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# KNEE INJURY: A COMMON PROBLEM AMONG MALE SPORTS PARTICIPANTS AND ITS ASSOCIATION WITH OVERALL LEVELS OF PRODUCTIVITY AMONG SCHOOL, COLLEGE AND UNIVERSITY STUDENTS

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## ABSTRACT

### Background:

The knee is amongst the largest, complicated and most commonly injured joint among young sports participants. Knee injuries accounts for 15-50% of all sport related injuries drastically restricting field rehearsal and performance level. Increase sports participation not only has great healthbenefits but can also be major reason for knee related injuries.

### Objectives:

The purpose of this study is to find out the prevalence of knee injuries among male sports participants of school, colleges and universities of Abbottabad. Simultaneously our secondary outcome measure is to find out the association of knee injury and overall level of productivity among students.

### Methods:

After approval of this cross-sectional survey research proposal by the IRB, data was collected from male students of schools, colleges and universitiesof District Abbottabad.

Convenient sampling technique was carried out to include the participants in the study. The duration of study was 6 months. Raosoft Online Sample Size Calculator was used to determine sample size. With a margin of error of 5%, a confidence interval of 95%, a total sample size of 377 was recruited. The NPRS a self-reported, or clinician administered, measurement tool was used in the collection of data. Analysis of collected data was performed through SPSS version 20.0. Data entry was performed manually and then was further organized into frequency tables.

## Results:

History of knee trauma and existing knee pain/injury were calculatedby adding a closed ended question in the self-designed questionnaire. According to our results, 56.0% have had knee pain/ injury once in their lives and 44% did not experience any pain or injury related to knee joint. Furthermore, our study results concluded the fact that 41.6% are mostly not aware of their knee problems while 31% were monthly aware.13% participants were always aware, 12.2% were weekly aware and 2.1% were daily aware of their knee problem. Our interpretation of the data 44.3% did not modify their lifestyle at all, 23.3% moderately, 21.8% mildly, 6.4% totally and4.2% severely modified their life style in order to avoid potential damaging activities to the knee joint.

## Conclusion:

Knee injuries are prevalent among male schools, colleges and universities students of Abbottabad. Also, students lack basic level of awareness and knowledge about management of such injuries.

## Keywords:

Prevalence, Knee Injuries, Sports Participants

## Introduction:

The knee is amongst the largest, complicated and most commonly injured joint among young sports participants (1). Knee injuries accounts for 15-50% of all sport related injuries drastically restricting field rehearsal and performance level (2, 3). The knee is known to be biomechanically dynamic and anatomically complex joint. With the growing emphasis on the importance of sports participation in modern life, a drastic increase in the injury rate has been observed as well. The knee joint is considered the largest and the most overused joint in our body. It is a synovial joint which serves as a connection point for three bones; the patella, femur and tibia. The knee joint is a complicated hinge joint and comprised of two bony articulations; the patellofemoral and tibiofemoral. The tibiofemoral joint composed of bony articulation between the femur and the tibia, while the femur and the patella articulate to form the patellofemoral joint.(4) The tibiofemoral joint is unification among the medial and lateral femoral condyles and the flat plateaus of tibia .This joint is covered by thick layered sheath of cartilage known as hyaline cartilage. In congruency is generally found among the femoral condyles and tibial plateaus of the tibiofemoral joint, so compatibility and unity of this joint is recruited by the lateral and medial meniscus**.** Sickle -shaped fibro cartilaginous menisci allow even distribution of the femoral coercion over the tibia.(5) It is imperious to understand the relationship between bones and joint (osteokinematics) , the relationship between the movement of a joint with adjacent joint surface (arthrokinematics) and to interpret the complex function of the knee joint. (6) Arthrokinematics pertains involuntary joint movements with respect to each other primarily involves spin, glide and roll these characteristics ensure congruency and stability during movement. (7)

Lower extremity injuries special to knee and ankle is are the major cause of loss of game duration and practice. Most notable knee injuries include tear of anterior cruciate ligament and medial collateral ligament, these injuries are particularly very severe and it may result in long time confinement. (8) There are two types of injuries of menisci, traumatic and degenerative. These injuries associated to the menisci are related to radial tears and anterior cruciate injury. Tears within range of 3 mm of the junction between meniscal synovium are correlated with active and younger patient who is likely to succor a sports-related injury. Tears described as, horizontal cleavage, complex, and flap tears are related with a geriatric age group and present with a degenerative pattern. (9) As the participation in sports increases so does the sports-related injuries, which imposes notable burdens on the player, their close ones and the healthcare medical system. Knee joint is considered the most vulnerable when it comes to the sports related injuries. (10) According to American figures any casualty department which is covering a 400000 population should expect about 500 notable knee injuries a year. (11)

As knee is the largest and most dynamic joint in the body, also considered to be the most commonly injured joint, this study is of great significance as it aims to determine the prevalence of knee injuries among male sports participants. Not to overlook the fact that knee injuries can impose really adverse effects later and can be a common cause of early osteoarthritis, henceforth it is essential to have proper education. Many recent studies have focused on the problem of the increasing prevalence of knee injuries during sports. Not only have there been studies regarding prevalence but also very little knowledge about proper management prior to and after the injury have been observed, greatly contributing to general sports injuries with knee

injuries being paramount.

## Methodology:

Descriptive cross sectional study was conducted after obtaining the approval from Institutional Review Board of Women Institute of Rehabilitation Sciences, Abbottabad (reference no. WIRS 2208/181A, date of issuance 13-02-23): Raosoft software was used to calculate sample size. Population was assumed to be 20 thousand with 95% of confidence interval. Study setting was Women Institute of Rehabilitation Science, Abbottabad. Convenience Sampling Technique used as sampling technique with sample size of 377 in total. Study duration was 6 months. Students of age limit 15 – 25 years, college and university male students of Abbottabad, students agreeing to participate in the study were included.

Female students, age less than 15 and greater than 25 years, any kind of musculoskeletal or congenital deformities, students not agreeing to participate in the study were excluded.

Afterseeking formal consent from Head of Institutes and research participants, self-designed questionnaires were distributed among male students of age groups from 15 to 25. Questionnaire included the numerical pain rating scale (NPRS) as a measuring tool for pain intensity. The collected data was coded manually organized and categorized into percentages and then frequecy tables were made. The descriptive statistical approches were used to find out the frequency variables. Chi square was used to find out the association.

## Results:

### Age of participants:

In this study total of 377 research participants were included. We divided them into 3 sub-groups accordingly.50.4% participants were in the range of 22 to 25 years, 36.9% were in the range of 19 to 21 years and likewise 12.7% in the age group of 15 to 18years. Therefore, it is certain by the results that study population predominantly represents the young adults.

**Table 1. Age of participants**

| Age | Frequency | Percent |
|---|---|---|
| **15 to 18 years** | 48 | 12.7 |
| **19 to 21 years** | 139 | 36.9 |
| **22 to 25 years** | 190 | 50.4 |
| **Total** | 377 | 100.0 |

### History of knee trauma or existing knee pain:

History of knee trauma or existing knee pain was calculated by adding a closed ended question in the questionnaire. According to our result 56.0% have had knee pain once in their lives and 44% did not

experience any pain related to knee joint. Thus, knee injuries were prevalent among our studied population because of sports related activities.

**Table 2: History of knee trauma or existing knee pain**

| Did you ever experience knee pain/knee injury? | Frequency | Percent |
|---|---|---|
| **Yes** | 211 | **56.0** |
| **No** | 166 | **44.0** |
| **Total** | **377** | **100.0** |

**Pain rating on Numerical Pain Rating Scale (NPRS):**

After considering our result we have come to a conclusion that 44.03% participants who did not experience any knee pain reported no pain. 19.09% reported pain intensity between 1 to 3 (mild), 23.60% reported pain intensity between 4 to 6 (moderate), and 13.26% had fallen into category of 7 to 10(severe) according to NPRS

**Table 3: NPRS**

| How would you rate your pain on NPRS? | Frequency | Percent |
|---|---|---|
| **No pain or Nil** | 166 | **44.03** |
| **1 to 3(mild)** | 72 | **19.09** |
| **4 to 6(moderate)** | 89 | **23.60** |
| **7 to 10( severe)** | 50 | **13.26** |
| **Total** | **377** | **100.0** |

**Treatment taken for knee pain:**

Severe knee pain if not resolved within expected period of time is often compensated by treatment. According to this study 79.3% participants didn't seek any treatment as they didn't have any knee injury. 12.46% participants preferred medication as a mode of treatment while 8.22% participants had chosen physical therapy for the treatment of their knee pain. None of the participants reported any history of knee surgery as a treatment protocol.

**Table 4: Have you ever had treatment for your knee?**

| Have you ever had any treatment for your knee? | Frequency | Percent |
|---|---|---|
| **No** | 299 | **79.3** |

| | | |
|---|---|---|
| **Yes(medication)** | 47 | **12.46** |
| **Yes(physical therapy)** | 31 | **8.22** |
| **Yes (surgery)** | **0** | **0** |

**Frequency of knee pain:**

. This study results concluded the fact that 41.6% were never aware of their knee problems while 31% felt pain monthly.13% participants were always in pain, 12.2% felt pain weekly and 2.1% were daily in pain (for some time of the day) due to their knee problem.

**Table 5: How often do you feel knee pain/problem?**

| How often do you feel knee pain/problem? | Frequency | Percent |
|---|---|---|
| **Never** | 157 | **41.6** |
| **Monthly** | 117 | **31.0** |
| **Weekly** | 46 | **12.2** |
| **Daily** | 8 | **2.1** |
| **Always** | 49 | **13.0** |
| **Total** | **377** | **100.0** |

**Lifestyle modifications to avoid potential damaging effects on knee:**

Knowledge about management and modification of lifestyle is an important conclusion of our research study. Proximity to our research objective we added a

specific question regarding the knowledge and modification of lifestyle in order to avoid any damage to knee. According to our interpretation of the data 44.3% did not modify their lifestyle at all, 23.3% moderately, 21.8% mildly, 6.4% totally and 4.2% severely modified their life style in order to avoid potential damaging activities to the knee joint.

**Table 6: lifestyle modification to avoid potential damaging activities to k**

| **Have you modified your lifestyle to avoid potential damaging activities to your knee?** | **Frequency** | **Percent** |
|---|---|---|
| **Not at all** | 167 | **44.3** |
| **Mildly** | 82 | **21.8** |
| **Moderately** | 88 | **23.3** |
| **Completely** | 16 | **4.2** |
| **Totally** | **24** | **6.4** |

**Association of knee injury with overall level of productivity:**

Productivity of students and their progress can be affected severely due to knee problems.Table no 9 shows significant relation that knee injury affects the overall level of productivity of students with p value less than 0.05.

**Table no. 7: Association of knee injury with overall level of productivity**

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 279.921[a] | 6 | .000 |
| Likelihood Ratio | 231.112 | 6 | .000 |
| N of Valid Cases | 377 | | |
| a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.38. | | | |

## Discussion:

In this research, we explored various aspects of knee injuries, encompassing its prevalence, associated issues, and factors causing an increase or decrease in the intensity of such injuries. Also, the level of awareness and knowledge about management about such injuries among male students was also taken into account. A sample size of 377 was taken and according to our research results the prevalence of knee injuries among the research participants was high i.e. 56% (211) whereas 44% (166) participants didn't experience any knee injury during sports. However, the prevalence rate was less of what was reported to be 73% in a study that was conducted in a college in Delhi, India. Also, in this study the knee injuries are more common in age group from 22 to 25 years whereas on contrary the average age of injuries in the former mentioned research was 20 and below. However, other researches correlated with this research that prevalence of knee injuries among males are high in sports. (12,13,14,15,16,17)

Furthermore, studies conducted in Riphah College of Rehabilitation Sciences

in 2019 and other research done in 2011 both supported the fact that prevalence of knee injuries was rather high in males than females. This might be due to the fact that males usually have aggressive nature related to sports, and are more indulged in competitive sports that involves contact mechanism, and their participation level is also rather high than females. The less participation ratio might be due to geographical differences and cultural barriers. The results of this studyare consistent with these studies which show high prevalence rate in males, even though females were our exclusion criteria yet alone among males itself the prevalence rate was high. (15,16)

Pain is always the most common and foremost symptom in any kind of injury or disease. It is the alarming signal that something is not going well in your body or you need to get treated. For knee injuries as well, the onset on pain is very crucial, sometimes it can subside but many a times it get be a red flag that you have been injured, but for that student education and knowledge is very important. In this study we found out that among students who had a knee injury in the past were unaware of the onset of the pain indicating less awareness, lack ofhealth education. Researches done in 2003 and 2021 are consistent with the results of this study. (17)

Even after clearance by their health professional, knee injury is a well-known factor for early knee osteoarthritis. (18,19) Therefore, talking about basic inadequacy about proper health education that should be given to these students, 2 questions were added in the self-designed questionnaire in order to know how well these students are informed or casually aware of the management they shouldbe doing after a knee injury or how well they are aware of their general knee conditions after injury and what steps they take, or how they modify their lives to prevent such

injuries in the near future. According to the results, majority of the students (41.6%) are never aware of their conditions, and also majority (44.3%) of them have no idea how to avoid potential damaging activities to protect the knee. Results of this study are consistent with the researches done in Delhi, Saudi, South Africa and Pakistan Hence, clearly indicating the significance and needfor proper supervision, health education and awareness campaigns so that physical and economic loses can be prevented. (13, 20)

## Conclusion:

Knee injuries are prevalent among male schools, colleges and universities students of Abbottabad. Also, students lack basic level of awareness and knowledge about management of such injuries and these injuries affect the overall productivity of the students.

## Research limitations:

- Study was done only in Abbottabad city.
- Study included only male students.
- Due to summer break in Abbottabad, lack of resources and permissions from the respective institutes, our study couldn't cover all the institutes.

## Recommendations:

- In addition to the current research further research can be carried out in order to know the prevalence among female students.
- A comparison can also be made between both genders, among students of

Abbottabad.

- Thorough research on preventive methods, the types and pattern of theinjuries or injuries prevalence in any one sport can be investigated

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