diabetes Mellitus

Among the 115 participants 63.5% (73) of them have controlled glycaemic level they were in controlled diabetes and 36.5% (42) were found as uncontrolled diabetes.

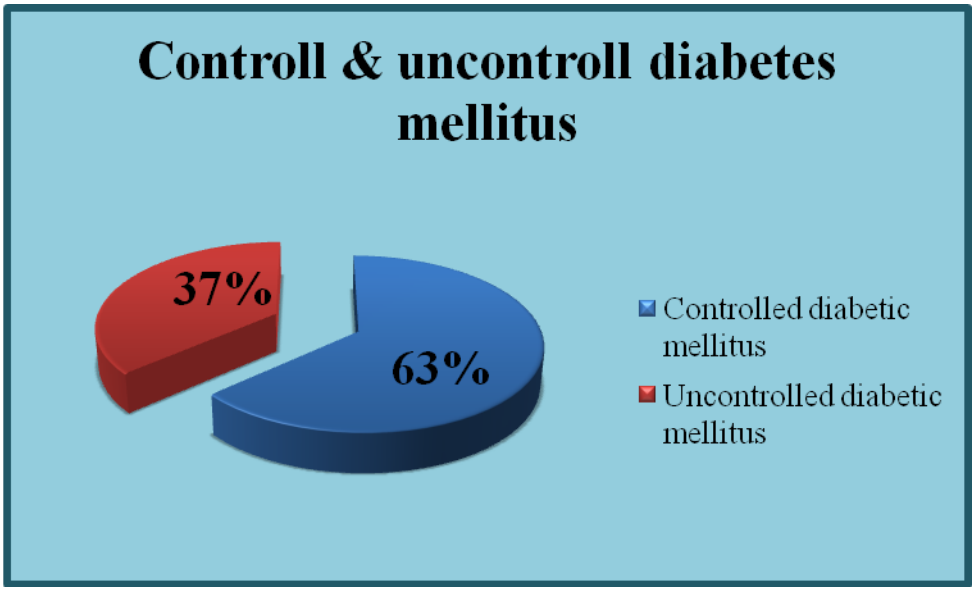

Figure- 4.7: Controlled or uncontrolled diabetes Mellitus

4.8 Compliance to diabetes treatment & guidelines

The pie chart shows that among the 115 participants 80% (92) 0f them were compliance to treatment and 20% (23) were not compliance to treatment or guidelines.

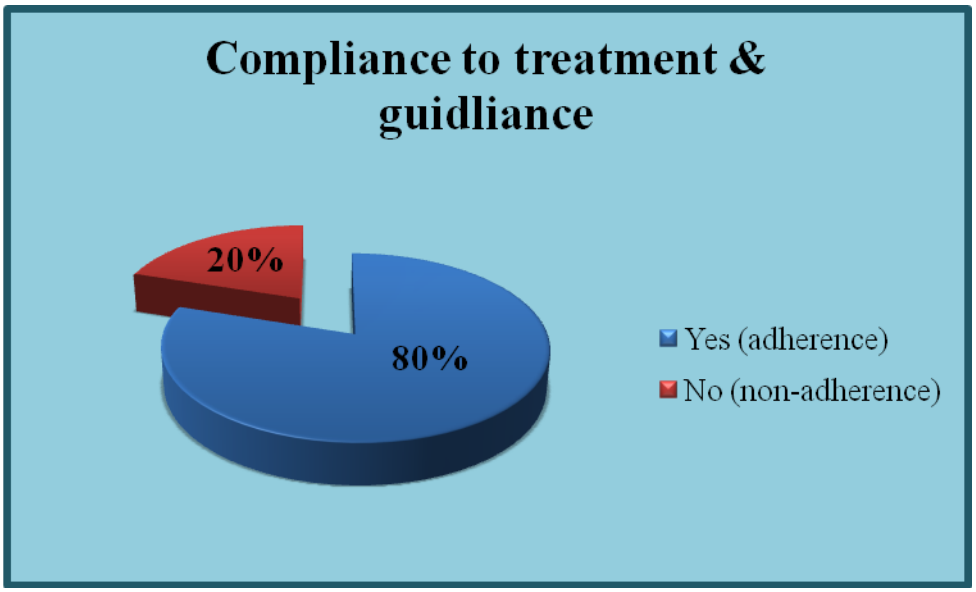

Figure- 4.8: Compliance to treatment & guidelines

4.9. Behavioral Risk factors

The bar graph shows that among the participants it was found that 10.4% (12) were smoker and majority of them 89.6% (103) were non smoker. Among 115 participants 20.9% (24) were betel nut user and 79.1% (91) were not user. The bar graph shows 80.9% (93) were done exercises and 19.1% (22) were not.

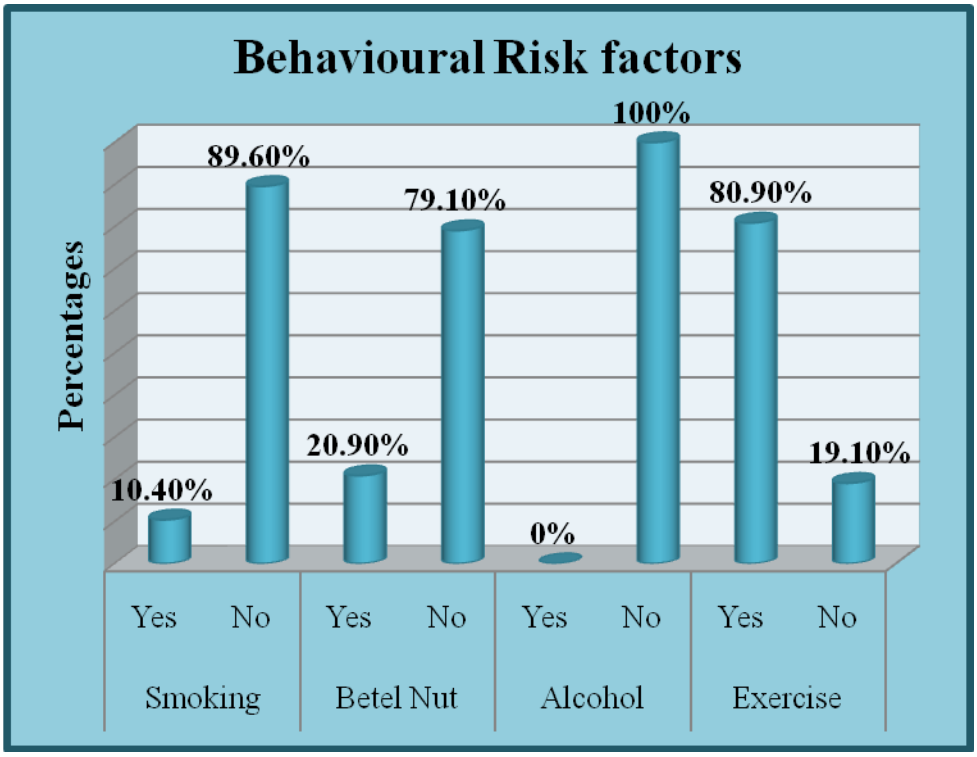

Figure- 4.9: Behavioral Risk factors

4.9.1 Duration of smoking

The bar graph shows that the highest number of participants 89.6% (103) is non smoker. It was found that a majority number of participants 3.5% (4) are used to smoke from 6-10 years, and also 3.5% (4) are used to smoke from 1-5 years, 1.7% (2) participants found who were used to smoke from 21 or more than 21 years and only 0.9% (1) of them were used to at 11-15 years and also another o.9% (1) from 16-20 years.

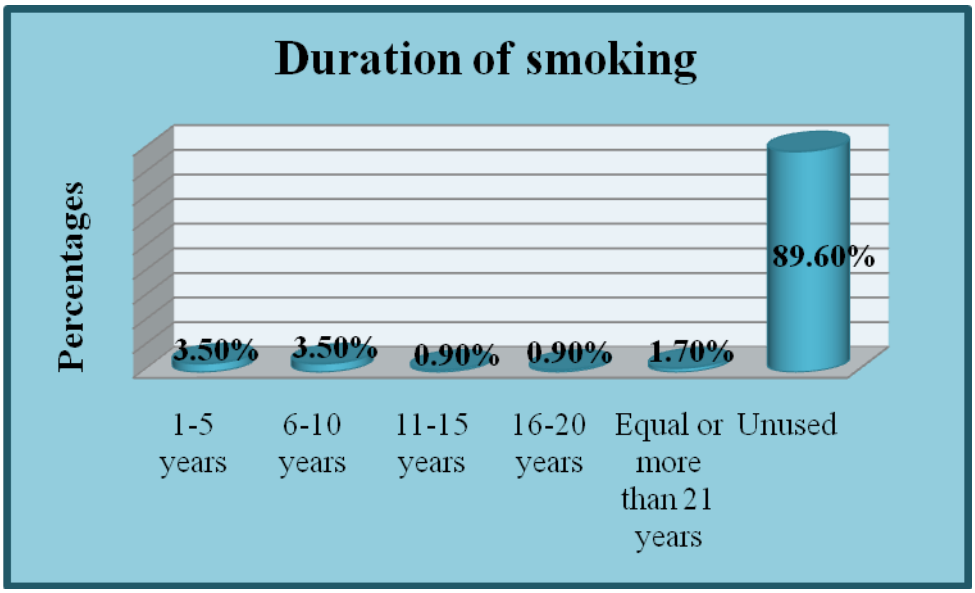

Figure- 4.9.1: Duration of smoking

4.9.2 Number of cigarette per day

Among 115 participants 10.4% (12) of them were smoker and 4.3% (5) from the smoker were used to smokes at 1-5 cigarette per day, 3.5% (4) of them were used 6-10 cigarette per day, 1.7% (2) participants were used to smoke 16-20 cigarettes per day, 0.9% (1) participant were used 11-15 cigarettes.

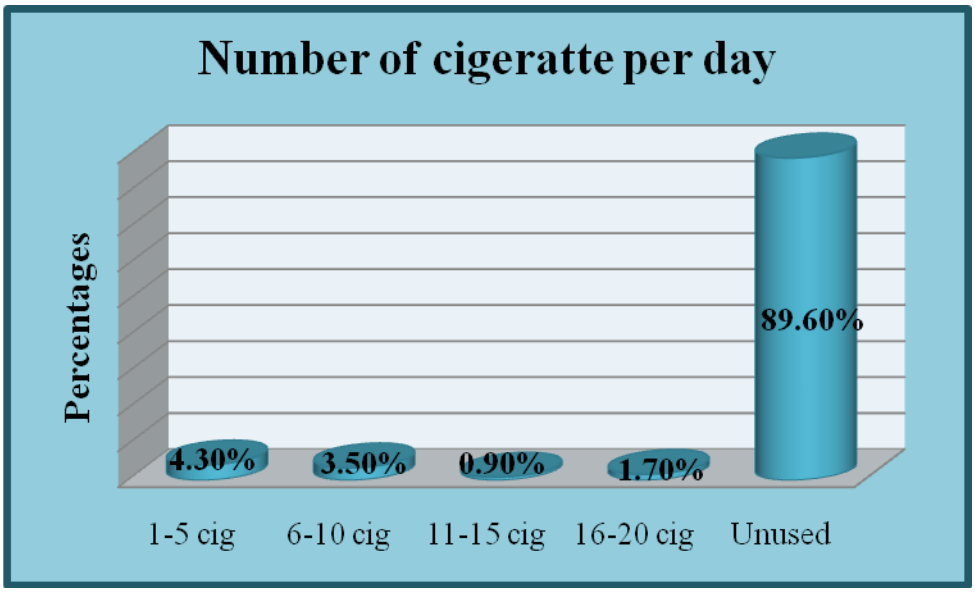

Figure- 4.9.2: Number of cigarette per day

4.9.3 Duration of betel nut

The bar graph shows that among the 115 participants more than half of the participants 79.1% (91) those are not use betel nut. It was found that 7.8% (9) those are used to betel nut from 6-10 years. Among them 7% (8) are used it from 1-5 years. And 3.5% (4) are used it from 11-15 years. Among the participants a limited number of participants 2.6% (3) found, used 16-20 years.

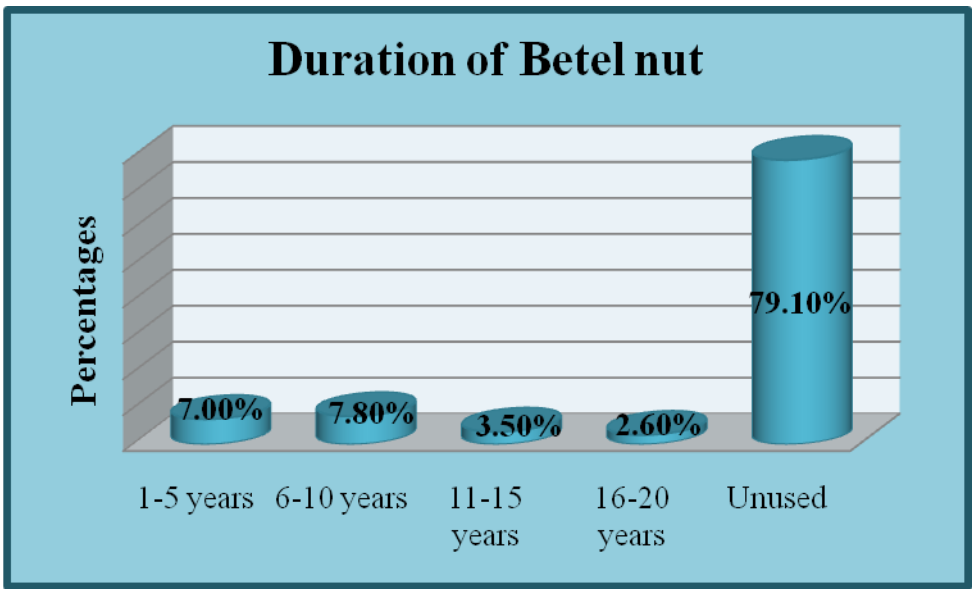

Figure- 4.9.3: Duration of betel nut

4.9.4 Eating fruits days per week

Among the 115 participants nearly half of the participants 44.3% (51) those are ate fruits for 2-3 days in a week, 34.8% (40) those are used to eat fruits at 0-1 day per week, and 15.7% (18) are ate for 6-7 days in a week. Among the participants a limited number of participants 5.2% (6) found, used to eat fruits at 4-5 days per week.

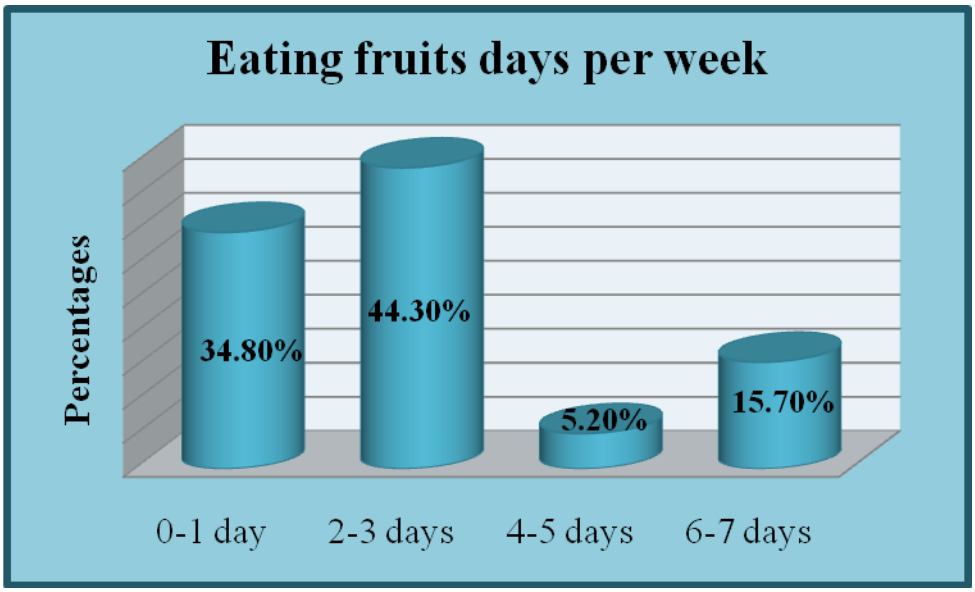

Figure- 4.9.4: Eating fruits days per week

4.9.5 Eating vegetables per week

The bar graph shows that among the 115 participants more than half of the participants 71.3% (82) those are ate vegetables for 6-7 days in a week. It was found that 18.3% (21) those are used to eat vegetables at 4-5 days per week, 9.6% (11) are ate for 2-3 days in a week and among the participants a limited number of participant 0.9% (1) found, used to eat vegetables at 0-1 day per week.

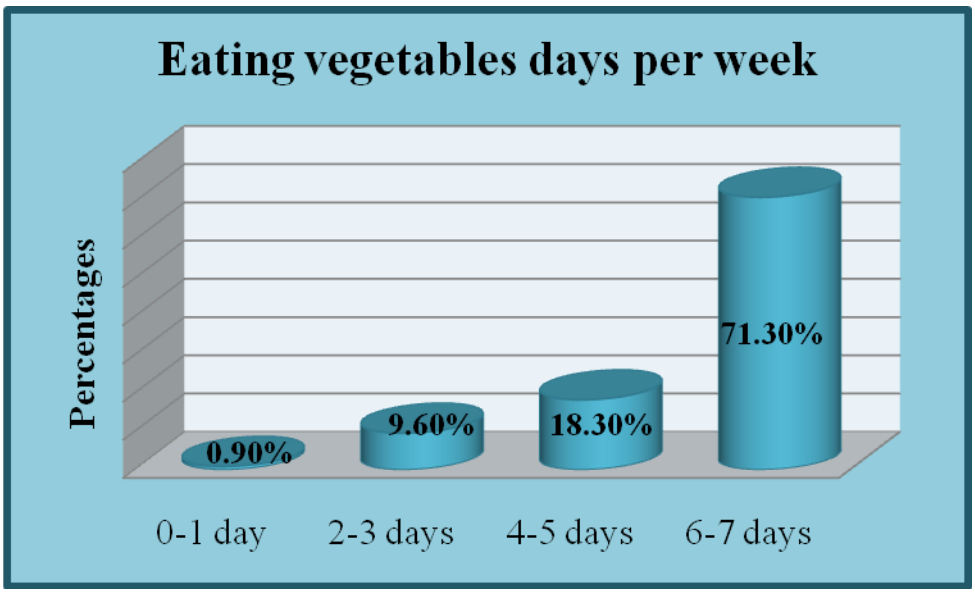

Figure- 4.9.5: Eating vegetables per week

4.9.6 Doing exercises per week

The bar graph shows that 19.1% (20) those are not done exercise in a week and among the 115 participants more than half of the participants 54.8% (63) those are done exercise for 6-7 days in a week, 13% (15) are done it for 4-5 days in a week, 9% done it at 2-3 days in a week and 5% found, used to do exercise at 0-1 day per week.

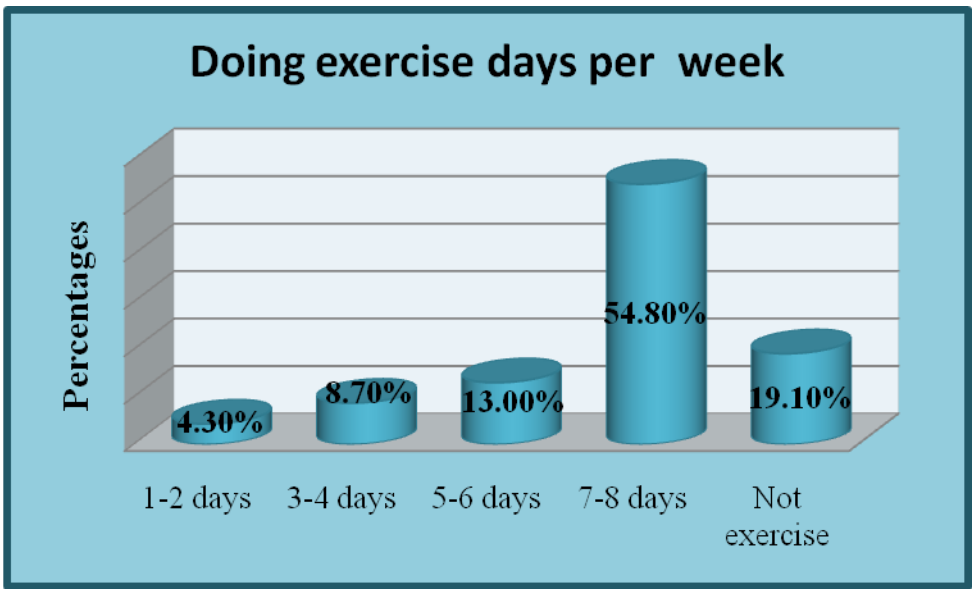

Figure- 4.9.6: Doing exercises per week

4.9.7 Duration of exercise

The bar graph shows that among the 115 participants about nearly half of the participants 44.3% (51) those are done exercise for 31-60 minutes, 26.1% (30) those are used to do it for 1-30 minutes, 19.1% (22) are not used to do it, 7.8% (9) of them are done exercise for 91-120 minutes and 2.6% (3) found, used to do it at 61-90 minutes.

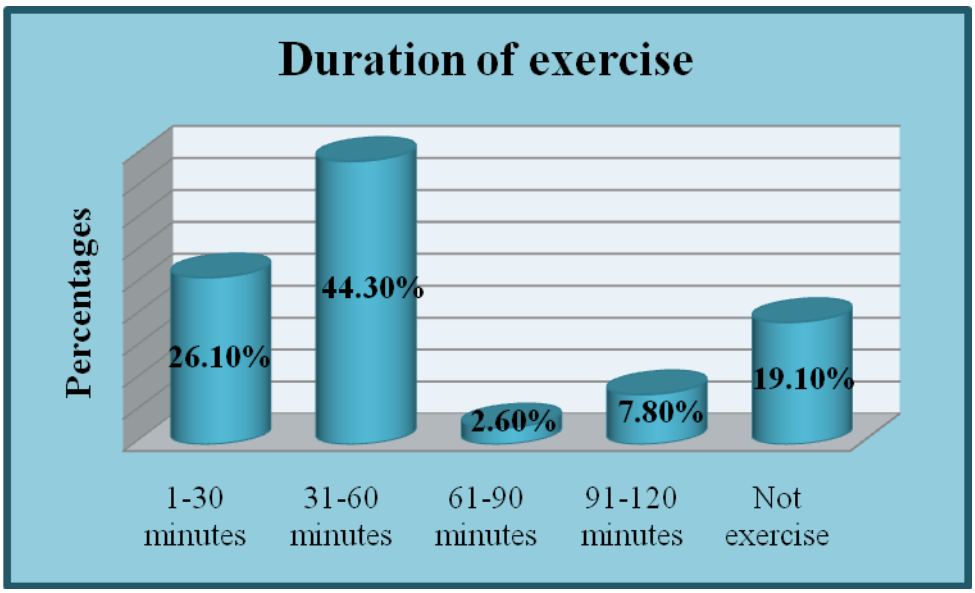

Figure- 4.9.7: Duration of exercise

4.10 Pain at any part of the body

Among the 115 participants, 115 of them were suffered by pain at any part of the body with mild or moderate or in severe rate. The bar graph shows that among the participants it was found that 100% (115) of them were suffered with pain at any part of the body.

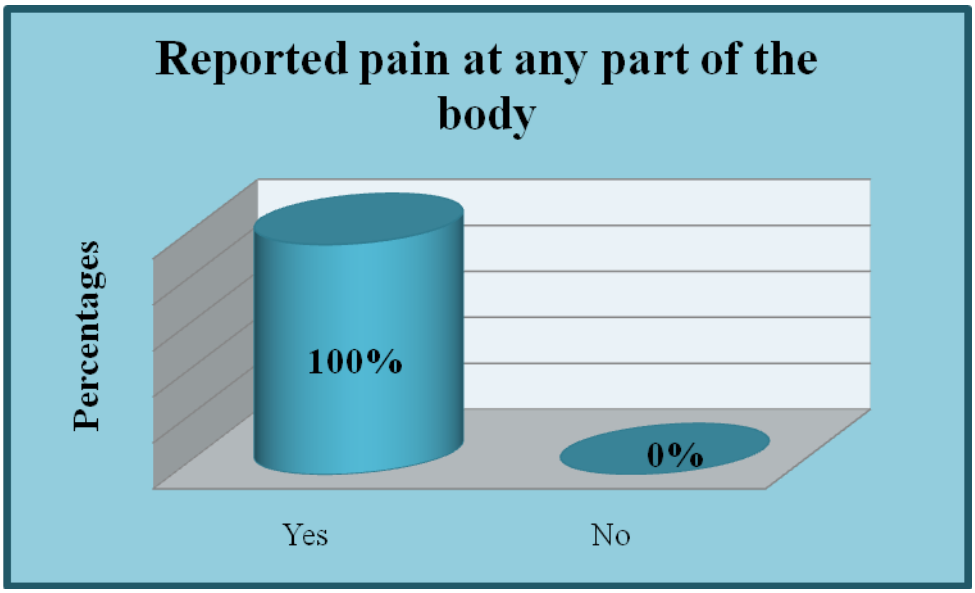

Figure- 4.10: Pain at any part of the body

4.10.1 Area of pain

The bar graph shows that among the participants it was found that limited number 2.6% (3) has neck pain and 97.4% (112) has no neck pain. Among them 28.7% (33) has shoulder pain and 71.3% (82) has no shoulder pain. Among the participants limited number 5.2% (6) has suffered by elbow pain and 94.8% (109) not suffered it. On the other hand 5.2% (6) also has wrist pain and 94.8% (109) has no wrist pain. But 39.1% (45) of them suffered with back pain and 60.9% (70) has no back pain. Among all participants near about half 37.4% (43) has suffering with knee pain and 62.6% (72) has no knee pain. The bar graph shows that 10.4% (12) of the participants has suffering with ankle joint pain and 89.6% (103) has no ankle pain.

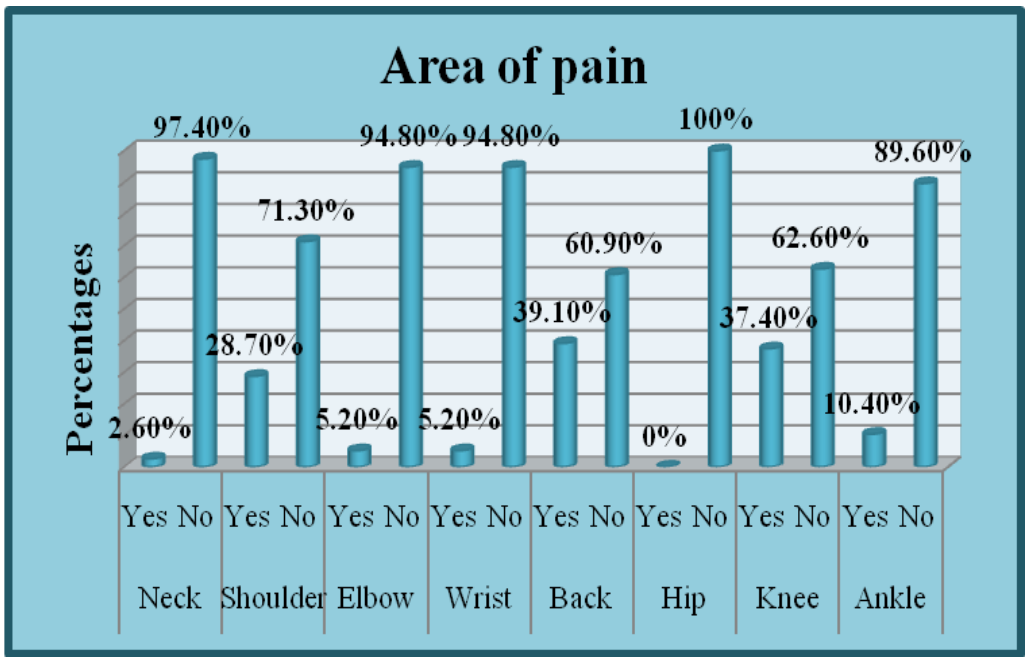

Figure- 4.10.1: Area of pain

4.10.2 Body side of the pain

The pie chart shows that among the participants it was found that 53% (61) feel pain at both side of body. It shows that 28.7% (33) has pain at right side and 18.3% (21) has pain at left side of the body.

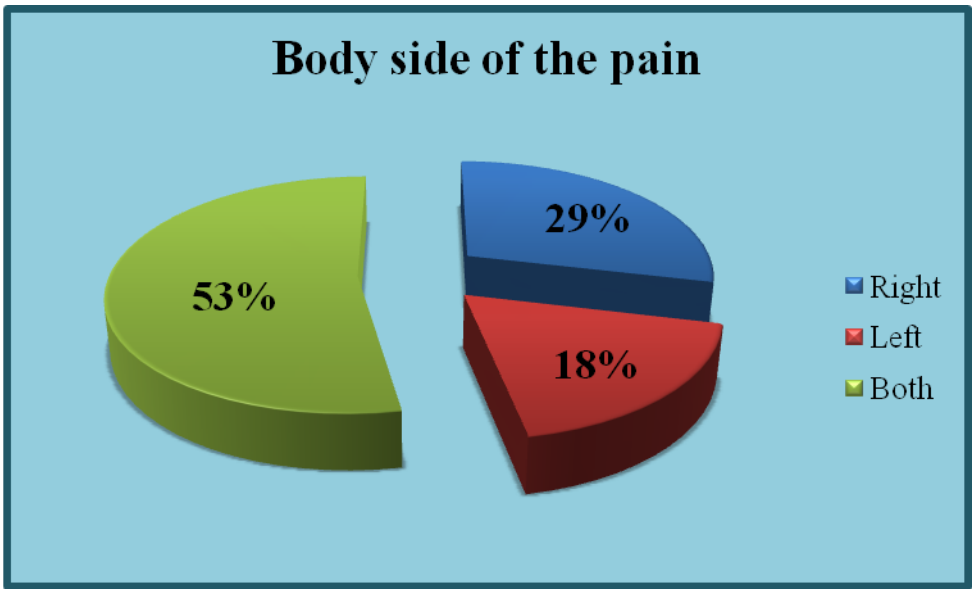

Figure- 4.10.2: Body side of the pain

4.10.3 Severity rate of pain

Among the 115 participants it was found that nearly half of them 44.3% (51) has severe type of pain. Among the participants 41.7% (48) has moderate level of pain and limited number 13.9% (16) also has mild type of pain.

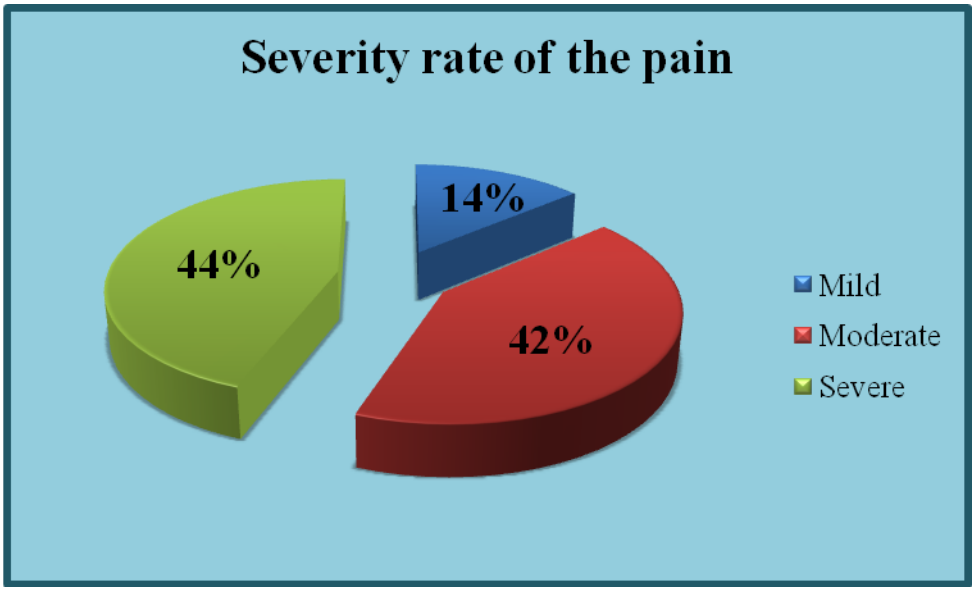

Figure- 4.10.3: Severity rate of pain

4.10.4 Duration of pain

Among the 115 participants more than half of the participants 83.5% (96) those were feel pain from 0-2 years. It was found that 13% (15) those have suffering with pain for 3-4 years. Among them 2.6% (3) has pain at 5-6 years. Among the participants a limited number of participant 0.9% (1) found, has pain from 7-8 years.

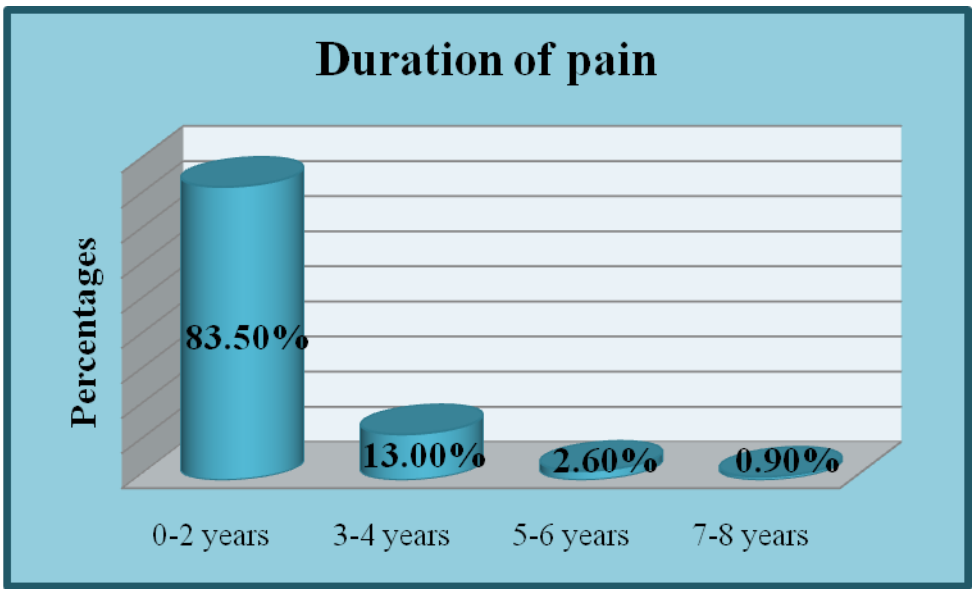

Figure- 4.10.4: Duration of pain

4.10.5 Episode of pain

The bar graph shows that among the 115 participants nearly half of the participants 43.5% (50) those feel pain at one time in a life. It was found that 23.5% (27) those have suffering with pain for three times. Among them 13.9% (16) has pain at two times. All of them 11.3% (13) has suffering with pain for five times or more. Among the participants a limited number of participant 7.8% (9) found, has pain at four times in a life.

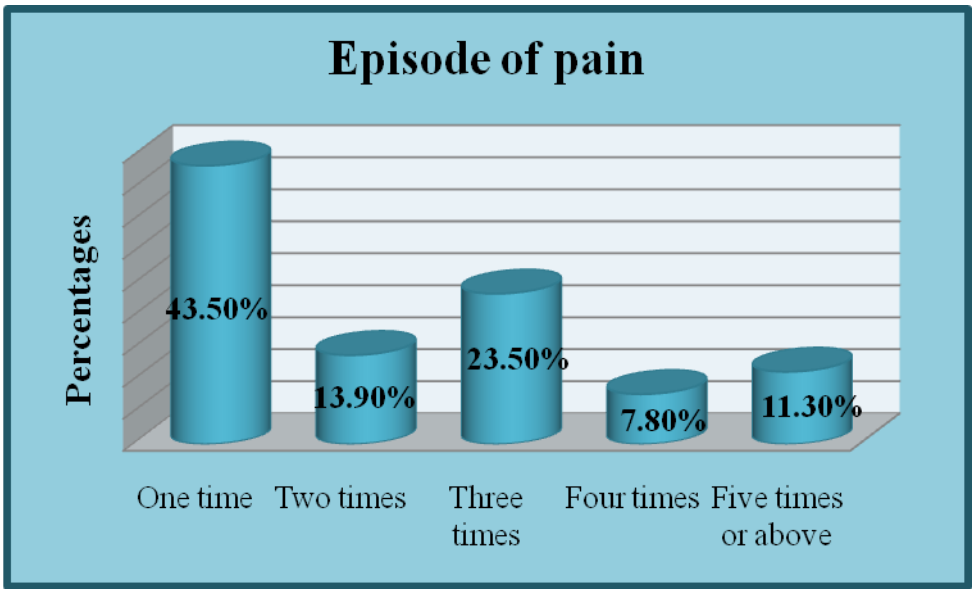

Figure- 4.10.5: Episode of pain

4.10.6 Pain hampering daily activities

Among the 115 participants 79.1% (91) of them reported that pain hampered their daily activity and pain not hampering 20.9% (24) of the participants.

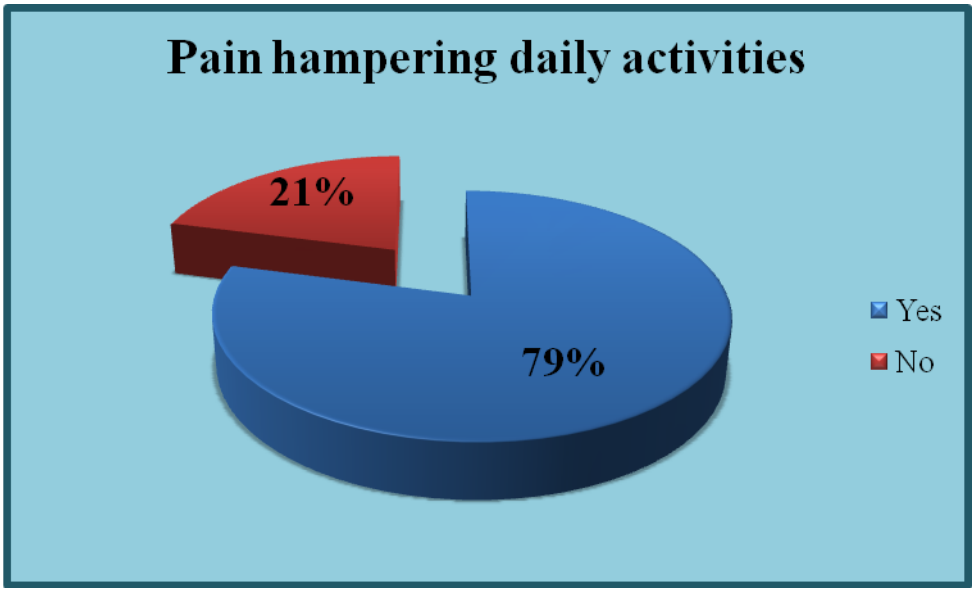

Figure- 4.10.6: Pain hampering daily activities

4.10.7 Pain makes them off from the job or occupation

The pie chart shows that among the participants it was found that more than half of them 50.4% (58) pain is not makes them job or occupation off and 49.6% (57) of total population off their jobs or occupation due to pain.

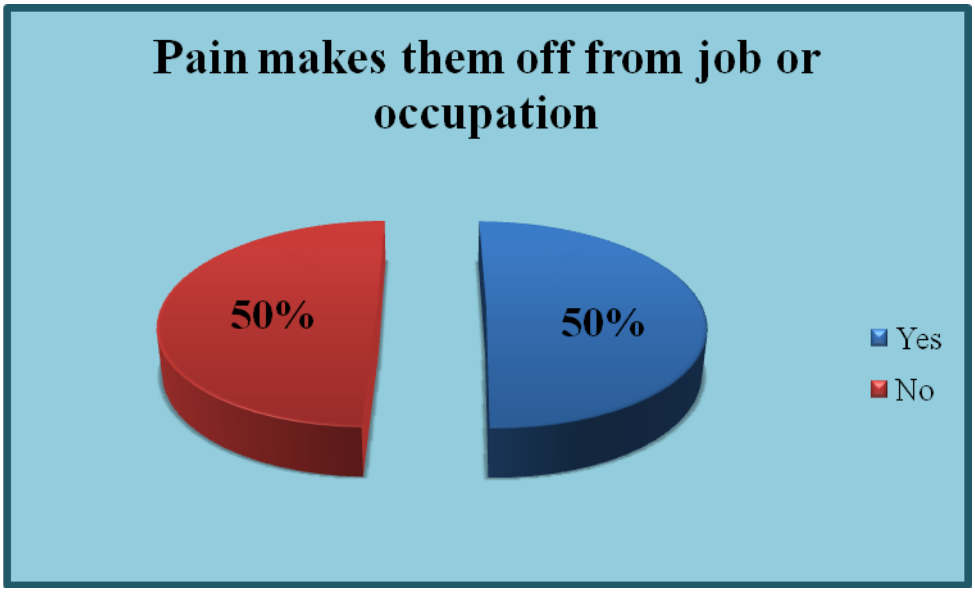

Figure- 4.10.7: Pain makes them off from the job or occupation

4.11 Getting less strength in muscle

The pie chart shows that among the participants it was found that more than half of them 69.6% (80) are getting less strength in muscle. Among them 30.4% (35) are not getting less strength in muscle.

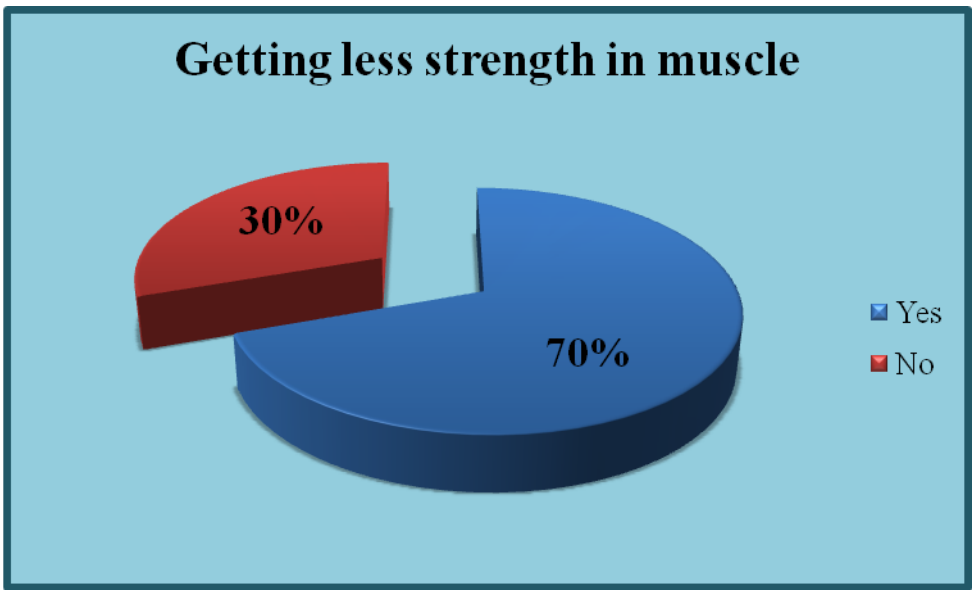

Figure- 4.11: Getting less strength in muscle

4.11.1 Location of muscle weakness

The bar graph shows that 30.4% (35) has no weakness in muscle. From the participants those have muscle weakness; it was found that nearly half of them 46.1% (53) feel muscle weakness in lower limb, 17.4% (20) has muscle weakness at both limb and limited number 6.1% (7) has weakness in muscle in upper limb of the body.

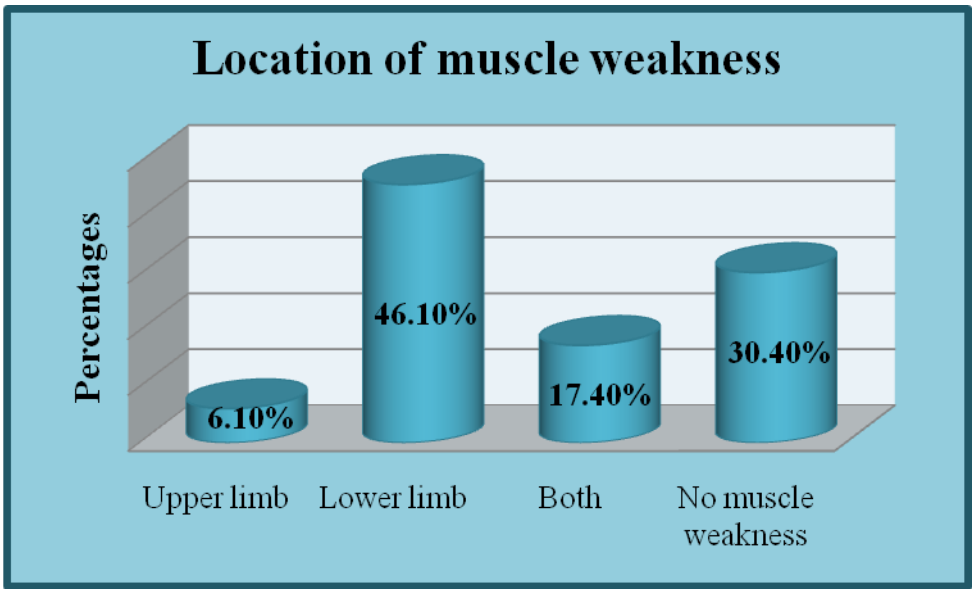

Figure- 4.11.1: Location of muscle weakness

4.11.2 Severity rate of muscle weakness

From the participants those have muscle weakness; it was found that nearly half of them 48.7% (56) has moderate type of muscle weakness, 10.4% (12) has severe and also 10.4% (12) has mild level of muscle weakness.

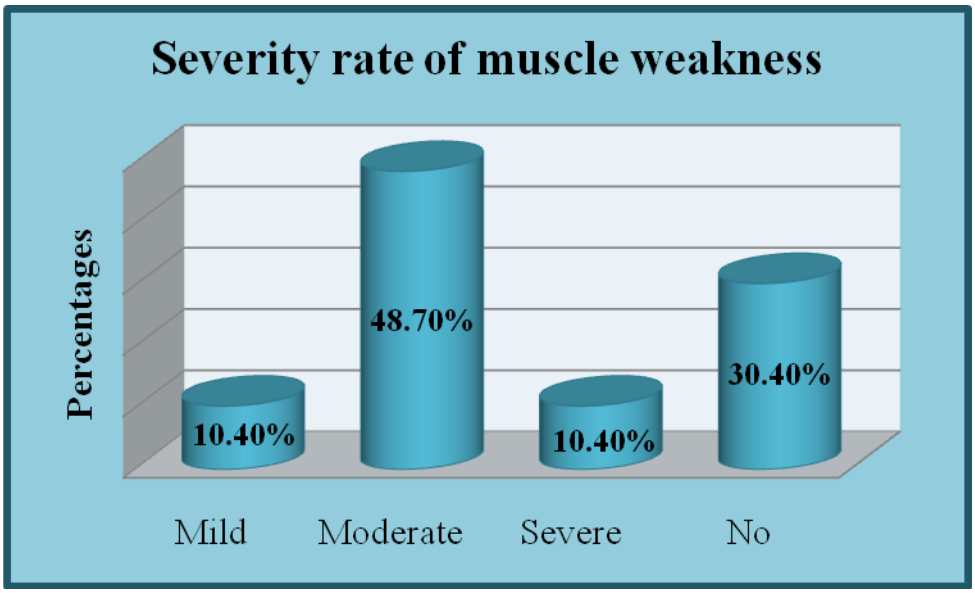

Figure- 4.11.2 Severity rate of muscle weakness

4.11.3 Duration of muscle weakness

From the total participants it was found that 30.4% (35) were not suffering with muscle weakness. From the total participants those have muscle weakness; it was found more than half of those 56.5% (65) has muscle weakness from 1-2 years, 8.7% (10) has muscle weakness from 3-4 years and 4.3% (5) found, has muscle weakness from 5-6 years.

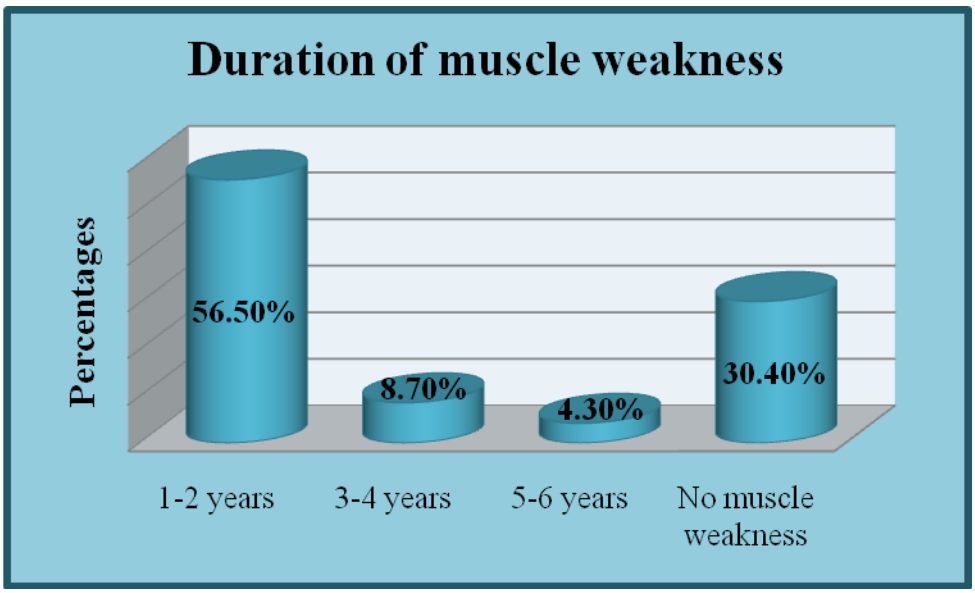

Figure- 4.11.3: Duration of muscle weakness

4.12 Muscle wasting

The pie chart shows that among the participants it was found that 60.9% (70) are not getting muscle wasting. Among them nearly half 39.1% (45) are getting muscle wasting.

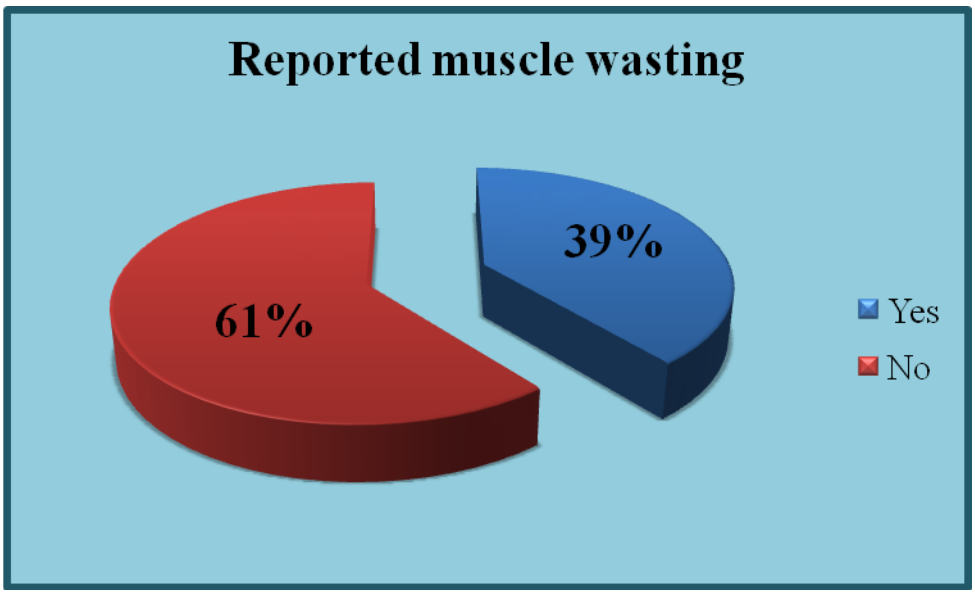

Figure- 4.12: Muscle wasting

4.12.1 Location of muscle wasting

The bar graph shows that among the participants it was found that more than half of them 60.9% (70) has no muscle wasting. Those have muscle wasting, from them it found that 20.9% (24) has wasting in muscle at the lower limb, 13.9% (16) has muscle wasting at upper limb and limited number 4.3% (5) has wasting in muscle in others part of the body.

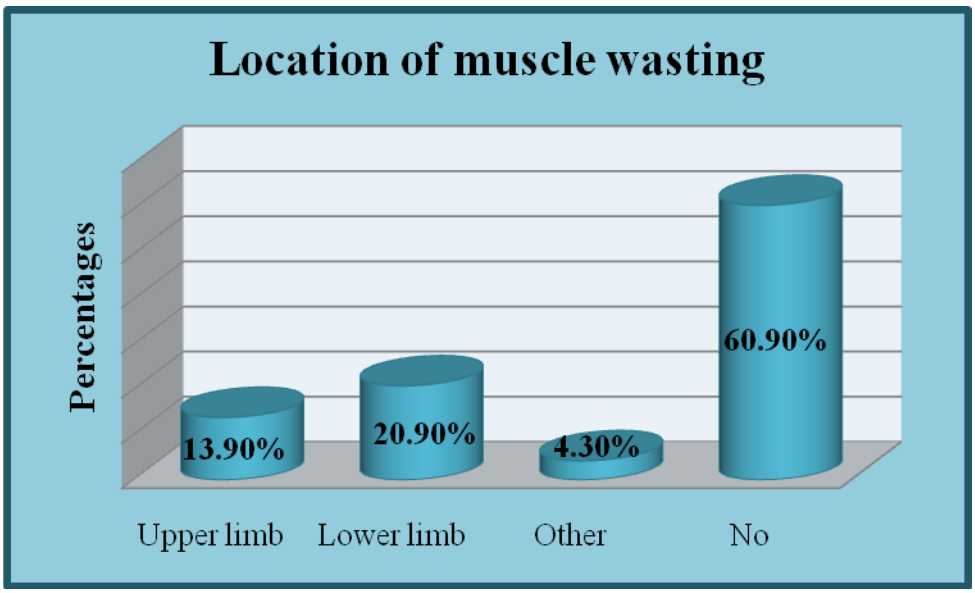

Figure- 4.12.1: Location of muscle wasting

4.12.2 Duration of muscle wasting

The bar graph shows that from the participants those were have muscle wasting; it was found that 34.8% (40) of them suffering with muscle wasting from 1-2 years, 1.7% (2) has muscle wasting at 3-4 years, also 1.7% (2) has muscle wasting for 5-6 years and a limited number of them 0.9% (1) found, has muscle wasting from 7-8 years.

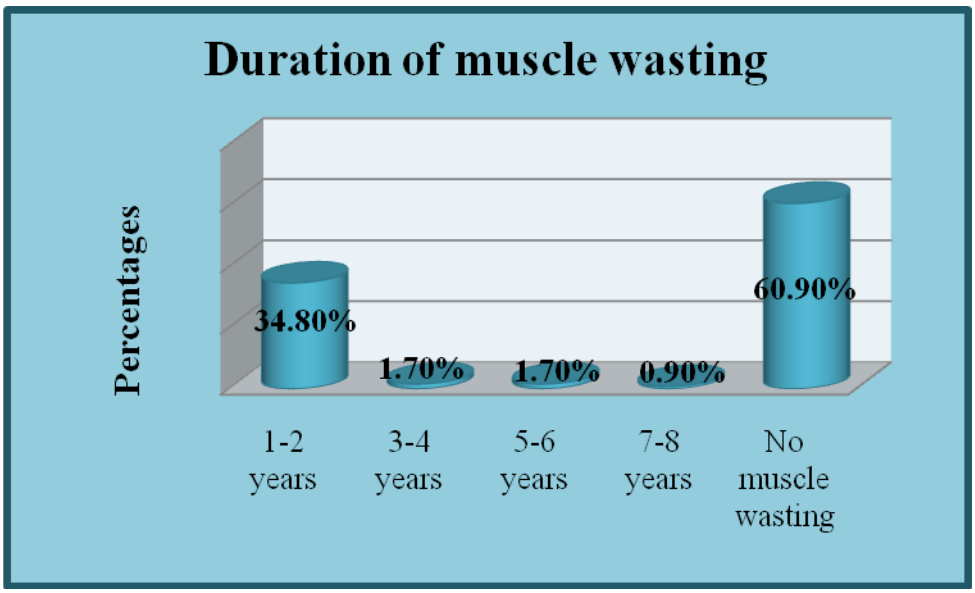

Figure- 4.12.2: Duration of muscle wasting

4.12.3 Severity rate of muscle wasting

From the participants those were having muscle wasting; it was found among them 29.6% (34) has moderate type of muscle wasting. All of them 7.8% (9) has mild and 1.7% (2) has severe type of muscle wasting.

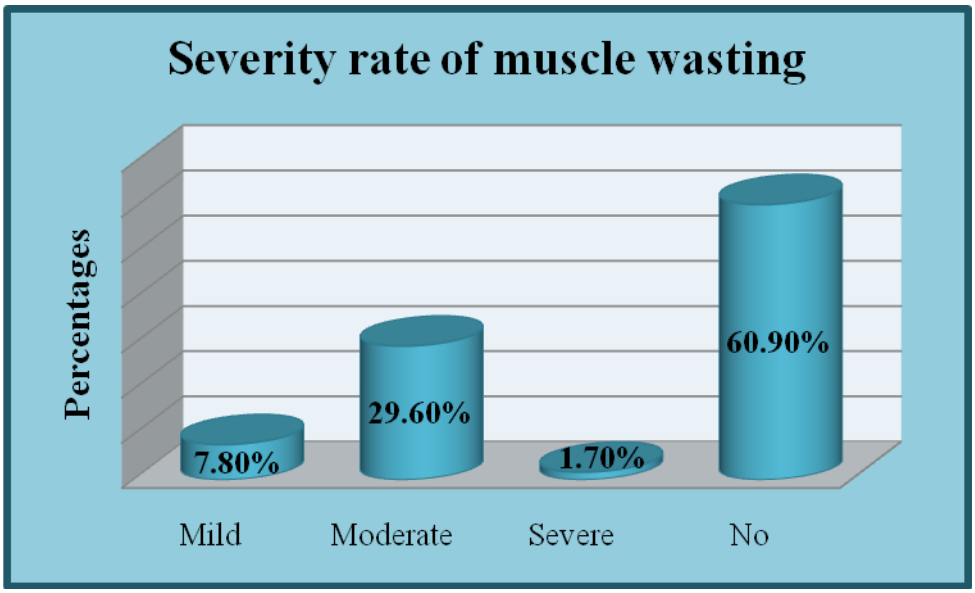

Figure- 4.12.3: Severity rate of muscle wasting

4.13 Movement difficulties

The pie chart shows that among the total participants it was found that 60% (69) are not getting movement difficulties. Among them nearly half 40% (46) are getting movement difficulties.

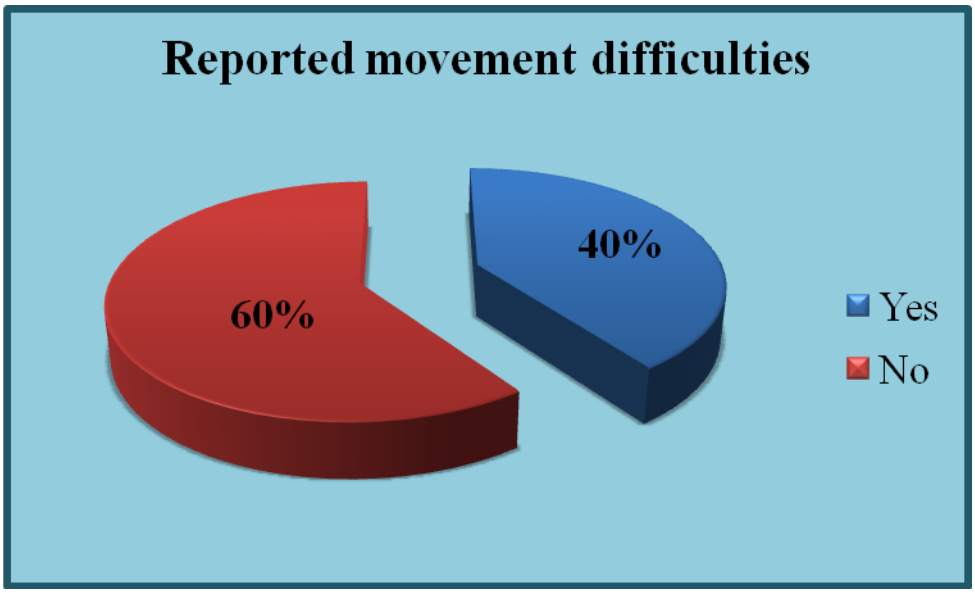

Figure- 4.13: Movement difficulties

4.13.1 Location of decreased movement

The bar graph shows that among the total participants limited number 0.9% (1) has decreased neck movement and 99.1% (114) has no loss. Among them 10.4% (12) has shoulder movement loss and 89.6% (103) has no loss of shoulder range of movement. Among the participants 8.7% (10) has suffered by movement loss at elbow and 91.3% (105) not suffered it. On the other hand 5.2% (6) has wrist movement decreased and 94.8% (109) has no movement decreased. Among all participants 20% (23) has suffering with limited movement at knee joint and 80% (92) has no knee movement difficulties. The bar graph shows that 0.9% (1) of the participants has suffering with movement difficulties at ankle joint and 99.1% (114) has no movement limitation at ankle joint. Among them 3.5% (4) is in difficulty with spine movement and 96.5% (111) has no movement limitation in spine.

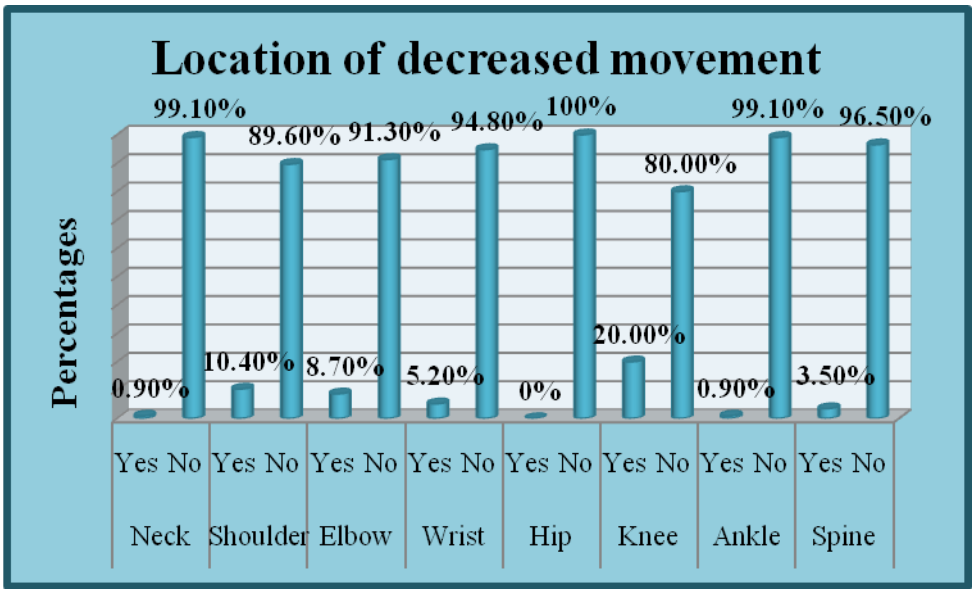

Figure- 4.13.1 Location of decreased movement

4.13.2 Severity rate of movement difficulty

From the participants those have movement difficulties among them 33% (38) have moderate type of difficulty during movement, 5.2% (6) has severe difficulties and 1.7% (2) has mild type of movement difficulties.

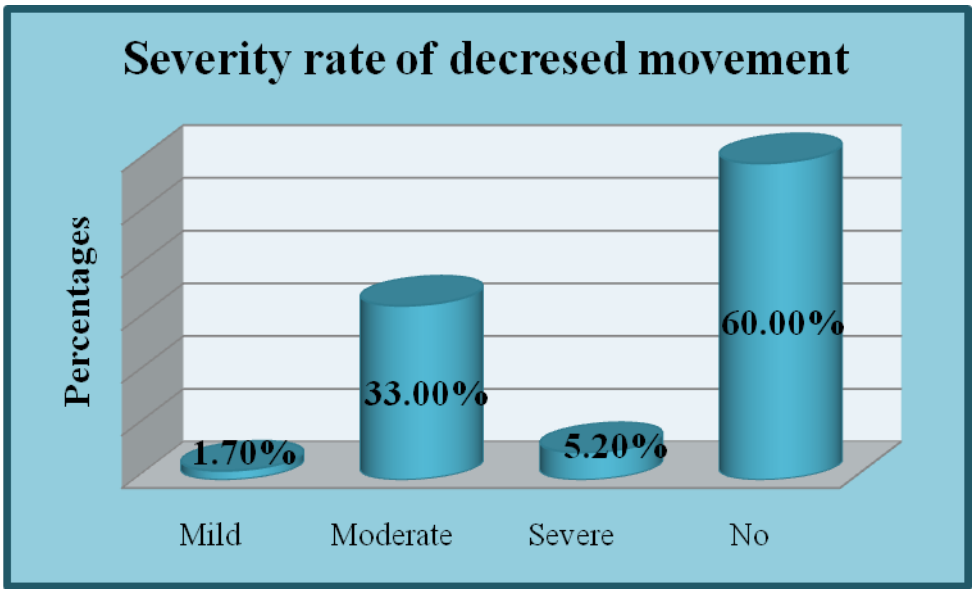

Figure- 4.13.2: Severity rate of movement difficulty

4.13.3 Duration of decreased movement

From the participants those have decreased movement it was found that 33.9% (39) of them suffering with movement difficulty from 1-2 years, 2.6% (3) have limited movement at 3-4 years, 2.6% (3) for 5-6 years with limitation of movement, a limited number of participants 0.9% (1) found have decreased movement from 9-10 years.

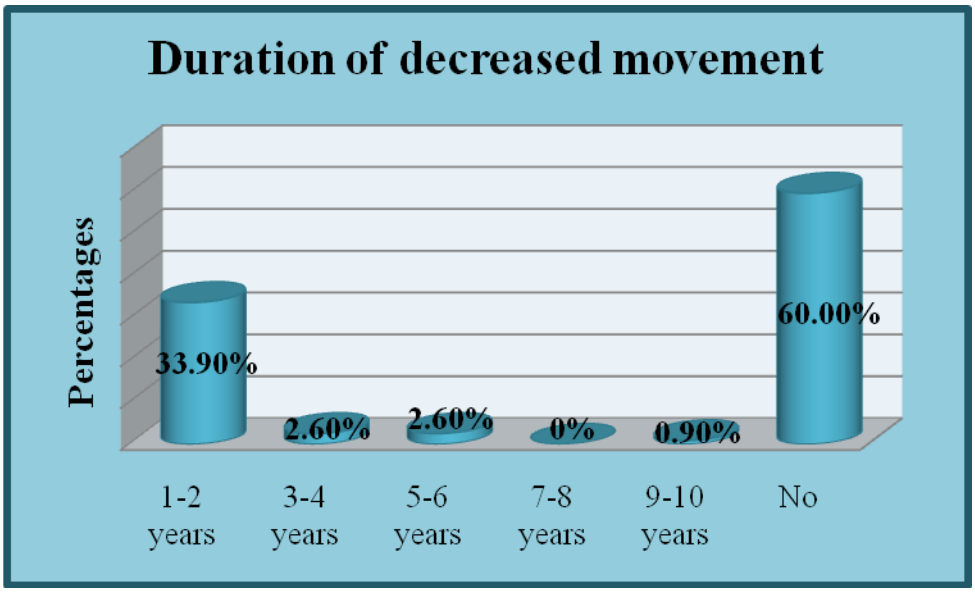

Figure- 4.13.3: Duration of decreased movement

4.14 Foot problem

The pie chart shows that among the participants it was found that 78.3% (90) has no foot problem. Among the participants 21.7% (25) has suffering with diabetic foot.

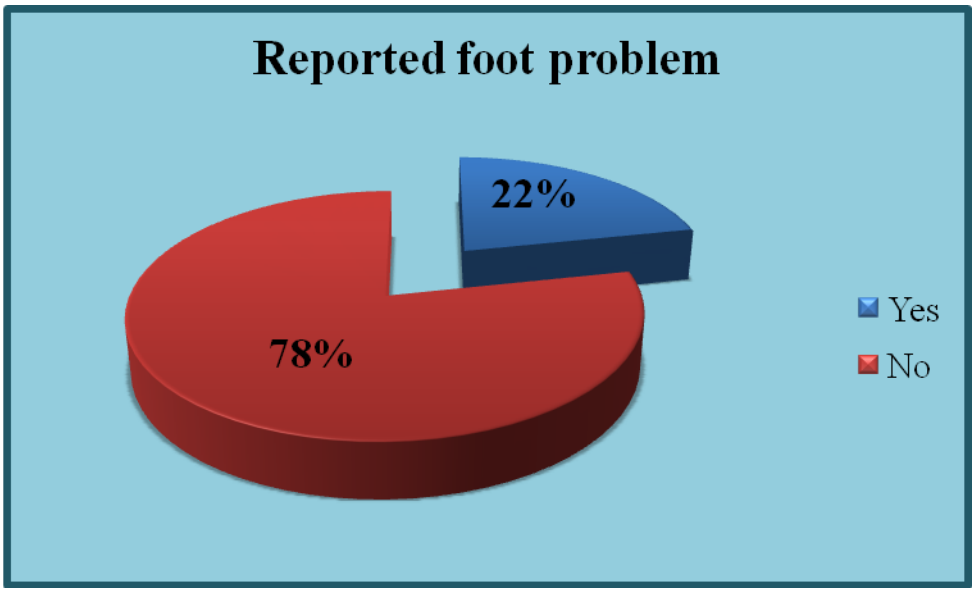

Figure- 4.14: Foot problem

4.14.1 Severity rate of foot problem

From the participants those have foot problem it was found that 10.4% (12) of them has moderate type of foot problem, 8.7% (10) has mild and 2.6% (3) has severe type of foot problem or diabetic foot.

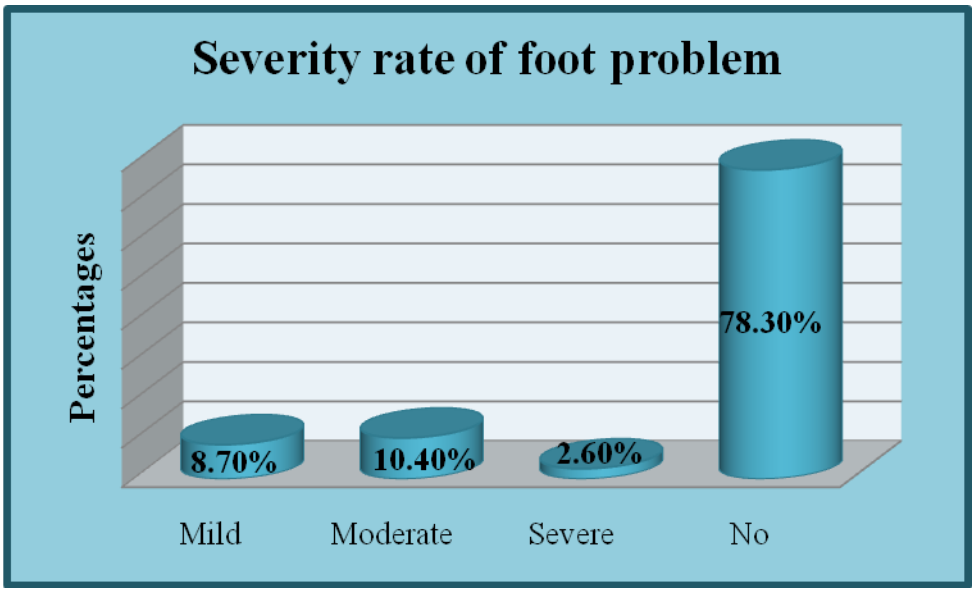

Figure- 4.14.1: Severity rate of foot problem

4.14.2 Duration of foot problem

It was found that 15.7% (18) participants, those have suffering with diabetic foot from 1-2 years, 2.6% (3) has foot problem at 3-4 years, 1.7% (2) suffering for 7-8 years with foot problem and a limited number of participant 0.9% (1) found, has foot problem from 5-6 years.

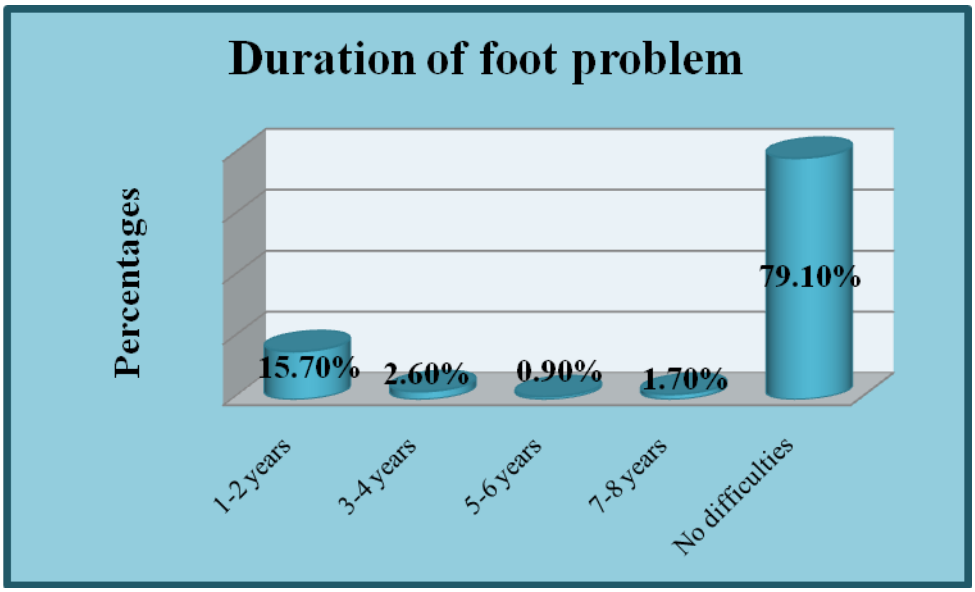

Figure- 4.14.2 Duration of foot problem

4.15 Getting weight loss

The pie chart shows that among the participants it was found that more than half of the participants 54.8% (63) are getting weight loss and 45.2% (52) are not getting any weight loss.

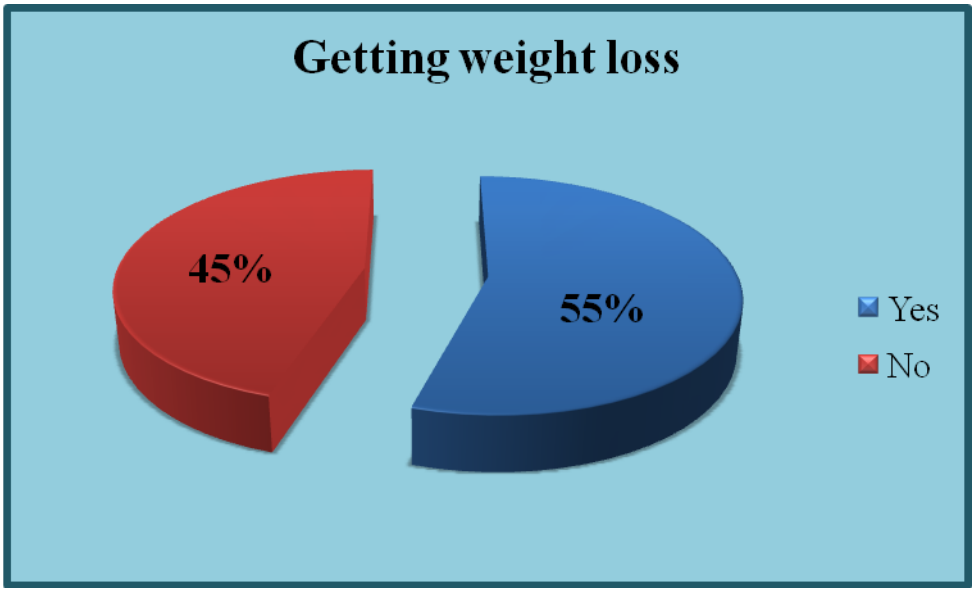

Figure- 4.15: Getting weight loss

4.16 Parasthesia or numbness

The pie chart shows that among the participants it was found that 63.5% (73) has no Parasthesia and 36.5% (42) has suffering with Parasthesia or numbness.

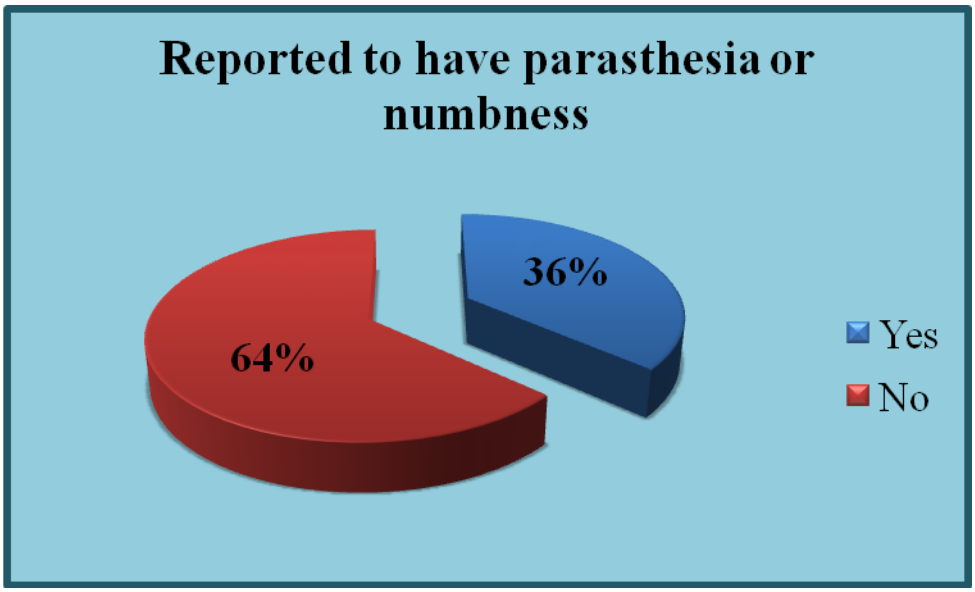

Figure- 4.16: Parasthesia or numbness

4.16.1 Area of Parasthesia

From the total participants those have Parasthesia it was found that 27.8% (32) has suffering with Parasthesia or numbness on lower limb and 8.7% (10) has Parasthesia on upper limb.

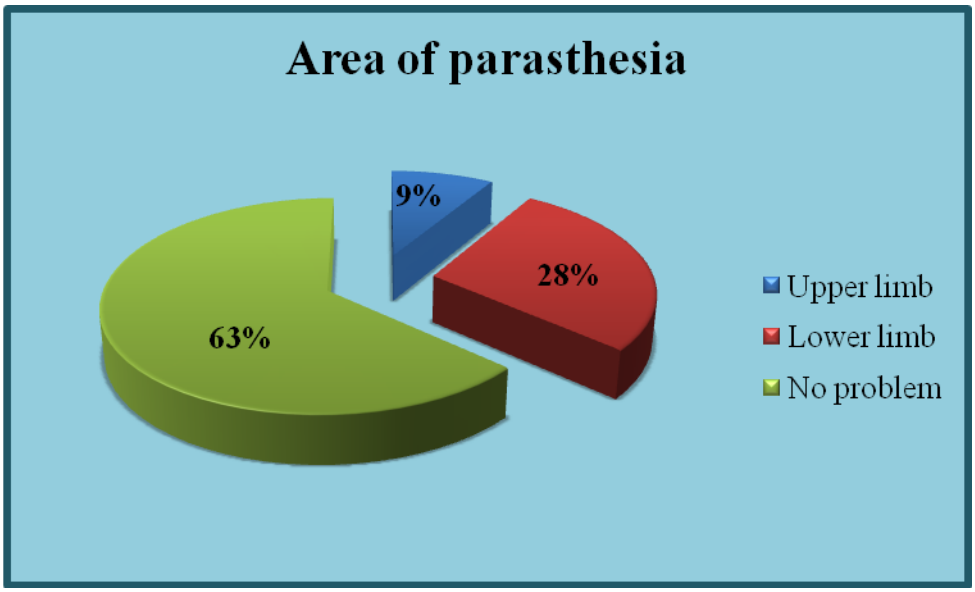

Figure- 4.16.1: Area of Parasthesia

4.17 Any fracture reported

The pie chart shows that among the participants it was found that 83.5% (96) has no fracture and 16.5% (19) has suffering with any type of fracture.

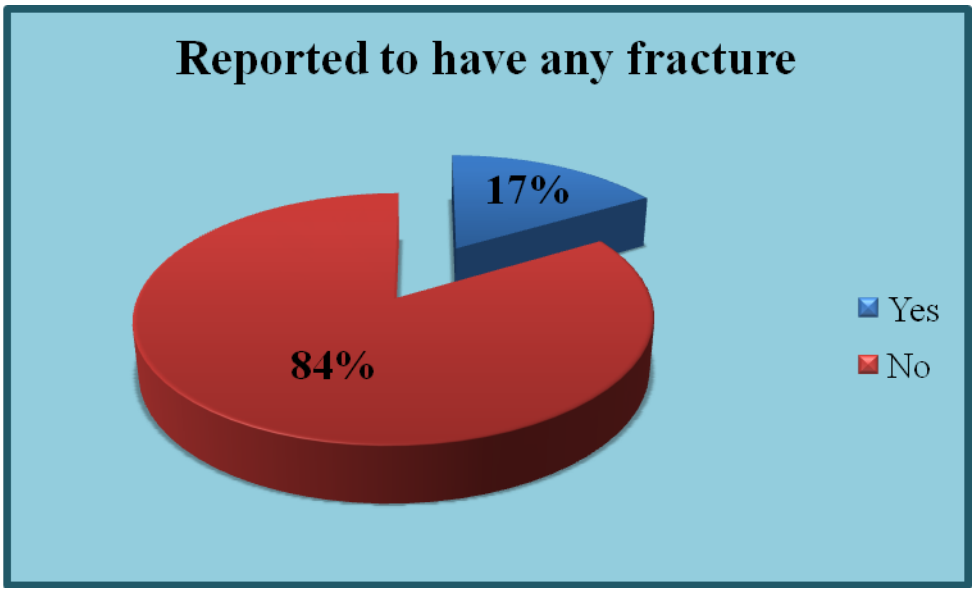

Figure- 4.17: Participants reported any fracture

4.18 Already diagnosed as musculoskeletal disorder

From the 115 participants more than half of them 52.2% (60) were not diagnosed yet and those were diagnosed among them 7% (8) frozen shoulder, 13.9% (16) osteoarthritis, 0.9% (1) rheumatoid arthritis, 19.1% (22) low back pain, 0.9% (1) diabetic foot and 6.1% (7) others.

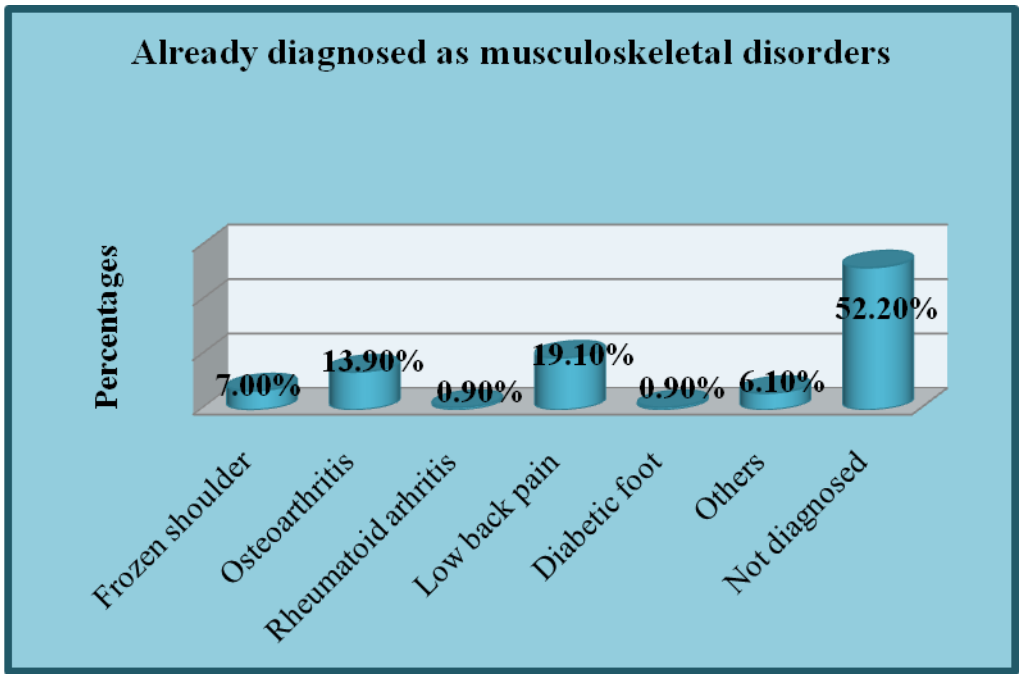

Figure- 4.18 Already diagnosed as musculoskeletal disorder

4.19 Association between age and onset time Diabetes Mellitus

Age of the Participants'	Onset time of Diabetes Mellitus					Total
		0-5 Years	6-10 Years	11-15 Years	16-20 Years	
	30-40	12	2	0	1	15
	41-50	26	17	3	1	47
	51-60	21	8	5	5	39
	61-70	5	5	1	3	14
Total		**64**	**32**	**9**	**10**	**115**

Table- 4.19: Association between age and onset time Diabetes Mellitus

Among the 115 participants those were in the age range of 41-50 years, it was found highest number 26 participants those have diabetes from 0-5 years and 17 have diabetes from 6-10 years. 12 participants in the age range of 30-40 have diabetes from 0-5 years. In the age of 51-60 years it was found 21 of participants have diabetes from 0-5 years.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.319	9	0.111
Likelihood Ratio	15.644	9	0.075
Linear-by-Linear Association	7.311	1	0.007
Total	**115**		

4.20 Association between gender and onset time Diabetes Mellitus

Gender of the Participants		Onset time of Diabetes Mellitus				Total
		0-5 Years	6-10 Years	11-15 Years	16-20 Years	
	Male	24	10	5	5	44
	Female	40	22	4	5	71
Total		**64**	**32**	**9**	**10**	**115**

Table- 4.20: Association between gender and onset time Diabetes Mellitus

Among the total participants it was found the highest number of female 40 has diabetes from 0-5 year age range and male found 24 has diabetes from 0- 5 years. It was found that 22 female have diabetes from 6-10 years age range.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.405	3	0.493
Likelihood Ratio	2.367	3	0.500
Linear-by-Linear Association	0.791	1	0.374
Total	**115**		

4.21 Association between diabetic under controlled or not and Compliance to treatment & guidelines

		Compliance to treatment & guidelines		Total
		Yes (adherence)	No (Non-adherence)	
Is your diabetic under controlled or not?	Controlled Diabetic mellitus	66	7	73
	Uncontrolled Diabetic mellitus	26	16	42
Total		**92**	**23**	**115**

Table- 4.21: Association between diabetic under controlled or not and Compliance to treatment & guidelines

It was found that 66 participants compliance to treatment & guideline those have controlled diabetes and 26 compliance to treatment & guideline those have uncontrolled diabetes mellitus.

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.540	1	0.000		
Continuity Correction	11.817	1	0.001		
Likelihood Ratio	13.142	1	0.000		
Fisher's Exact Test				0.000	0.000
Linear-by-Linear Association	13.423	1	0.000		
Total	**115**				

4.22 Association between diabetic under controlled or not and duration of exercise per week.

		Is your diabetic under controlled or not?		Total
		Controlled Diabetic mellitus	Uncontrolled Diabetic mellitus	
How many days per week do you exercise?	No	3	13	16
	1-2	3	2	5
	3-4	6	3	9
	5-6	7	2	9
	7	44	17	61
Total		**63**	**37**	**100**

Table- 4.22 Association between diabetic under controlled or not and duration of exercise per week.

It was found that those are exercise every day in a week found the number 46 have controlled diabetes and it was found the highest number 18 participants have uncontrolled diabetes those are not doing any exercise.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.631	4	0.000
Likelihood Ratio	25.903	4	0.000
Linear-by-Linear Association	18.922	1	0.000
Total	**115**		

4.23 Association between onset time of diabetes and duration of pain

		Duration of pain				Total
		0-2 years	3-4 years	5-6 years	7-8 years	
Onset time of Diabetes Mellitus	0-5 Years	61	3	0	0	64
	6-10 Years	22	8	2	0	32
	11-15 Years	7	1	0	1	9
	16-20 Years	6	3	1	0	10
Total		**96**	**15**	**3**	**1**	**115**

Table- 4.23: Association between onset time of diabetes and duration of pain

Among the 115 participants those have diabetes from 0-5 years found the highest number 61 participants have pain for 0-2 years, 22 participants have pain for 0-2 years those have diabetes from 6-10 years and a few 7 found have pain for 0-2 years those have diabetes from 11-15 years.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.167	9	0.001
Likelihood Ratio	22.904	9	0.006
Linear-by-Linear Association	12.042	1	0.001
Total	**115**		

CHAPTER-V: DISCUSSION

In this study, 115 participants were selected who had type-2 diabetes where more than half of the participants 61.7% (71) were female and 38.3% (44) were male. Douloumpakas et al., (2007) found in their study that was very similar to this study that among 208 participants, 119 were female those has diabetes. It was found significantly the highest number of female 32% has diabetes from 0-5 year age range which was found statistically non significant (X^2=2.405, df=3, P>0.05) at 5% significant level. So female might be the highly vulnerable for incidence of diabetes.

Among the respondents 40.9% (47) of them were in the age range of 41-50 years and 33.9% (39) found in the age range of 51-60, which indicates that adult with these age range are the most vulnerable for incidence of type 2 diabetes. Adeniyi et al., (2010) found the occurrence of type 2 diabetes among the age range of 30-64 years. Smith, (2003) found that people over 40 years are the highly vulnerable for incidence of type 2 diabetes. From the association between the age and onset time of diabetes found 47 people diagnosed from 0-5 years those were in the age range of 41-60 years. This study showed that at the age range of 41-60 years DM occurred most which was found statistically non significant (X^2= 14.319, df= 9, P>0.05) at 5% significant level.

Education is the important issue for the socio-demographic characteristics. In this study found 21.7% (25) is in the primary education level, 20% (23) are passed the H.S.C and 19.1% (22) were completed the graduation and 7% (8) were completed the post graduation. 13.9% (16) of them were found those were not able to read and write. 3.5% (4) participant found those were only able to sign their name. So this study indicates that less education level might be the vital issue for incidence of DM. Due to lack of education they were not aware the DM, risk factors and its treatments. So the prevalence of this problem is increasing day by day.

Among the participants a highest number of respondents 43.5% (50) found those are housewife. Housewives work more than other professions but they done less physical activity. It was found that those are exercise every day in a week found the number 46 have controlled diabetes and 18 participants have uncontrolled diabetes those are not doing any exercise. The prevalence of chronic MSCs also increased higher among the physically inactive than active individuals (Hoff et al., 2008).

More than half of the participants 55.7% (64) found those suffered from 0-5 year's age range with diabetes & 27.8% (32) are suffered with diabetes from 6-10 years. Majority of respondents 63.5% (73) have controlled glycaemic level they were in controlled diabetes and 36.5% (42) were found as uncontrolled diabetes.

Maximum number 92 of total participants were compliance to treatment or guideline which indicates that people is aware of DM and its effects. It also found that 66 of total participants follow the treatment and its guideline and they have controlled diabetes which was found statistically highly significant (X^2= 13.540, df= 1, P< 0.05) at 5% significant level. If the people with DM follow the treatment and guideline then they have better life than others.

Different behavioral risk factors found among the participants, 12 were smoker and 24 were betel nut user and 93 were done exercises and among them 54.8% (63) those are done exercise for 7 days in a week. It was found that those are doing exercise for 7 days per week among them 46 participants have controlled DM which was found statistically highly significant (X^2= 25.631, df= 4, P< 0.05) at 5% significant level. So exercise is the key factors for controlling the DM and people with DM can lead a better life with doing exercise.

Total participants were reported pain at any part of their body with severe level (44%) in mostly both side of the body. In this study participants reported 69.6% (80) are getting less strength in muscle specially in lower limb (46.10%), 39.1% (45) are getting muscle wasting in lower limb (20.90%) and 40% (46) are getting movement difficulties specially in the area of shoulder, elbow, wrist, knee and spine.

Douloumpakas et al., (2007) found in their study that was very similar to this study that (82.6%) of the type 2 diabetics to have specific musculoskeletal disorders, while only 17.3% of the patients were symptom-free. Prevalence of chronic MSCs was higher among patients with DM than among individuals without (Hoff et al., 2008). It was found that participants (22%) have foot problem with moderate level for 1-2 years mostly.

Among the 115 participants those have diabetes from 0-5 years found the highest number 61 participants have pain for 0-2 years. Most musculoskeletal complications seem to be associated with the duration of DM (Douloumpakas et al., 2007). In this study people those are diagnosed 0-5 years complain of pain for 0-2 years seems mostly which was found statistically highly significant (X^2= 29.167, df= 9, P< 0.05) at 5% significant level. So having pain relates to the duration of the DM.

CHAPTER-VI: CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The researcher explored the characteristics of musculoskeletal complains among type 2 diabetes patients. In this study, the total respondents were 115 whereas 61.7% (71) were female and 38.3% (44) were male. The result shows that the highest number participants, 40.9% (47) are in the age range of 41-50 years and 33.9% (39) are in the age range 51-60 years. Educational level of the participants found 21.7% (25) at primary level. Among them 10.4% (12) were smoker. Among 115 participants 20.9% (24) were betel nut user. The result shows that more than half 80.9% (93) were done exercises. Among the 115 participants, 100% (115) of them were suffered by pain at any part of the body and severity level of pain from mild to severe. It was found that nearly half of them 44.3% (51) has severe type of pain. More than half of them 69.6% (80) are getting less strength in muscle, 39.1% (45) are getting muscle wasting. Nearly half 40% (46) are getting movement difficulties. Among the participants 21.7% (25) has suffering with diabetic foot. More than half of the participants 54.8% (63) are getting weight loss. And 36.5% (42) has suffering with Parasthesia or numbness. It was found highest number 26 participants those have diabetes from 0-5 years. Among the total participants it was found the highest number of female 40 has diabetes from 0-5 year age range. So it shows that female are more vulnerable than male and also they are suffering with diabetes for long time. It was found that 66 participants compliance to treatment & guideline those have controlled diabetes. Those are exercise every day in a week found the number 46 have controlled diabetes. So we can understand that any type of physical activity helps to control diabetes. Among the 115 participants those have diabetes from 0-5 years found the highest number 61 participants have pain for 0-2 years. Associated with other musculoskeletal problems they are suffering with pain and it become more severe and increasing with progression of time.

6.2 Recommendation

The researcher proposed the following recommendations to certain authorities and personnel:

- Government need to plan awareness program in different area of our country for preventing the diabetes and controlling the use of tobacco and others behavioral risk factors.
- Specialized those were involved in the management and treatment team for type 2 diabetic patients, should refer to Physiotherapists for improvement for the client's conditions.
- BIHS Hospitals providing massive services to the diabetic patients and need to create more post for Physiotherapy to provide collaborative services.
- Continued and regular study in this area should play an essential part in improving quality of life of the type 2 diabetes patient. Recommendation for other researcher as follows:
    - ✓ Increasing the number of the participants and conduct the research in different places.
    - ✓ Using simple random sampling.
    - ✓ Including both subjective and objective to find out the objective.
    - ✓ Take sample from BIRDEM and include other diabetic hospitals.

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APPENDIX

Appendix-1 (A) (Translated)

Socio-Demographic Information Chart

ID/পরিচয়ঃ

নামঃ **মোবাইল নাম্বারঃ**

বয়সঃ **তারিখঃ**

প্রশ্ন নাম্বার	প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
১.	লিঙ্গ	পুর ষ = ১, মহিলা= ২	
২.	শিক্ষাগত যোগ্যতা	অশিক্ষিত=১,শিক্ষিত =২ প্রাইমারী=৩, এস, এস, সি =৪, এইচ,এস, সি =৫, াতক=৬, াতকত্তর এবং আরো উপরে=৭	
৩.	পেশা	চাকুরী জিবী =১, ব্যবসায়ী=২, গৃহিনী=৩ ছাত্র=৪, শ্রমজীবী (কৃষিজীবী)=৫, শ্রমজীবী (শ্রমিক)=৬, অন্যান্য (নির্দিষ্ট).....=৭	
৪.	মাসিক আয়		
৫.	ডায়াবেটিসের সময়সীমা	মাস= বছর=	
৬.	আপনার ডায়াবেটিস কি নিয়ন্ত্রনে আছে অথবা নেই? (সর্বশেষ glycaemic অনুপাত থেকে)	নিয়ন্ত্রিত ডায়াবেটিস=১ অনিয়ন্ত্রিত ডায়াবেটিস=২	
৭.	আপনি কি চিকিৎসা অথবা নীতিমালা অনুসরন করেন?	হ্যাঁ=১ (সংলগ্ন), না=২ (অসংলগ্ন)	

অভ্যাসগত ঝুকিপূর্ণ আচরনের বিবরণ (তামাক)

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
১১.	ক)	আপনি কি ধুমপান করেন?	হ্যাঁ=১, না=২	
	খ)	কত দিন ধরে ধুমপান করেন?	মাস= বছর=	
	গ)	প্রতিদিনে সিগারেটের পরিমান?		

অভ্যাসগত ঝুকিপূর্ণ আচরনের বিবরণ (মদপান)

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
১২.	ক)	আপনি কি মদপান করেন?	হ্যাঁ=১, না=২	

অভ্যাসগত ঝুকিপূর্ণ আচরনের বিবরণ (পানসুপারী)

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
১৩.	ক)	আপনি কি পান সুপারি খাওয়ার অভ্যাস আছে?	হ্যাঁ=১, না=২	
	খ)	কত দিন ধরে পানসুপারি খান?	মাস= বছর=	
	গ)	প্রতিদিনে পান সুপারির পরিমান?		

অভ্যাসগত ঝুকিপূর্ণ আচরনের বিবরণ (অস্বাস্থ্যকর খাদ্য সামগ্রী)

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
১৪.	ক)	সপ্তাহে কয়দিন আপনি ফল খান?		
	খ)	সপ্তাহে কয়দিন আপনি সবজি খান?		

অভ্যাসগত ঝুকিপূর্ণ আচরনের বিবরণ (দৈহীক অলসতা)

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
১৫.	ক)	আপনি কি ব্যায়াম করেন? (হাঁটা/দৌড়ানো)	হ্যাঁ=১, না=২	
	খ)	সপ্তাহে কয়দিন আপনি ব্যায়াম করেন?		
	গ)	কতক্ষন ব্যায়াম করেন?	মিনিট= ঘন্টা=	

প্রশ্ন সমূহ (আপনার সমস্যা সমূহ টিক দিয়ে চিহ্নিত করুণ)

ব্যাথা সম্বন্ধীয় তথ্য সমূহ

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
১.	ক)	আপনার শরীরে কোথাও কি কোন প্রকার ব্যাথা আছে?	হ্যাঁ=১, না=২	
	খ)	শরীরের কোন অংশে ব্যাথা হয়।	ঘাড়=১, কাঁধ=২, কনুই=৩, কব্জি=৪, কোমড়=৫, উরু=৬, হাঁটু=৭. গোড়ালী=৮. অন্যান্য (নির্দিষ্ট).....=৯	
	গ)	কোন পাশে ব্যাথা হয়?	ডান দিকে =১, বাম দিকে =২, উভয়ই=৩	
	ঘ)	ব্যাথার তীব্রতা কেমন?	অল্প=১, মোটামোটি=২, বেশী=৩,	
	ঙ)	ব্যাথার সময় কাল	মাস= বছর=	
	চ)	কত বার ব্যাথা হয়েছে?	এক=১, দুই=২, তিন=৩, চার=৪, পাঁচ অথবা আরো বেশী=৫	
	ছ)	ব্যাথা কি আপনার দৈনন্দিন কাজে বিঘ্ন ঘটায়?	হ্যাঁ=১, না=২	

	জ)	এই সমস্যার জন্য কি আপনি কর্মক্ষেত্র থেকে বিরত আছেন?	হ্যাঁ=১, না=২	

মাংসপেশী সমন্বন্ধীয় তথ্য সমূহঃ

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
২.	ক)	আপনার মাংসপেশীতে কি শক্তি কম বোধ হয়?	হ্যাঁ=১, না=২	
	খ)	শরীরের কোন অংশে শক্তি কম মনে হয়?	উপরের অংশে=১, নীচের অংশে=২, উভয়ই=৩, না=৪	
	গ)	মাংসপেশীর দুর্বলতার মাত্রা কেমন?	অল্প=১, মোটামোটি=২, বেশী=৩, না=৪	
	ঘ)	মাংসপেশীর দুর্বলতার সময়সীমা	মাস= বছর=	
৩.	ক)	আপনার মাংসপেশী কী শুকিয়ে যাচ্ছে?	হ্যাঁ=১, না=২	
	খ)	শরীরে কোন জায়গার মাংসপেশী শুকিয়ে যাচ্ছে?	উপরের অংশে=১, নীচের অংশে=২, অন্যান্য=৩ (নির্দিষ্ট) ....., না=৪	
	গ)	কত দিন ধরে মাংসপেশী শুকিয়ে যাচ্ছে?	মাস= বছর=	
	ঘ)	মাংসপেশী শুকিয়ে যাওয়ার মাত্রা কেমন?	অল্প=১, মোটামোটি=২, বেশী=৩ না=৪,	

অস্থির চলন সম্বন্ধিয় তথ্যাবলীঃ

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
৪.	ক)	আপনি কি অস্থির চলনের কোন সমস্যা অনুভব করছেন?	হ্যাঁ=১, না=২	
	খ)	শরীরের কোথায় অস্থির চলন কমে যাচ্ছে?	ঘাড়=১, কাঁধ=২, কনুই=৩, কব্জি=৪, উরু সন্ধি=৫, হাঁটু=৬. গোড়ালী=৭, মেরুদন্ড=৮, অন্যান্য (নির্দিষ্ট).....=৯	
	গ)	অস্থি চলন কমে যাওয়ার মাত্রা কেমন?	অল্প=১, মোটামোটি=২, বেশী=৩, না=৪	
	ঘ)	কত দিন ধরে অস্থির চলন কমে যাচ্ছে?	মাস= বছর=	

ডায়াবেটিস রোগীদের পা সম্বন্ধিয় তথ্য

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
৫.	ক)	আপনার পায়ে কি কোন সমস্যা আছে?	হ্যাঁ=১, না=২	
	খ)	পায়ের সমস্যার মাত্রা কেমন?	অল্প=১, মোটামোটি=২, বেশী=৩, না=৪	
	গ)	কত দিন ধরে পায়ের সমস্যা আছে?	মাস= বছর=	

ওজন সম্বন্ধিয তথ্যসমূহ

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
৬.	ক)	আপনার ওজন কি কমে যাচ্ছে?	হ্যাঁ=১, না=২	

বোধ শক্তি সম্বন্ধিয় তথ্যসমূহ

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
৭.	ক)	আপনার কি অবস অবস মনে হয়	হ্যাঁ=১, না=২	
	খ)	শরীরের কোন জায়গায় অবস অবস মনে হয়?	শরীরের উপরের অংশে=১, শরীরের নীচের অংশে=২, অন্যান্য=৩ (নির্দিষ্ট) ..... , না=৪	

অস্থির ভাঙ্গন সম্বন্ধে তথ্যসমূহ

প্রশ্ন নাম্বার		প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
৮.	ক)	আপনার কি কখনও কোথাও ভেঙ্গে গেছে?	হ্যাঁ=১, না=২	

মেডিক্যাল রেকর্ড থেকে প্রাপ্ত তথ্যসমূহঃ

প্রশ্ন নাম্বার	প্রশ্ন সমূহ/তথ্যসমূহ	কোডিং প্রণালী/ধরণ	কোড
৯.	চিন্হিত মাস্কিওলোস্কেলেটাল সমস্যা	ফ্রজেন সোল্ডার=১, অস্টিওআর্থরাইটিস=২, রিওমাটয়েডআর্থরাইটিস=৩, এঙ্কাইলোসিং স্পনডাইলাইটিস=৪, সাভাইকাল স্পনডাইলাইটিস=৫, কার্পাল টানেল সিন্ড্রোম=৬, নেক পেইন=৭, লো ব্যাক পেইন=৮, ডায়াবেটিক অ্যামায়ট্রফি=৯, ডুপুইট্রেন্স কন্ট্রাকচার=১০, ডায়াবেটিক ফুট=১১, অনান্য (নির্দিষ্ট)= ১২, নাই=১৩	

Appendix-1 (B)

Socio Demographic Information Chart

ID: **Date:** **Mobile No:**

Name: **Age:**

Question Number	Questions/ Information on	Coding Category	Code
1	Sex	Male=1,Female=2	
2	Education	Illiterate=1,Literate=2,Primary=3,SSC=4, HSC=5,Graduation=6, Masters and Above=7	
3	Occupation	Service holder=1, Businessman=2, Housewife=3, Student=4, Labor (Agriculture) =5, Labor (Non-agriculture) =6, Others=7 (Specify)……	
4	Monthly Income		
5	Onset time of Diabetes Mellitus	Months= Years=	
6	Is your diabetic under controlled or not? (From the last glycaemic ratio)	Controlled Diabetic mellitus=1, Uncontrolled Diabetic mellitus=2	
7	Compliance to treatment & guidelines	Yes (adherence)=1, No (Non-adherence)=2	

History of Behavioral Risk Factors (Tobacco)

11	(a)	Do you Smoke?	Yes=1, No=2	
	(b)	Duration of Smoking (Only for current smoker)	Months= Years=	
	(d)	Number of stick per day		

History of Behavioral Risk Factors (Alcohol)

12	(a)	Do you consume alcohol?	Yes=1, No=2	

History of Behavioral Risk Factors (Betel nut)

13	(a)	Do you habituate with betel nut?	Yes=1, No=2	
	(b)	Duration of using betel nut (Only for current users)	Months= Years=	
	(d)	Number of using betel nut per day		

History of Behavioral Risk Factors (Unhealthy diet)

14	(a)	How many days per week do you have fruits?		
	(b)	How many days per week do you have vegetables?		

History of Behavioral Risk Factors (Physical Inactivity)

15	(a)	Do you exercise? (walking/ Jogging)	Yes=1, No=2	
	(b)	How many days per week do you exercise?		
	(c)	Duration of exercise	Minutes= Hours=	

Appendix- 1 (C)

Questionnaire

(Pain Related Information)

Question Number		Questions/ Information on	Coding Category	Code
1	(a)	Do you have any pain in any part of your body?	Yes=1,No=2	
	(b)	Area of pain	Neck=1, Shoulder=2, Elbow=3, Wrist=4, Back=5, Hip=6, Knee=7, Ankle=8, Others=9(specify)……,	
	(c)	Side of pain	Right=1,Left=2,Both=3	
	(d)	Severity rate of pain	Mild=1, Moderate=2, Severe=3	
	(e)	Duration of pain	Months= Years=	
	(f)	Episode of pain	One=1,Two=2,Three=3,Four=4,5 or above=5	
	(g)	Is it hampering in your daily activity?	Yes=1,No=2	
	(h)	Does it make you off from the job or occupation?	Yes=1,No=2	

(Muscle Related Information)

Question Number		Questions/ Information on	Coding Category	Code
2	(a)	Are you getting less strength in your muscle?	Yes=1,No=2	
	(b)	Location of muscle weakness	Upper limb=1,Lower limb=2, Both=3, No=4	
	(c)	Severity rate of muscle weakness	Mild=1,Moderate=2,Severe=3, No=4	
	(d)	Duration of muscle weakness	Months= Years=	
3	(a)	Do you have muscle wasting?	Yes=1,No=2	
	(b)	Location of muscle wasting	Upper limb=1, Lower limb=2, Others=3(specify)……, No=4	
	(c)	Severity rate of muscle wasting	Mild=1,Moderate=2,Severe=3, No=4	
	(d)	Duration of muscle wasting	Months= Years=	

(Movement Related Information)

Question Number		Questions/ Information on	Coding Category	Code
4	(a)	Do you feel movement difficulties?	Yes=1,No=2	
	(b)	Location of decreased movement	Neck=1, Shoulder=2, Elbow=3, Wrist=4, Hip=5, Knee=6, Ankle=7, Spine=8, Others=9(specify)……,	
	(c)	Severity of decreased movement	Mild=1,Moderate=2,Severe=3, No=4	
	(d)	Duration of decreased movement	Months= Years=	

(Diabetic foot related information)

Question Number		Questions/ Information on	Coding Category	Code
5	(a)	Have you any foot problem?	Yes=1,No=2	
	(b)	Severity rate of foot problem	Mild=1,Moderate=2,Severe=3, No=4	
	(c)	Duration of foot problem	Months= Years=	

(Weight related information)

Question Number		Questions/ Information on	Coding Category	Code
6	(a)	Are you getting weight loss?	Yes=1,No=2	

(Sensory related information)

Question Number		Questions/ Information on	Coding Category	Code
7	(a)	Do you have Paraesthesia or numbness?	Yes=1,No=2	
	(b)	Area of Parasthesia	Upper limb=1, Lower limb=2, Others=3(specify)……, No=4	

(Fracture related information)

Question Number		Questions/ Information on	Coding Category	Code
8	(a)	Do you have any fracture?	Yes=1,No=2	

(Medical Record Review)

Question Number	Questions/ Information on	Coding Category	Code
9	Diagnosed musculoskeletal problems	Frozen shoulder=1, Osteoarthritis=2, Rheumatoid arthritis=3, Ankylosing spondylitis=4, Cervical spondylitis=5, Carpal tunnel syndrome=6, Neck pain=7, Low back pain=8, Diabetic amyotrophy=9, Dupuytren's contracture=10, Diabetic foot=11, Others =12(Specify)……., No=13	

Appendix-2 (A)

Permission Letter from BIHS

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

Ref: বিএইচপিআই-৪৬২২/০৪/১১ *Date :* ২৩-০৪-১১

প্রতি

পরিচালক,
বাংলাদেশ ইনষ্টিটিউট অফ হেল্‌থ সায়েন্স(বিআইএইচএস) হাসপাতাল,
১২৫/১,দারুস সালাম, মিরপুর-১,
ঢাকা-১২১৬।

বিষয় ঃ রিসার্চ প্রজেক্ট (dissertation) এর জন্য আপনার প্রতিষ্ঠান সফর ও তথ্য সংগ্রহ প্রসঙ্গে।

জনাব,

আপনার সদয় অবগতির জন্য জানাচ্ছি যে, পক্ষাঘাতগ্রস্থদের পুনর্বাসন কেন্দ্রে-সিআরপি'র প্রতিষ্ঠান বাংলাদেশ হেলথ্ প্রফেশনস্ ইনষ্টিটিউট (বিএইচপিআই) ঢাকা বিশ্ববিদ্যালয় অনুমোদিত বিএসসি ইন ফিজিওথেরাপী কোর্স পরিচালনা করে আসছে। উক্ত কোর্সের ছাত্রছাত্রীদের কোর্স কারিকুলামের অংশ হিসাবে বিভিন্ন বিষয়ের উপর রিসার্চ ও কোর্সওয়ার্ক করা বাধ্যতামূলক।

বিএইচপিআই'র ৪র্থ বর্ষ বিএসসি ইন ফিজিওথেরাপী কোর্সের ছাত্রী **ফাবিহা আলম** তার রিসার্চ সংক্রান্ত কাজের তথ্য সংগ্রহের জন্য আপনার সুবিধামত সময়ে আপনার প্রতিষ্ঠানে সফর করতে আগ্রহী। তার রিসার্চ শিরোনাম **"Prevalence of Common Musculoskeletal Problem among Diabetic patients."**

তাই তাকে আপনার প্রতিষ্ঠান সফর এবং প্রয়োজনীয় তথ্য প্রদান সহ সার্বিক সহযোগীতা প্রদানের জন্য অনুরোধ করছি।

ধন্যবাদান্তে

23.04.11
মোঃ ওবায়দুল হক
সহকারী অধ্যাপক ও কোর্স-কো অর্ডিনেটর
ফিজিওথেরাপী বিভাগ
বিএইচপিআই।

Allowed by
Director, BIHS

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ, ফোনঃ ৭৭৪৫৪৬৪-৫, ৭৭৪১৪০৪, ফ্যাক্সঃ ৭৭১০০৬৯
CRP-Chapain, Savar, Dhaka-1343, Tel: 7745464-5, 7741404, Fax: 7745069, E-mail: contact@crp-bangladesh.org; Website: www.crp-bangladesh.org
BHPI-Mirpur Campus, Plot-A/5, Block-A, Section-14, Mirpur, Dhaka-1206, Bangladesh, Tel: 8020178, 8053662-3, Fax: 8053661

Appendix- 3 (A) (Translated)

সম্মতি পত্র

আস্সালামুআলাইকুম/নমশকার, আমার নাম ফাবিহা আলম। আমি একটা ব্যচেলর প্রজেক্টের জন্য, *একটা সংশ্লিষ্ট হাসপাতালে বহুমুত্র রোগীদের প্রচলিত অস্থি ও মাংসপেশী সমস্যাজনীত ব্যক্তির অনুপাতের হার*, এই বিষয়ের উপর গবেষনা করছি, বাংলাদেশ হেলথ্ প্রফেশনস্ ইনষ্টিটিউট, ঢাকা বিশ্ববিদ্যালয় হইতে। আমি কিছু ব্যক্তিগত এবং অন্যান্য বিষয় সম্পর্কে জানতে চাই বহুমুত্র রোগীদের প্রচলিত অস্থি ও মাংসপেশী সমস্যা, এই বিষয়ের উপর। এই আলোচনার সময়সীম সর্বোচ্চ ২০-৩০ মিনিট।

আমি আপনাকে জানাচ্ছি যে, এই গবেষনা সম্পূর্নভাবে কোর্সের কাজে ছাড়া অন্য কোন উদ্দেশ্যে ব্যবহার করা হবে না। এই গবেষনা , বাংলাদেশ ইনষ্টিটিউট অফ হেলথ্ সাইন্সের সাথে সরাসরি ভাবে জরীত না তাই আপনার অংশগ্রহনে আপনার বর্তমান ও পরবর্তী চিকিৎসার কোন প্রকার ক্ষতি সাধিত হবে না । গবেষক অংশগ্রহনকারীদের কাছ থেকে গৃহীত সকল তথ্যের গোপনীয়তা রক্ষা করবেন এবং প্রকাশের ক্ষেত্রে নাম বাদ দিয়ে প্রকাশ করা হবে।

এই গবেষনায় আপনার অংশগ্রহন হবে ঐচ্ছিক এবং আপনি যে কোন সময় এই গবেষনা থেকে নিজেকে প্রত্যাহার করতে পারবেন। এখানে উলেণ্যখ্য যে, এই সাক্ষাৎকার গ্রহনকালে অংশগ্রহনকারী সকল প্রশ্নের জবাব দিতে বাধ্য থাকবেননা। আপনার যদি কোন তথ্য জানার থাকে বা অংশগ্রহনকারী হিসেবে আপনার অধিকার যে, আপনি যোগাযোগ করতে পারেন গবেষক ফাবিহা আলম অথবা কোর্স-কোঅর্ডিনেটর মো: ওবায়দুল হক, ফিজিওথেরাপী বিভাগ, বাংলাদেশ হেলথ্ প্রফেশনস্ ইনষ্টিটিউট।

আলোচনা শুর" করার আগে, আপনার কি কিছু জানার আছে?

আলোচনার জন্য আমি কি আপনার অনুমতি পেতে পারি?

হ্যাঁ ☐

না ☐

অংশগ্রহনকারীর স্বাক্ষর ও তারিখ

গবেষকের স্বাক্ষর ও তারিখ

Appendix- 3 (B)

VERBAL CONSENT STATEMENT

(Please read out to the participant)

Assalamualaikum/Namasker, my name is *Fabiha Alam*, I am conducting a research project (dissertation) study which included in our course curriculum of Bangladesh Health Professions Institute (BHPI). The title of the study is "Prevalence of common musculoskeletal problem among diabetic Patients." I would like to know about some personal and other related questions about musculoskeletal problem. This will take approximately 20 - 30 minutes.

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

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

If you have any query about the study or your right as a participant, you may contact with Fabiha Alam, researcher and/ or Md. Obaidul Haque, Course Coordinator, Department of Physiotherapy.

Do you have any questions before I start?

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

YES ☐

NO ☐

Signature of Participants & Date

Signature of Investigator & Date