RISK FACTORS FOR PLANTAR FASCITIS

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Bachelor of Science in Physiotherapy (B. Sc. PT)

Roll No: 1593

Reg. No: 1901

Session: 2010 – 2011

BHPI, CRP, Savar, Dhaka.

Bangladesh Health Professions Institute

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Bangladesh.

August' 2015

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

entitled

RISK FACTORS FOR PLANTAR FASCITIS.

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

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Declaration

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

Signature: **Date:**

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Acknowledgement

First of all, I would like to pay my gratitude to ALLAH who has given me the ability to complete this project in time with success. The second acknowledgement must go to my family members who have always inspired me for preparing the project properly.

I am extremely grateful to my honorable and praise worthy Supervisor **Muhammad Rezaul Karim**, Coordinator School of Prosthetics & Orthotics and Lecturer, Department of Physiotherapy, BHPI, CRP, Savar, Dhaka for giving me his valuable time,his keen supervision and excellent guidance without which I could not able to complete this project.

I would like to express my gratitude to **Mohammad Anwar Hossain**, Associate professor, Department of Physiotherapy, CRP, Chapain, Savar, Dhaka for providing me excellent guidelines.

I would like to express gratitude to **Md. Obaidul Haque**, Associate Professor, Departmentof Physiotherapy, BHPI; **Muhammad Millat Hossain**, Senior Lecturer, Department of Physiotherapy, BHPI and all of my teachers for helping me in this study.

I would also like to give my special appreciation to my respected teacher Assistant Professor **Md. Shofiqul Islam**, Department of Physiotherapy, Bangladesh Health Professions Institute (BHPI) for his proficient guidance to carry out this study.

My special thanks to all the staffs of Musculoskeletal Outdoor Physiotherapy Department especially to the head of the department for giving me the permission to collect data. I am grateful to Shahriar Zaman, Research and Development Officer and Roksana Haque, M & E Officer, CRP, Savar, Dhaka for their excellent guidelines throughout the period of this study.

My special thanks to my friends for their continuous suggestions and supports to take challenges which have inspired me throughout the project.

I would like to thank the Librarian of Bangladesh Health Professions Institute (BHPI) and her associates for their kind support to find out related books, journals and also access to internet. Finally I would like to thank to all participants of the study for their enormous co-operation.

Abbreviations

BHPI	**:**	Bangladesh Health Professions Institute
BMI	**:**	Body Mass Index
BMRC	**:**	Bangladesh Medical Research Council
CI	**:**	Confidence Interval
CRP	**:**	Centre for the rehabilitation of the Paralysed
FHSQ	**:**	Foot Health Status Questionaire
MS	**:**	Musculoskeletal
PF	**:**	Plantar Fascitis
PT	**:**	Physiotherapy
WHO	**:**	World Health Organization
IRB	**:**	Institutional Review Board

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ABSTRACT

Purpose: To identify the risk factors for Plantar fascitis in Bangladesh. *Objective:* To identify the socio-demographic information, to identify the vulnerable age group, occupation, complication and physical activities developing risk of plantar fascitis in Bangladesh. *Methodology:* The study was hospital based unmatched case control study. Convenience sampling technique was used to carry out the study. Total sample was 50 among them 25 were cases and 25 were controls. The data were collected through using structured questionnaire by face to face interview. The area of

the study was musculoskeletal unit of CRP, Savar and Mirpur, Dhaka. Descriptive statistics were used for data analysis. *Result*: Investigator found the risk of plantar fascitis increased in female rather than male, odds ratio (OR) = 2.111 (95% confidence interval [CI] = 0.625-7.134), heel spurs, OR = 18.857 (95% CI = 4.254 -83.592), BMI, OR = 0.510 (95% CI =0.161-9.1.610), duration of heavy physical activity more than four hours, OR = 1.385 (95% CI = o.451-4.246), prolong standing, OR = 0.583(95% CI = 0.178 - 1.906), regular weight bearing activity, OR = 0.599 (95% CI = 0.189 -1.89 8), and recreational jogger, OR = 0.812 (95% CI = 0.229 -2.882). *Conclusion:* The result of research is including the all general people who have any occupational measure or physical problem. Acknowledging these risk factors are useful for the prevention of plantar fascitis in Bangladesh.

Keywords: Plantar fascitis, Risk factors

CHAPTER -I INTRODUCTION

1.1. Background

Plantar fascitis (PF) is a degenerative syndrome of the plantar fascia resulting from repeated trauma at its origin on the calcaneus (Martin et al., 2014). PF is reported to be the most common cause of inferior heel pain in adults (Singh et al., 2007). Other names for PF include painful heel syndrome, heel spur syndrome (Davies et al., 2009), runners heel, subcalcaneal pain, calcaneodynia, and calcaneal periostitis.

Plantar fascitis, typically a localized inflammatory condition of the plantar aponeurosis. The disorder is seen relatively frequently in athletically active individuals (Singh et al., 2007) and military personnel (Kibler et al., 2011), but also is diagnosed in individuals with sedentary lifestyles. Researchers have estimated that the condition occurs in approximately two million Americans per year (Davis et al., 2009) and affects as much as 10% of the population during the course of a life time (Pfeffer et al., 2009). It has been reported that approximately 5% of patients who are diagnosed with plantar fascitis undergo surgery for the condition. The etiology of plantar fascitis is poorly understood (Crawford et al., 2003). It is well known that plantar fascitis can occur in associated with various arthritis, but in approximately 85% of cases the etiology is unknown (Scheren et al., 2009). Several cause have been hypothesized, with the most common being overuse due to prolonged weight-bearing, obesity, unaccustomed walking or running, and limited dorsiflexion of the ankle joint (Furney, 2005).

There is no accepted so-called gold understand for the diagnosis of plantar fascitis. The diagnosis is typically made on the basis of clinical findings. The general consensus in the literature is that patients with plantar fascitis report pain and tenderness in the area of the medial tubercle of the calcaneus, pain when taking the first few steps in the morning, and pain that is generally worse while weight-bearing (Clinical practice guideline Heel Pain Panel, 2001).

Plantar fascitis is one of the most common foot pathologies with approximately one million Americans seeking medical attention for this condition each year (Riddle and

Schappert, 2004). In a retrospective study of 2002 runners, plantar fascitis was found to be the third most common overuse injury with an incidence of 7.9% (Taunton et al., 2002). The foot leg complex takes the brunt of impact during locomotion, making it susceptible to injury. Adults take an average of 10,000 steps per day (Bonanno et al., 2011). This dosage increases with running because 10,000 steps are taken during the course of a single, hour-long run. Even with a shorter run, ground reaction forces and joint excursions are double in magnitude compared with walking, leading to greater stress on joints and soft tissue of the foot. The plantar fascia is one of the most important tissues in maintaining the structural integrity of the foot. It plays a key role in supporting the medial longitudinal arch, creating tension between the proximal and distal aspects of the foot. Plantar fascitis has been described as an overload of the plantar fascia (Kibler et al., 2011).

Foot pronation has often been implicated with the incidence of plantar fascitis (Davis et al., 2009). The associated flattening of the medial arch with excessive pronation may place increased stress on the plantar fascia (Kwong et al., 2008). It has been postulated that greater than average pronation may occur as a result of foot structure or as a compensatory mechanism resulting from a lack of available ankle dorsiflexion. Two studies have reported reduced ankle dorsiflexion range of motion in the limb and healthy control subjects. In contrast, another investigation reported similar dorsiflexion range of motion in plantar fascitis runners and control subjects. Additionally, a retrospective study revealed that only 16% of the 267 patients with plantar fascitis were deemed to have excessive tightness in the gastrocnemius soleus complex (Martin et al., 2001). Therefore the relationship between sagital plane ankle mechanics and plantar fascitis require further clarification.

Although hyperpronation is belived to increase the load on the plantar fascia, several comprehensive reviews have failed to distinguish a definitive link between pronation and plantar fascitis.This may be attributable, in part, to the differing methods of assessing pronation between studies (Mcpoil & Cornwall, 2005).

1.2. Rationale

Plantar fascitis is one of the more common soft-tissue disorder of the foot,Yet little is known about its etiology. The purpose of the present study will be to use an epidemiological design to determine whether risk factors for plantar fascitis could be identified. Specifically, we will examine the risk factors sex, heel spurs, obesity, and time spent weight-bearing. However recent research suggests that some presentations of PF manifest non-inflammatory, degenerative processes and should more appropriately termed as “plantar fasciosis”. In the United States, more than two million individuals are treated for PF on an annual basis, accounting for 11-15% of professional visits related to foot pain (Alvarez & Canoso, 2006). It is estimated that 10% of the U.S. population will experience plantar heel pain during the course of a lifetime (Lynch et al., 2008). PF affects individuals regardless of sex, age, ethnicity, or activity level. It is seen in physically active individuals such as runners and military personnel, but also prevalent in the general population, particularly in women ages 40-60 (Buchbinder, 2004). The number of sufferer of plantar fascitis is increasing day by day due to lack of awareness. It affects a large number of individuals who become a burden for themselves and make a devastating effect on their family and society as well as in whole country. Research on this area can establish the skill of physiotherapist and be a base for spreading the profession in a new dimention in this country. So, investigator wanted to conduct the study with the title ‘Risk factors for plantar fascitis’ for Bangladeshi people. Other health professional will get update knowledge about factors which causing plantar fascitis. By this knowledge also mass of population will be benefited (Kishner & Colby, 2007).

1.3. Research Question

What are the risk factors for plantar fascitis?

1.4. Objective

1.4.1. General objective

To identify what are the risk factors for plantar fascitis in Bangladesh.

1.4.2. Specific objectives

1) To identify the socio-demographic factor of patients with plantar fascitis.
2) To identify the association between genders and causing of plantar fascitis.
3) To determine whether any association exists between heel spurs and plantar fascitis.
4) To collect the association between overweight and causing of plantar fascitis.
5) To recognize the association between prolong standing and causing of plantar fascitis.
6) To recognize the association between regular weight bearing and causing of plantar fascitis.
7) To recognize the association between duration of heavy physical acitivities more than four hours and causing of plantar fascitis.
8) To identify the association between recreational jogger and causing of plantar fascitis.

1.5. List of Variables

Independent Variable

- Sociodemographic factor
- Heel spurs
- BMI
- Prolong standing
- Regular weight bearing
- Duration of heavy physical activities more than four hours
- Recreational jogger

Dependent Variable

- Plantar fascitis

1.6. Operational Definition

Risk Factor

A risk factor is something that increases your chances of getting a disease. Sometimes, this risk comes from something you do. For example, smoking increases your chance of developing colon cancer. Therefore, smoking is a risk factor for colon cancer. Other times, there's nothing you can do about the risk. It just exists. For example, people 50 and older are more likely to develop colon cancer than people under 50. So, age is a risk factor for colon cancer (Riddle et al., 2003).

Plantar fascitis

Plantar fascitis is a degenerative syndrome of the plantar fascia resulting from repeated trauma at its origin on the calcaneus. Plantar fascitis is the most common cause of inferior heel pain (Martin et al., 2014).

CHAPTER-II LITERATURE REVIEW

Plantar fascitis (say ‘‘PLAN-terfash-ee-EYE-tus”) is the most common cause of heel pain. The plantar fascia is the flat band of the tissue (ligament) that connects heel bone to toes. It supports the arch of the foot. If strain occur in plantar fascia, it gets weak, swollen, and irritated (inflamed). Then heel or bottom of the foot hurts when stand or walk (Orchard, 2012).

Plantar fascitis is common in middle-aged people. It also occurs in younger people who are on their feet a lot, like athelets or soldiers. It can happen in one foot or both foot (Scheren et al., 2009).

The specific cause of plantar fascitis is poorly understood and is multifactorial. Riddle et al (2003) determined risk factors for plantar fascitis in a nonathletic population using an unmatched case-control design with 2 controls for each patient. A total of 50 patients with unilateral plantar fascitis met the inclusion criteria. The authors concluded that the risk of plantar fascitis increased as ankle dorsiflexion range of motion decreased. Other factors that increased the risk of developing plantar fascitis in this study population were spending the majority of the workday on the feet and a body-mass index of greater than 30 kg/m^2. While ankle dorsiflexion, obesity, and work-related weight bearing were reported to be independent risk factors, heel spurs is to be the most important (Riddle et al., 2003).

In a recent systematic review examining risk factors associated with chronic plantar heel pain, Irving et al (2006) reported a strong association between a body-mass index of 25 to 30 kg/m^2 and a heel spur in a non-athletic population. They reported a weak association for the development of plantar fascitis with increased body-mass index in an athletic population, increased age, decreased ankle dorsiflexion, decreased first metatarsophalangeal joint extension, and prolonged standing. Irving et al (2006) noted that the relationship between static foot posture as well as dynamic foot motion and the development of plantar fascitis was inconclusive.

The findings of Irving et al (2006) with regard to static foot posture and dynamic foot motion are of interest because the high incidence of plantar fascitis in runners has been anecdotally attributed to repetitive microtrauma associated with excessive pronation. Messier & Pittala (2008) as well as have assessed dynamic foot motion retrospectively in both runners and walkers with plantar fascitis. Both studies reported no differences between case and control groups, but the sample size evaluated in these studies were small.

Clinicians should consider limited ankle dorsiflexion range of motion and a high body-mass index in nonathletic populations as factors predisposing patients to the development of heel pain/plantar fascitis (Hicks, 2009).

The plantar aponeurosis or fascia consists of 3 bands: lateral, medial, and central. It is the central band that originates from the medial tubercle on the plantar surface of the calcaneus and that travels toward the toes as a solid band of tissue dividing just prior to the metatarsal heads into 5 slips. Each slip then divides in half to insert on the proximal phalanx of each toe. As a result of the central band only attaching to the calcaneus and the proximal phalanx of each toe, when the toes are extended, the plantar fascia is functionally shortened as it wraps around each metatarsal head. Hicks (2009) was the first to describe this functional shortening as the “windlass effect” of the plantar fascia. The windlass effect can assist in supinating the foot during the later portion of the stance phase.

The following intrinsic muscles of the foot have the same insertion as the central band of the plantar fascia: flexor digitorum brevis, abductor hallucis, and the medial head of the quadrates plantae. Medial calcaneal branches from the tibial nerve innervate the plantar heel pad. The tibial nerve divides into the medial and lateral plantar nerves while traveling through the tarsal tunnel (Crawford et al., 2003). Both the medial plantar, lateral plantar, and their respective nerve branches can be subject to entrapment leading to “tarsal tunnel syndrome.” This includes a second branch of the lateral plantar nerve, also referred to as “Baxter's nerve,” which can also be entrapped. There appears to be an anatomical connection between the Achilles tendon and the plantar aponeurosis (Martin et al., 2005).

Green et al (2005) reported an anatomical continuity of the fibers between the Achilles tendon and the plantar fascia in the feet of cadavers. They noted that there was a continuous diminution of the number of fibers connecting the Achilles tendons and plantar fascia as the foot aged (Kitaoka et al., 2007).

The most common site of abnormality in individuals complaining of heel pain diagnosed as plantar fascitis is near the origin or enthesis of the central band of the plantar aponeurosis at the medial plantar tubercle of the calcaneus. On occasion, individuals will complain of pain and symptoms in the mid-portion of the central band, just prior to it splitting into the 5 slips (Irving et al., 2006).

Plantar fascitis occurs as an enthesopathy in patients with a seronegative arthropathy. Generally symptoms are present bilaterally in these cases. In systemic rheumatic diseases, enthesitis (insertitis) can occur as a result of endogenous, unknown causes (Snow et al., 2005). Plantar fascia insertitis can be associated with Reiter's syndrome, psoriatic arthropathy, ankylosing spondylitis, and enteropathic spondylo arthopathy (Orchard, 2012). Clinicians should assess for impairments in muscles, tendons, and nerves, as well as the plantar fascia, when a patient presents with heel pain.

The primary condition associated with heel pain is plantar fascial fibromatosis/Plantar fascitis (Michelsson et al., 2005). Other, secondary conditions associated with heel pain are Tarsal tunnel syndrome and lesion of plantar nerve/Morton's metatarsalgia (Michelsson et al., 2005). The corresponding conditions, which are used in the USA, Plantar fascial fibromatosis/Contracture of plantar fascia, Plantar fascitis (traumatic), Tarsal tunnel syndrome, and Lesion of plantar nerve/Morton's metatarsalgia, neuralgia, or neuroma. The clinical features that differentiate pathology of the plantar fascia, plantar nerves near the proximal plantar fascia, or tissues of the tarsal tunnel, are often overlapping because it is difficult to selectively load the tissues hypothesized to be the source of a patient's heel pain during physical examination and treatment procedures (Meyer et al., 2002).

The primary body function associated with plantar fascitis, tarsal tunnel syndrome, and plantar nerve lesions are the sensory functions related to pain. The primary body structures associated with plantar fascitis are ligaments and fasciae of ankle and foot and structures of ankle and foot, neural (Meyer et al., 2002).

The primary activities and participation associated with plantar fascitis are walking short distances, Walking long distances, and Maintaining a standing position.

The diagnosis of plantar fascitis is made with a reasonable level of certainty on the basis of a clinical assessment alone (Alvareza & Canoso, 2006).
Patients typically report an insidious onset of pain under the plantar surface of the heel upon weight bearing after a period of non-weight bearing.
This pain in the plantar heel region is most noticeable in the morning with the first steps after waking or after a period of inactivity.
In some cases, the pain is so severe that it results in an antalgic gait.
The patient will usually report that the heel pain will lessen with increasing levels of activity (ie, walking, running), but will tend to worsen toward the end of the day.
The history usually indicates that there has been a recent change in activity level, such as increased distance with walking or running, or an employment change that requires more time standing or walking.
In most cases the patient will initially complain of sharp, localized pain under the anteromedial aspect of the plantar surface of the heel, with paresthesias being uncommon.
The history usually indicates that there has been a recent change in activity level, such as increased distance with walking or running, or an employment change that requires more time standing or walking.

Pain in the plantar medial heel region; most noticeable with initial steps after a period of inactivity, but also worse following prolonged weight bearing; and often precipitated by a recent increase in weight bearing activity are useful clinical findings for classifying a patient of plantar fascitis (Martin et al., 2005).

Imaging studies are typically not necessary for the diagnosis of plantar fascitis (Buchbinder, 2004 & Cole et al., 2006). Imaging would appear to be most useful to rule out other possible causes of heel pain or to establish a diagnosis of plantar fascitis if the healthcare provider is in doubt. Michelsson et al (2005). In a study, Osborne and Allison (2006) utilized lateral radiographs to assess radiographic changes in 27 patients diagnosed with plantar fascitis in comparison to 79 controls. A single blinded examiner evaluated the plain non-weight-bearing films. Calcaneal spurs were observed in 85% of the individuals with plantar fascitis and in 46% of those in the control group. Plantar fascia thickness and fat pad abnormalities were the 2 best factors for group differentiation of plantar fascitis, with a sensitivity of 85% and a specificity of 95%. These authors concluded that calcaneal spurs were not a key radiographic feature to distinguish differences between the 2 groups and that a lateral non-weight-bearing radiograph to assess soft tissue changes should be the first choice if imaging is desired (Osborne & Allison, 2006).

The following differential diagnoses have been suggested for plantar heel pain (Riddle et al., 2003).

Calcaneal stress fracture

Bone bruise

Fat pad atrophy

Tarsal tunnel syndrome

Soft-tissue, primary, or metastatic bone tumors

Paget disease of bone

Sever's disease

Referred pain as a result of an S1 radiculopathy

Clinicians should consider diagnostic classifications other than heel pain/plantar fascitis when the patient's reported activity limitations or impairments of body function and structure are not consistent with those presented in the diagnosis/classification section of this guideline, or when the patient's symptoms are not resolving with interventions aimed at normalization of the patient's impairments of body function (Riddle et al., 2003).

Although anti-inflammatory agents, including non-steroidal anti-inflammatory drugs (NSAIDs) and steroid injections, are not commonly within the purview of physical therapist practice, patients often seek advice from their therapist as to whether or not they should utilize anti-inflammatory agents in the management of plantar fascitis.

While healthcare providers often prescribe NSAIDs for patients with plantar fascitis, randomized clinical trials evaluating the use of NSAIDs in isolation have not been conducted (Snow et al., 2005).

There is limited evidence to support the use of steroid injection to provide short-term pain relief (Crawford et al., 2003). A major concern with steroid injection has been the risk of subsequent plantar fascia rupture and plantar fat pad degeneration. Acevedo & Beskin (2008) in a retrospective review of 765 patients diagnosed with plantar fascitis reported that of the 122 patients who had received a steroid injection, 44 patients (36%) had a fascial rupture as a result of the injection. Of even greater importance was the fact that 50% of the patients who suffered a rupture reported only a fair or poor recovery at a 27-month follow-up (Acevedo & Beskin, 2008).

More recent studies have reported minimal to no risk for fascia rupture following a steroid injection. Genc et al (2005) performed a palpation-guided steroid injection to 47 heels of 30 patients with plantar fascitis and assessed outcome using ultrasound examination as well as pain intensity at 1 and 6 months post injection. Thirty healthy individuals served as a control population for the ultrasound examination (Martin et al., 2005). They reported that while the initial ultrasound examination demonstrated a significantly thicker plantar fascia in the patient group in comparison to the controls, the thickness of the fascia and pain levels were significantly decreased 1 month after injection. A further decrease in fascial thickness in the patient group was also noted at the 6-month follow-up. They also noted that gross fascia disruption or other side-effects were not observed after steroid injection (Gence et al., 2005).

Gudeman et al (2007) performed a double-blinded, placebo controlled study in which 39 subjects (44 feet) were assigned to 1 of 2 treatment groups. Although 4 feet were eliminated for various reasons, 20 feet were assigned to the placebo group, which had iontophoresis electrodes attached to the feet with only phosphate buffered saline administered. The 20 feet in the treatment group received iontophoresis with 0.4% dexamethasone sodium phosphate USP. Both groups also received 6 sessions of physical therapy in addition to the iontophoresis over a 2- to 3-week period, which consisted of ice, plantar fascia and calf muscle stretching, and the use of viscoelastic heel orthoses (Martin et al., 2005). The Maryland Foot Score was used to assess treatment outcome in relation to pain and functional changes pretreatment, after the 6 treatments, and at 1 month posttreatment. The group receiving iontophoresis had significantly greater improvement between pretreatment and after 6 treatments in comparison to the placebo group. At 1 month posttreatment there were no differences in pain or function between the 2 groups. The authors concluded that because the use of iontophoresis did not have an effect on long-term pain or function, this modality should be considered for those patients who need an immediate reduction in pain symptoms (Gudman et al., 2007).

In a more recent study, Osborne & Allison (2006) conducted a double-blinded, randomized, controlled trial that assigned 31 patients diagnosed with plantar fascitis into 1 of 3 treatment groups: a placebo using 0.9% sodium chloride (10 subjects), iontophoresis with 0.4% dexamethasone (11 subjects), and iontophoresis with 5% acetic acid (10 subjects). Each patient received 6 treatment sessions over 2 weeks and was continuously taped using a low-Dye method throughout the 2-week period. Patients were also instructed to perform calf stretching. (Hyland et al., 2006) Pain and stiffness were independently assessed using a visual analogue scale prior to starting treatment, at the conclusion of 2 weeks of treatment, and 2 weeks following the conclusion of the treatment. The results indicated that both acetic acid and dexamethasone, when delivered via iontophoresis is in combination with low-Dye taping, provided good short-term relief of pain and function. Acetic acid produced greater improvements in morning pain than dexamethasone, but continued relief of pain during the 2-week post-treatment period was only observed in the dexamethasone group (Osborne & Allison, 2006).

There is limited evidence to support the use of manual therapy as an intervention for plantar fascitis. Young et al (2004) reported on 4 patients referred to physical therapy for plantar fascitis or unilateral plantar heel pain. The duration of symptoms for the 4 patients ranged from 6 to 52 weeks. The authors used a pain rating scale and a self-reported function scale to assess outcome over a period of 1 to 3 months. All 4 patients received manual therapy and stretching (Martin et al., 2005). Two patients were also prescribed foot orthoses and another patient received additional strengthening exercises. The manual therapy techniques utilized in this case series included talocrural joint posterior glides, subtalar joint lateral glides, anterior/posterior glides of the first tarsometatarsal joint, and subtalar joint distraction manipulations. All 4 patients in this case series reported a rapid improvement in pain and function as a result of the interventions utilized. Meyer et al (2002) reported on 1 patient referred to physical therapy for plantar fascitis with an 8-month history of subcalcaneal heel pain that limited standing and walking. This patient's heel pain was reproduced with the straight-leg raising (SLR) test in combination with ankle dorsiflexion and eversion to sensitize the tibial nerve, suggesting that there was a neurogenic component to this patient's heel pain. The examination findings of this patient appear consistent with the findings of Coppieters and associates (Cole et al., 2006) who reported significant strain and excursion of the tibial nerve in 8 embalmed cadavers when ankle dorsiflexion is combined with the SLR test. This patient with heel pain described by Meyer et al (2002) received passive and active mobilization aimed at restoring pain-free soft tissue mobility along the course of the median nerve. The passive neural mobilization procedures were performed with the patient in the slump sitting position. Because restricted ankle dorsiflexion, excessive pronation, and posterior tibialis weakness were also found, low-Dye taping and therapeutic exercises were utilized to control excessive pronation and reduce stress on the plantar fascia. Following 10 treatment sessions over a period of 1 month, this patient's heel pain resolved and his standing and walking tolerance were fully restored. Although case series provide a low level of evidence, the findings of Young et al (2004) and Meyer et al (2002) provide the foundation for future randomized, controlled clinical trials to assess the effectiveness of manual therapy as an intervention for plantar fascitis.

Numerous authors have recommended that calf stretching should be one of the interventions incorporated into the management program for patients with plantar fascitis (Osborne & Allison, 2006). The continuity of connective tissue between the Achilles tendon and the plantar fascia, as well as the fact that decreased ankle dorsiflexion is a risk factor in the development of plantar fascitis, provides some justification for calf stretching (Osborne & Allison, 2006).

Porter et al (2002) conducted a prospective, randomized, blinded study to assess the duration and frequency of calf stretching on improvement in ankle dorsiflexion range of motion and patient outcome as determined using the American Academy of Orthopaedic Surgeon's Lower Limb and Foot and Ankle Modules. Participants included 54 patients with plantar fascitis who performed a sustained stretch, 40 patients with plantar fascitis who performed an intermittent stretch, and 41 healthy individuals who served as controls. Participants were instructed to stretch their calf muscles standing at the edge of a step with the heel hanging off the edge while keeping the knee straight and the foot in a neutral position (no abduction or adduction) (Mcpoil & Cornwall, 2005). The individuals in the sustained stretch group stretched for 3 minutes at a time, 3 times a day. Those in the intermittent stretch group stretched for five 20-second intervals, twice daily. Participants in both the sustained and intermittent stretch groups had ankle dorsiflexion range of motion and functional outcomes assessed prior to starting treatment and once a month for 4 consecutive months (Riddle et al., 2003). Participants in the study were provided with no other treatment interventions. At the end of 4 months, 40 patients remained in the sustained-stretch group and 26 patients remained in the intermittent-stretch group. The results indicated that while there were no differences in outcome between the 2 stretching groups, both groups had similar increases in ankle dorsiflexion. Furthermore, the increase in ankle dorsiflexion correlated with a decrease in pain for both groups (Porter et al., 2002).

DiGiovanni (2006) conducted a prospective, randomized study to determine if a plantar fascia-specific stretch would be more effective than calf stretching. These authors hypothesized that a plantar fascia-specific stretch might have a greater amount of patient compliance as well as a greater improvement in functional outcomes. One hundred one participants were initially assigned to 2 groups: calf stretching (n = 50) and plantar fascia-specific stretching (n = 51) (Crawford et al., 2003). Both groups received over-the-counter soft insoles, a 3-week course of NSAIDS, and patient education regarding plantar fascitis. The plantar fascia tissue-specific stretch was performed in sitting, with the patient placing the fingers of one hand across the toes of the involved foot, then pulling the toes back (extension) toward the shin until stretching was felt in the arch of the foot. (Scheren et al., 2009) To confirm that they were stretching the fascia, patients were instructed to use the opposite hand to palpate the tension of the fascia on the bottom of the foot. The calf-stretching group was instructed to perform the stretch in standing while leaning into the wall with the non affected foot behind the leg being stretched (Davies et al., 2009). Patients in the calf-stretching group were asked to stand on their orthotics while stretching, in a slightly toe-instance. Both groups were instructed to hold each stretch for a count of 10, repeat the stretch 10 times, and perform the stretch 3 times per day. Of the initial 101 patients, heel pain was either eliminated or much improved at 8 weeks in 24 (52%) of the 46 patients who performed the plantar fascia specific stretch, as compared to 8 (22%) out of 36 patients who performed calf stretching. It is important to note, however, that this study was not blinded, a large percentage of patients dropped out of the study (28% calf stretching, 10% plantar fascia stretch), and only the data for those patients who completed the 8-week trial were analyzed (DiGiovanni, 2006).

Adhesive strapping appears to provide short-term relief of pain in patients with a clinical diagnosis of plantar fascitis. As previously noted in the discussion on modalities, Osborne & Allison (2006) reported that iontophoresis combined with low-Dye taping provided relief of pain and stiffness when assessed 4 weeks post treatment.

Hyland et al (2006) conducted a prospective, randomized, controlled trial to determine the effect of calcaneal taping in comparison to sham taping and stretching. Forty-one patients with a clinical diagnosis of plantar fascitis were assigned to 4 groups: calcaneal taping (n = 11), sham taping (n = 10), stretching only (n = 10), and a control (n = 10). The stretching group was given both calf stretching and plantar fascia-specific stretching exercises. The calcaneal taping procedure was designed to invert the calcaneus, thus to improve biomechanical position. Patient outcome was assessed using a visual analogue scale for pain and a patient-specific function scale (PSFS) prior to treatment and after 1 week of treatment. While stretching and sham taping decreased pain, calcaneal taping demonstrated a significantly greater decrease in pain than either stretching or sham taping. No differences with regard to function were found among the 4 groups, although calcaneal taping did have the greatest pretest versus posttest difference. Unfortunately, this study was not blinded, had a small number of subjects assigned to each group, and only provided a 1-week follow-up (Hyland et al., 2006).

Radford et al (2006) performed a participant-blinded, randomized trial to determine the effectiveness of low-Dye taping for pain and improvement of function in patients with plantar fascitis. A sample size of 92 patients was divided into 2 equal groups of

46:1 group receiving low-Dye taping with sham ultrasound and the other group receiving sham ultrasound only. Outcome measures included first-step pain, assessed using a visual analogue scale, as well as the change in foot pain, foot function, and general foot health as determined using the Foot Health Status Questionnaire (FHSQ). Outcome was assessed prior to the initiation of treatment and after 1-week. Participants in the taping group had their foot taped for a median of 7 days (range 3 to 9 days). Similar to the findings reported by Hyland et al (2006) the low-Dye tape group reported a small but significant difference in first-step pain in comparison to the sham group. No significant differences in FHSQ scores were found between the 2 groups; however, limitations of this study include no control group and short-term follow-up of outcome measures (Radford et al., 2006).

Foot orthoses are frequently utilized as a component of the conservative management plan for plantar fascitis. The justification given for the use of foot orthoses is to decrease abnormal foot pronation that is thought to cause increased stress on the medial band of the plantar fascia. To date, evidence that establishes an association between plantar fascitis and foot motion is inconclusive. 24 Studies conducted using cadaver specimens suggest that foot orthoses can reduce the strain in the plantar fascia during static loading, reduce the collapse of the medial longitudinal arch, and reduce elongation of the foot associated with pronation (Kitaoka et al., 2007; kitaoka et al., 2002 & Kogler et al., 2006).

Seven randomized, controlled clinical trials have been conducted to determine the effectiveness of foot orthoses for the treatment of plantar fascitis. Two of these studies evaluated the effect of magnetic insoles on plantar heel pain (Winmiller et al., 2003). Both studies concluded that magnets do not provide an additional benefit compared to nonmagnetic insoles for the treatment of plantar heel pain.

The remaining 5 studies focused on comparing various types of foot orthoses including customized, prefabricated, felt arch pads, and heel cups or pads. Lynch et al (2008) compared the effectiveness of 3 types of conservative therapy for the management of plantar fascitis. A total of 103 subjects were assigned to 1 of 3 treatment groups: anti-inflammatory therapy consisting of a corticosteroid injection and NSAIDs (n = 35), an accommodative viscoelastic heel cup (n = 33), and a mechanical treatment which consisted of an initial low-Dye taping followed by custom orthoses (n =35). The primary outcome measure was pain rating based on a visual analogue scale and patients were followed for 3 months. The authors reported that the mechanical treatment group had a greater reduction in pain and had fewer drop-outs than the other 2 groups. In addition to the fact that pain was the only outcome measure assessed, the foot orthoses group had the confounding short-term effect of taping (Lynch et al., 2008).

Taunton et al (2002) focused on the effect of foot orthoses alone by evaluating 60 patients with plantar fascitis, assigned to either a custom, functional foot orthosis group (n = 26), or a generic gel heel pad group (n = 34). While the actual duration of the intervention was unclear, most patients were followed for at least 3 months, with 5 subjects dropping out of the heel pad group. To assess patient outcomes, a 5-item outcome survey was developed by the authors. The authors reported that the custom, functional foot orthoses group had better outcomes than the heel pad group. Unfortunately, the author-developed outcome scale was not evaluated for reliability or validity and the group assignment was not blinded (Taunton et al., 2002).

Pfeffer et al (2009) conducted a randomized multicenter trial involving 236 patients diagnosed with plantar fasciitis recruited from 15 orthopaedic foot and ankle clinics. The patients in the study were used to evaluate 5 different treatments: (1) calf stretching only, (2) a silicone heel pad and calf stretching, (3) a felt arch insert and calf stretching, (4) a rubber heel cup and calf stretching, and (5) a custom, functional foot orthosis and calf stretching. The patients were followed for an 8-week period and they used the pain subscale of the Foot Function Index (FFI) as their outcome measure. They reported that the groups treated with the prefabricated inserts (silicone pad, felt arch insert, rubber heel cup) had significantly better outcomes than the group treated with custom orthotics and the group treated with stretching only. Although the 8-week intervention period for this study was extremely short, the results indicate that prefabricated orthoses are effective and that stretching and prefabricated orthoses are more effective than stretching alone (Pfeffer et al., 2009).

Martin et al (2001) evaluated custom foot orthoses in comparison to prefabricated arch supports and night splints in 255 patients with plantar fascitis. Patients were randomly assigned to 1 of 3 treatment groups and the primary outcome measures were self-reported first step pain as well as pain during work, leisure, and exercise activities using a visual analogue scale. Of the 255 patients initially enrolled in the study, only 193 were seen at the final 12-week follow-up visit. Patients in the prefabricated orthoses group and the night splint group had the poorest compliance rates and the highest number of patients withdrawn, with 21% and 26%, respectively. At the 12-week follow-up visit, there was no significant difference in pain reduction between the 3 groups. The authors did indicate that patient compliance was greatest with the use of custom foot orthoses (Martin et al., 2001).

Crawford et al (2003) in their Cochrane review reported limited evidence to support the use of night splints as an intervention for patients with plantar fascitis lasting more than 6 months. A key clinical issue is the duration of use once night splint therapy has been initiated. Batt et al (2006) reported that between 9 and 12 weeks of night splint wear time was required to achieve a good outcome in 40 patients with chronic plantar fascitis. Powell et al (2008) found that only 1 month of wearing the night splint was sufficient to create an 88% improvement in 37 patients with chronic plantar fascitis. Therefore, based on limited evidence, it would appear that a night splint should be worn between 1 and 3 months to achieve adequate symptom improvement.

In a study, Roos et al (2006) investigated the effects of foot orthoses and night splints, either individually or combined, in a prospective, randomized trial with a 1-year follow-up. Forty-three patients with a mean duration of symptoms of 4.2 months were assigned to 1 of 3 groups: foot orthoses only (n = 13), foot orthoses and night splint (n = 15), or night splint only (n = 15). Follow-up data were available on 38 patients after 1 year. While previous studies had used a posterior night splint, Roos et al (2006) utilized an anterior night splint. In addition to daily logs to monitor compliance, the Foot and Ankle Outcome Score (FAOS) was used as an outcome measure. The results indicated that compliance to either the foot orthoses or night splint was good (at least 75%) and all 3 groups had a reduction in pain as early as 6 weeks and at the 1-year follow-up. Improvements in function as determined using the FAOS supported the use of foot orthoses over night splints.

Most night splints, whether anterior or posterior in design, are fabricated using a rigid thermoplastic material that can be uncomfortable for the patient and lead to noncompliance. More recently, a soft, sock-type night splint has been made commercially available that utilizes a Velcro strap to position the ankle in neutral and the toes in slight extension (Taunton et al., 2002). A retrospectively analyzed the use of this type of night splint in comparison to standing calf stretching in 160 patients with a clinical diagnosis of plantar fascitis. The mean duration of symptoms for all 160 patients prior to the start of treatment was approximately 2 months. Although there are numerous issues with this study including poor control of introduction of adjunctive treatments, a 13% dropout of the patients receiving calf stretching, and the use of pain as the only outcome measure, the use of the sock-type night splint did result in a shorter recovery time and fewer additional interventions.A prospective, randomized controlled trial is required to validate this specific type of night splint (Singh et al., 2007).

CHAPTER–III METHODOLOGY

3.1. Study Design

The purpose of the study was to find out the risk factors for plantar fascitis for Bangladeshi people. Investigator will be used unmatched case control study design to identify the risk factors of planter fascitis. All individual cases were unmatched with a control. The entire sample was then searched for the exposure.

3.2. Study Site

Musculoskeletal unit of the Centre for the Rehabilitation of the Paralysed (CRP) Savar and Mirpur was selected as the study site. The investigator thought that this place was easy to obtain desire data for his study. Patient with planter fascitis come this place for physiotherapy treatment from different area of Bangladesh, so the investigator selected this place.

3.3. Study population and sample population

All patients with planter fascitis in Bangladesh were the target population and sample population were those who came to CRP to receive treatment during the investigator study time August 2015 to October 2015.

3.3.1. Sampling procedure

The investigator used the convenient sampling technique because considering the inclusion-exclusion criteria and the number of patients coming to musculoskeletal unit. It would be difficult to find out the expected number of subjects. The technique was more feasible, less time consuming and expensive for the investigator to obtain relevant information.

3.3.2. Inclusion criteria

Patients with planter fascitis who were attending in CRP for treatment as a case.

Planter fascitis that was confirmed was diagnosed by Bone-scan or MRI.

All male and female were same priories.

Male and female has different anatomical, physiological changes as well as different intensity, frequency and pattern of activity.

Inclusion of males and females may be more comprehensive in identifying the risk factors.

3.3.3. Exclusion criteria

Patients with planter fascitis and other serious associated diseases.

Subject who were unconscious, cognitive problem.

3.4. Sample size

There were 25 cases and 25 controls, were selected as sample in the study.

Formula,

$$n = \frac{2\mathrm{pq}(\mathrm{Za} + \mathrm{Zb})^2}{(\mathrm{P1} - \mathrm{Po})^2}$$

Where,

$$\mathrm{P1} = \frac{PoR}{1 + \mathrm{Po}\,(\mathrm{R} - 1)}$$

$$P = \frac{\mathrm{P1} + \mathrm{Po}}{2}$$

q = 1 – p

Here, the quantities Za and Zb are values from the standard normal distribution.

Hypothesized minimum relative risk to detected by the study, R= 2

Level of significance, a= 0.05 (Za = 1.96)

Power of the study, 80% (Zb = 0.84)

Number of the calculated sample = n

Po = 0.05 (prevalence of plantar fascitis in literature)

According to this formula the actual sample size was about 464 but, due to the limitation of the time only 50 samples were selected conveniently from the population for this study.

3.5. Data collection methods and tools

Data were collected by direct interview using the questionnaire and from the reports of planter fascitis. The questions were divided into four sections which almost covered all issues regarding risk factors for planter fascitis including age, sex, occupation, residential area, family income, heel spurs, BMI, prolong standing, regular weight bearing activity, duration of heavy physical activities more than four hours, recreational jogger. Beside this paper, pen, pencil, computer, printer and calculator comprehensive field note would be used as the materials of data collection.

3.6. Data management and analysis

Measurement of association

Exposure	Plantar fascitis	
	Yes(Case)	No(Control)
Yes	a	b
No	c	d
Odds of exposure=ad/bc		

Table-01: Measurement of Odds ratio

In the case control study, there was not calculate the incidence of rate of the disease so actual relative could not be obtained. The measure of the association between exposure and occurance of disease of the case-control study was odds ratio. The ratio of odds of then exposure in diseased participants to the odds of the exposure in the non disease participants was calculated as an odds ratio. According to the above mention was an example of a calculated Odds ratio.

SPSS 20 version was used to analyze data. Data will be analyzed in the form descriptive statistics for demographic data. Odds ratio was computed to determine how much risk there was in presence of certain exposure compared to those who did not have that exposure.

3.7. Quality control and assurance

The investigator had enough knowledge in the study, hence the study area and underneath issue would be kneely explored by him. The format of the questionnaire was purely structured, thus it enabled a definitive answer. The questionnaire were developed according to the literature search and peer review for reliable questionnaire. The investigator will tried to avoid selection bias due to strictly maintained inclusion and exclusion criteria.

Both cases and control were well defined in this study to the avoid conflict the selection the case and control. The data were collected when the experience physiotherapist who will identify plantar fascitis patients as a case.

3.8. Inform consent

The aims and objectives of this study should be informed to the subjects verbally. The investigator should given the consent form to the subject and explained them. The subjects have the rights to withdraw themselves from the research at any times. It should be assured the participant that her name or address would not be used. The information of the subjects might be published in any normal presentation or seminar or writting but they would not be identified. The participant will also be informed or gives notice that the research result will not be harmful for them. It will be kept confidential. Every participant has the right to discuss about her problem with senior authiority. The proposal of the study is approved by the ethical committee of the member of faculty of Physiotherapy Department. The investigator would follow the guideline given by local ethical review committee. Followed the WHO, BMRC and IRB guidelines. Strictly maintained the confidentiality. Informed consent would be taken.

CHAPTER – IV	RESULTS

In this study there were 50 participants. Among them 25 participants were in case group and 25 participants were in control group. The analysis was done by the SPSS 20 version.

Socio-demographic Information

4.1. Age of the participants

Among the 50 participants 12 participants were between 21-30 years, 18 participants were between 31-40 years, 14 participants were between 41-50 years, 3 participants were between 51-60 years and 3 participants were between 61-70 years. There mean age 42.8 years, minimum age was 21 years and maximum age was 65 years. In percentage 24% participants were between 21-30 years, 36% participants were between 31-40 years, 28% participants were between 41-50 years, 6% participants were between 51-60 years and 6% participants were between 61-70 years (Figure-1).

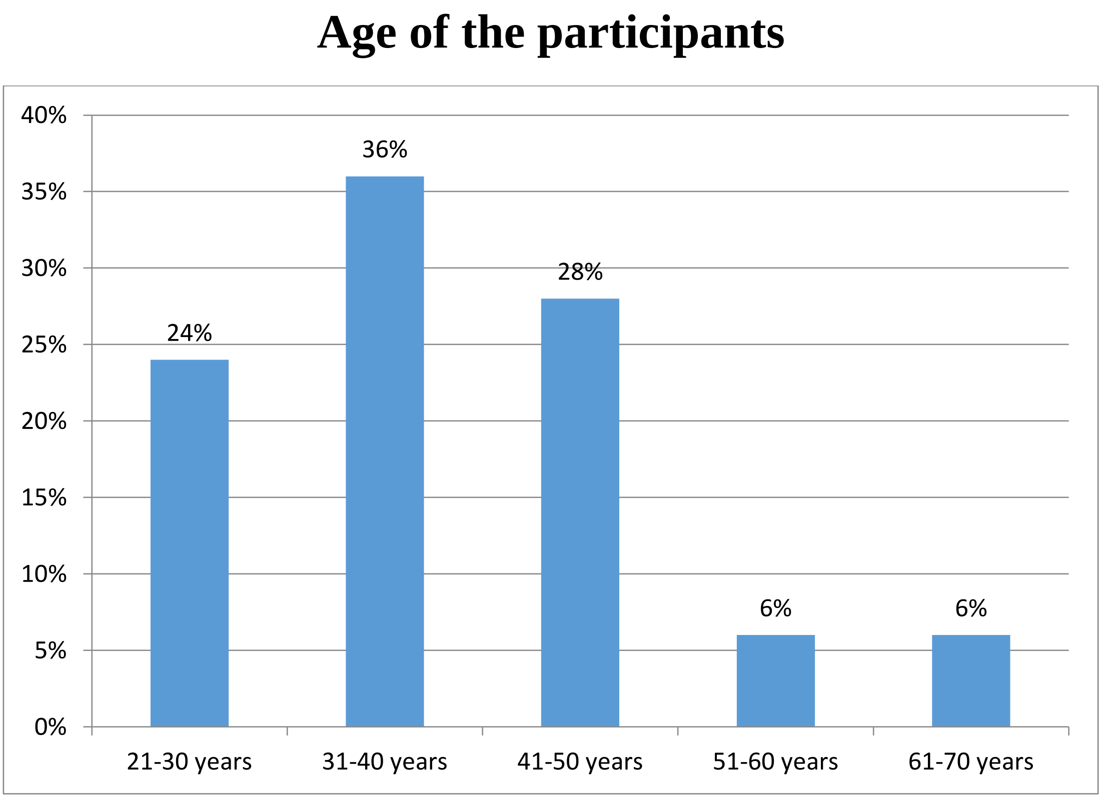

Figure -1: Age of the participant

4.2. Sex of the participant

In 50 participants, female 34 (68%) were in more in number than male 16 (32%) as shown in (Figure-2).

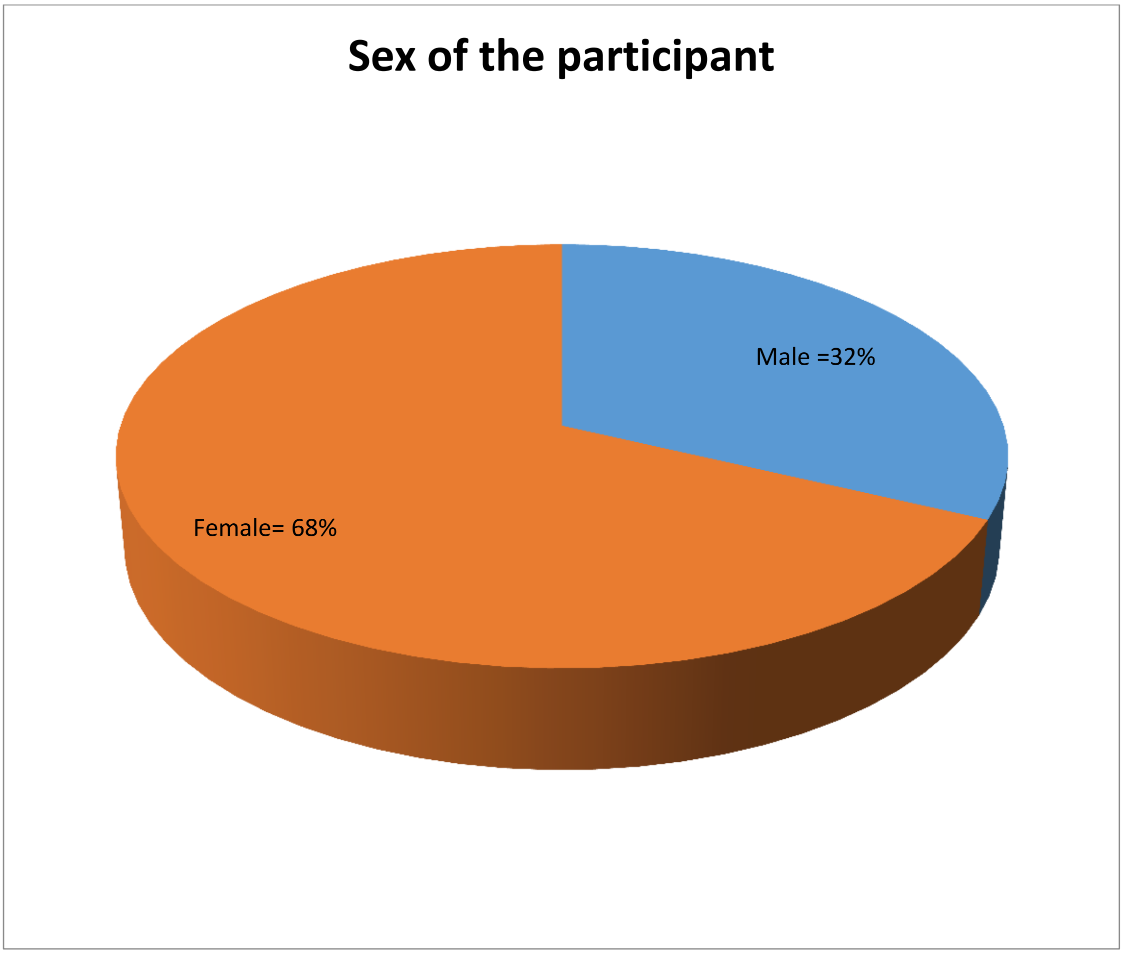

Figure -2: Sex of the participant

4.3. Educational status of the participant

In 50 participants, 3 (6%) participants had no formal schooling, 1 (2%) participants had less than primary education, 2 (4%) participants completed primary education, 8 (16%) participants secondary education, 8 (16%) participants completed higher secondary education, 11 (22%) participants completed bachelor degree, 2 (4%) participants completed masters degree and 15 (30%) participants completed others (Figure-3).

Educational status of the participant

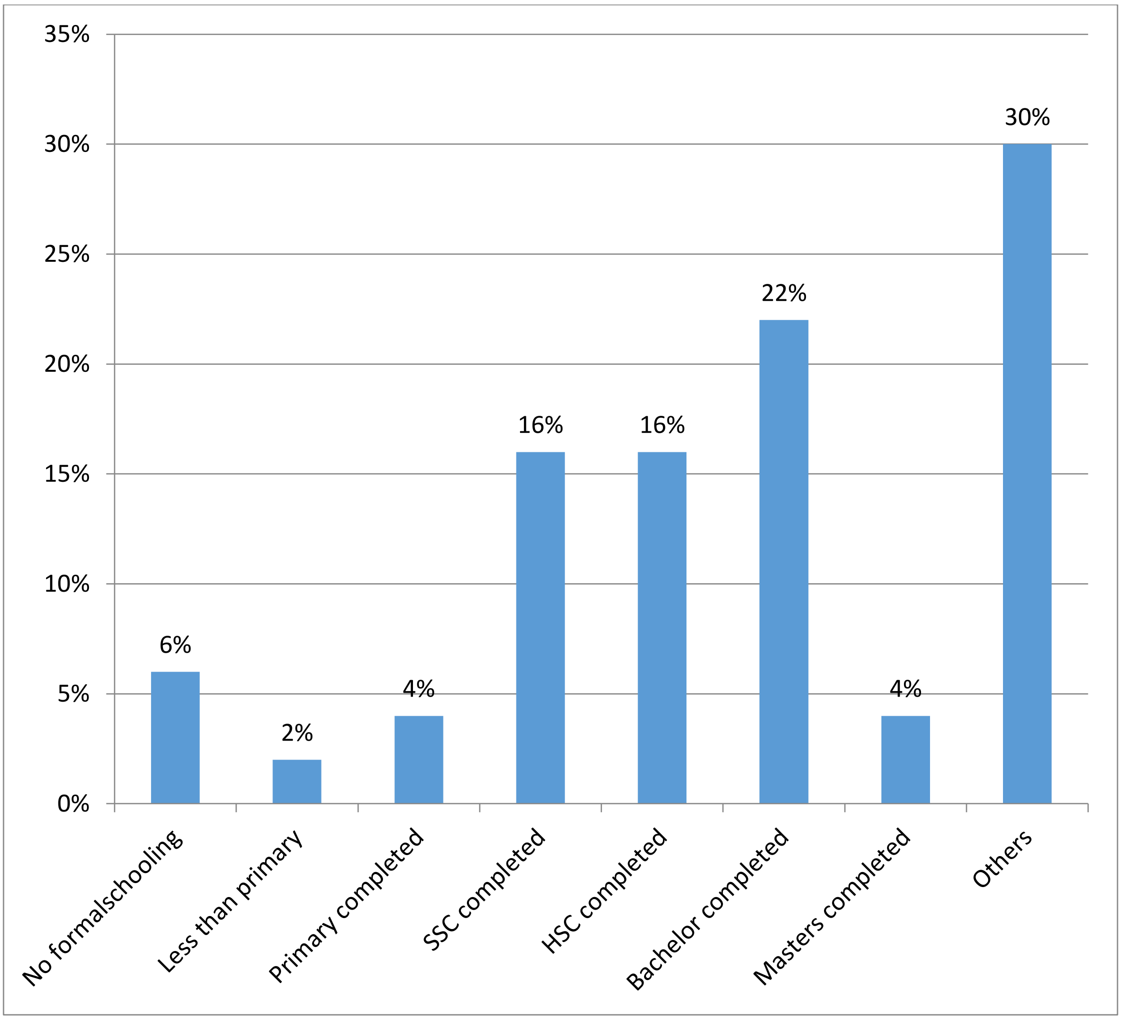

Figure-3: Educational Status

4.4. Residential area

Among 50 participants, 23 (46%) were from urban area, 15 (30%) were from rural area and 12(24%) were from semirural area (Figure-4).

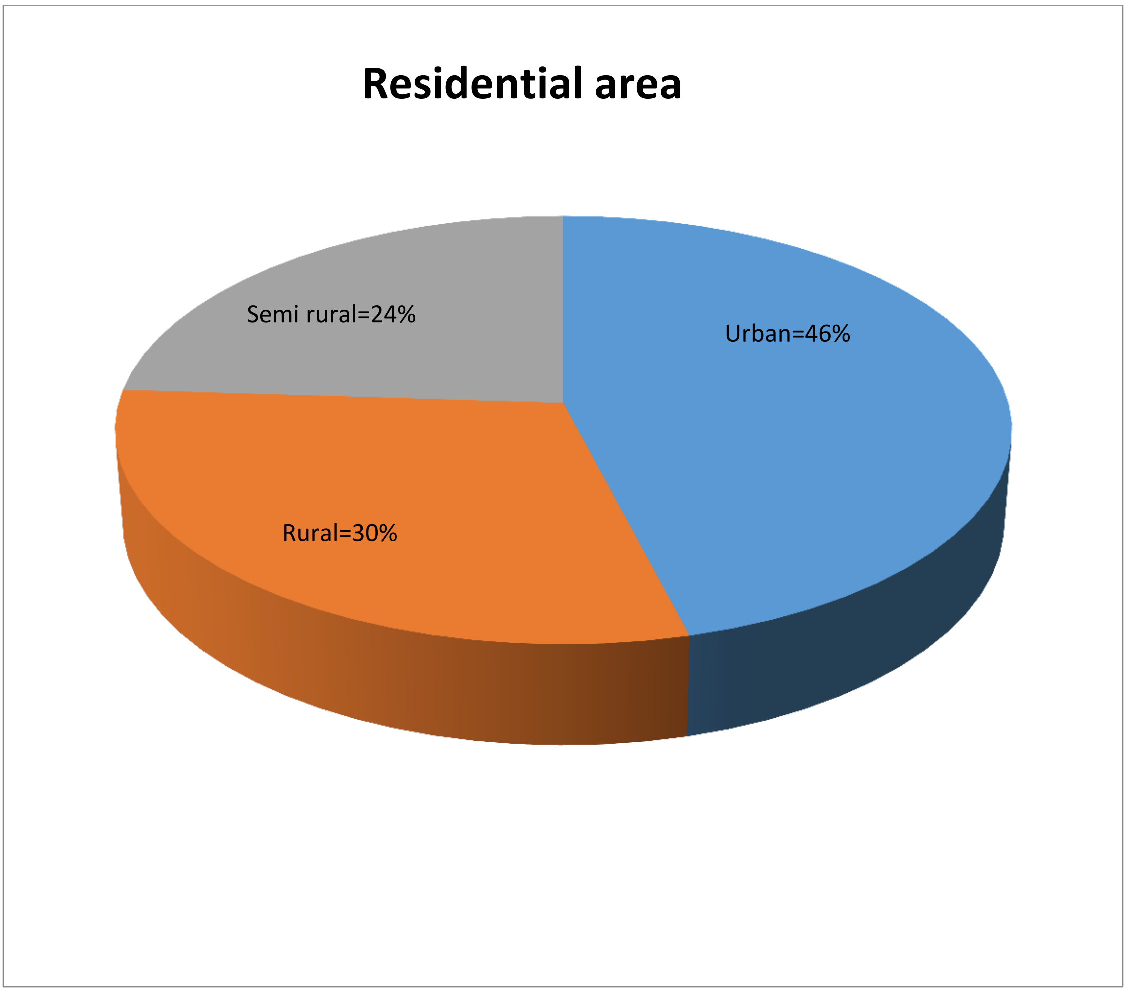

Figure-4: Residential area

4.5. Occupation of the participant

In 50 participants 1 participant was farmer, 2 participants were garments worker, 4 participants were serviceholder, 6 participants were businessman, 31 participants were housewife,2 participants were teacher, 1 participants was students and 3 participants were other occupation. In percentage 2% participants were farmer, 4% participants were garmentsworker, 8%participants were serviceholder, 12% participants were businessman, 62% participants were housewife, 4% participants were teacher, 2% participants were students and 6% participants were other occupation (Figure-5).

Occupation of the participant

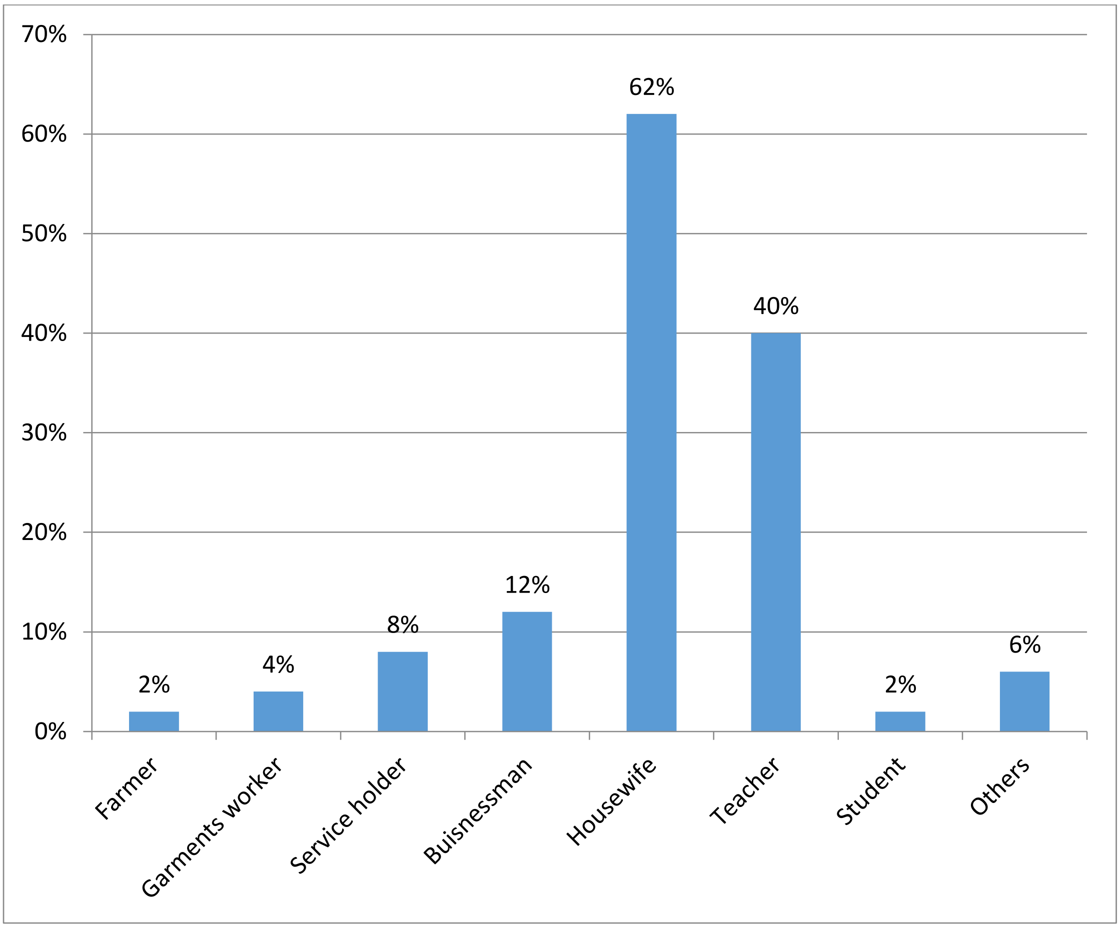

Figure 5: Occupation of the participant

The individual factors of knee osteoarthritis results were shown this table as below-

Name of the factors	Number of Cases	Number of Controls	ODD Ratio (OR)	95% CI
Sex	**19**	**15**	**2.11**	**0.63, 7.13**
Heel spurs	**18**	**3**	**18.86**	**4.25, 83.59**
BMI	**12**	**18**	**0.51**	**0.16, 1.61**
Prolong standing	**15**	**18**	**0.58**	**0.18, 1.91**
Regular weight bearing	**8**	**11**	**0.60**	**0.19, 1.90**
Duration of heavy physical activities	**10**	**12**	**1.39**	**0.45, 4.25**
Recreational jogger	**6**	**7**	**0.81**	**0.23, 2.89**

Table-02: The individual risk factors for plantar fascitis

Sex

From the table 3 it is observed that the total participants of this study were 50 where 25 were case and 25 were control, among them 19 participants had female and 6 participants had male in the case group. On the other hand 15 participants had female and 10 participants had male in the control group. Calculated odds ratio for the sex of the participants is 2.11 (Table-3) which means there was association between sex of the participants and plantar fascitis, that is 2.11times more possible chance to occur plantar fascitis of female than male and 95% CI was 0.63 and 7.13.

Heel Spurs

From the table 3 it is observed that the total participants of this study were 50 where 25 were case and 25 were control, among them 18 participants had heel spurs and 7 participants had no heel spurs in the case group. On the other hand 3 participants had heel spurs and 22 participants had no heel spurs in the control group. Calculated odds ratio for the heel spurs is 18.86 (Table-3) which means there was association between heel spurs and plantar fascitis, that is 18.86 times more possible chance to occur plantar fascitis of heel spurs and 95% CI was 4.25 and 83.59.

BMI

From the table 3 it is observed that the total participants of this study were 50 where 25 were case and 25 were control, among them, BMI of 12 participants had over weight and 13 participants had no not in the case group. On the other hand BMI of 8 participants had over weight and 17 participants had not in the control group. Calculated odds ratio for the BMI is 0.51 (Table-3) that means there was 0.51 times lower chance to occur plantar fascitis due to overweight in BMI 95% CI was 0.16 and 1.61.

Prolong Standing

From the table 3 it is observed that the total participants of this study were 50 where 25 were case and 25 were control, among them, 15 participants were doing prolong standing and 10 participants had not in the case group. On the other hand 18 participants were doing prolong standing and 7 participants were not in the control group. Calculated odds ratio for the for the prolong standing is 0.58 (Table-3) that means there was 0.58 times lower chance to occur plantar fascitis due to prolong standing and 95% CI was 0.18 and 1.91.

Regular Weight Bearing

From the table 3 it is observed that the total participants of this study were 50 where 25 were case and 25 were control, among them 8 participants were doing regular weight bearing and 17 participants were not in the case group. On the other hand 11 participants were doing regular weight bearing and 14 participants were not in the control group. Calculated odds ratio for the for the regular weight bearing is 0.60 (Table-3) that means there was 0.60 times lower chance to occur plantar fascitis due to regular weight bearing and 95% CI was 0.19 and 1.90.

Duration of Heavy Physical Activities

From the table 3 it is observed that the total participants of this study were 50 where 25 were case and 25 were control, among them 10 participants were doing heavy physical activity more than four hours and 15 participants were not in the case group. On the other hand 12 participants were doing heavy physical activity and 13 participants were not in the control group. Calculated odds ratio for the duration of heavy physical activity is 1.39 (Table-3) which means there was association between the duration of heavy physical activity for more than four hours and plantar fascitis, that is 1.39 times more possible chance to occur plantar fascitis due to heavy physical activity for more than four hours and 95% CI was 0.45 and 4.25.

Recreational Jogger

From the table 3 it is observed that the total participants of this study were 50 where 25 were case and 25 were control, among them 6 participants were recreational jogger and 19 participants were not in the case group. On the other hand 7 participants were recreational jogger and 18 participants were not in the control group. Calculated odds ratio for the for the recreational jogger is 0.81 (Table-3) that means there was 0.81 times lower chance to occur plantar fascitis due to recreational jogger and 95% CI was 0.23 and 2.89.

CHAPTER-V DISCUSSION

In this study there were 25 cases and 25 number of control that means case: control was 1:1 and hospital based unmatched setting. Intention of this study was to determine the risk factors for plantar fascitis. With considering the variables like socio-demographic and socio economic variables, heel spurs, BMI, prolong standing, regular weight bearing, duration of heavy physical activity more than four hours, recreational jogger (Singh et al., 2007).

This study claimed that, there was association between sex of the participants and plantar fascitis that is 2.11times more possible chance to occur plantar fascitis of female than male agreed that, the prevalence, incidence, and severity of plantar fascitis are different in women than in men. Women are more likely than men to suffer from plantar fascitis (Singh et al., 2007).

Heel spur is one of the common risk factors for developing plantar fascitis found that, there was strong association between heel spurs and developing plantar fascitis. That was 18.86 times more possible chance to occur plantar fascitis due to heel spur (Kwong et al., 2008).

In this study, (Riddle et al., 2003) it was stated that, there was association between the BMI and plantar fascitis. People with overweight according to BMI 0.51 times lower chance to occur plantar fascitis. In a study (Osborne and Allison, 2006) found that, greater body mass index (BMI) and increased body weight have been associated with risk of plantar fascitis. According to excess body weight is a risk for developing plantar fascitis. Obesity has been identified as a significant risk factor for plantar fascitis. One twin study (Porter et al., 2002) found a 9–13% increased risk for the onset of the disease with every kilogram increase in bodyweight. Higher baseline body mass index increased the risk of PF.

In this study, it was state that 0.58 times lower chance to occur plantar fasciitis due prolong standing. Hayland et al (2006) stated that, prolong standing in occupation or recreational activities are a factor of plantar fascitis.

This study showed that, there was association between the duration of heavy physical activity for more than four hours and plantar fascitis that is 1.39 times more possible chance to occur plantar fascitis due to heavy physical activity for more than four hours. Increase physical activity increased the risk of PF.

This study showed that, there was association between the regular weight bearing and plantar fascitis. That was 0.60 times lower chance to occur plantar fascitis due to regular weight-bearing, Recreational jogger is also be a risk factor of developing plantar fascitis.

The limitation of this study was as followed that the study did not represent the total population of the condition because there was lack of randomization. This was a hospital based study which also is not a ideal sample because people with special characteristics (e.g. severe condition, people living closer to the hospitals, referred by others etc) arrives in that particular hospital. The study site is a specialized rehabilitation center where usually patients with special characteristics such as severe condition, referred by other etc come. Sample was drawn with convenient sampling technique which had possible chance to selection bias.

CHAPTER-VI CONCLUSION AND RECOMENDATION

6.1. Conclusion

In this study there were 25 cases and 25 number of control that means case: control was 1:1 and hospital based unmatched setting. Intended of this study to determine the risk factors of for plantar fascitis with considering the variables like sociodemographic and socio-economic variables using sex, heel spurs, BMI, prolong standing, regular weight bearing, duration of heavy physical activity and recreational jogger. The investigator found the strong positive association of plantar fascitis between sex, heel spurs, and duration of heavy physical activity more than four hours. The important way for prevention of plantar fascitis including the modification daily activity for reduces risk factors.

So the investigator wishes to correct the BMI, and reduce prolong standing, regular weight bearing, duration of heavy physical activity more than four hours.

It is crucial to develop research based findings about the risk factors of plantar fascitis. This study can be considered as a ground work for the physiotherapy service provision for plantar fascitis. Proper physiotherapy can reduce the complication of plantar fascitis.

6.2. Recommendation

Like other countries, plantar fascitis patients are likely to be an upcoming burden for Bangladesh. For this reason, it is important to develop research based evidence of physiotherapy practice in this area. Physiotherapist's practice which is evidence based in all aspect of health care. There are few studies on musculoskeletal area in the plantar region. These cannot cover all aspect of the vast area. So, it is recommended that the next generation of physiotherapy members continue study regarding this area, this may involve-use of large sample size and participants form different districts of Bangladesh. Conduct research on other musculoskeletal problems on plantar area where physiotherapist can work. So it is very important to conduct such type research in this area.

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APPENDIX

VERBAL CONSENT STATEMENT

(Please read out to the Participant)

Assalamu alaikum/nomosker, my name is Amina Akter, I am conducting a research project (disseretation) study which included in our course curriculam of Bangladesh Health Professions Institute (BHPI). The title of the study is “Risk factors for plantar fascitis”. I would like to know about some personal and other related questions about plantar fascitis. This will take approximately 20-30 minutes.

I would like to inform you that this is purely academic study and will not be used any other purpose. The researcher is not directly related with this musculoskeletal area, so your participation in the research will have no impact on your present or future treatment. All information provided by you will be treated as confidential and in the event of any report or publication. It will be insured 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 consequence. You also have a right not to answer a particular question that you do not like or not want to answer during interview.

If you have any query about the study or your right as a participant you may contact with me and or Muhammad Rezaul Karim, co-ordinator School of Prosthetics and Orthotics. Do you have any question before you start?

So may have your consent to proceed with the interview?

Yes ☐

No ☐

Signature of the participant……………………………………………………………………Date:

Signature of the interviewer………………………………………………………………..…..Date:

মৌখিক অনুমতি পত্রঃ

(অংশগ্রহনকারীকে পড়ে শোনাতে হবে)

আস্‌সালাম্‌ুআলাইকুম / নমস্কার আমার নাম আমিনা আক্তার। আমি এই গবেষণাটি " বাংলাদেশ হেলথ্‌ প্রফেশন্স ইনস্টিটিউট" (বি, এইচ, পি, আই) এ করছি যা আমার অধ্যয়নের অন্তর্ভুক্ত। যার শিরোনাম হল " গোড়ালির হলো বেষ্টনীতে প্রদাহ হওয়ার ঝুঁকিসমূহ। এজন্য আমি কিছু ব্যক্তিগত এবং গোড়ালির সমস্যাজনিত আনুষঙ্গিক প্রশ্ন জানতে চাচ্ছি, যা আনুমানিক ২০-৩০ মিনিট সময় নেবে।

আমি আপনাকে অবগত করছি যা, আমার অধ্যয়নের অংশ এবং অন্য কোন উদ্দেশ্যে এি ব্যবহার হবেনা। গবেষক সরাসরি এই অস্থিপেশী অংশটির সাথে জড়িত নয়। তাই এই গবেষনায় অংশগ্রহণ আপনার বর্তমান এবং ভবিষ্যৎ চিকিৎসার ক্ষেত্রে কোনরূপ প্রভাব ফেলবেনা। আপনি যেসব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং আপনার প্রতিবেদন ঘটনাপ্রবাহে নিশ্চিত করা হবে যে, এই তথ্যেও উৎস অপ্রকাশিত থাকবে।

এই অধ্যায়নে আপনার অংশগ্রহন স্বেচ্ছাপ্রণোদিত এবং আপনি যে কোনসময় এই অধ্যয়নে থেকে কোন নেতিবাচক ফলাফল ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন। এছাড়া সাক্ষাৎকাওে সময় কোন প্রশ্ন অপছন্দ করার বা উত্তর দিতে নাচাওয়ার সম্পূর্ণ অধিকার আপনার রয়েছে। এই অধ্যয়নে অংশগ্রহনকারী হিসেবে যদি আপনার কোন প্রশ্ন থাকে তাহলে আপনি আমাকে এবং মোঃ রেজাউল করিম, কোর্স সমন্বয়কারী প্রস্থেসিস এবং অর্থোসিস বিভাগএর সাথে যোগাযোগ করতে পারেন।

গবেষণাটি আরম্ভ করার পূর্বে আপনার কোন প্রশ্ন আছে?

আমিকি আপনার অনুমতি পেয়ে এই সাক্ষাৎকারটি আরম্ভ করতে পারি?

হ্যাঁ ☐

না ☐

সাক্ষাৎকার প্রদানকারীর স্বাক্ষর____________________তারিখঃ

সাক্ষাৎকার গ্রহনকারীর স্বাক্ষর____________________তারিখঃ

Questionnaire

Risk factors for Plantar Fascitis

Section 1:Patient's Identification	
1.	Identification Number:
2.	Date of Interview:
3.	Address: House number/vill: P.O: P.S: Dist:
4.	Contact number:
5.	Place of data collection:
6.	Consent taken: Yes/No

Section 2: Demographic Questions

QN	Questions and filters	Responses
7.	Age (in year)	……...years
8.	Sex	1=Female 2=Male
9.	Educational status	………….
10.	Residential area	1=Urban 2=Rural 3=Semirural
11.	Average monthly family income	………(taka)
12.	Occupation	………….

Section 3: Disease and other complication History

QN	Questions and filters	Responses
13.	Past history of painful ankle swelling	1=Yes 2=No
14.	Pattern of plantar fascitis	1=Unilateral 2=Bilateral
15.	Heel Spurs (Inferior calcaneal exostoses)	1=Yes 2=No
16.	Height	…………..Centimeters
17.	Weight	……………Kilograms

Section 4: Leisure and Physical activities

18.	Prolong standing	1=Yes 2=No
19.	Regular weight bearing	1=Yes 2=No
20.	Duration of heavy physical activities	1=Less than four hours 2=More than fourhours 3=Others (Specify)
21.	Recreational jogger	1=Yes 2=No

প্রশ্নাবলী

“গোড়ালীর হলোবেষ্টনীতে প্রদাহহওয়ার ঝুঁকিসমূহ ”

শাখা: ১ রোগীর সনাক্তকরণ	
১.	সনাক্তকারী সংখ্যা
২.	সাক্ষাৎকার গ্রহনের তারিখ ঃ
৩.	ঠিকানা ঃ বাড়ি নম্বর/ গ্রামঃ পোষ্টঅফিস ঃ থানাঃ জেলাঃ
৪.	যোগাযোগের নম্বর ঃ
৫.	তথ্য সংগ্রহের স্থান ঃ
৬.	সম্মতিগ্রহন ঃ হ্যাঁ / না

শাখা ২ : জনসংখ্যাতাত্ত্বিক প্রশ্নাবলী

প্রশ্ননং-	প্রশ্নসমূহ	উত্তর
৭.	বয়স (বছরে)	.......বছর
৮.	লিঙ্গ	১= নারী ২= পুরুষ
৯.	শিক্ষাগত যোগ্যতা	....
১০.	আবাসিক এলাকা	১= গ্রামীণ ২= নগরস্থ ৩= অর্ধনগরস্থ
১১.	পারিবারিক মাসিক গড় আয়	.........(টাকা)
১২.	পেশা	....

শাখা ৩ : রোগ এবং অন্যান্য জটিলতা ইতিহাস

প্রশ্ননং-	প্রশ্নসমূহ	উত্তর
১৩.	পূর্ব কখনো ব্যথার কারনে আপনার গোড়ালি ফুলে গিয়েছিল	১= হ্যাঁ ২= না
১৪.	প্ল্যান্টার ফ্যাসাইটিসের ধরণ	১= এক পায়ে ২= উভয় পায়ে
১৫.	হিল স্পারস্ (নিচের ক্যালকেনিয়ার এক্সোসটোসিস)	১= হ্যাঁ ২= না
১৬	উচ্চতা	------সেন্টিমিটার
১৭.	ওজন	------কিলোগ্রাম

শাখা ৪: অবসর এবং শারীরিক কার্যকলাপ

প্রশ্ননং-	প্রশ্নসমূহ	উত্তর
১৮.	স্থায়ী দাঁড়িয়ে থাকা	১= হ্যাঁ ২= না
১৯.	নিয়মিতওজন বহনকরণ	১= হ্যাঁ ২= না
২০.	ঋারী শারীরিক পরিশ্রম সময়?	১= চার ঘন্টার কম ২= চার ঘন্টার বেশি ৩= অন্যান্য (নির্দিষ্টকৃত)
২১.	বিনোগনমূলক জগার	১= হ্যাঁ ২= না

Permission Letter

Date.. 28.08.2015

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Through: Head, Department of Physiotherapy,BHPI.

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

Dear Sir,

With due respect the humble submission to state that, I am Amina Akter, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI).The ethical committee has approved my research project titled on "**Risk factors for plantar fasciitis**" under the supervision of Md. Rezaul Karim,course co-ordinator, Department of Prosthesis and Orthosis, CRP.Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc in Physiotherapy.I want to collect data for my research project from the patients of CRP.So, I need permission for data collection from the Musculoskeletal outpatient unit of Physiotherapy department of CRP-Mirpur.I would like to assure that anything of my study will not be harmful for the participants.

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

Sincerely Yours

Amina Akter

Amina Akter

4th Professional B.Sc in Physiotherapy

Roll-10, Session: 2010-2011

Bangladesh Health Professions Institute (BHPI)

CRP, Chapain, Savar, Dhaka-1343.

Forward for kind permission.

01-09-15

M Rezaul Karim
Coordinator
School of Prosthetics & Orthotics
BHPI, CRP, Savar, Dhaka-1343

She may be allowed for data collection.

2/09/15

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

Permission is given, contact with Ms. Shamima Islam (Nipa), Senior Clinical PT, MS unit, as a counter part of the data collection procedure.

02/09/15

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