

**PREVALENCE OF ANTERIOR CRUCIATE LIGAMENT INJURY
AND ITS ASSOCIATED FACTORS AMONG THE TRAINEES AT
BANGLADESH KRIRA SHIKKHA PROTISTHAN**

Tasmia Osman

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

DU Roll No: 910

Registration No: 1712

Session: 2011-2012

BHPI, CRP, Savar, Dhaka.



Bangladesh Health Professions Institute (BHPI)

Department of Physiotherapy

CRP, Savar, Dhaka-1343

Bangladesh

August' 2016

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

entitled-

**Prevalence of Anterior Cruciate Ligament Injury and Its Associated Factors Among
the Trainees at Bangladesh Krira Sikkha Protisthan**

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

Habib

.....
Mohammad Habibur Rahaman
Assistant Professor,
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka.
Supervisor

Anwar

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

E. Rahman

.....
Ehsanur Rahman
Assistant Professor
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

Shofiq

.....
Md. Shofiqul Islam
Assistant Professor
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

Obaidul Haque

.....
Md. Obaidul Haque
Associated Professor & Head
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

Declaration

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

Signature: Tasmia Osman

Date: 22-02-2017

Tasmia osman

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

DU Roll No: 910

Registration No: 1712

Session: 2011-2012

BHPI, CRP, Savar, Dhaka – 1343

Bangladesh

CONTENTS

| | Page No. |
|--------------------------------------|-----------------|
| Acknowledgement | i |
| Acronyms | ii |
| List of Figures | iii |
| List of tables | iv |
| Abstract | v |
| | |
| CHAPTER: I INTRODUCTION | 1-7 |
| 1.1 Background | 1-2 |
| 1.2 Rationale | 3 |
| 1.3 Research Question | . 4 |
| 1.4 Aim | 5 |
| 1.5 Study objectives | 5 |
| 1.5.1 General objectives | 5 |
| 1.5.2 Specific objectives | 5 |
| 1.6 Conceptual framework | 6 |
| 1.7 Operational definition | 7 |
| | |
| CHAPTER: II LITERATURE REVIEW | 8-15 |
| | |
| CHAPTER: III METHODOLOGY | 16-21 |
| 3.1 Study design | 16 |
| 3.2 Study area | 16 |
| 3.3 Study population | 16 |
| 3.4 Sample size | 17 |
| 3.5 Sampling procedure | 17 |

| | Page No. |
|--|-----------------|
| 3.6 Inclusion criteria | 17 |
| 3.7 Exclusion criteria | 17 |
| 3.8 Data collection procedure | 17-18 |
| 3.9 Method of data collection | 18 |
| 3.10 Materials and tools | 18 |
| 3.11 Duration of data collection | 18 |
| 3.12 Data analysis | 19 |
| 3.13 Ethical consideration | 19 |
| | |
| CHAPTER: IV RESULTS | 20-36 |
| | |
| CHAPTER: V DISCUSSION | 37-40 |
| | |
| CHAPTER: VI CONCLUSION AND RECOMMENDATION | 41 |
| | |
| REFERENCES | 42-47 |
| | |
| APPENDIX | 48-58 |

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 praiseworthy supervisor **Mohammad Habibur Rahman**, Assistant Professor, Physiotherapy BHPI, CRP, Savar, Dhaka for giving me his valuable time, his supervision and excellent guidance without which I could not able to complete this project.

I would like to express my gratitude to my honorable teacher **Md. Obaidul Haque**, Associate Professor and Head of the Physiotherapy Department, BHPI, Chapain, Savar, Dhaka for providing me permission for data collection. I would like to express gratitude to my honorable teachers **Md. Sohrab Hossain**, Associate Professor of physiotherapy, BHPI & Head of Programs of CRP, **Mohammad Anwar Hossain**, Associate Professor of physiotherapy, BHPI & Head of the Department of Physiotherapy, CRP, Savar, **S.M Ferdous Alam**, Assistant Professor, Physiotherapy, BHPI, CRP, Savar. **Ehsanur Rahman**, Assistant Professor, Physiotherapy, BHPI, CRP, Savar and all of my teachers for helping me in this study. I would also like to give my special appreciation to my respected teacher **Md. Shofiqul Islam**, Assistant Professor of Physiotherapy, BHPI for his proficient guidance to carry out this study. My special thanks to all the staffs of Exercise Physiology Department of BKSP. I am grateful to **Mohammad Bakhtiar**, Senior Researcher & Head of the Department of Exercise Physiology, BKSP, Savar, Dhaka, other Clinical Physiotherapist, for their excellent accumulation throughout of this study.

I like to thanks my friends, Kamruzzaman, Myeen, Shohag, Tisha, Rasel, Jhumu for help me to complete this 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.

Acronyms

| | |
|---------------|---|
| ACL : | Anterior Cruciate Ligament |
| BHPI : | Bangladesh Health Professions Institute |
| BKSP: | Bangladesh Kira Shikkha Protisthan |
| BMRC: | Bangladesh Medical Research Council |
| IRB : | Institutional Review Board |
| SPSS : | Statistical Package for the Social Sciences |
| WHO : | World Health Organization |

List of Figures

| | Page No. |
|--|-----------------|
| Figure 1: Age of the participants | 21 |
| Figure 2: sex of the participants | 23 |
| Figure 3: Educational level of the participants | 24 |
| Figure 4: Training events of injured participants | 25 |
| Figure 5: Duration of training among injured participants | 26 |
| Figure 6: Posture of the participants | 27 |
| Figure 8: ACL Injury | 28 |
| Figure 9: Associated knee injury | 29 |
| Figure10: Type of injury of the participants | 30 |
| Figure 11: Severity of injury | 31 |
| Figure 12: Nature of pain | 32 |
| Figure 13: Recurrences of injury | 33 |
| Figure 14: Times of recurrences | 34 |
| Figure 13: Duration of Warm up and Cool down | 35 |
| Figure 14: Treatment taken by the participants | 36 |

List of Tables

| | Page No |
|---|----------------|
| Table 1: Association between ACL injury and age | 22 |
| Table 2: Association between ACL injury and sex | 23 |
| Table 3: Association between ACL injury and educational level | 24 |
| Table 4: Association between ACL injury and training events | 25 |
| Table 5: Association between ACL injury and duration of training event | 26 |
| Table 6: Association between ACL injury and posture | 27 |
| Table 7: Association between ACL injury and associated knee injuries | 29 |
| Table 8: Association between ACL injury and Type of injury | 30 |
| Table 9: Association between ACL injury and severity of injury | 31 |
| Table 10: Association between ACL injury and nature of pain | 32 |
| Table 11: Association between ACL injury and recurrences of injury | 33 |
| Table 12: Association between ACL injury and times of recurrences of injury | 34 |
| Table 13: Association between ACL injury and duration of warm up and cool down | 35 |
| Table 14: Association between ACL injury and treatment taken by the participants | 36 |
| Table 15: Association between ACL injury and associated factors | 37 |

Abstract

Purpose: To identify the prevalence of ACL injury among the trainees at BKSP. *Objective:* To expose the injured participant's age, training duration and sporting event, identify other associated knee injuries, extract the types of injury, identify recurrence of injuries among the trainees, know about the management of injury (medication, physiotherapy or both). *Methodology:* A quantitative cross-sectional study design was chosen to achieve the objectives of the study. 50 subjects were selected through convenience sampling technique from the trainees, who trained in BKSP by using a structural questionnaire to collect data. *Results:* The prevalence of ACL injury 78% (n=39) among the 50 participants. Among the injured participants most affected age was 14, 25.6% (n=10). Male trainees are more affected at the percentage of 71.8% (n=28). 28.2% (n=11) participants are suffered from ACL injury who are trainees of athletics and 41% (n=16) participants are injured whom training event is 2 years. Along with ACL injury 15.4% (n=6) participants are suffered from meniscus injury. 87.2% (n=34) injured participants are affected by direct hit and recurrence rate is 23.1% (n=9). Among 39 affected participants 41% (n=16) participants do their warm up cool down activities for 15 to 20 minutes and most of them about 79.5% (n=31) taken both medicines and physiotherapy treatment.

Keywords: Prevalence, ACL Injury, Trainees, BKSP.

1.1 Background

Anterior Cruciate Ligament (ACL) is an intraarticular and extra synovial ligament provided support to stabilize the knee joint. This ligament is located into the tibiofemoral joint (Grindem,2014). ACL injuries are most often a result of low-velocity, noncontact, deceleration injuries and contact injuries with a rotational component and Contact sports also may produce injury to the ACL secondary to twisting, valgus stress, or hyperextension all directly related to contact or collision. The image below depicts a ruptured ACL (Cimino et al., 2010).

Both the male and female athletes all over the world are suffering from injuries (Shadanfar,2011). As earlier we consider sports as a fact of entertainment but now sports persons take it as a profession. Children's are getting admitted into sports institutes and academies to being a professional athlete (Yoon et al., 2004). Many sports events are organized by various sports organizations. Such as – FIFA, ICC, Olympic committee and so many others and these events get huge importance and coverage by world media. (Junge et al., 2004). In world athlete history we can see many great athletes could not participate in big events due to injury (Hawkins & Fullar, 2006). According to Yoo et al.,(2010) About 1 million Americans annually receive medical attention for their sports-related injuries which is equate to almost 26 per 1,000 people. In sports among various injuries ACL injury incidence in male is 67% and in female is 90%.

200,000 ACL related injuries occur annually in USA, with approximately 95,000 ACL ruptures (greis et al., 2012). ACL injury has been estimated incidence 78 – 81 injuries per 100,000 persons – year. Athletes aged 15 – 25 years have been found to compose more than 50% of all ACL injured patient (Grindem,, 2014).

Incidence of ACL tear is 3.2% for men and 3.5% for women during a 4 year period. (Spindler & Wright, 2016). According to Grindem, (2014) women have a 2 – 3 fold of sustaining ACL injury and sustain their injuries at a lower leg then men and ACL injury is more commonly occur in sports like football, basketball, professional

rustling, martial arts, artistic gymnastics, alpine skiing (Grindem, 2014). Knee injury in football is known to be high and ACL injury incidence is also increased and The annual prevalence is between 0.5 and 6.0% Of all female players and between 0.6 and 8.5% of all male player (Ardern et al., 2011).

Female soccer players are at up to six times higher risk for sustaining ACL injury and the occurrence of ACL injury in a soccer team expressed as a percentage of all injuries on that team is as 1.3% in male and 3.75% in female (Edward et al., 2007). In USA ACL injury constitute 6% of all match injury and 2% of all training injuries in female and less than 1% of all injuries among males (Ardern et al.,2011). According to a questionnaire survey in Norway based on surgery records, ACL injured female players were significantly younger (19 vs. 27) than their male counter parts and in another study based on reported insurance claims in Sweden, female players were four years younger (19 vs. 23 years) sustaining their injury than male players. (Walden et al., 2011).

ACL injury is associated with increased risk of new knee injuries (Chmeielewski et al., 2008) as well as long term medical disability such as Osteoarthritis of knee. (Bizzini et al., 2006). A history of previous ACL injury has been associated with a 5 fold risk of new ACL injury in women's elite football. (Chmeielewski et al., 2008). A complete tear causes long layoff from football and may even be career ending (Ageberg et al., 2007).

90% patient who sustain ACL injury in USA eventually have an ACL reconstruction, ACL injury within 2 years of reconstruction is 1 in 17 (06%, ACL injury within 5 years of reconstruction is 1 in 8.3 (12%) and ACL injury within reconstruction is 1 in 3.7 (27%). (Greis et al., 2012).

Data presented at the 2006 American Orthopaedic Society for Sports Medicine seminar on allografts¹ indicated that nearly 350000 anterior cruciate ligament (ACL) reconstructions are performed annually in the United States; 60 000 of those involve allografts. The annual cost of care is estimated to be more than \$2 billion.² Long-term costs will no doubt be much higher.

1.2 Rationale

Now a day's and before sports become one of the most popular way of recreation to the young generation. Its now become profession. Both males and females are now participate in various sports. High pivoting sports such as football, basketball, gymnastics are now very much popular in Bangladesh. So ACL injury is now a days common in athletes. Although some studies have done on ACL injury in other countries, the exact nature and prevalence of this injury has not been studied before in Bangladesh. This study was formulated to fill the gap of knowledge in this area. The aims of the study were to assess the ACL injury among the trainees at BKSP. And from this study awareness was increased and may provide proper recommendation for every single risk which was helpful for them. Beside this it was help to established proper guideline and proper technique. This study will also help to discover the lacking area of trainees especially about their posture before doing any activities and during playing. Beside this it will be helpful to professional development which is mandatory for current situation. So physiotherapist can help them to teach and give proper education about the posture the condition and preventive methods. And it was helped to discover the role and importance of physiotherapy in every sector of Bangladesh.

According to Freddie et al. (2001), therapeutic management of athletes should begin before any injury occurs. Until now Bangladesh is behind addressing physiotherapy measures for athletes in comparison to other countries. This study also will be helpful in making physiotherapist to aware about this particular problem ACL injury of athletes and create an opportunity to work on sports background.

1.3 Research Question

What is the prevalence and associated factors of ACL injury among the trainees at BKSP?

1.4 Aim

To find out the ACL injury prevalence and associated factors among the trainees at BKSP.

1.5 Objectives of the study

1.5. a. General objectives

To identify the prevalence and associated factors of ACL injury among the trainees at BKSP.

1.5. b. Specific objectives

1. To expose the injured participant's age, training duration and sporting event.
2. To identify other associated knee injuries.
3. To extract the types of injury.
4. To identify recurrence of injuries among the trainees.
5. To know about the management of injury (medication, physiotherapy or both).

1.6 Conceptual Frame Work

Independent variable variable

Socio-demography:

Age

Education

Participating event

Training

Posture

Injury related question:

Warm up-cool down

Severity

Recurrence

Dependent

ACL Injury

Table: List of variables

1.7 Operational Definition

Prevalence: Period prevalence is the proportion of a population that has the condition at some time during a given period.

ACL Injury: ACL injury is the overstretching or tearing of the Anterior cruciate ligament in the knee. ACL injuries are most often a result of low-velocity, noncontact, deceleration injuries and contact injuries with a rotational component. Contact sports also may produce injury to the ACL secondary to twisting, valgus stress, or hyperextension all directly related to contact or collision. The image below depicts a ruptured ACL.

BKSP: BKSP is run by a Board of Governors, which is headed by the Minister of Youth and Sports. At this moment Brig Gen Ali Mortuza Khan, is the Director General of BKSP. Present management is bringing lot of changes in this institute. BKSP admits students in different areas of sports such as athletics, basketball, cricket, football, gymnastics, hockey, swimming, shooting and tennis. Basic training programme is of maximum eight years for athletics, basketball, cricket, football, hockey, shooting, tennis. Students under thirteen years of age are admitted to class VII. But in the categories of boxing, gymnastics and swimming students below ten years of age are admitted to class IV.

The knee is one of the most commonly injured joints in sports. Clinically, the knee accounts for nearly 50% of all sporting injuries. Within these, rupture of the ACL is common and devastating, occurring often during noncontact cutting and landing manoeuvres and Previous studies have shown that large loads are exerted on the knee during these sporting manoeuvres, placing the ACL at risk of injury, especially in unanticipated circumstances (Cimino et al., 2010). A major knee injury in many cases cause severe consequences such as an interrupted sports career, the risk for an early developing knee osteoarthritis with permanent disability for the player must also be considered.

The human anterior cruciate ligament (ACL) primarily serves as a restraint against anterior tibial translation at low flexion angles and there are an estimated 80,000 to 250,000 cases annually where the stability of the knee is compromised and the ACL fails. Additionally, about 70% of these failures are classified as non-contact Activities in which non-contact ACL injuries occur include pivoting or side step cutting, decelerating while the knee is in an extended position, or landing from Most ACL tears occur from noncontact injuries. (Hashemi et al.,2009). According to Spindler & Wright, (2016) less than 10% isolated ACL injury occurs in athletes. The mechanism of ACL rupture can be divided into noncontact and contact. The noncontact mechanism occurs attributable to quadriceps loading with the knee in slight flexion, with valgus and internal rotation of the tibia. In the contact injury, a valgus load is applied to the knee. In this study, 86% of patients with ACL ruptures described a noncontact mechanism, and 14% had a contact mechanism, which is similar to findings of other studies

(Edward et al., 2008). ACL injuries caused by contact require a fixed lower leg (i.e., when planted) and torque with enough force to cause a tear and Contact injuries account for only about 30 percent of ACL injuries, on the other hand The remaining 70 percent of ACL tears are noncontact injuries occurring primarily during deceleration of the lower extremity, with the quadriceps maximally contracted and the knee at or near full extension and In noncontact scenarios, the stress on the ACL resembles that of a collision of the knee, when the knee is at

or near full extension, quadriceps contraction increases ACL tensile force (Cimino et al., 2010). According to Boden et al., (2010) Nearly three quarters of ACL injuries are noncontact injuries and several theories and risk factors have been proposed to explain the mechanism of noncontact ACL injury, including impingement on the intercondylar notch, quadriceps contraction, the quadriceps-hamstring force balance and, more recently, axial compressive forces on the lateral aspect of the joint. Female athletes have been reported to sustain noncontact ACL injuries at a rate two- to eightfold greater than their male counterparts and there are many explanations for the increased risk of injury to female athletes have been proposed, including increased knee valgus or abduction moments, generalized joint laxity, knee recurvatum, ACL size , and the hormonal effects of estrogen on the ACL.). Anatomic and training related factors have been discussed as explanations for the higher risk for knee injuries in female players. Conceivable anatomic factors are the wider pelvis, the more spherical shape of the femoral condyles, the narrower inter-condylar notch, and the increased general joint laxity in females compared to males, the menstrual cycle might influence the injury rate for ACL injuries on the other hand training related risk factors in females that have been discussed are the possible deficient of muscular control, insufficient muscular strength, a possible imbalance between strength and mobility of the lower extremities and low aerobic endurance (Wojtys et al., 2008).

Patients who sustain ACL injuries classically describe a popping sound, followed by immediate pain and swelling of the knee, have the feeling of instability or giving-way episodes typically limit the ability to participate in activities and patients might describe the feeling of instability with the “double fist sign”, i.e., fists facing each other, rotating in a grinding motion (Cimino et al.,2010). These are indicate a 90% probability of rupture the ACL (Di Stassi et al., 2010). ACL injured patient also show varying degree of muscle strength deficits (T sepsis et al., 2006; Ageberg et al., 2007,), altered neuromuscular strategies (Risberg et al.,2009). Quadriceps strength deficit have been stated to be one of the hallmarks of an ACL injured knee and are usually more pronounced and persistent over time than hamstring deficits (T sepsis et al., 2006; Agberg et al.,2007,). The loss of quadriceps strength can be attributed to both disuse atrophy and muscle activation failure (Bizzini et al.,2006, de Jong et al., 2007, Ingersoll et al., 2008). The muscle activation failure is

suggested to be caused by abnormal gamma loop function, where the afferent feedback from the mechanoreceptors in the ACL inhibits recruitment of high-threshold motor units in the quadriceps muscle (Konishi et al.,2007). After 2 to 5 years, 30-50% of

patient exhibit less than 90% quadriceps strength of the injured leg (Ageberg et al.,2007; Thomee et al.,2012). Comparable hamstring strength deficits are found in 20-35% of patients in the same studies.

ACL injured patients also show altered movement patterns after injury, characterized by reduced internal knee extensor moments (Risberg et al.,2009), reduced knee flexion angles (Chmielewski et al.,2005; Risberg et al.,2009) and increased contraction of the muscles surrounding the knee (Chmielewski et al.,2005). Limited evidence also suggests that the injury may cause a joint differentiation due to a reorganization of the central nervous system where the activity in sensory and motor areas are reduced and the activity in the pre-supplementary motor areas is increased (Kaprili & Athanasopoulos,2006; Kaprili et al.,2009). However, while there is a positive relationship between altered movement patterns and functional limitations (Di Stassi et al., 2013) joint compartmental forces have recently shown to be reduced and equally distributed between the medial and lateral compartment early after ACL injury (Gardinier et al.,2013). The less alteration of movement patterns is proposed as one of multiple factors that may drive the progression of knee osteoarthritis both directly, through prolonged changes in joint loading and indirectly, through an increased risk of traumatic cartilage and meniscus injuries as a result of dynamic knee instability (Edward et al., 2007).

Younger athletes usually sustain growth plate injuries (avulsion fractures) rather than ligamentous injuries because of the relative weakness of the cartilage at the epiphyseal plate compared with the ACL (Cimino et al., 2010). The yearly incidence of ACL injuries has been reported to be 3 per 10000 inhabitants in Denmark, with a greater frequency among athletes. One large New Zealand study found an incidence of 36.9 injuries per 100,000 person-years. Many estimates suggest there are 80,000 to 100,000 ACL repairs performed each year in the United States. ACL injuries generally occur beginning in late adolescence. ACL injury has been estimated incidence of 78-81 injuries per 100,000persons- year and athletes aged 15-25 years have been found ACL injury (Grindem ,2014). Sport-related injuries occurs

at ages 5–14 years and tapers gradually with age and visit rates for sports injury are highest for school-age children (5–12years), adolescents (13–18 years) and young adults(18–24 years), compared with other age groups (Adirim and Cheng, 2003). According to Walden et al., (2011) ACL injured female players are significantly younger than the male players. The age range is usually 19-27 for both male and female athletes. Female players have 2-3 fold risk to sustaining ACL injury and in female elite soccer, athletes are found to sustain 2.2 AC L injuries, per 1000 match per hour (Grindem, 2014). The injury rate was not different compared to male soccer, but knee injuries were more common compared to male counterparts according to a recent Norwegian study (Nadler et al., 2010). Specific to age distribution, the Scandinavian ACL registries of 2004 –2007 reported a total of 17 632 injuries, with a median age of injury of 25 years. The skeletally immature population appears to be sustaining rising numbers of ACL injuries and higher rates of mid substance tears. The general risk of ACL injury in those with open growth plates is still low, but participation in organized sports significantly increases the risk. In a US report by (Adirim & Cheng, 2003) of 5- to 18-year-old soccer players, 30.8%of all injuries involved the knee, and 6.7%of all injuries were ACL tears. (Statistics were garnered from insurance data documenting 6 million athlete-years). In a Finnish population-based cohort study of 14-, 16-, and 18-year-olds (46 472 responding; 78%response rate), 265 cruciate ligament injuries (194 in adolescent boys, 71 in adolescent girls; 92% were ACL tears) reflected an incidence rate of 60.9 per 100 000 person-years. Most interesting were the hazard ratios: 8.5 for adolescent girls and 4.0 for adolescent boys among those participating in organized sports 4 or more times per week.

According to Nadler et al., (2010) Girls had significantly higher knee injury rates than boys in gender-comparable sports (soccer, volleyball, basketball, baseball/softball, lacrosse, swimming and diving, and track and field). In case of ACL injury studies have shown a 1.4 to 9.5 times increased risk of ACL tear in women. Different theories for this predominance in women have been suggested, as well as other factors that could increase the likelihood of an ACL injury (Cimino et al.,2010). In USA ACL injury constitute 6% of all match injury and 2% in all training injuries in female and less than 1% of all injuries among males (Spindler & Wright, 2016). Multiple factors, whether individually or in combination, likely

contribute to noncontact ACL injury, such as anatomical for example posture, structure, body composition and structural, for example tibial slope, condylar geometry factors, as well as the associated neuro-mechanical outcomes such as, integrated findings from kinetic, kinematic, and neuromuscular measures (Shultz et al., 2010).

Another risk factor is quadriceps dominance that's why there is excessive movement in frontal plane and limited movement in sagittal plane (Cimino et al., 2010). The next risk factor is trunk and leg dominance in which females exhibit greater kinematic leg asymmetry in knee valgus angles, hip abduction and ankle abduction in performance situations (Ageberg et al., 2007).

According to Grindem (2014) More than 50% ACL injuries frequently occurring in sports such as- soccer, alpine skiing, basketball, handball, professional rustling, martial arts, artistic gymnastics etc. A study by Oeisted et al., (2011) showed that 48.5% number of injury occur in track and field events includes running, long jump, high jump and skipping. This study also showed that injury occurs in jogging- 12.8%, in gymnastics- 3.6% , in swimming- 3.2% and in shooting- 2.1%. in Sweden, ACL injuries comprise 43% of all soccer related knee injuries (Kvist, 2004).

In a retrospective review of 39 patients 14 years of age or younger (30 girls, 9 boys: mean Age = 13.6 years; range, 10 to 14 years), medial meniscus tears were 4 times more common in those whose ACL injuries were treated 6 weeks after injury, suggesting that the time course from injury to treatment may be an important factor in preserving the menisci. Magnetic resonance imaging scans of skeletally immature patients with ACL tears showed that 36% had meniscal tears when the growth plates were wide open, whereas 52% had medial meniscal tears and 17% had lateral meniscal tears when the growth plates were partially closed. These findings suggest a trend toward fewer meniscal injuries in the skeletally immature population (Woztys and Browser., 2010). As this review and other studies have demonstrated, chondral defects are commonly seen in conjunction with ACL insufficiency about 30% of athletes in our review and a recent systematic review of ACL reconstruction and concomitant articular cartilage injury has shown that articular cartilage defects are frequently seen at the time of ACL reconstruction with the incidence of 16%–46% in acute injury (Cimino et al., 2010). A major concern with early ACL reconstruction in the skeletally immature patient is growth-plate injury from tunnel

placement or graft fixation (DeJong et al.,2007) Although the concern is justified, very few reports of growth-plate arrest have been published, and growth-plate injury is undoubtedly avoidable with meticulous surgery (Westin & Noyes., 2011). Physical anatomy is well known, and experience has shown us that the risks of surgery can be minimized with proper technique (Konishi et al., 2007). The response to ACL surgery, however, is not always predictable: Femoral or tibial overgrowth is possible with stimulation of an active physics secondary to the operative procedure. More problematic can be the occurrence of a growth spurt in close proximity to an ACL reconstruction. This potential for asymmetric long-bone growth may increase, possibly justifying the postponement of ACL reconstruction in some cases, Recent reports by Marx et al., in 2009 were equally optimistic. When comparing early reconstruction in children with delayed reconstruction after skeletal maturity Bizzini et al., (2006) noted fewer medial meniscus tears (16% versus 41%) in those children reconstructed initially and no growth-plate injuries after a mean follow-up time of 27 months. Similarly, DeJong et al., (2007) monitored 55 children (age range, 8 to 16 years; mean, 13 years) for a mean of 3.2 years after ACL reconstruction (range, 1 to 7.5 years), finding no growth arrests and 88% normal or almost normal Tanner scores (90 of 100 possible points).

In the American Journal of Sports Medicine a study shows that less than 4 year practice session higher rate (55.9%) of injury occurs among 509 female athlete. The elevated number 65%, participants duration of warp up and cool down were more than 16 min and 33.3% were under duration of less than or equal 15 min in this study. Another study shows that 9.1% within 76 participants done warm up and cool down activity to prevent athletic injury (Payne et al., 2007).

Physiotherapy has a wide spectrum role to manage or improve the athletic injury related conditions. Several studies have revealed that physical fitness is associated with dramatic reductions in all causes of mortality, while patients and physicians alike are most familiar with the positive cardiovascular effects of exercise; the benefits extend beyond the heart. Increased physical activity is associated with additional benefits such as, decreased risk of diabetes, breast cancer, and even depression (Hall & Brody, 1999). Starting a regular exercise routine in adolescence can have a huge effect on overall health status later on. It has been shown that high

school female athletes who are active in sports have higher graduation rates, fewer unwanted pregnancies, and greater self-esteem than those who are not active. Physical activity positively influences almost every aspect of a young woman's health from her physiology to her social interactions and mental health (Freddie et al., 2001).

Because ACL injuries most often occur in athletically active people, great importance is placed on the resumption of sports participation after injury. A qualitative study (Agrberg et al., 2008) reported that, early after injury, patients can experience the potentiality of not being able to resume preinjury sport as a threat to personal self-value and self-respect. Still, far from all ACL-injured patients resume their preinjury sport participation. In a meta-analysis of 48 studies, it has been estimated that 18% do not return to any kind of sports participation, 37% do not return to their preinjury level of sports participation, and 56% do not return to competitive sports (Ardern et al., 2011). However there is an extreme variation in study result on this topic, suggesting that factors other than the injury itself highly influence the reported rates. Furthermore, Agerberg et al., (2007) reported that, 2-7 years after their injury, 80% of ACL-injured female soccer players who had retired did so due to the ACL injury. Thus both returning to sport and sustaining participation in sports is challenge. While resumption of sports participation is associated with the functional status of the knee (Lentz et al., 2012) whether or not the patient resumes sports depends on several factors. Problems with the injured knee is reported to be the third most frequently cited reason for not returning to sport, with more patients attributing not returning to sports to a fear of reinjury or to reasons other than knee function, such as family commitments, lifestyle change and fear of job loss with reinjury (Ardern et al., 2011). However, the relationship between knee function, fear of reinjury and sports participation is not fully understood, as patients who have poorer knee function higher fear of reinjury (Kvist et al., 2005; Chemielewski et al., 2008; Kvist et al., 2012). While ceasing or changing sports participation may do not directly reflect poor knee function, resuming sports participation may also not reflect an asymptomatic knee. After returning to sports, ACL-injured patients still exhibit increased knee abduction angles and internal abduction moments compared with uninjured athletes (Oiestad et al., 2009), and active soccer players who have sustained a previous knee injury also have lower self-reported knee function than players with no previous knee

trauma (Steffen et al., 2008). This may suggest that the current treatment is inadequate in restoring knee function and/or that athlete return to sport prior to completing rehabilitation. Steffen et al., (2008) further reported that both a history of a previous knee injury and lower self-reported knee function increased the risk of sustaining a new knee injury during soccer , lending support to authors advocating caution in the decision of if and when a patient should return to sport (Myklebust & Bhar, 2005). Thus, knee function, sports participation and new knee injuries are important parts of assessing the outcome of ACL-injured patients and more knowledge is needed on the expected in regard to these three factors.

3.1 Study design

This study was done through using cross sectional retrospective survey under a quantitative study design. This methodology was chosen to fulfill the aim of the study as an effective way to collect data. For conducting the research work, in the form of a retrospective type of survey design quantities research model is used. Survey is a way to research where information is collected from a large number of people using interview or questionnaire, by which a complete picture of the group can be found in the fact of any characteristics which fulfils the demand and purpose of the research.

This research analyzes different facts, events, similar points to find result and drawing a calculative decision. For this, retrospective approach is taken to conduct this research work.

3.2. Study site

The study was conducted at Bangladesh Krira Shikkha Protisthan, Savar, Dhaka. Researcher chosen this organization as study site because this is the only institute which aims to find out the promising sports talents among young boys and girls in our country to provide adequate facilities and opportunities for their intensive training. And this institute directly conducted by the ministry of youth and sports.

3.3 Study population

The study population was the trainees of Bangladesh Krira Shikkha Protisthan who had injuries in between last 2 years.

3.4. Sampling technique

Samples was selected by convenience sampling technique, to meet the trainees easily.

3.5. Sample Size

The equation of sample size calculation are given below-

$$n = \left\{ \frac{Z \left(1 - \frac{\alpha}{2} \right)^2}{d} \right\} \times pq$$

Here,

$$Z \left(1 - \frac{\alpha}{2} \right) = 1.96$$

P= 0.10 (Here P=Prevalence and P=10 %)

q= 1-p

=1-0.10

=0.90

d= 0.05

According to this equation the sample should be more than 139 people but due to lack of accessibility and time the study was conducted with 50 trainees by convenience sampling.

3.6. Inclusion criteria

1. Both male and female trainees at BKSP (Spindler & Wright, 2016).
2. Who had sports related knee injuries (Spindler & Wright, 2016).
3. Who had injuries in between last 2 years (Hashemi et al., 2010).
4. Age group: 13 to 19 years (Walden et al., 2011).

3.7. Exclusion criteria

1. Those trainees who were not injured
2. Trainees who were not willing to participant.

3.8. Data collection procedure

Though there was several ways of collecting data, it was easy and reliable if the questionnaire completed or filled up in the presence of the researcher (Bailey, 1997).

Subjects were chosen under convenience sampling procedure and the data will be taken from the previous documents and filled up the questionnaire form by the researcher. In the

questionnaire participant's socio-demographic information including age, level of education, training age, health and history including their injury were asked. Data collection was one of the most crucial parts of research. For this study data collection includes- method of data collection, materials used for data collection and duration.

3.9. Method of data collection

The data was collected from the institution BKSP. Data was collected by using a close ended structured questionnaire. Questionnaire was used, because it is still a very popular and very useful technique of data collection within the health care area (Hicks, 2009). The aim of the study was to identify the prevalence of ACL injury among trainees at BKSP. So, it is easier to identify these problems by using questionnaire than any other methods. The strength of structured questionnaire is the ability to collect unambiguous and easy to count answer leading to quantities data for analysis (Bowling, 1998). So, Structural questionnaire is the most suitable way for data collection.

3.10. Materials and tools

The materials and tools for this study were consent form, questionnaire, pencil, pen, pages, file, tape, laptop, modem and SPSS software-16 version to analyze data.

3.11. Duration of data collection

Data was collected within 4 weeks of time. Data was collected carefully as much as possible from the field data. To collect data necessary time was taken, for each sample. This time varied for each participant.

3.12. Data Analysis

Data was analyzed with the software named SPSS, version 20.0. And descriptive statistics was used to analyze data because a descriptive statistics refers methods of describing a set of results in terms of their most interesting characteristics (Hicks, 2009). The variables were labeled in a list and a researcher is keeping a computer based data record file. And after calculation; data is presented by using bar graph, pie chart and table by using Microsoft Office Excel 2010.

3.13. Ethical Consideration

The ethical guideline of WHO, IRB & BMRC was strictly followed. The research proposal was submitted to the ethical review committee of BHPI for approval & to CRP's ethical committee for getting permission for data collection. After the proposal was approved to carry on with the study the researcher had moved the study. Then collect the approval to carry out with the study from BKSP. Data collection was started and completed within the allocated time frame. Initially a consent form was given to each participant. This form explains the title, objective, confidentiality & anonymity of the research project. The participant was also informed that, they are free to withdraw at any time. The researcher was assured them that it would be never harmful for them & it would never affect in their lives. Otherwise they not give the right information. The researcher was also assured that their information was keep in a secured place. The interview notes and recording words was not be shared or discussed with others. It will being explained to all the participants that their personal identity was to be kept confidential, their name & address was not be written, except for social number or a pseudonym. Before participating in the study the researcher had provided them a written consent form to sign, responsible physiotherapist sign as a witness. The researcher had also signed in the consent form. Only principle investigator had the access of that information. The raw data destroyed after the completion of the research & all the data on computer file were deleted. Finally the study was reviewed & appropriate by the authorities. Considering all those ethical norms & values no ethical problem arises as there are some personal & sensitive questions. The participants will be informed that they have the right to withdraw consent & discontinue participation at any time.

The purpose of the study was to find out the prevalence and associated factors of ACL injury among the trainees at BKSP and to achieve this goal the result need to calculate and analyse in a systematic way and the result or analysed data represent by graph and pie charts.

4.1 Socio-demographic Information

4.1.1 Age

Among the injured participants 25.6% (n=10) participants age were 14, 23.1% (n=9) participants age were 15, 20.5% (n=8) participants age were 13, at the age of 16 and 17 participants were 10.3% (n=4) and at the age of 18 and 19 participants were 5.1% (n=2).

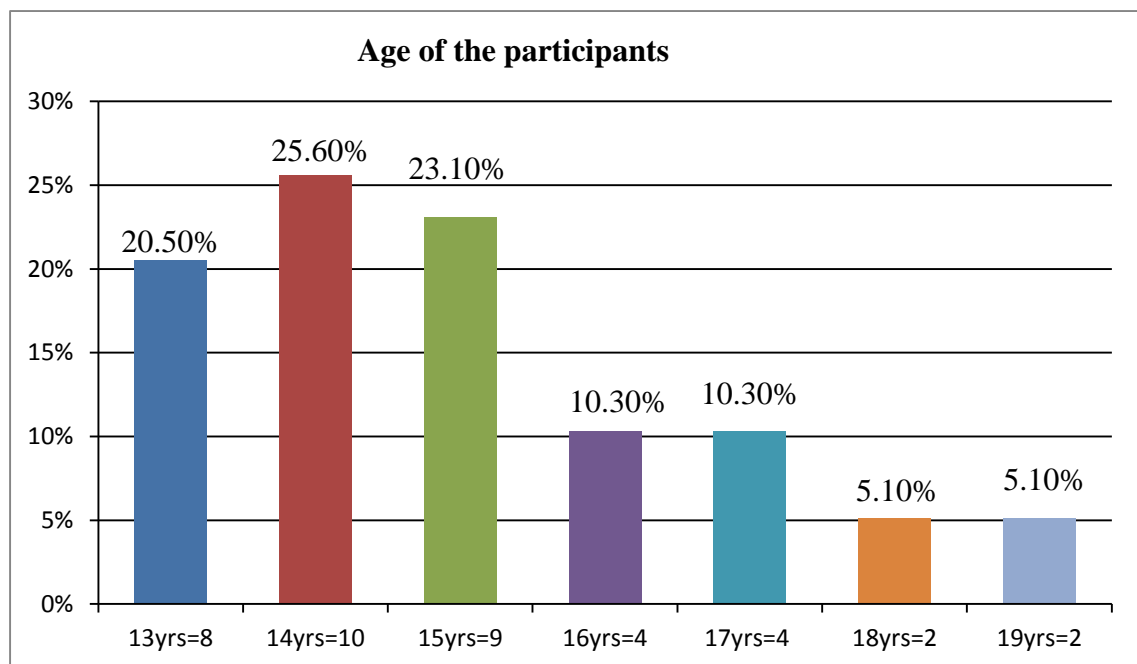


Figure: Age of the participants

Table 1: Association between age of the participants and ACL injury:

| Variable | Chi square value | P value |
|-------------------------|-------------------------|----------------|
| Age of the participants | 5.090 | 0.532 |

This analysis shows that age of the participants is not significant ($p>0.05$) associated with ACL injury.

4.1.2 Sex of the Participants

Among the 39 injured participants 71.8% (n=28) were male participants and 28.2% (n=11) were female participants.

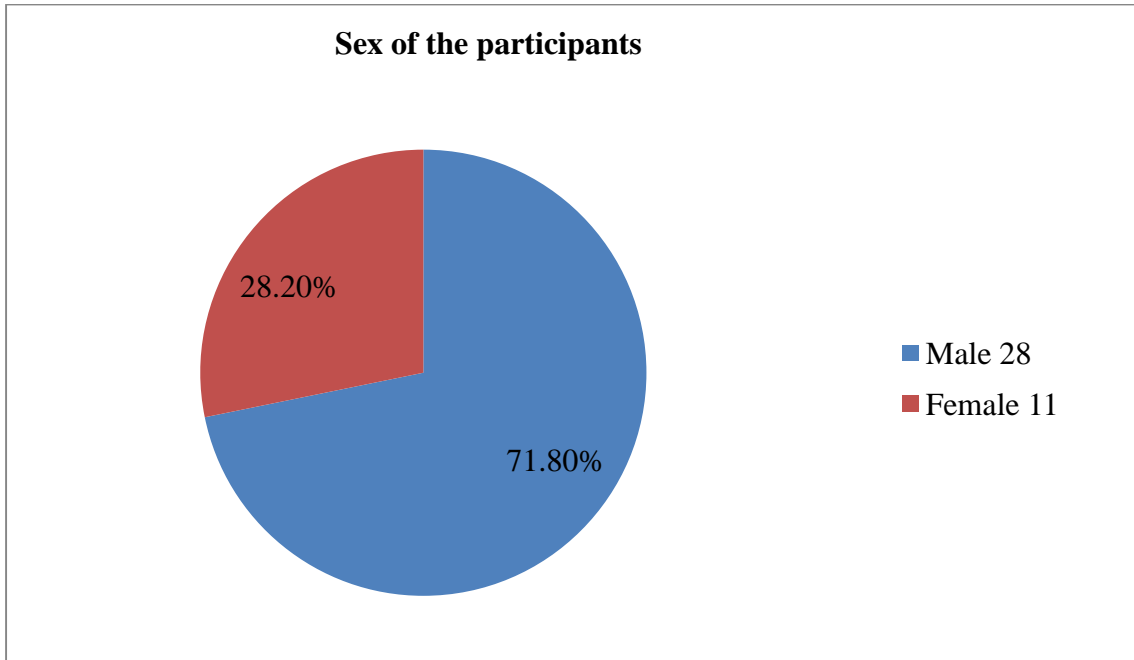


Figure: Sex of the participants

Table 2: Association between sex of the participants and ACL injury:

| Variable | Chi square value | P value |
|-------------------------|------------------|---------|
| Sex of the participants | 0.448 | 0.503 |

In this analysis sex of the participants is not significant ($p > 0.05$) associated with ACL injury.

4.1.3 Educational level

This study shows that 41% (n=16) injured participants were at junior school certificate label, 38.5% (n=15) were at primary school certificate label and 20.5% (n=8) were at secondary school certificate label.

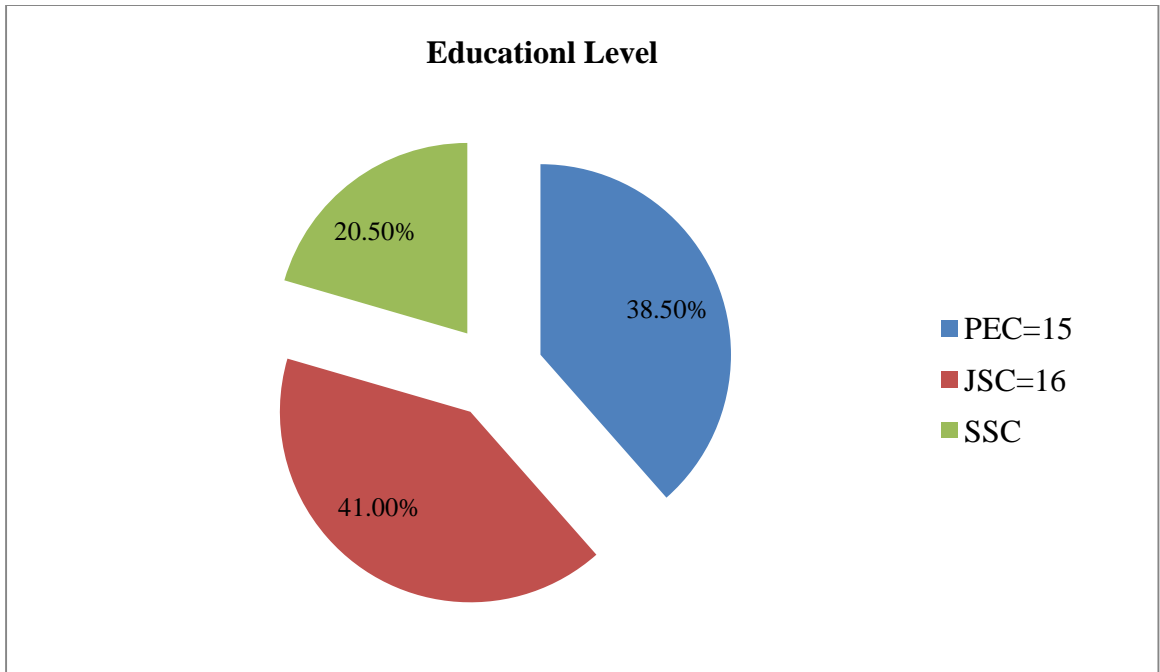


Figure: Educational level of the participants

Table 3: Association between educational level of the participants and ACL injury:

| Variable | Chi square value | P value |
|---------------------------------------|------------------|---------|
| Educational level of the participants | 3.535 | 0.171 |

This analysis shows that educational level of the participants is not significant ($p > 0.05$) associated with ACL injury.

4.1.4 Training events

The highest number of injured participants 28.2% (n=11) were athletic trainees, 23.1% (n= 9) were football trainees, 12.8% (n= 5) were cricket trainees, 10.3% (n= 4) were hockey trainees, 7.7% (n=3) were taekwondo trainees, 5.1% (n=2) were basketball and gymnastic trainees and 2.6% (n=1) were swimming, judo and volleyball trainees.

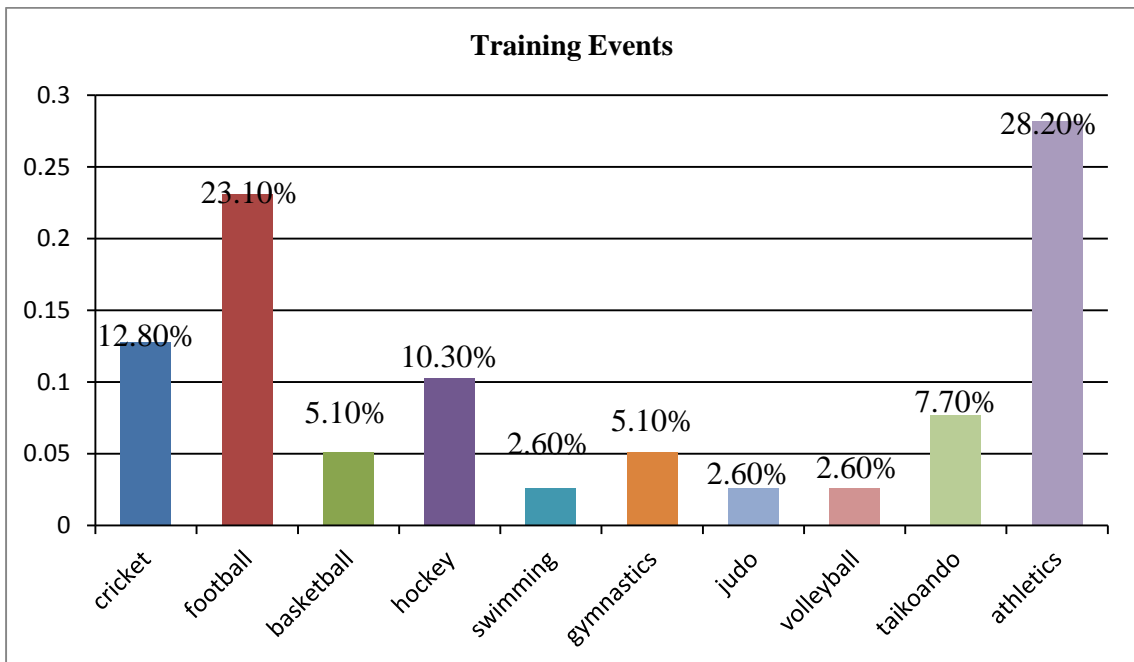


Figure: Training events of the participants

Table 4: Association between training events and ACL injury:

| Variable | Chi square value | P value |
|-------------------------------------|------------------|---------|
| Training events of the participants | 4.168 | 0.900 |

This study shows that training events is not significant ($p > 0.05$) associated with ACL injury.

4.1.5 Duration of training of participants

Among the injured participants 41% (n=16) were trainees for 2 years, 33.3% (n=13) were trainees for 1 year, 12.8% (n=5) were trainees for 3 years, 6% (n=3) were trainees for < 1 year and 5.1% (n=2) were trainees for 4 years at BKSP.

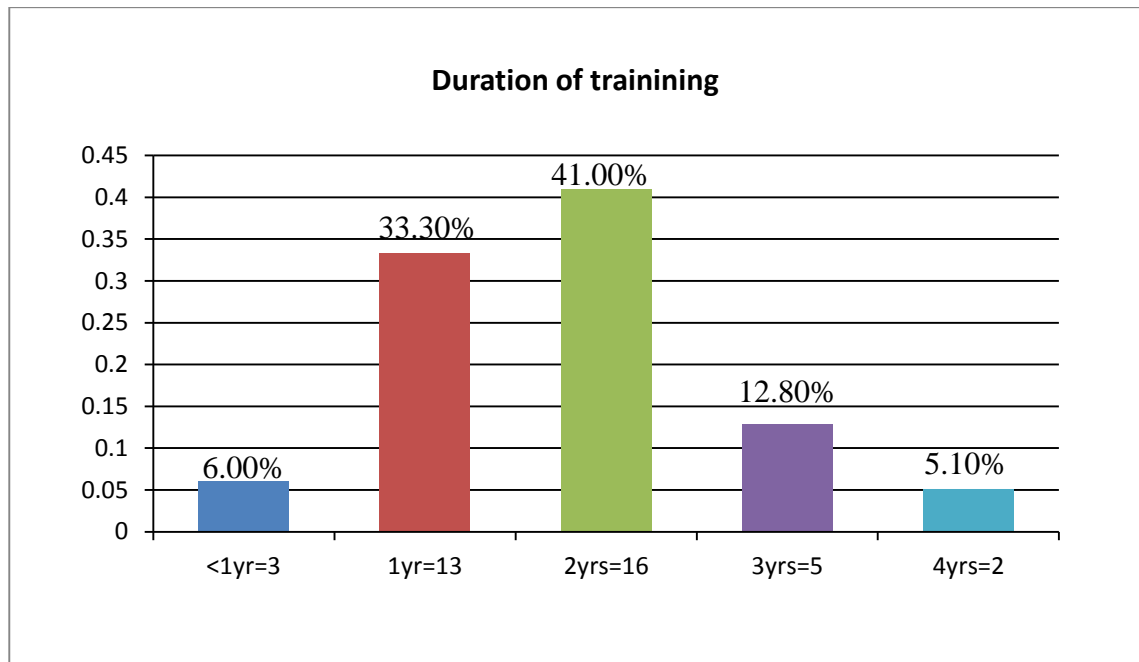


Figure: Duration of training

Table 5: Association between duration of training and ACL injury:

| Variable | Chi square value | P value |
|-----------------------------|------------------|---------|
| Duration of training events | 2.061 | 0.725 |

In this analysis shows that duration of events is not significant ($p > 0.05$) associated with ACL injury.

4.1.6 Posture of the participants

In the injured participants 69.2% (n=27) had normal curvature of spine, 23.1% (n=9) were lordotic and 7.7% (n=3) were kyphotic

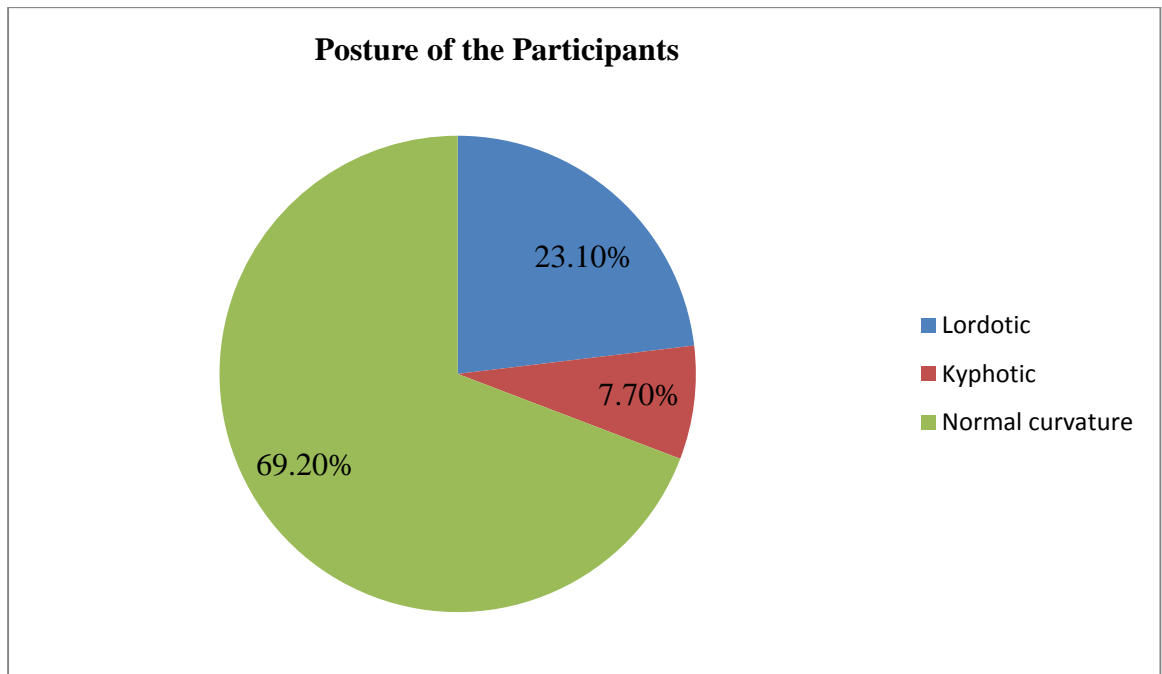


Figure: Posture of the participants

Table 6: Association between posture of the participants and ACL injury:

| Variable | Chi square value | P value |
|-----------------------------|------------------|---------|
| Posture of the participants | 0.924 | 0.630 |

This analysis shows that posture of the participants not significant ($p > 0.005$) associated with ACL injury.

4.2 Injury related information

4.2.1 ACL Injury

In this study ACL injury is present in 78% (n=39) participants and absent in 22% (n=11) participants.

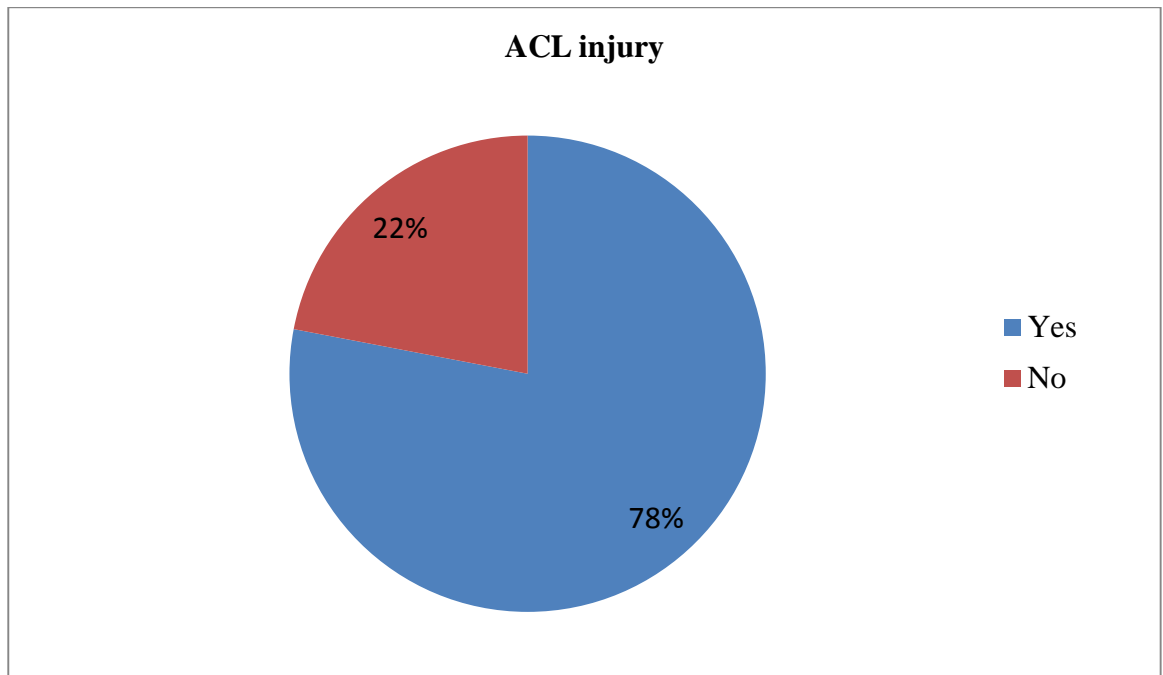


Figure: ACL Injury

4.2.2 Associated knee injuries

In the injured participants along with ACL injury, 15.4%(n=6) were suffered with meniscus injury, 7.7% (n=3) were suffered with subchondral injury, 5.1% (n=2) were suffered with medial collateral ligament injury and 2.6% (n=1) were suffered with collateral ligament injury, patellar injury and fracture.

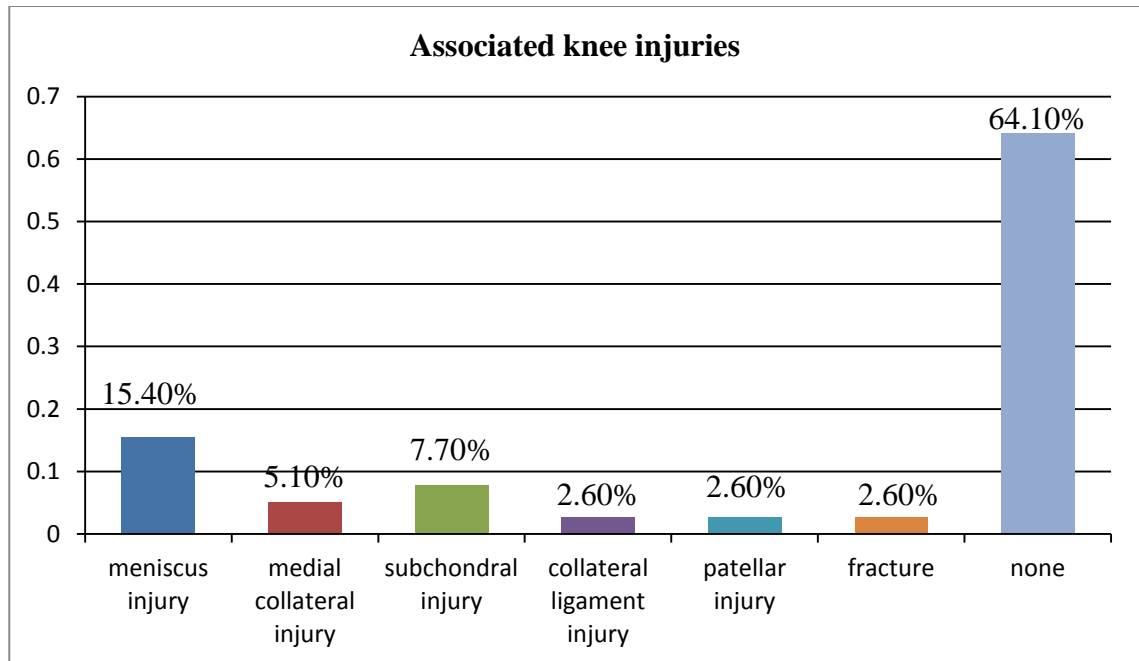


Figure: Associated knee injuries

Table 7: Association between associated knee injuries and ACL injury:

| Variable | Chi square value | P value |
|--------------------------|------------------|---------|
| Associated knee injuries | 6.044 | 0.418 |

This analysis shows that associated knee injuries is not significant ($p > 0.05$) associated with ACL injury.

4.2.3 Type of Injury

Among the total injured participants 87.2% (n=34) got injured by direct hit during training time and rest 12.8% (n=5) got injured because of overuse.

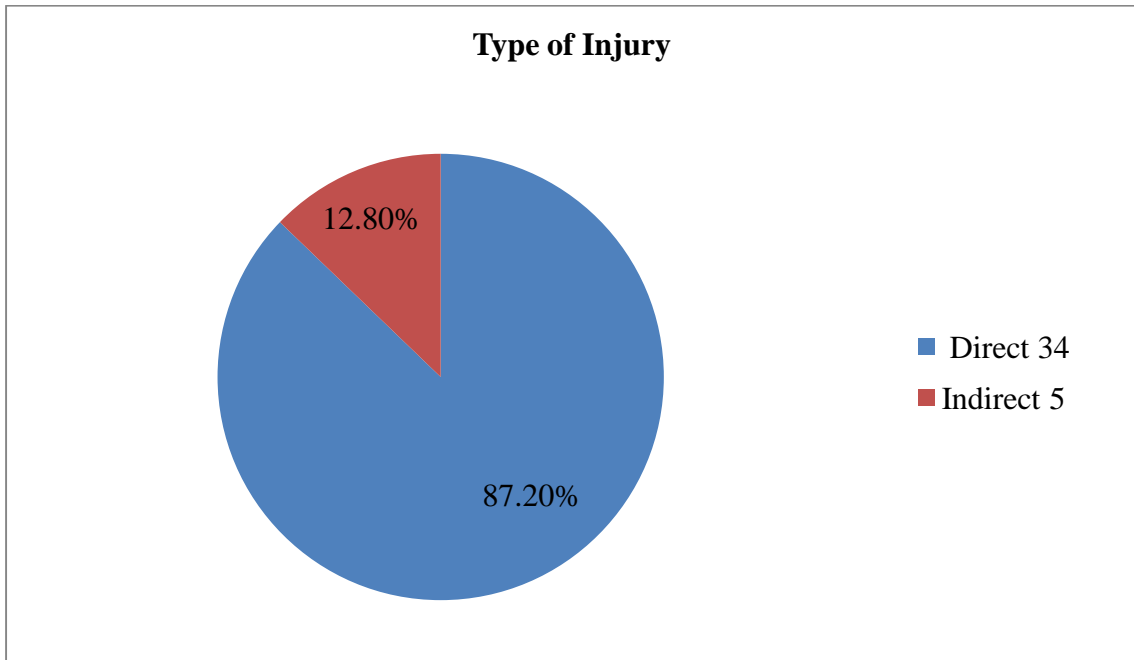


Figure: Type of injury

Table 8: Association between type of injury and ACL injury:

| Variable | Chi square value | P value |
|----------------|------------------|---------|
| Type of injury | 50.000 | 0.000 |

In this analysis type of injury is highly significant ($p < 0.05$) associated with ACL injury.

4.2.4 Severity of Injury

43.6% (n=17) participants were got moderate injured, 41% (n=16) were severe injured and 15.4% (n=6) were mild injured among the injured participants.

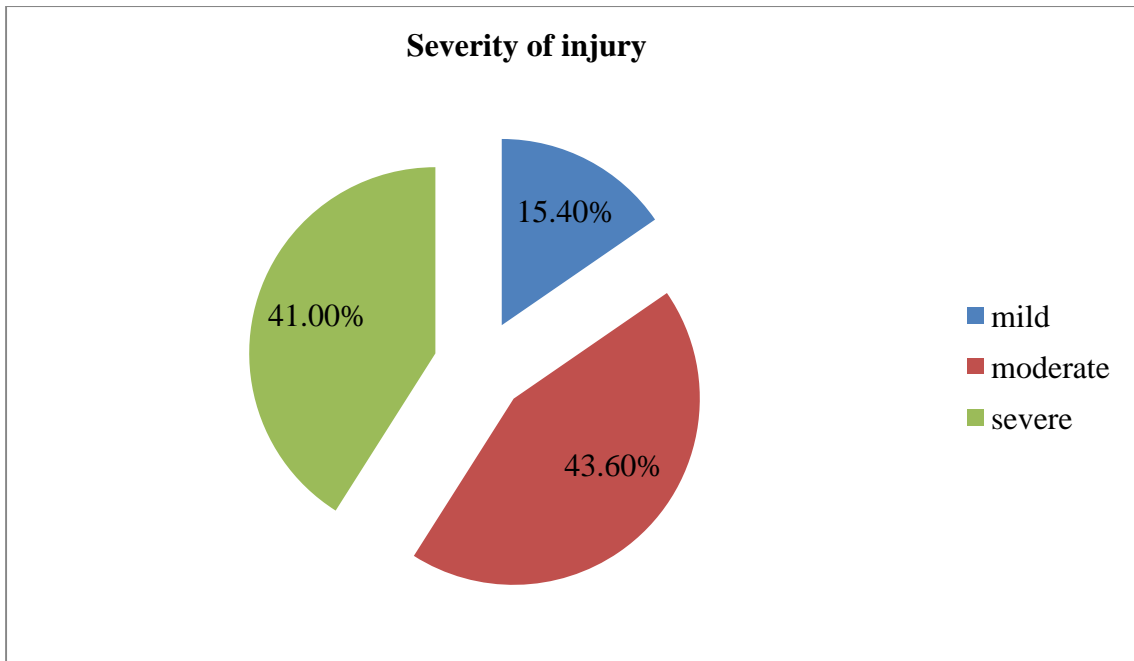


Figure: Severity of injury

Table 9: Association between severity of injury and ACL injury:

| Variable | Chi square value | P value |
|--------------------|------------------|---------|
| Severity of injury | 50.000 | 0.000 |

This study shows that severity of injury is highly significant ($p < 0.05$) associated with ACL injury.

4.2.5 Nature of Pain

Among injured participants pain nature is moderate in 43.6% (n= 17) participants, severe in 41% (n=16) participants and mild in 15.4% (n=6) participants.

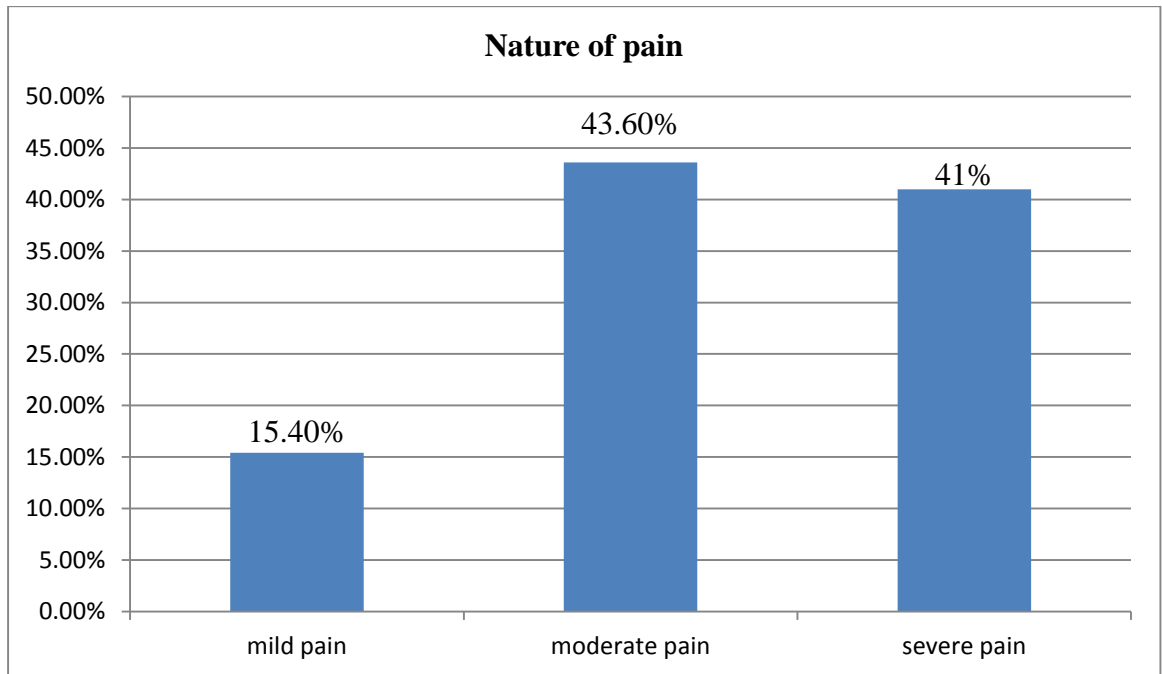


Figure: Nature of pain

Table 10: Association between nature of pain and ACL injury:

| Variable | Chi square value | P value |
|----------------|------------------|---------|
| Nature of pain | 50.000 | 0.000 |

In this analysis shows that nature of pain is highly significant ($p < 0.05$) associated with ACL injury.

4.2.5 Recurrence of Injury

In the injured participants 23.1% (n=9) had recurrent injury in the same side and 76.9% (n=30) had no recurrent injury.

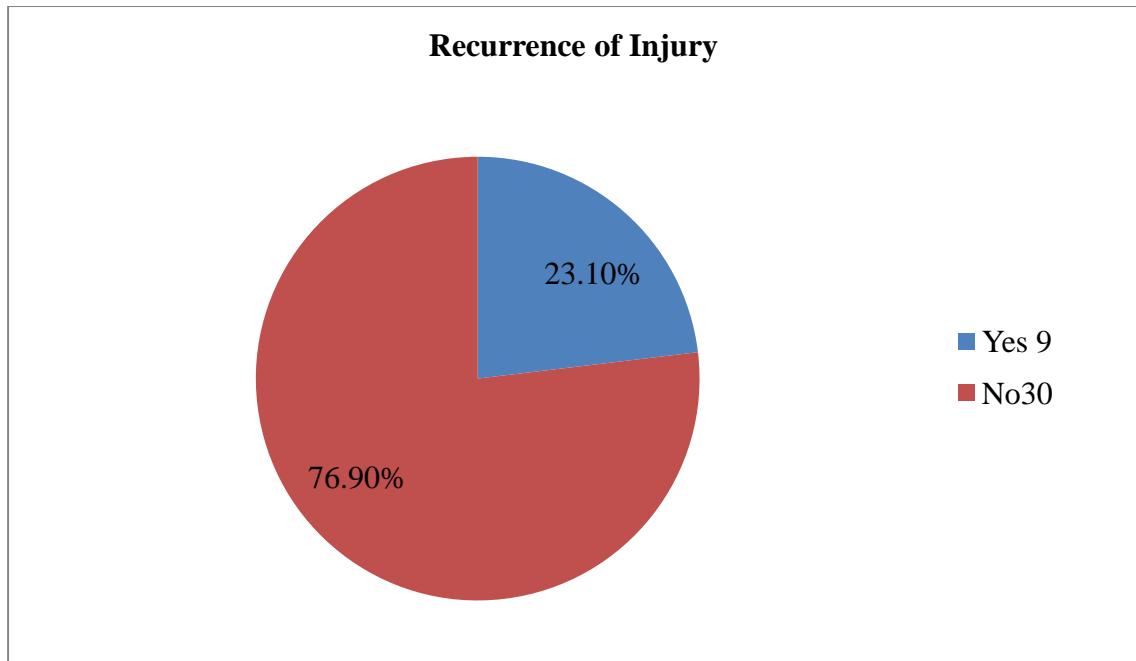


Figure: Recurrence of injury

Table 11: Association between recurrences of injury and ACL injury:

| Variable | Chi square value | P value |
|-----------------------|------------------|---------|
| Recurrences of injury | 50.000 | 0.000 |

This analysis shows that recurrences of injury is highly significant ($p < 0.05$) associated with ACL injury.

4.2.6 How Times of Recurrence

Among 23.1% recurrent injuries 15.4% (n=6) had 2 times of injury and 7.7% (n=3) had 1 time of injury.

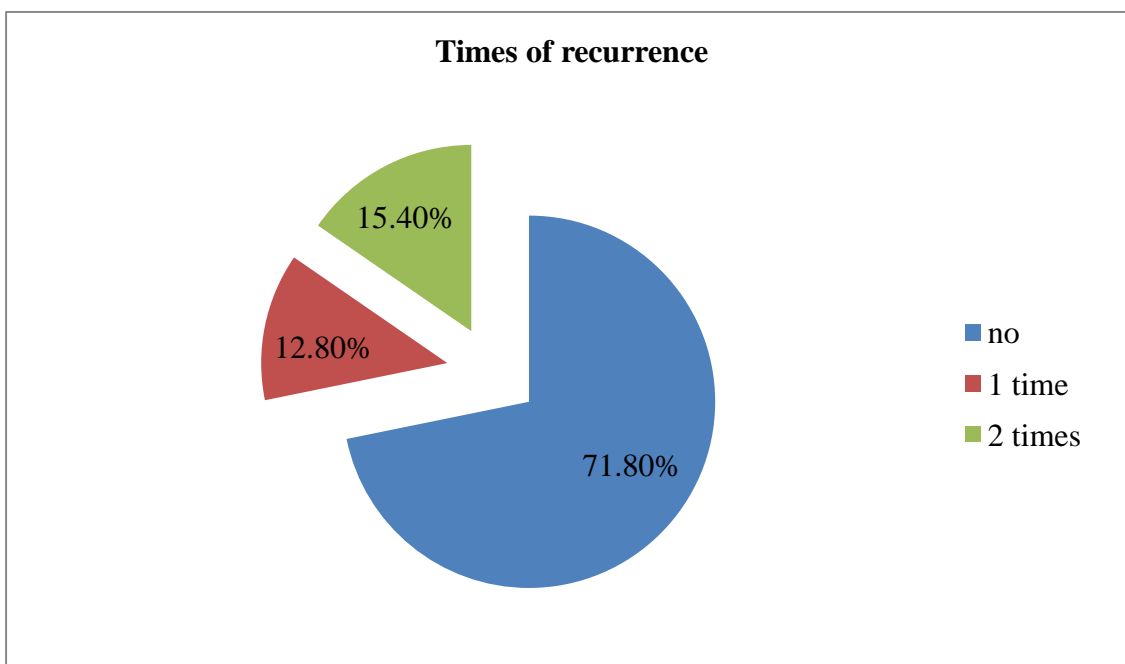


Figure: Times of recurrence

Table 12: Association between times of recurrences of injury and ACL injury:

| Variable | Chi square value | P value |
|----------------------|------------------|---------|
| Times of recurrences | 3.978 | 0.137 |

In this analysis recurrences of injury is not significant ($p > 0.05$) associated with ACL injury.

4.2.7 Duration of Warm Up and Cool Down

In the study among the injured participants 41% (n=16) participants do their warm up and cool down activities both for 15 minutes and between 15 to 20 minutes and rest of 18% (n=7) do their war up and cool down activities for 20 minutes .

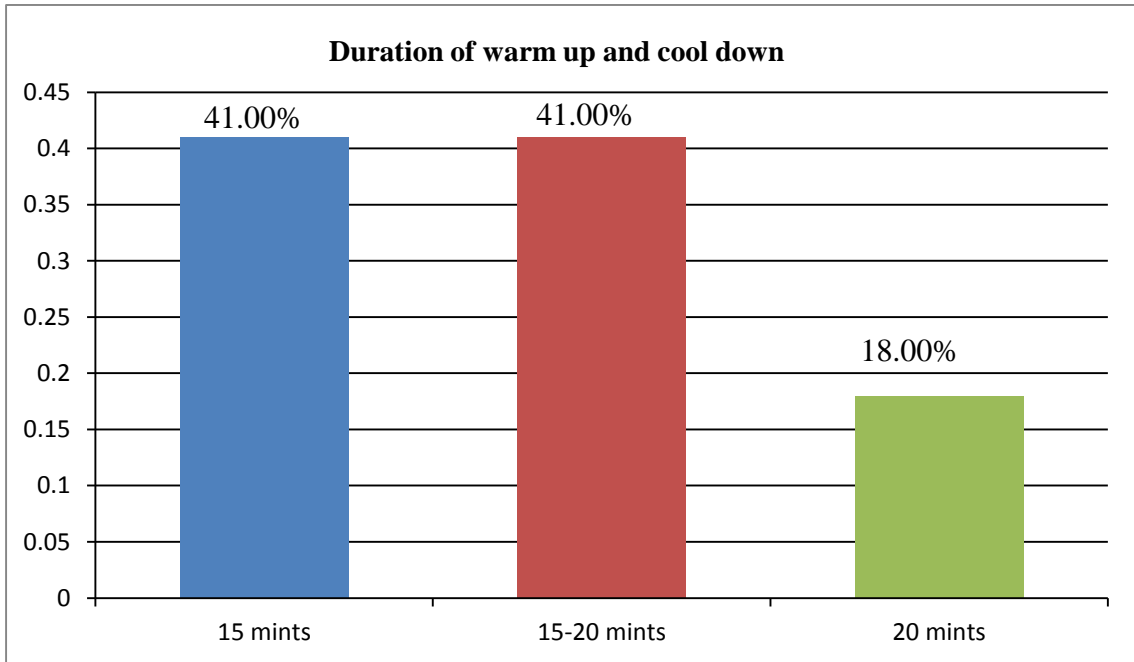


Figure: Duration of warm up and cool down

Table 13: Association between duration of warm up and cool down activities with ACL injury:

| Variable | Chi square value | P value |
|-----------------------------------|------------------|---------|
| Duration of warm up and cool down | 44.355 | 0.000 |

This analysis shows duration of warm up & cool down session is highly significant ($p < 0.05$) associated with ACL injury.

4.2.8 Treatment of Injury taken by the participants

The participants are mostly 79.5% (n=31) taken both medicines and physiotherapy treatment. Rest of the 20.5% (n=8) taken only physiotherapy treatment.

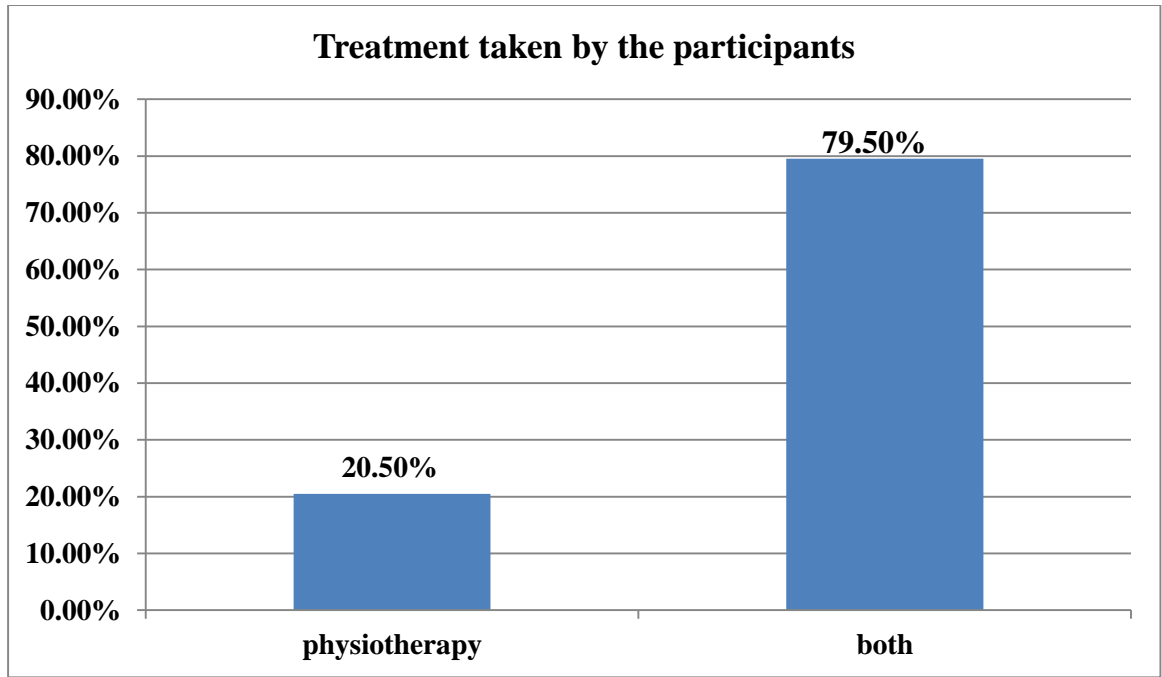


Figure: Treatment taken by the participants

Table 15: Association between treatment taken by the participants and ACL injury:

| Variable | Chi square value | P value |
|-------------------------------------|------------------|---------|
| Treatment taken by the participants | 44.355 | 0.00 |

This analysis shows that treatment taken by the participants is highly significant ($p < 0.05$) associated with ACL injury.

Table 16: Association between ACL injury and its associated factors

| Associated factors | Chi square value | P value | Comments |
|---------------------------------------|------------------|---------|-----------------|
| Age of the participants | 5.090 | 0.532 | Not significant |
| Sex of the participants | 0.448 | 0.503 | Not significant |
| Educational level of the participants | 3.535 | 0.171 | Not significant |
| Training events | 4.168 | 0.900 | Not significant |
| Duration of training | 2.061 | 0.725 | Not significant |
| Posture | 0.924 | 0.630 | Not significant |
| Associated knee injuries | 6.044 | 0.418 | Not significant |
| Type of injury | 50.00 | 0.00 | Significant |
| Severity of injury | 50.00 | 0.00 | Significant |
| Nature of pain | 50.00 | 0.00 | Significant |
| Recurrence of injury | 50.00 | 0.00 | Significant |
| Times of recurrences | 3.978 | 0.137 | Not significant |
| Duration of warm up and cool down | 44.355 | 0.00 | Significant |
| Treatment taken by the participants | 44.355 | 0.00 | Significant |

In this study ACL injury is present in 78% (n=39) participants and absent in 22% (n=11) participants.. According to Kvist et al., (2004) The yearly incidence of ACL injuries has been reported to be 3 per 10000 inhabitants in Denmark, with a greater frequency among athletes. In Sweden, ACL injuries comprise 43% of all soccer-related knee injuries and one large New Zealand study found an incidence of 36.9 injuries per 100,000 person-years.

Among the injured participants 25.6% (n=10) participants were at the age of 14. 23.1% (n=9) was at the age of 15, 20.5% (n=8) was at the age of 13, 10.1% (n=4) was both for the age 16 and 17 and 5.1% (n=2) was both for the age of 18 and 19. Sport-related injuries occurs at ages 5–14 years and tapers gradually with age and visit rates for sports injury are highest for school-age children (5–12years), adolescents (13–18 years) and young adults(18–24 years), compared with other age groups (Adirim and Cheng,2003). According to Walden et al., (2011) ACL injured female players are significantly younger than the male players. The age range is usually 19-27 for both male and female athletes.

Among the 39 injured participants 71.8% (n=28) were male trainees and 28.2% (n=11) were female participants. Incidence of ACL tear is 3.2% for men and 3.5% for women during a 4 year period. (Kurt et al. , 2016). According to Grindem (2014) women have a 2 – 3 fold of sustaining ACL injury and sustain their injuries at a lower leg then men. Female soccer players are at up to six times higher risk for sustaining ACL injury and the occurrence of ACL injury in a soccer team expressed as a percentage of all injuries on that team is as 1.3% in male and 3.75% in female (Eduard et al. , 2009). In USA ACL injury constitute 6% of all match injury and 2% of all training injuries in female and less than 1% of all injuries among males (Westin & Noyes,2011). But in BKSP we found that less trainees are injured than male. Because in Bangladesh less females are participate in sports than other countries due to our culture and social environment. But now a days circumstances are changing and hopefully the number of female players will increase in sports.

This study shows that 41% (n=16) injured participants were junior school certificate level, 38.5% (n=15) were primary school certificate level and 20.5%

(n=8) were secondary school certificate level. The National Federation of State High School Associations data shows that between 1988 and 1998 participation in girls' high school sports has risen, nearly 40% of the female participants were below graduation level (Powell & Foss, 2006).

The highest number of injured participants 28.2% (n=11) were athletic trainees, 23.1% (n= 9) were football trainees, 12.8% (n= 5) were cricket trainees, 10.3% (n= 4) were hockey trainees, 7.7% (n=3) were taekwondo trainees, 5.1% (n=2) were basketball and gymnastic trainees and 2.6% (n=1) were swimming, judo and volleyball trainees. ACL injury is more commonly occur in sports like football, basketball, professional rustling, martial arts, artistic gymnastics, alpine skiing (Grindem, 2014). Knee injury in football is known to be high and ACL injury incidence is also increased and The annual prevalence is between 0.5 and 6.0% Of all female players and between 0.6 and 8.5% of all male player (Markus et al. , 2011). A study showed that most participants, 48.5% number of injury occur in track and field events which includes running, long jump, high jump and skipping, 12.8% injury occur in jogging, 3.6% in gymnastics, 3.2% in swimming, shooting 2.1% (Orava et al., 2011). Surveillance of high school organized sports has found that football had the highest injury rate with 41–61% of athletes injured, annually injury rates include wrestling and gymnastics (40–46%), basketball (31-37%) volleyball, baseball, soccer, cross country, softball and track (7–18%). (Hawkins & Fuller, 2006).

Among the injured participants 41% (n=16) were trainees for 2 years, 33.3% (n=13) were trainees for 1 year, 12.8% (n=5) were trainees for 3 years, 6% (n=3) were trainees for < 1 year and 5.1% (n=2) were trainees for 4 years in BKSP. A total of 389 training injuries were recorded, with an overall incidence of injury of 105.9 [95% CI 95.4 to 116.4] per 1000 training hours. More than 35% of the training injuries sustained. Other sports with high annual were to the thigh and calf. Injuries to the ankle and foot (23.9%), knee (12.1%), and thorax and abdomen (12.6%) were less common. Over the course of the season, a total of 948 match injuries were recorded, with an overall incidence of injury of 917.3 [95% CI 857.9 to 976.6] per 1000 playing hours. Approximately 19.0% of the injuries sustained during matches were to the thigh and calf. Injuries to the face (14.2%), knee (13.8%), and arm and hand (12.9%) were less common. But in BKSP find out about the effect of training

hours on injuries was not possible because there was no records about the training hours of trainees and trainees themselves could not say about their training or activity hours.

In the injured participants 69.2% (n=27) had normal curvature of spine, 23.1% (n=9) were lordotic, 7.7% (n=3) were kyphotic. In a study it was found that No differences between groups were found in nine of the ten posture components examined. However, a significant difference ($P < 0.01$) was found in lumbar lordosis between groups. A greater deviation in lumbar posture was found in the injured group than in the control group. (Konishi et al., 2007).

In the injured participants along with ACL injury 15.4% (n=6) were suffered with meniscus injury, 7.7% (n=3) were suffered with subchondral injury, 5.1% (n=2) were suffered with medial collateral ligament injury and 2.6% (n=1) were suffered with collateral ligament injury, patellar injury and fracture. As this review and other studies have demonstrated, chondral defects are commonly seen in conjunction with ACL insufficiency about 30% of athletes in our review and A recent systematic review of ACL reconstruction and concomitant articular cartilage injury has shown that articular cartilage defects are frequently seen at the time of ACL reconstruction with the incidence of 16%–46% in acute injury (DeJong et al., 2017). According to Spindler & Wright, (2016) prevalence of associated meniscus injuries with ACL tear is up to 60 to 75%, articular cartilage injuries up to 46%, subchondral bone injuries 80% and complete collateral ligament injuries 5 to 24%.

Among the total injured participants 87.2% (n=34) got injured by direct hit during training time and rest 12.8% (n=5) got injured because of overuse. 43.6% (n=17) participants were got moderate injured, 41% (n=16) were severe injured and 15.4% (n=6) were mild injured among the injured participants.

Among injured participants pain nature is moderate in 43.6% (n= 17) participants, severe in 41% (n=16) participants and mild in 15.4% (n=6) participants.

In the injured participants 23.1% (n=9) had recurrent injury in the same side and 76.9% (n=30) had no recurrent injury. Among 23.1% recurrent injuries 15.4% (n=6) had 2 times of injury and 7.7% (n=3) had 1 time of injury. A Cohort studies suggest that a prior history of ACL injury may be a risk factor for another ACL injury on the

ipsilateral or contralateral side. Family history of ACL injury also appears to increase risk. (Edward et al., 2008).

In the study among the injured participants 41% (n=16) participants do their warm up and cool down activities both for 15 minutes and between 15 to 20 minutes and rest of 18% (n=7) do their warm up and cool down activities for 20 minutes. In the American Journal of Sports

Medicine a study shows that less than 4 year practice session higher rate (55.9%) of injury occurs among 509 female athlete. The elevated number 65%, participants duration of warm up and cool down were more than 16 min and 33.3% were under duration of less than or equal 15 min in this study. Another study shows that 9.1% within 76 participants done warm up and cool down activity to prevent athletic injury (Payne et al., 2007).

The participants are mostly 79.5% (n=31) taken both medicines and physiotherapy treatment. Rest of the 20.5% (n=8) taken only physiotherapy treatment. As mentioned by Freddie et al. (2001) trainees among 1200 trainees in England National Federation of Athletics have taken physiotherapy 84% after injury and 26% took conservative or surgical treatment. The differences of treatment ratio between these two studies occur due to different sample size and socio-demographic characteristics.

Limitation of the study was the expected sample size was 139, but the number of injured trainees in BKSP is very small amount. Due to resource constrain researcher was elect to choose just 50 samples which is very small to generalize the result in all over the Bangladesh. There are a few literatures found about ACL injury among the trainees of Bangladesh so it is difficult to compare the study with the other research. In this study only Bangladesh Krira Shikkha Protisthan (BKSP) was the study area to generalize for wider population. On the other hand in Bangladesh Krira Shikkha Protisthan (BKSP) number of female athletes is very few in comparison to other researches. So making a comparison between male and female trainees was difficult.

CHAPTER-VI CONCLUSION AND RECOMMENDATION

Bangladesh Krira Shikkha Protisthan is the largest governmental organization aims to explore talents in sports and train them, also give opportunity to play in different national or international competitions. From this study it was found that ACL injury is one of the most common injuries among the trainees and which is most common in male trainees. Trainees of athletic were more vulnerable than other events like football, cricket, gymnastics etc. Sometimes many associated injuries were present with ACL injury among them meniscus injury is the most common, subchondral bone injury, medial collateral injury are also common with ACL injury. Most of the ACL injuries among the trainees were occurred by direct hit rather than overuse. Severity of injury were commonly moderate. Recurrence of injury occurs in few participants among them 2 times of recurrence was common. Warm up and cool down session was also variable among them, most of their warm up and cool down session was for both 15 minutes or between 15 to 20 minutes. Most of the injured participants in BKSP took both medicines and physiotherapy treatment for their injury.

The researcher proposed the following recommendation to certain authority and Personnel to prevail over limitation: In BKSP the total number of female athlete or trainee is very small amount, limitation of sample size researcher did not gather total participants and use convenience sampling consequently the result cannot be generalized in all over the Bangladesh. So for the further proposal it is strongly recommendation to increase sample size and use simple random sampling by include participants from different sports organizations with adequate time to generalize the result in all over the country. And the result of the study demonstrates the frequency of injury among trainees, characteristics of athletic injury and factors associating injury in sports trainees. In this study only prevalence of injury identified it could be more specified if and effectiveness of physiotherapy treatment also done among sports trainees which might be play an vital role in improving the professional efficacy.

REFERENCES

- Ageberg, E., Petterson, E. and Friden T., (2007). 15-year follow-up of neuromuscular function in patients with unilateral nonreconstructed anterior cruciate ligament injury initially treated with rehabilitation and activity modification: a longitudinal prospective study. *American journal of sports Medicine*. 35(12):2109-2117.
- Ageberg, E., Thomee, R., Neeter, C., Silbernagel, K.G. and Roos E.M., (2008). Muscle strength and functional performance in patients with anterior cruciate ligament injury treated with training and surgical reconstruction or training only: a two to five-year follow up. *Arthritis Rheumatic*. 59(12):1773-1779.
- Adirim, T. A. and Cheng, T. L., (2003). Overview of Injuries in the Young Athlete. *Sports Medicine* 33 (1): 75-81.
- Ardern C.L., Webster K.E., Taylor N.F., Fellar J.A., (2011). Return to sport following anterior cruciate ligament reconstruction surgery: a systematic review and meta-analysis of the state of play. *British journal of sports medicine*. 45(7):596-606.
- Barber-Westin, S.D. and Noyes, F.R., (2011). Factor used to determine return to unrestricted sports activities after anterior cruciate ligament reconstruction. *Arthroscopy*. 27(12): 1697-1705.
- Bizzini, M., Gorelick, M., Munzinger, U. and Drobny.T., (2006). Joint laxity and isokinetic thigh muscle strength characteristics after anterior cruciate ligament reconstruction: bone patellar tendon bone versus quadrilateral hamstring autografts. *Clinical Journal of Sports Medicine*. 16(1):4-9.
- Chmielewski, T.L., Jones, D., Day T., Tillman, S.M., Lentz, T.A. and George S.Z., (2008). The association of pain and fear of movement/reinjury

with function during anterior cruciate ligament reconstruction rehabilitation. *Journal of Orthopaedic Physical Therapy*. 38(12):746-753.

- Chmielewski, T.L., Ramsey, D.K. and Synder-Mackler, I., (2005). Evidence for differential control of tibial position in perturbed unilateral stance after acute ACL rupture. *Journal of Orthopaedic Research*. 23(1):54-60.
- Cimino, F., Volk B. S. and Setter D., (2010). Anterior Cruciate Ligament Injury: Diagnosis, Management, and Prevention. *American Family Physician*, 82 (8): 918-922.
- De Jong, S.L., Van Casped, D.R., Van Haeff, M.J. and Saris D.B., (2007). Functional assessment and muscle strength before and after reconstruction of chronic anterior cruciate ligament lesions. *Arthroscopy*. 23(1):21-28.
- Di Stassi, S.L., Logerstedt, D., Gardinier E.S. and Synder-Mackler, L., (2013). Gait patterns differ between ACL- reconstructed athletes who pass Return-to-Sport Criteria and Those who Fail. *American Journal of Sports Medicine*. 41(6):13310-1318.
- Edward, A., Bull, A.M. and Amis ,A.A., (2007). The attachments of the anteromedial and posteromedial bundles of the anterior cruciate ligament: Part 1: tibial attachment. *Knee Surgery Sports Traumatology Arthroscopy*. 15(1):1414-1421.
- Edward, A., Bull, A.M., and Amis, A.A., (2008). The attachments of the anteromedial and posteromedial bundles of the anterior cruciate ligament: Part 2: femoral attachment. *Knee Surgery Sports Traumatology Arthroscopy*. 16(1):29-36.
- Freddie, H., David, A. and Stone., (2001). *Sports injuries*, 2nd ed, Lippincot Williams & Wilkins:Philadelphia.

- Gardinier, E.S., Manal K., Buchanan, T.S. and Synder-Mackler, L., (2013). Altered loading in the injured knee after ACL rupture. *Journal of Orthopaedic Research*. 31(3):458-464.
- Grindem H., (2014). Knee function and sports participation after nonoperative and operative treatment of Anterior Cruciate Ligament injuries. A dissertation from the Norwegian School of Sports Sciences.
- Greis, P.E., Koch, B.S. and Adams, B., (2012). Tibial anterior or posterior allograft anterior cruciate ligament reconstruction versus hamstring autograft reconstruction: an economic analysis in a hospital based outpatient setting. *Arthroscopy*. 28(11):1695-1701.
- Hall, C.M, and Brody, L.T., (1999), *Therapeutic exercise*, Lippincott Williams and Wilkins: Philadelphia.
- Hawkins, R.D., and Fuller, C.W., (2006). Risk assessment in professional football: an examination of accidents and incidents in the 1994 World Cup finals. *British Journal Sports Medicine*, 30:165–170.
- Hashemi, j., Breighner, R., Jang, T., Chandrashekar, N., Ekwaro-Osire, S. and Slauterbeck, J. R., (2010). Increasing pre-activation of the quadriceps muscle protects the anterior cruciate ligament during the landing phase of a jump: An in vitro simulation. *The Knee*, 17: 235–241
- Junge, A., Dvorak, J., and Baumann, G. T., (2004). Football injuries during the World Cup 2002. *American Journal Sports Medicine*, 321:23–27
- Kapreli, E., Athanasopoulos, S., Gliatis, J., Papathanasiou, M., Peeters, R. and Strimpakos N., (2009). Anterior cruciate ligament deficiency causes brain plasticity: A functional MRI study. *American Journal of Sports Medicine*. 37(12):2419-2426.
- Konishi, Y., Aihara, Y., Sakai, M., Ogaowa, G. and Fukubayashi T., (2007). Gamma loop dysfunction in the quadriceps femoris of patients who underwent anterior cruciate ligament reconstruction remains bilaterally. *Scandinavian Journal of Medical Science and Sports*. 17(4):393-399.

- Kvist, J., Ek A., Sporrstedt, K. and Good, L., (2005). Fear of reinjury: a hindrance for returning to sports after anterior cruciate ligament reconstruction. *Knee SurgerySports Traumatology Arthroscopy*. 13(5):393-397.
- Kvist, J., (2004). Rehabilitation Following Anterior Cruciate Ligament Injury. *Sports Medicine* 34 (4): 269-280.
- Lentz, T.A., Zeppieri, G., Tillman, S.M., Indelicato, P.A., Moser, M.W. and George, S.Z., (2012). Return to preinjury sports participation following anterior cruciate ligament reconstruction: contributions of demographic, knee impairment, and self-report measures. *Journal of Orthopaedic Sports Physical Therapy*. 42(11):893-901.
- Myklebust, G. and Bahr, R., (2005). Return to play guidelines after anterior cruciate ligament surgery. *British Journal of Sports Medicine*. 39(3):127-131.
- Nadler, F.S., Malanga, G.A., Deprience, M., Stitik, P.T. and Feinberg, H.J., (2010). The Relationship Between Lower Extremity Injury, Low Back Pain and Hip Muscle Strength in Male and Female Collegiate Athletes, *Clinical Journal of Sports Medicine*, 10:89-97.
- Nordenvall, R., Bahmanyar, S., Adami, J., Stenros, C., Wredmark, T. and Fellander- Tsai, L., (2012). A population base nationwide study of cruciate ligament injury in Sweden, 2001-2009: incidence, treatment, and sex differences. *American Journal of Sports Medicine*. 40(8):1808-1813.
- Orava, S., Hulkko, A., and Jormakka, E., (2011). Exertion injury among female athletes, *British Journal of Sports Medicine*, 15(4):229-33.
- Oeistad, B.E., Engebretsen, L., Storheim, K. and Risberg M.A., (2009). Knee osteoarthritis after anterior cruciate ligament injury: a systematic review. *American Journal of Sports Medicine*. 37(7):1434-1443.

- Payne, K., Berg, K., and Latin, R., (2007). Ankle injuries and ankle strength, flexibility and proprioception in college basketball players. *Journal of Athletic Training*, 32:221–225.
- Powell, J.W., and Foss, B.K.D., (2006). Sex-Related Injury Patterns Among Selected High School Sports, *The American Journal of Sports Medicine*, 28(3):385-46.
- Risberg, M.A., Moksnes, H., Storevold, A., Holm, I. and Synder- Mackler L., (2009). Rehabilitation after anterior cruciate ligament injury influences joint loading during walking but not hopping. *British Journal of Sports Medicine*. 43(6):423-428.
- Shultz, S. J., Schmitz, R. J., Chaudhari, A. M., McLean, S. G. and Sigward, M. S., (2010). ACL Research Retreat V: An Update on ACL Injury Risk and Prevention. *Journal of Athletic Training* 45(5):499–508.
- Spindler, K. P. and Wright, R. W., (2016). Anterior Cruciate Ligament Injury. *New England Journal of Medicine* 359:2135-2142
- Steffen K.M., Myklebust G., Andersen T.E., Holme I., Bahr R., (2008). Self-reported injury history and lower limb function as risk factors for injuries in female youth soccer. *American Journal of Sports Medicine*. 36(4):700-708.
- Thomee, R., Neeter, C., Gustavsson, A., Thomee, P., Augustsson, j. and Eriksson B., (2012). Variability in leg muscle power and hop performance after anterior cruciate ligament reconstruction. *Knee Surgery Sports Traumatology Arthroscopy*. 20(6):1143-1151.
- T sepsis, E., Vagenas, G., Ristanis S. and Georgoulis, A.D., (2006). Thigh muscle weakness in ACL-deficient knees persist without structured rehabilitation. *Clinical Orthopaedic and Related Research*. 450:211-218.
- Waldén, M., Hägglund, M., Magnusson, H. and Ekstrand J., (2011). Anterior Cruciate Ligament Injury in Elite Football: A Prospective Three-Cohort Study. *Knee Surgery, Sports Traumatology, Arthroscopy*, 19 (1): 11-19.

- Wojtys, M.D., Laura, J., Huston, M.S., Edward, M., Thomas, N., Lindenfeld, Timothy E., Hewett., and Mary, V.H., (2008). Association Between the Menstrual Cycle and Anterior Cruciate Ligament Injuries in Female Athletes. *The American Journal of Sports Medicine*, 26(5):614-19.
- Yoon, Y.S., Chai, M., and Shin, D.W., (2004). Football injuries at Asian tournaments *American Journal of Sports Medicine*, 321:36-42.
- Yoo, J.H., Lim, B.O., and Ha, M., (2010). A meta-analysis of the effect of neuromuscular training on the prevention of the anterior cruciate ligament injury in female athletes, *Knee Surgery Sports Trauma Arthroscopy*, 18:824-30.

APENDIX



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

Ref: CRP-BHPI/IRB/04/17/83

Date: 05/04/2017

To
Tasmia Osman,
4th year B.Sc. in Physiotherapy,
Department of Physiotherapy
Session: 2011-2012, DU Reg. No.: 1706
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal – “Prevalence of Anterior Cruciate Ligament injury and Its associated factors among the trainees at Bangladesh KriraSikkhaProtisthan.” by ethics committee.

Dear Tasmia Osman,

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on before February 23, 2016 to conduct the above mentioned thesis, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

| Sr. No | Name of the Documents |
|--------|---|
| 1 | Thesis Proposal |
| 2 | Questionnaire (English and Bengali version) |
| 3 | Information Sheet & Consent form |

Since the study involves answering a closed ended structured questionnaire that takes 10 to 15 minutes and have no likelihood of any harm to the participants, the members of the Ethics committee has approved the study to be conducted in the presented form at the meeting held at 08:30 AM on February 25, 2016 at BHPI.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

Muhammad Millat Hossain

Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

CRP-Chapain, Savar, Dhaka-1343. Tel: 02-7745464-5, 7741404, Fax: 02-7745069,
Email: contact@crp-bangladesh.org, www.crp-bangladesh.org



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)

(The Academic Institute of CRP)

CRP-Chapain, Savar, Dhaka, Tel: 7745464-5, 7741404, Fax: 7745069

BHPI-Mirpur Campus, Plot-A/5, Block-A, Section-14, Mirpur, Dhaka-1206. Tel: 8020178,8053662-3, Fax: 8053661

সিআরপি-বিএইচপিআই/০৯/১৬/৬৫১৬

তারিখ : ০৩.০৯.২০১৬

প্রতি
মহাপরিচালক
বাংলাদেশ ক্রীড়া শিক্ষা প্রতিষ্ঠান
জিরানী, সাতার, ঢাকা।

বিষয় : রিসার্চ প্রজেক্ট এর জন্য আপনার প্রতিষ্ঠান সফর ও তথ্য সংগ্রহ প্রসঙ্গে।

জনাব,
আপনার সদয় অবগতির জন্য জানাচ্ছি যে, পক্ষাঘাতগ্রস্তদের পুনর্বাসন কেন্দ্রে-সিআরপি'র শিক্ষা প্রতিষ্ঠান বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই) ঢাকা বিশ্ববিদ্যালয় অনুমোদিত বিএসসি ইন ফিজিওথেরাপি 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 ফিজিওথেরাপি কোর্সের ছাত্রী তাসমিয়া ওসমান তার রিসার্চ সংক্রান্ত কাজের তথ্য সংগ্রহের জন্য আগামী ২০.০৯.২০১৬ থেকে ১৫.১০.২০১৬ তারিখ পর্যন্ত আপনার প্রতিষ্ঠানে সফর করতে অগ্রহী। তার রিসার্চ শিরোনাম

“Prevalence of anterior cruciate ligament injury and it's associated factors among the trainees at Bangladesh Krira Sikkha Protisthan.”

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

ধন্যবাদান্তে

মোঃ ওবায়দুল হক
অধ্যক্ষ-ভারপ্রাপ্ত
বিএইচপিআই।



বাংলাদেশ ক্রীড়া শিক্ষা প্রতিষ্ঠান

জিরানী, সাভার, ঢাকা

bksp.portal.gov.bd

নং-৩৪.০৪.০২০০.০০৪.০০.০১৩.১৫৭ ৫৫০


তারিখ: ১৩ আশ্বিন ১৪২৩ বঙ্গাব্দ
২২ সেপ্টেম্বর ২০১৬ খ্রিস্টাব্দ

বিষয়: রিসার্চ প্রজেক্ট তৈরীর জন্য তথ্য সংগ্রহের অনুমতি।

সূত্র: সিআরপি-বিএইচপিআই/০৯/১৬/৬৫১৬, তারিখ: ০৩/০৯/২০১৬খ্রি।

উপর্যুক্ত বিষয় ও সূত্রের আলোকে নির্দেশক্রমে জানানো যাচ্ছে যে, রিসার্চ প্রজেক্ট তৈরীর নিমিত্ত ফিজিওথেরাপী কোর্সের নিম্নবর্ণিত ছাত্র/ছাত্রীদেরকে ২৭ সেপ্টেম্বর হতে ১৫ অক্টোবর ২০১৬ খ্রি. তারিখ পর্যন্ত বিকেএসপি হতে তথ্য সংগ্রহের বিষয়ে কর্তৃপক্ষের সম্মতি জ্ঞাপন করা হলো।

- ১। তাসমিয়া ওসমান
- ২। মাইনউদ্দিন আহমেদ
- ৩। পংকজ কান্তি দাস


২৬.০৯.১৬
শামীমা সাভার মিমু
পরিচালক (প্রশিক্ষণ) অ. দা.
বিকেএসপি
ফোন: ৭৭৮৯২১৫-৬ (এক্স-২২৪)।

প্রাপক: জনাব মো: ওবায়দুল হক
ভারপ্রাপ্ত অধ্যক্ষ
বিএইচপিআই
সিআরপি, সাভার, ঢাকা।

অনুলিপি: সদয় জ্ঞাতার্থে ও কার্যার্থে

- ১। মহাপরিচালক, বিকেএসপি
- ২। পরিচালক (প্রশাসন ও অর্থ), বিকেএসপি
- ৩। অধ্যক্ষ, ক্রীড়া কলেজ, বিকেএসপি
- ৪। চিফ কোচ/সিনিয়র কোচ/কোচ.....বিকেএসপি
- ৫। নিরাপত্তা কর্মকর্তা, বিকেএসপি
- ৬। জনসংযোগ কর্মকর্তা, বিকেএসপি
- ৭। সংশ্লিষ্ট নথি।

Consent Form

Assalamualaikum,

I am Tasmia Osman, Final Year of B.Sc. in Physiotherapy student of Bangladesh Health Professions Institute (BHPI) under the Faculty of Medicine, University of Dhaka. To obtain my Graduation degree, I have to conduct a research project and it is a part of my study. The participants are requested to participate in the study after a brief following.

My research title is **“Prevalence of Anterior Cruciate Ligament Injury and Its Associated Factors Among the Trainees at Bangladesh Krira Sikkha Protisthan”**.

To fulfil my research project, I need to collect data. So, you can be a respected participant of this research.

I would like to inform you that this is a purely academic study and will not be used for any other purposes. I assure that all data will be kept confidential. Your participation will be voluntary. You may have the rights to withdraw consent and discontinue participation at any time of the experiment. You also have the rights to answer a particular question that you don't like.

Do you have any questions before I start?

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

Yes No

Signature of participant and Date

Signature of the researcher and Date.....

Signature of the witness and Date.....

সম্মতিপত্র

আসসালামুয়ালাইকুম ,

আমি তাসমিয়া ওসমান ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধিভুক্ত বাংলাদেশ হেলথ প্রফেশনস্ ইন্সটিটিউট এর বি.এস.সি ইন ফিজিওথেরাপি কোর্সের চূড়ান্ত বর্ষের একজন শিক্ষার্থী। অধ্যয়নের অংশ হিসেবে আমাকে একটি গবেষণা সম্পাদন করতে হবে এবং এটা আমার প্রাতিষ্ঠানিক কাজের একটা অংশ। নিম্নোক্ত তথ্যাদি পাঠ করার পর অংশগ্রহণকারীদের গবেষণায় অংশগ্রহনের জন্য অনুরোধ করা হলো।

আমার গবেষণার বিষয় "বিকেএসপিতে প্রশিক্ষণরত শিক্ষানবিশদের মধ্যে এসিএল ইঞ্জুরি এর প্রকটতা"

গবেষণাটি সম্পাদনের জন্য, আমার তথ্য সংগ্রহ করা প্রয়োজন হবে। গবেষণার ক্ষেত্র বিবেচনা করে আপনারমাঝে আমার গবেষণায় অংশগ্রহণ করার জন্য প্রয়োজনীয় বৈশিষ্ট্য লক্ষ্য করা গেছে। এজন্য, আপনি আমার গবেষণার একজন সম্মানিত অংশগ্রহণকারী হতে পারেন এবং আমি আপনাকে আমার গবেষণায় অংশগ্রহন করতে অনুরোধ জানাচ্ছি।

আমি প্রতিজ্ঞা করছি যে,এই গবেষণা আপনার জন্য ঝুঁকিপূর্ণ হবে না অথবা আপনার কোন ক্ষতি করবে না। গবেষণা চলাকালীন সময়ে কোন রকম দ্বিধা বা ঝুঁকি ছাড়াই যেকোন সময়ে আপনি এটাকে বাদ দিতে পারবেন। এই গবেষণার প্রাপ্ত তথ্য সম্পূর্ণভাবে গোপনীয় থাকবে এবং অংশগ্রহণকারীর ব্যক্তিগত তথ্য অন্য কোথাও প্রকাশ করা হবে না।

শুরু করার আগে আপনার কি কোন প্রশ্ন আছে ?

আমি কি শুরু করতে পারি ?

হ্যাঁ না

অংশগ্রহণকারীরস্বাক্ষর ও তারিখ

গবেষকের স্বাক্ষর ও তারিখ

সাক্ষীর স্বাক্ষর ও তারিখ

Questionnaire


| | | |
|----------|--------|-------|
| Code no: | ID no: | Date: |
| Address: | | |

Part 1: Sociodemographic Questions

| SL No. | Questions | Responses | Score |
|--------|----------------------|--|-------|
| 1. | Age | _____years | |
| 2. | Sex | Male=1 Female=2 | |
| 3. | Education | Primary Educational Certificate (PEC)= 1 Junior School Certificate (JSC)= 2 Secondary School Certificate (SSC)= 3 Higher Secondary Certificate (HSC)= 4 Other (Specify)= 5 | |
| 4. | Training event | Cricket =1 Football= 2 Archery= 3 Basketball= 4 Boxing=5 Hockey= 6 Swimming= 7 Tennis=16 Shooting=8 Gymnastic=9 Tennis= 10 Judo= 11 Karate=12 Volleyball=13 Taikoandoo=14 Athletic=15 Table Woshoo=17 | |
| 5. | Duration of training | Less than 1yr=1 1yr=2 2yr=3 | |

| | | | |
|----|---------|---|--|
| | | 3yr=4 4yr=5 5yr=6 6yr=7 | |
| 6. | Posture | Lordotic=1 Kyphotic=2 Scoliotic=3 Normal curvature=4 | |

Part 2: Injury related questions

| SL NO | Questions | Responses | Score |
|-------|--|--|-------|
| 7. | ACL Injury | Yes =1, No =2 | |
| 8. | Associated knee injuries | Meniscus injury=1 Medial cruciate ligament injury=2 Posterior cruciate ligament injury=3 Subchondral injury=4 Articular cartilage injury=5 Collateral ligament injury=6 Patellar injury=7 Fracture=8 Tendon injury=9 None=0 | |
| 9. | Type of injury | Direct(Traumatic)=1 Indirect(Overuse)=2 | |
| 10.. | Severity of injury | Mild=1 Moderate=2 Severe=3 | |
| 161. | Nature of pain (According to VAS scale) |  | |

| | | | |
|-----|--|--|--|
| 12. | Recurrence of injury | Yes=1 No=2 | |
| 13. | How many times you experienced this injury | _____times | |
| 14. | Warm up & cool down activity | Yes=1 No=2 | |
| 15. | Duration of warm up & cool down | _____Min | |
| 16. | Treatment | Drug=1 Physiotherapy=2 Both drug & physiotherapy=3 | |

প্রশ্নাবলী

| | | |
|---------|----------|--------|
| কোড নং: | আইডি নং: | তারিখ: |
| ঠিকানা: | | |

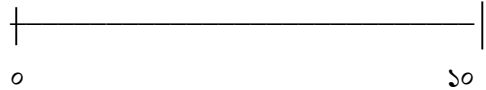
খণ্ড ১: সামাজিকচিত্রের প্রশ্ন

| ক্রমিক নং | প্রশ্ন | উত্তর | হিসাব |
|--------------|---------------------|--|-------|
| ১. | বয়স | _____ বছর | |
| ২. | লিঙ্গ | ছেলে= ১ মেয়ে= ২ | |
| ৩. | শিক্ষাগত যোগ্যতা | প্রাইমারি স্কুল সার্টিফিকেট (পিএসসি)= ১ জুনিয়র স্কুল সার্টিফিকেট (জিএসসি)= ২ সেকেন্ডারি স্কুল সার্টিফিকেট (এসএসসি)= ৩ হাইয়ার সেকেন্ডারি স্কুল সার্টিফিকেট (এইচ এস সি)= ৪ অন্যান্য (উল্লেখ)= ৫ | |
| ৪. | প্রশিক্ষণ কার্যক্রম | ক্রিকেট = ১ ফুটবল= ২ আর্চেরি= ৩ বাস্কেটবল= ৪ বক্সিং= ৫ হকি= ৬ সুইমিং= ৭ শুটিং= ৮ জিমন্যাসটিক= ৯ টেনিস= ১০ জুডো= ১১ কেরাতি= ১২ ভলিবল= ১৩ তান্ধক উন্দু= ১৪ এথলেটিক= ১৫ টেবিল টেনিছ= ১৬ উশু= ১৭ | |
| ৫. | প্রশিক্ষণ সময়কাল | ১ বছরের কম= ১ ১ বছর= ২ ২ বছর= ৩ ৩ বছর= ৪ ৪ বছর= ৫ ৫ বছর= ৬ ৬ বছর= ৭ | |

| | | | |
|--|--|--------------------------------|--|
| | | ৭ বছর=৮ অন্যান্য (উল্লেখ)=৯ | |
|--|--|--------------------------------|--|

| | | | |
|----|----------|--|--|
| ৬. | দেহভঙ্গি | লর্ডোটিক= ১ কাইফটিক= ২ স্কলিওটিক= ৩ স্বাভাবিক বক্রতা= ৪ | |
|----|----------|--|--|

খণ্ড ২: আঘাত জড়িত প্রশ্ন

| ক্রমিক নং | প্রশ্ন | উত্তর | হিসাব |
|--------------|------------------------------------|--|-------|
| ৭. | এসিএল ইঞ্জুরি | হ্যাঁ=১ না=২ | |
| ৮. | সংশ্লিষ্ট হাঁটুর আঘাত | মিনিস্কাস ইঞ্জুরি = পোস্টারিয়োর লিগামেন্ট ইঞ্জুরি =২ সাবকনডাল ইঞ্জুরি =৩ আরটিকুলার কারটিলেজ ইঞ্জুরি =৪ কোলেটারাল লিগামেন্ট ইঞ্জুরি =৫ ফ্রেকচার =৬ টেনডোন ইঞ্জুরি=৭ পেটেলার ইঞ্জুরি=৮ | |
| ৯. | আঘাতের ধরন | সরাসরি(আঘাতমূলক)=১ পরোক্ষ(অতিরিক্ত ব্যবহার)=২ | |
| ১০. | আঘাতের প্রকরতা | স্বল্প=১ মোটামোট=২ তীব্র=৩ | |
| ১১. | ব্যথার ধরন (VAS স্কেল অনুসারে) |  | |
| ১২. | আঘাতের পুনরাবৃত্তি | হ্যাঁ=১ না=২ | |
| ১৩. | কতবার আঘাতের অভিজ্ঞতা হয়েছে | _____ বার | |
| ১৪. | গরম করা এবং কার্যকলাপ ঠাণ্ডা করা | হ্যাঁ=১ | |

| | | | |
|-----|----------------------------|---|--|
| | | না=২ | |
| ১৫. | উষ্ণতা এবং ঠাণ্ডার সময়কাল | _____মিনিট | |
| ১৬. | চিকিৎসা | ঔষধ=১ ফিজিওথেরাপি=২ ঔষধ ও ফিজিওথেরাপি উভয়ই=৩ | |

