The prevalence and determinants of anterior cruciate ligament rupture among athletes practicing football in Jeddah Avenues 2020

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Abstract

Background: Anterior cruciate ligament (ACL) tear is a common sport injury and one of the most serious sport injuries affecting non-professionals and professional athletes. It is most commonly torn during sports that involve sudden stops and changes in direction such as football. Objective: To measure the prevalence and determinants of anterior cruciate ligament rupture as well as assess knowledge about it among young adult athletes practicing football. Materials and Methods: An analytical cross-sectional study based on a questionnaire was carried out during the period from December 2019 to March 2020 among a sample of Saudi athletes recruited from natural grass, artificial turf, and dirt football fields in the Jeddah region. A structured questionnaire composed of four parts was used to collect data: socio-demographic variables, questions to assess awareness and knowledge of ACL, questions to assess the prevalence and determinants of ACL, and description of cases and the Arabic version of the Lysholm Knee Score (LKS) to assess the impact of ACL injury on patients’ daily life. Results: The study included 320 participants. Their age ranged between 15 and 40 years with an arithmetic mean of 27.9 and a standard deviation of ±6.8 years. The majority of them were males (97.8%). The prevalence of ACL injury was 14.7% among the participants; it was significantly higher among overweight and obese subjects (P = 0.042) as well as those who reported more than 10 training weekly hours (P = 0.034). Most of the playgrounds at the time of injury were either artificial turf (44.7%) or dirt football fields (34%). Overall, the level of adequate knowledge about ACL was observed among most of the participants (70.3%). The only factor significantly associated with the level of participants’ knowledge about ACL was the level of physical activity, P = 0.011. The total of LKS ranged between 21 and 100 with a median (inter-quartile range) of 82.5 (57–91). Conclusion: The prevalence rate of ACL injury among athletes in Jeddah, Saudi Arabia, is within the world wide range. Their awareness and knowledge of ACL are encouraging, although some risk factors were not well known. The quality of life of injured athletes was high, irrespective of demographic as well as physical factors and the history of surgical repair.

Keywords: Anterior cruciate ligament, knowledge, prevalence, quality of life

Introduction

The anterior cruciate ligament (ACL) is a band of dense connective tissues to help stabilize our knee joint. The ACL connects the posterior medial aspect of the lateral femoral
condyle in the intercondylar notch to the anterior aspect of the intercondylar eminence of the tibia and limits anterior movement of the tibia relative to the femur.\(^1\)

It is a common sport injury and one of the most serious sport injuries affecting non-professionals and professional athletes. It is most commonly torn during sports that involve sudden stops and changes in direction such as football.\(^2\)

Worldwide, there is a great gap in the prevalence of ACL injuries as some studies reported a rate of ACL repair operations ranged between 32 and 78 per 100,000 persons per year.\(^3\) Additionally, it has been estimated to be one in 3000 in the United States of America.\(^4\) Also, some authors have documented that the number of ACL repairs performed has increased in the past few years.\(^5,6\)

ACL injury affects usually the young, active persons, and athletes and is commonly noticed in those practicing high-active sports such as football, basketball, and soccer, compared with others.\(^7\)

It had been documented that further knee injury can result from ignoring a torn ACL.\(^8\) Females have 2- to 10-fold higher risk than males to get ACL injury if they are playing the same sport.\(^9\) The high risk of injury in addition to the high rate of practicing sports among young women over the past decades has resulted in a fast rise in ACL injuries in females.\(^9\)

Although most ACL reconstructions (ACLRs) restore the mechanical stability of the injured knee, unfortunately, one of the most serious complications of the ACLR is a second injury when return to sport (RTS), and the time to RTS is varied. Cessation of the sport after ACL reconstruction is increasing despite normal post-operative knee functions.\(^9\)

As injuries of the ACL are relatively common and in a considerable proportion of cases presented initially at primary care settings, primary care physicians should be familiar with prompt evaluation and diagnosis of such injuries as well as with first aid treatment measures in the form of immediate cessation of sporting activity, application of ice packs and compression, and then adequate referral for continuing the care by specialists.\(^10\)

The present study aims to evaluate ACL rupture in football players in Jeddah Avenues, Kingdom of Saudi Arabia.

**Materials and Methods**

**Study design**

This was an analytical cross-sectional study based on a questionnaire distributed to the participants in natural grass, artificial turf, and dirt football fields in the Jeddah region.

**Study period**

The study was conducted during the period from December 2019 to March 2020.

**Study population**

All the available athletes found in eight different playgrounds, natural grass, artificial turf, and dirt football fields in the Jeddah region.

**Inclusion criteria**

Saudi, male subjects, and the age ranged between 15 and less than or equal 40 years.

**Exclusion criteria**

All persons below 15 years and/or above 40 years were excluded from the study. Also, participants who refused to be involved in the study by answering the questionnaire were excluded too.

**Sample size**

The sample size was designed based on the equation with a margin error of 5% and a confidence level of 95%.\(^11\) Accordingly, the study was supposed to include 400 subjects.

**Sampling technique**

The Jeddah region was divided to four parts as North, South, East, and West and then two random different playgrounds, natural grass, artificial turf, and dirt football or rubbery court fields from each part. A total of 100 subjects were randomly chosen using multiple stratified random sampling techniques from each part.

**Data collection tool (instrument)**

The study was carried out using a structured questionnaire which consists of four parts. The first part consists of information regarding socio-demographic variables of included subjects (age, level of education, marital status, occupation), in addition to information regarding practicing physical activity. Section 2 consists of questions to assess awareness and knowledge of ACL. The third part includes questions to assess the prevalence and determinants of ACL as well as description of cases. The fourth part used the Arabic version of the Lysholm Knee Score (LKS)\(^12\) to assess the impact of ACL injury on patients’ daily life. It is divided into eight sub-scales assessed limping (5 marks), need for support (5 marks), instability (25 marks), catching (15 marks), pain (25 marks), stair climbing (10 marks), swelling (10 marks), and squatting (5 marks). The total score is the sum of each response to the eight questions and ranges between 0 and 100. Higher scores indicate better quality of life.\(^13-18\)

The knowledge score was computed in the way that correct answers were given a score of “1” and incorrect or missing answers were given a score of “0”. The total score and score percentages were computed for each participant. Participants scoring below 50% were considered having “inadequate knowledge,” whereas those scoring 50% and above were considered having “adequate knowledge.”
**Ethical consideration**

The proposal was submitted to the research ethical committee, and permission was taken from the Joint Program of Family Medicine, Jeddah. A letter was attached to each questionnaire, and it was emphasized that confidentiality of personal data was granted to all participants by the researcher. Verbal consent was taken from each participant.

**Data entry and analysis**

All data were coded and entered to Statistical Package for Social Sciences software version 26. (SPSS Inc., Chicago, IL, USA). Description of data was performed utilizing the frequency and percentage for categorical variables and the mean and standard deviation (SD) for numerical variables. Chi-square test or Fischer Exact test (in the case of small frequencies) was applied to investigate for the association and/or difference between categorical variables. Unpaired t-test was used to compare arithmetic means of a continuous variable between two different groups. Data of LKS were tested for normality using Shapiro Wilk test, and because data were abnormally distributed as evidenced by a P value of 0.001, non-parametric statistical tests were used for comparisons. Mann–Whitney test was used to compare percentage of knowledge score between two groups, and Kruskal–Wallis test was applied to compare LKS between more than two groups. The statistical significance level was determined at \( P < 0.05 \).

**Results**

**Socio-demographic characteristics**

The study included 320 participants out of targeted 400 with a response rate of 80%. Table 1 summarizes their socio-demographic characteristics. Their age ranged between 15 and 40 years with an arithmetic mean of 27.9 and an SD of ±6.8 years. The majority of them were males (97.8%). More than half of them (58.1%) were at least university graduated, being full-time employees (55.9%) and singles (54%). Approaching half of them (47.8%) were either overweight (30.9%) or obese (15.9%).

**History of physical activity**

The history of usual practice of sports was reported by the majority of the participants (88.1%). Among them, the level of physical activity was average and high among 32.3% and 57.1%, respectively. Approximately half (49.6%) of the participants reported less than 5 hours, whereas 16.3% reported more than 10 hours of weekly training.

**Awareness and knowledge about ACL**

The majority of the participants (91.9%) reported hearing about ACL. From Table 2, it is obvious that regarding the ACL risk factors, the majority of the participants (84.4%) could recognize physical activities, whereas only 23.4% and 19.4% could recognize lifting heavy objects and car accidents, respectively. Regarding the participants’ knowledge about the factors increasing the rate of ACL tear during physical activities, the lack of warming and unsuitable playgrounds/shoes were known by 65.6% and 63.7% of the participants, respectively, whereas the majority of them (89.4%) could recognize that decreased walking was not a factor increasing the rate of ACL tear. Concerning a suitable way

**Table 1: Socio-demographic characteristics of the participants**

| Frequency | Percent |
|-----------|---------|
| Gender    |         |
| Male      | 313     | 97.8  |
| Female    | 7       | 2.2   |
| Age in years |     |
| Range     | 15-40   |       |
| Mean±SD   | 27.9±6.8|       |
| Educational level |   |
| High school/ below | 105 | 32.8  |
| Diploma   | 29      | 9.1   |
| Bachelor  | 147     | 45.9  |
| Post-graduate | 39 | 12.2  |
| Occupation |         |
| Students  | 85      | 26.6  |
| Full-time employee* | 179 | 55.9  |
| Not working* | 29 | 9.1   |
| Partial time employee* | 27 | 8.4   |
| Marital status |       |
| Single    | 173     | 54.0  |
| Married   | 142     | 44.4  |
| Divorced  | 5       | 1.6   |
| Body mass index |     |
| Underweight | 21 | 6.6   |
| Normal    | 149     | 46.6  |
| Overweight | 99 | 30.9  |
| Obese     | 51      | 15.9  |

*In other than sport fields

**Table 2: Response of the participants to ACL knowledge statements**

| Correct answer | Frequency | % |
|----------------|-----------|---|
| Risk factors for ACL tear |                   |
| Physical activities (Yes) | 270 | 84.4 |
| Car accidents (Yes) | 62 | 19.4 |
| Overweight (Yes) | 146 | 45.6 |
| Lifting heavy objects (Yes) | 75 | 23.4 |
| Factors increasing the rate of ACL tear during physical activities |                   |
| Lack of awareness about protective measures (Yes) | 170 | 53.1 |
| Lack of warming up (Yes) | 210 | 65.6 |
| Lack of fitness (Yes) | 160 | 50.0 |
| Unsuitable playground/shoes (Yes) | 204 | 63.7 |
| Decreased walking (No) | 286 | 89.4 |
| Suitable way to reduce pain |                   |
| Rest (Yes) | 206 | 64.4 |
| Applying ice on the trauma site (Yes) | 234 | 73.1 |
| Applying hot fomentation on the trauma site (No) | 278 | 86.9 |
| Prescribed medications (Yes) | 138 | 43.1 |
| Herbal/alternative medicine (Yes) | 28 | 8.8 |
to reduce pain, applying ice on the trauma site was recognized by 73.1% of the participants, whereas the rest was recognized by 64.4% of them. The majority of the participants correctly knew that applying hot fomentation on the trauma site was not a suitable way to reduce pain. Overall, the level of adequate knowledge about ACL was observed among most of the participants (70.3%).

Table 3 shows that the only factor significantly associated with the level of participants’ knowledge about ACL was the level of physical activity. Most of the participants who reported high (73.2%) or average (74.1%) of physical activity compared to only 52.1% of those who reported a low level of physical activity expressed an adequate level of knowledge about ACL, *P* = 0.011.

### ACL injury

The history ACL injury was mentioned by 14.7% of the participants. ACL injury was reported among 18.2% and 17.6% of overweight and obese subjects, respectively, compared to 13.4% of normal subjects and none of underweight subjects, *P* = 0.042. ACL injury was reported among 21.3% of the participants who had >10 weekly training hours compared to 10.9% among those who reported <5 weekly training hours, *P* = 0.034. Other studied factors (age, gender, educational level, occupation, marital status, usual practice of sports, and level of ACL knowledge) were not significantly associated with ACL injury [Table 4].

### Description of the ACL injury

Table 5 presents a full description of cases which reported the history of ACL injury. The duration since injury exceeded 2 years among 46.8% of the cases. It affected the right knee in most of the cases (63.8%). Most of the playgrounds at the

### Table 3: Factors associated with the level of knowledge about ACL among the participants

| Knowledge about ACL | P | Inadequate n=95 (% | Adequate n=225 (%) |
|---------------------|---|-------------------|-------------------|
| Gender              |   |                   |                   |
| Male (n=313)        |   | 92 (29.4)         | 221 (70.6)        |
| Female (n=7)        |   | 3 (42.9)          | 4 (57.1)          |
| Age in years        |   |                   |                   |
| Mean±SD             |   | 26.9±7.3          | 28.4±6.5          |
| Educational level   |   |                   |                   |
| High school (n=105) |   | 37 (35.2)         | 68 (64.8)         |
| Diploma (n=29)      |   | 5 (17.2)          | 24 (82.8)         |
| Bachelor (n=147)    |   | 45 (30.6)         | 102 (69.4)        |
| Post-graduate (n=39)|   | 8 (20.5)          | 31 (79.5)         |
| Occupation          |   |                   |                   |
| Students (n=85)     |   | 76 (89.4)         | 9 (10.6)          |
| Full-time employee  |   | 147 (82.1)        | 32 (17.9)         |
| Not working (n=29)  |   | 24 (82.8)         | 5 (17.2)          |
| Partial time        |   | 23 (85.2)         | 4 (14.8)          |
| employees (n=27)    |   |                   |                   |
| Marital status      |   |                   |                   |
| Single (n=173)      |   | 150 (86.7)        | 23 (13.3)         |
| Married (n=142)     |   | 116 (81.7)        | 26 (18.3)         |
| Divorced (n=5)      |   | 4 (80.0)          | 1 (20.0)          |
| Body mass index     |   |                   |                   |
| Underweight (n=21)  |   | 7 (33.3)          | 14 (66.7)         |
| Normal (n=149)      |   | 41 (27.5)         | 108 (72.5)        |
| Overweight (n=99)   |   | 29 (29.3)         | 70 (70.7)         |
| Obese (n=51)        |   | 18 (35.3)         | 33 (64.7)         |
| Usual practice of sports | | | |
| No (n=38)           |   | 14 (36.8)         | 24 (63.2)         |
| Yes (n=282)         |   | 81 (28.7)         | 201 (71.3)        |
| Level of physical activity | | | |
| Low (n=48)          |   | 25 (47.9)         | 25 (52.1)         |
| Average (n=108)     |   | 28 (25.9)         | 80 (74.1)         |
| High (n=164)        |   | 44 (26.8)         | 120 (73.2)        |
| Weekly training hours |   |                   |                   |
| <5 (n=175)          |   | 55 (31.4)         | 120 (68.6)        |
| 5-10 (n=98)         |   | 26 (26.5)         | 72 (73.5)         |
| >10 (n=47)          |   | 14 (29.8)         | 33 (70.2)         |

*Chi-square test, **Fisher Exact test, *Unpaired t-test*

### Table 4: Factors associated with ACL injury among the participants

| ACL injury | P | No n=273 (% | Yes n=47 (% |
|------------|---|------------|------------|
| Gender     |   |            |            |
| Male (n=313)|   | 267 (83.3) | 46 (14.7)  |
| Female (n=7)|   | 6 (85.7)   | 1 (14.3)   |
| Age in years |   | 27.8±7.0 | 28.7±5.5 |
| Educational level |   | 0.068* | 0.393* |
| High school (n=105) |   | 94 (89.5) | 11 (10.5) |
| Diploma (n=29) |   | 25 (86.2) | 4 (13.8)  |
| Bachelor (n=147)|   | 121 (82.3)| 26 (17.7) |
| Post-graduate (n=39)|   | 33 (84.6)| 6 (15.4)  |
| Occupation |   |            |            |
| Students (n=85) |   | 78 (91.8) | 7 (8.2)   |
| Full-time employee (n=179) |   | 147 (82.1) | 32 (17.9) |
| Not working (n=29) |   | 25 (82.8) | 4 (13.8)  |
| Partial time employee (n=27) |   | 23 (85.2) | 4 (14.8)  |
| Marital status |   |            |            |
| Single (n=173) |   | 152 (87.9) | 21 (12.1) |
| Married (n=142) |   | 117 (82.4) | 25 (17.6) |
| Divorced (n=5) |   | 4 (80.0)   | 1 (20.0)  |
| Body mass index |   |            |            |
| Underweight (n=21) |   | 21 (100) | 0 (0.0)   |
| Normal (n=149) |   | 129 (86.6) | 20 (13.4) |
| Overweight (n=99) |   | 81 (1.8) | 18 (82.2) |
| Obese (n=51) |   | 42 (82.4) | 9 (17.6)  |
| Usual practice of sports | | | |
| No (n=38) |   | 35 (92.1) | 7 (7.9)   |
| Yes (n=282) |   | 238 (84.4) | 44 (15.6) |
| Level of physical activity |   |            |            |
| Low (n=48) |   | 43 (89.6) | 5 (10.4)  |
| Average (n=108) |   | 95 (88.0) | 13 (12.0) |
| High (n=164) |   | 135 (82.3) | 31 (17.7) |
| Weekly training hours |   |            |            |
| <5 (n=175) |   | 156 (89.1) | 19 (10.9) |
| 5-10 (n=98) |   | 80 (81.6) | 18 (18.4) |
| >10 (n=47) |   | 37 (78.7) | 10 (21.3) |
| Level of ACL knowledge | | | |
| Inadequate (n=95) |   | 80 (84.2) | 15 (15.8) |
| Adequate (n=225) |   | 193 (85.8) | 32 (14.2) |

*Chi-square test, **Fisher Exact test, *Unpaired t-test*
time of injury were either artificial turf (44.7%) or dirt football fields (34%). The majority of the cases (97.9%) reported injury caused by sport-related activities, and the injury damaged the knee structure (83%). Most of the cases (70.2%) reported surgical repair of injury, mainly inside the KSA (87.9%). The duration between injury and operative repair exceeded 6 months among 36.3% of cases. Most of the cases (78.8%) reported returning to practice sports after surgery. However, about two-thirds (65.4%) of them reported practicing sports not as the same before surgery. The main reason for not returning to practice sports after surgery was the fear of recurrence (57.1%). Regarding diagnosis of ACL injury cases, the majority of cases (91.5%) were diagnosed in a hospital and by orthopedic surgeons (87.3%) through magnetic resonance imaging (MRI) (83%). ACL injury was direct in 66% of the cases, whereas it was indirect in the remaining 34%.

### Impact of ACL injury on patients’ daily life

Assessment of the impact of ACL injury on patients’ quality of life was performed using LKS. Data were available in 42 patients. The total score ranged between 21 and 100 with a median (inter-quartile range) of 82.5 (57–91) as shown in Figure 1. None of the studied factors was significantly associated with total LKS.

### Discussion

ACL injuries are a common problem in athletes associated with several symptoms including severe pain, joint effusion, impaired movement, weakness of muscles, and reduced performance. They are preventable by awareness of the athletes regarding the risk factors that lead to ACL damage as well as preventive mechanisms. Additionally, its early discovery and providing proper treatment are essential for improving the quality of life of affected persons. Therefore, this study was carried out mainly to assess the awareness and knowledge of the young adult athletes (15–40 years) practicing football in Jeddah avenues regarding ACL rupture and its determinants among them.

### Awareness and knowledge about ACL

In the current study, the majority of the participants (91.9%) reported hearing about ACL, and the level of adequate knowledge about it was observed among most of the participants (70.3%).

| Table 5: Description of ACL injury among the participants (n=47) |
|---------------------------------------------------------------|
| **Duration since injury**                                      |
| ≤2 years                                                      | 25  53.2 |
| >2 years                                                      | 22  46.8 |
| **Affected knee**                                             |
| Right                                                        | 30  63.8 |
| Left                                                         | 10  21.3 |
| Both                                                        | 7   14.9 |
| **Nature of the playground at the time of injury**            |
| Dirt football field                                          | 16  34.0 |
| Natural grass                                                | 6   12.8 |
| Artificial turf                                              | 21  44.7 |
| Rubber flooring                                              | 4   8.5 |
| Injury caused by sport-related activities                     | 46  97.9 |
| Injury damaging the knee structures                          | 39  83.0 |
| History of therapy for the injury                            | 27  57.4 |
| Warming and lengthening training before playing at the time of injury | 43  91.5 |
| **Surgical repair**                                          | 33  70.2 |
| If yes (n=33), where                                         |
| Inside KSA                                                   | 29  87.9 |
| Outside KSA                                                 | 4   12.1 |
| **Duration between injury and operative repair (months)**    |
| ≤1                                                          | 6   18.2 |
| 2-6                                                         | 15  45.5 |
| >6                                                          | 12  36.3 |
| **Returning to practice sports after surgery**               |
| No                                                          | 7   21.2 |
| Yes                                                         | 26  78.8 |
| **Practicing sports was the same as before surgery? (n=26)** |
| No                                                          | 17  65.4 |
| Yes                                                         | 9   34.6 |
| **Reasons for not returning to practice sports after surgery (n=7)** |
| Fear of recurrence                                          | 4   57.1 |
| Carelessness                                                | 2   28.6 |
| No enough time                                              | 1   14.3 |
| **Place of the diagnosis**                                   |
| Primary healthcare center's clinic                           | 4   8.5 |
| Hospital                                                    | 43  91.5 |
| **Specialty of the diagnosing physicians**                   |
| General practitioner                                        | 5   10.6 |
| Emergency physician                                         | 1   2.1 |
| Orthopedic surgeon                                         | 41  87.3 |
| **Method of diagnosis**                                     |
| Plain X-ray                                                 | 1   2.1 |
| Computed tomography scan                                    | 7   14.9 |
| Magnetic resonance imaging                                  | 39  83.0 |
The only factor that indicated a high level of participants’ knowledge about ACL was the high level of practicing physical activity. In another Saudi study, 84% of the participants were aware of ACL injury and its seriousness. Mather et al. reported that ACL injury can lead to a considerable impairment of knee functions and disability and, consequently, impairment of quality of life of affected individuals. Therefore, increasing awareness of the general public about it is highly recommended.

In this study, 84.4% of the athletes could recognize the role of physical activity as the main risk factor. In another Saudi study, only 48.1% of the college students could recognize that. The difference is mainly because of the nature of the participants in both studies.

**Prevalence rate of ACL injury**

In the present study, the history of ACL injury was mentioned by 14.7% of the athletes with no gender difference. Comparable rates have been reported in other studies carried out in Saudi Arabia (10.3%) and India (13.5%). However, higher rates were reported in studies carried out locally in Riyadh (23.2%) and UK (31.8%). Moreover, the prevalence rate reported in the current study falls within the worldwide prevalence ranging between 10 and 25% as documented by a systematic review published by Louw QA et al. (2008), which included 19 studies. A study carried out among students of Physical Education College at Umm Al-Qura University reported a prevalence rate of 5.3%. Other studies reported predominance of ACL injury among female athletes compared to males.

**Factors associated with ACL injury**

Because the present study was conducted among athletes aged between 15 and 40 years, the history of usual practice of sports was reported by the majority of the participants (88.1%), and among them, the level of physical activity was high among 57.1%. However, approximately half (49.6%) of them reported less than 5 hours of practicing sports per week. In another Saudi study carried out among college students aged between 18 and 25 years in Riyadh, more than half of the participants practice sports for 1 h or less per week. The difference between both studies is apparently because of the nature of the participants (athletes versus college students).

In the present study, the majority of the cases of ACL injury (97.9%) reported injury caused by sport-related activities. In other studies carried out in Riyadh (Saudi Arabia), USA, and UK, sport-related activities and participants’ competitive sports were more likely to result in ACL injury as shown in the current study. Moreover, the ACL injury damaged the knee structure in the majority of the cases (83%). The same has been reported in some other studies that showed that ACL injury was mostly accompanied by other knee structural injuries.

The present study in accordance with others reported an association between overweight and obesity from one side and ACL injury from the other side. This can be explained by the increased mechanical load on knee joints during practicing of physical activity.

In the present study, the mechanism that led to ACL injuries was mainly a direct one (66%). This contradicts what has been reported by others that is, a non-contact mechanism was the main mechanism of ACL injury. We have no clear explanation for this finding; however, again our study was carried out among athletes, whereas other studies were carried out among college students.

**Outcome of ACL injury**

In the present study, 70.2% of the cases of ACL injury reported repair by surgery. This figure is far away from that reported among college students in Riyadh (10%) as most of the cases were treated conservatively by analgesics, physical therapy, and knee braces. Also, another USA study reported a rate of 21% for surgical repair, and the management was mainly conservative. The difference could be attributed to the fact that we included only athletes in the present study, where the injury might be more severe and needs surgical intervention. Waldén et al. documented that ACL injury is quiet less severe in the general population compared with athletes.

In the current study, most of the cases (78.8%) reported returning to practice sports after surgery. However, about two-thirds (65.4%) of them reported practicing sports not as the same before surgery. The main reason for not returning to practice sports after surgery was the fear of recurrence. Similarly in other studies, most of the cases who underwent surgery were unable to return to their level of activity prior to the injury. However, a recent Saudi study reported that most of the ACL-injured persons returned to normal (40.5%) or nearly normal activities (39.2%) after the injury.

**Study limitations**

Some limitations of the present study should be addressed. The tool used was a self-report survey; therefore, we could not verify the accuracy of participants’ responses. Also, the cross-sectional design applied in this study allows only testing the association and documenting defective points concerning knowledge about ACL injury among athletes as well as those who are at a higher risk for injury and the impact of injury on their quality of life.

**Conclusion and recommendations**

Awareness and knowledge of ACL among athletes in Jeddah, Saudi Arabia, are encouraging, although some risk factors were not well known, such as car accidents, overweight, lifting heavy
objects, and falling from high places. The rate of ACL injury among them is within the world wide range. It affects mainly overweight/obese subjects and those who reported higher training weekly hours. Surgical repair was carried out among a considerable portion of the affected athletes, mainly performed inside Saudi Arabia. Most of the injured cases who underwent surgery reported returning to practice sports after surgery. However, most of them reported practicing sports not as the same before surgery. The quality of life of injured athletes was high, irrespective of demographic as well as physical factors and the history of surgical repair.

**Therefore, we recommended**

- Health education is needed to improve knowledge of athletes as well as the general population regarding risk factors for developing ACL injury.

- Preventive measures for ACL injury should be well known and implemented among athletes to decrease more the rate of ACL injury among them.

- Further larger and more comprehensive study is recommended to understand well the true situation.

- Inclusion of more females in further study as it has been documented that they are more affected than males.

- Healthcare workers and researchers should be encouraged to look for factors that can reduce the rate of such injuries to prevent the long-term physical and economic outcomes.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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