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Research Article

**POPULATION AWARENESS OF THE ANTERIOR
CRUCIATE LIGAMENT INJURY IN THE SOUTHERN
REGION****Omar Saeed Alshahrani, Ashaq Mubarak Alqahtani, Rakan Mahdi Aldosri,
Waleed Mohammed Aldawsari, Mubarak Barrak Aldosari, Saeed Saad Alshahrani**
Najran University, Najran, Saudi Arabia**Article Received:** October 2019 **Accepted:** November 2019 **Published:** December 2019**Abstract:**

Background: anterior cruciate ligament injury is a serious medical problem that can increase morbidity and reduce the quality of life of patients. Although people practicing sports are at the highest risk of injury, other people are still at significant risk. Hence, the awareness of the general population towards the anterior cruciate ligament injuries is crucial.

Objective: This survey analysis aims to explore the population perception of anterior cruciate ligament injury in the southern region, Saudi Arabia.

Design and Setting: A self-administered structured questionnaire was distributed to the general public in the southern region, Saudi Arabia. The questions were in Arabic. The survey consists of sections including the socio-demographic variables, in addition to questions about population perception and practices related to anterior cruciate ligament injury. Data analysis was done through SPSS program version 24.

Results: 549 participants fully responded to the questionnaire. Individuals aging between 18 and 24 years old showed significantly (P -value <0.001) higher knowledge (64.7%). Males showed a significantly higher level of knowledge (P -value <0.001) (71.1%). Furthermore, Non-Saudi responders showed significantly better (P -value <0.001) level of knowledge (75%), and responders who had higher educational levels had a significantly higher level of knowledge compared to other educational levels (75%). The Internet was the most important source of information (15.3%), and rest was the most important strategy to reduce pain (39.7%).

Conclusion: The awareness of the Saudi public in the southern region is considered satisfactory; further studies in other regions in the kingdom are mandatory to figure out the awareness of the Saudi population as a whole.

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INTRODUCTION:

Anterior cruciate ligament injury is regarded as one of the common and major injuries, especially in sportsmen [1]. The frequency of anterior cruciate ligament injury in developed countries is estimated to reach two hundred thousand cases per year [2]. Moreover, anterior cruciate ligament injury is more common in young adult and adolescent population, which represents a critical economic burden on the community [3].

Most of the patients, who have anterior cruciate ligament injury, will require an operation for reconstruction of anterior cruciate ligament in addition to physiotherapy and rehabilitation protocol [4]. Most of the patients can return to their normal life and practicing sports after completing their treatment course [5]. However, it has been reported that almost half of the patients who have anterior cruciate ligament injury will progress into knee osteoarthritis in the long term, regardless of the treatment protocol [6].

Because of the increasing population who are at risk of anterior cruciate ligament injury, there is an urgent requirement for protocols and strategies to reduce the incidence of this injury [7]. This is mainly achieved by improving the awareness of the general population about the risk factors of anterior cruciate ligament injury, the ways of prevention, as well as strategies to treat this injury [8].

Previous reports have shown that training programs and awareness campaigns about anterior cruciate ligament injury among young adults who play sports can significantly reduce the incidence of anterior cruciate ligament injury, especially among females [9]. Additionally, it has been shown that the level of knowledge of sportsmen about anterior cruciate ligament injury is unsatisfactory [10].

However, the development of awareness programs and campaigns is mainly dependent on the baseline level of knowledge of the population about the injury [11]. Yet till present, there is a scarcity of data about the awareness of the general population about the risk factors and prevention of anterior cruciate ligament injury, particularly in developing countries [12].

Therefore, the aim of this study is to assess the population awareness towards anterior cruciate ligament injury in the southern area, Saudi Arabia.

PATIENTS AND METHODS

Study design:

This is a cross-sectional, qualitative prospective study that was performed in the Southern region, Saudi Arabia. Only adult participants aging 18 years old and older who filled the survey were

included in the analysis.

Data collection:

A self-developed questionnaire was distributed to the general public in the Southern region, Saudi Arabia, aging 18 years old and older. The questions were in the Arabic language because all of the participants were native Arabic speakers. The survey consists of questions identifying socio-demographic variables, in addition to questions about population perception and practices related to anterior cruciate ligament injury.

Statistical analyses:

Data were represented in terms of frequencies and valid percentages for categorical variables. Chi-square analysis was used to compare categorical variables between the subgroups. All P values < 0.05 were considered statistically significant. IBM SPSS (Statistical Package for the Social Science; IBM Corp, Armonk, NY, USA) was used to perform all statistical calculations, version 24 for Microsoft Windows.

Ethical considerations:

Institutional research ethics board approval was acquired from the ethical committee before conducting any study procedure. Confidentiality was assured to all participants who agreed to participate in the study. The respondents were given a brief description of the study and its objectives.

RESULTS:

Five hundred and forty-nine participants responded to this online questionnaire. Only participants who responded to all the questions in the survey were included in the analysis. Socio-demographics of participants and analysis of the questionnaire are shown below.

General Characters of responders:

Out of 549 participants, age was subcategorized into four groups, starting with less than 18 years old and ending with more than 45 years old. Most of the responders (63.5%) belonged to the age group between 18 and 24 years old. On the other hand, the age group who were more than 45 years old had the least number of responses, with only 1.1% of responses.

Turning to the gender of participants, males constituted 48.7% of participants, while females were 50.4 %. The educational level was also evaluated. 0.7% had a Ph.D., while 61.4% had a bachelor's degree. Additionally, 93.3% of the responders were Saudi, and 91% were employed. All socio-demographic data is shown in detail in table 1.

Table 1. Socio-demographic characters of participants.

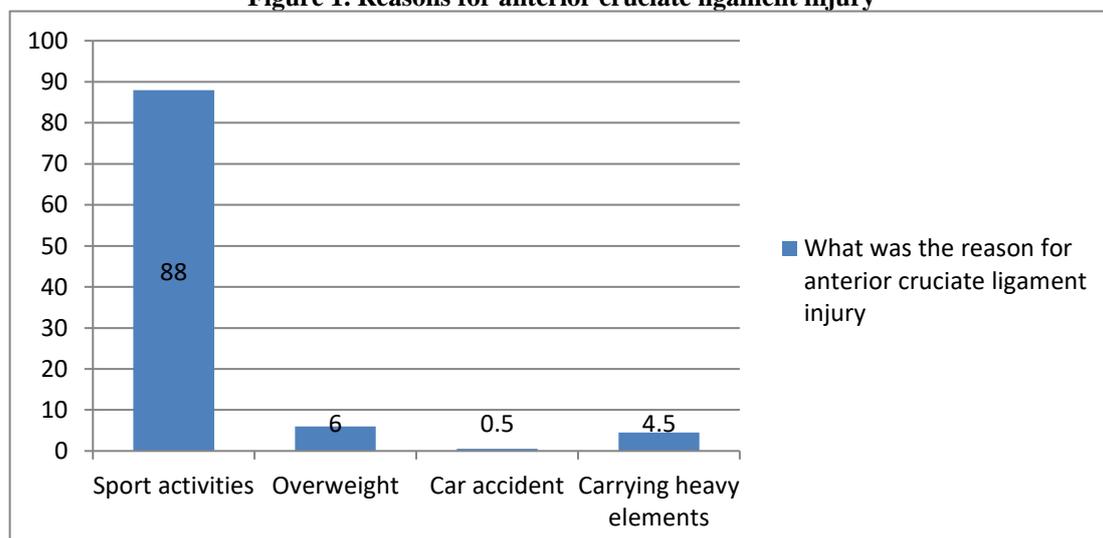
	Frequency (N)	Percent (%)
Gender		
Female	279	50.4
Male	270	48.7
Age		
< 18	39	7.0
18 -24	352	63.5
25- 45	156	28.2
> 45	6	1.1
Educational level		
Secondary	138	24.9
Bachelor	340	61.4
Diploma	48	8.7
PhD	4	.7
MSc	19	3.4
Nationality		
Saudi	517	93.3
Non-Saudi	36	6.5
Employment status		
Employed	493	91
Unemployed	61	11.0

Additionally, the participants were asked about their awareness of anterior cruciate ligament injury. 63% of the responders were aware of the injury, and 50.5% were playing sports. Yet, only 5.6% had a previous anterior cruciate ligament injury. All responses are detailed in table 2.

Table 2. Awareness and history of anterior cruciate ligament injury

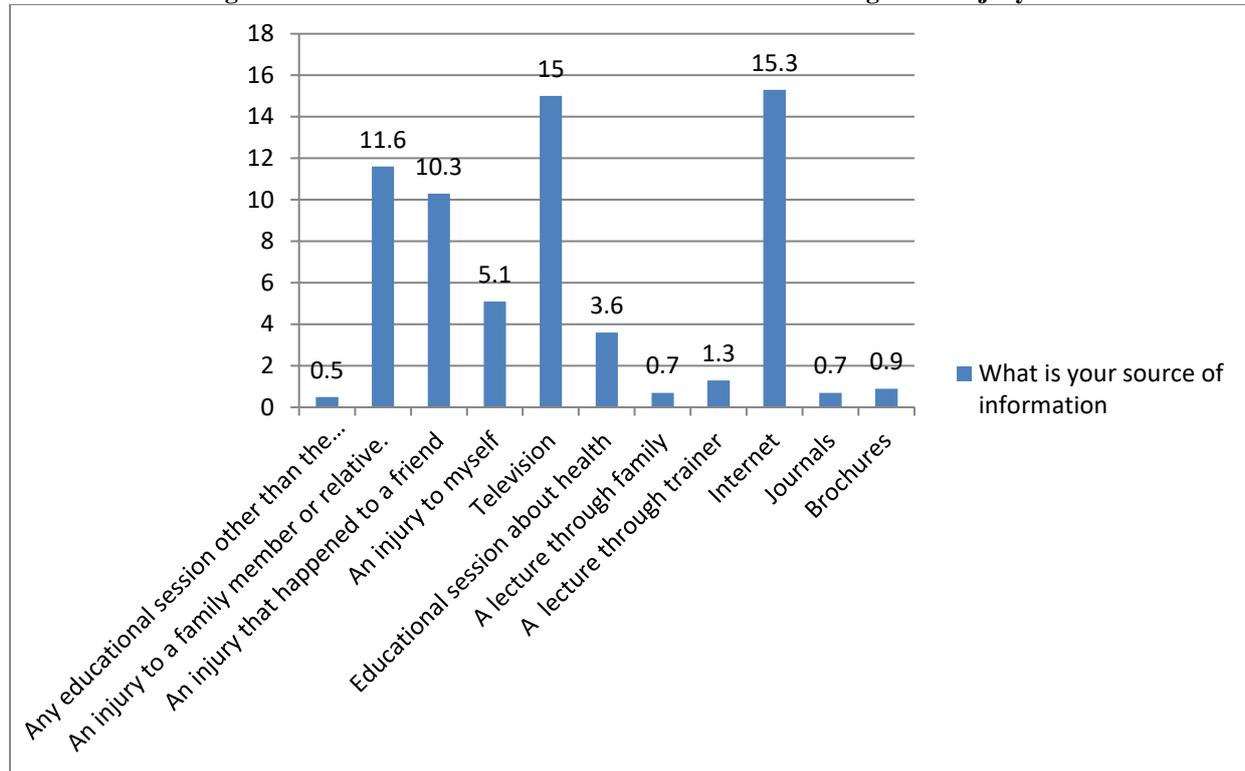
		Frequency (N)	Percent (%)
Among the knee injuries, are you aware of anterior cruciate ligament injury	No	202	36.5
	Yes	349	63.0
Do you play sports	No	267	48.2
	Yes	280	50.5
Did you have cruciate ligament injury previously	No	518	93.5
	Yes	31	5.6

Participants were also asked about the cause of their anterior cruciate ligament injury. The most common cause of injury was playing sports (88%), while the least common cause was car accidents, as expressed by 0.5% of the participants. All responses are shown in figure 1.

Figure 1. Reasons for anterior cruciate ligament injury

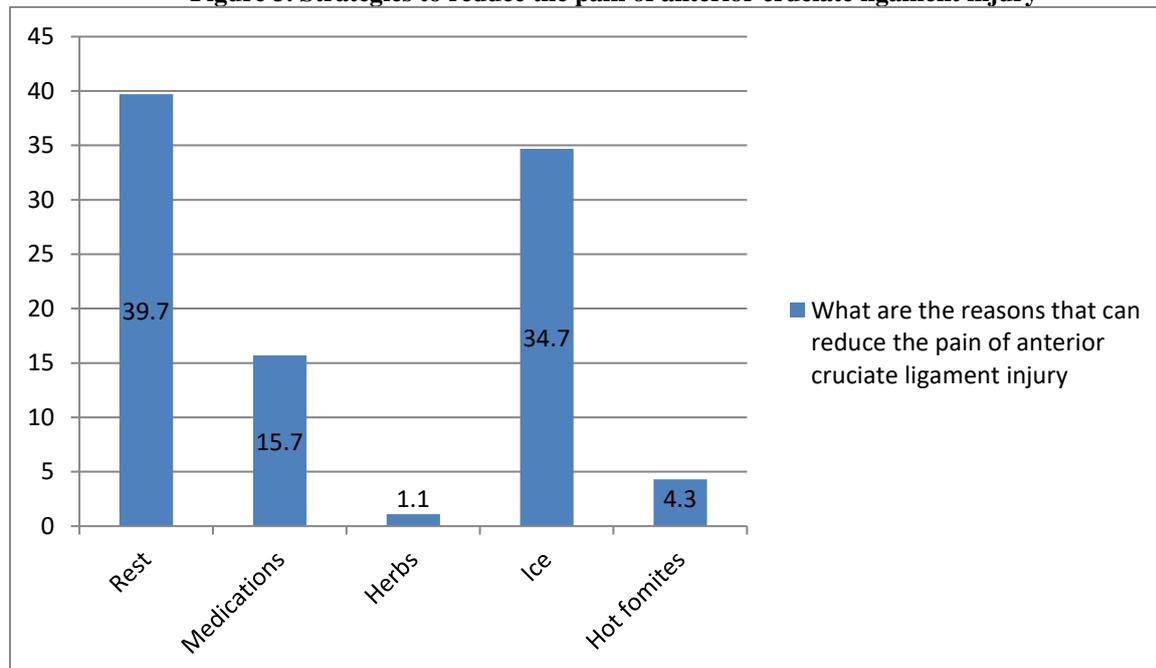
Participants were also asked about their source of information about anterior cruciate ligament injury. The Internet came on the top of the list, with 15.3% of participants depending mainly on it. Following the internet, television was the second most common source of information (15%). Other significant sources were previously injured to a family member or a friend. All responses are illustrated in figure 2.

Figure 2. Sources of information about anterior cruciate ligament injury



Turning to pain reduction, participants were asked about their opinion towards interventions that can reduce the pain of anterior cruciate ligament injury. 39.7% of the responders mentioned rest as the most important strategy to reduce pain, while 1.1% thought that herbs could reduce pain, as shown in figure 3.

Figure 3. Strategies to reduce the pain of anterior cruciate ligament injury



Finally, responders were asked if they have information about anterior cruciate ligament. Responses were then compared over different demographic variables, including age, gender, nationality, and educational level. The comparison was carried out using the Chi-square test, at the level of significance p-value <0.05.

The comparison revealed that responders in the age group between 18 and 24 years old showed significantly (P-value <0.001) higher knowledge compared to other age groups (64.7%). Also, males showed a significantly higher level of knowledge (P-value <0.001) compared to females (71.1%).

Furthermore, Non-Saudi demonstrated significantly better (P-value <0.001) level of knowledge compared to Saudi responders (75%), and responders who had a higher educational level (Ph.D.) had a significantly higher level of knowledge compared to other educational levels (75%). All comparisons are detailed in table 3.

Table 3. Comparison of knowledge about anterior cruciate ligament injury

		No	Yes	P-value
Age	< 18	56.4%	43.6%	<0.001*
	18 -24	34.4%	65.1%	
	25- 45	35.3%	64.7%	
	> 45	66.7%	33.3%	
Gender	Female	44.4%	55.2%	<0.001*
	Male	28.5%	71.1%	
Nationality	Saudi	37.3%	62.3%	<0.001*
	Non-Saudi	25.0%	75.0%	
Educational level	Secondary	46.4%	52.9%	<0.001*
	Bachelor	32.1%	67.6%	
	Diploma	37.5%	62.5%	
	PhD	25.0%	75.0%	
	MSc	47.4%	52.6%	

*P-value at a level of significance <0.05

DISCUSSION:

Anterior cruciate ligament injury is considered a serious injury, especially in the youth population [13]. The injury can significantly reduce the morbidity of patients, which have a negative influence on their quality of life [2, 7]. However, anterior cruciate ligament injury can be avoided by improving the awareness and knowledge of people at risk towards the risk factors and preventable measures of this type of injury [9, 12].

The present study investigated the perception of the Saudi public towards risk factors and prevention of anterior cruciate ligament injury. It was shown that individuals aging between 18 and 24 years old showed significantly (P-value <0.001) higher knowledge compared to other age groups (64.7%). Also, males showed a significantly higher level of knowledge (P-value <0.001) compared to females (71.1%).

Furthermore, Non-Saudi demonstrated significantly better (P-value <0.001) level of knowledge compared to Saudi responders (75%), and responders who had higher educational levels (Ph.D.) had a significantly higher level of knowledge compared to other educational levels (75%). Regarding sources of information about anterior cruciate ligament injury, Internet was the most important source of information (15.3%), and rest was regarded as the most important strategy to reduce pain (39.7%).

The perception of anterior cruciate ligament injury has been evaluated in different settings. A qualitative piece of research was carried out by

Matava et al. [14], which questioned the perception of the public about the reconstruction of anterior cruciate ligament injury. Matava et al. [14] used a forty-three question structured questionnaire to evaluate the knowledge of the participants about the injury. Two hundred and ten participants responded to the survey [14].

Matava et al. [14] revealed that the knowledge of the general public in the united states was greatly variable, Matava et al. [14] also showed that the public might have some misconception particularly in relation to return of injured individuals to their normal life, in terms of playing sports and general mobility [14].

Similarly, the present study showed that there was a variation in the level of knowledge of the responders towards, where this variation was correlated to age, gender, nationality, and educational level. Additionally, the number of responders in the present work was almost double the sample size in Matava et al. [14] study, which increases the reliability of our work.

Another study was carried out in the Japanese population by Nagano et al. [15]. The study included a questionnaire to evaluate the knowledge and perception of the general public about the anterior cruciate ligament injury [15]. Nagano et al. [15] demonstrated that television was the main source of information for the Japanese people and that the knowledge of the Japanese public towards anterior cruciate ligament injury is satisfactory [15].

Unlike Nagano et al. [15], the present study revealed that the major source of information about

anterior cruciate ligament injury in the Saudi population is the internet, followed by the television. Yet, the awareness of the Saudi population towards anterior cruciate ligament injury is considered satisfactory, as demonstrated by Nagano *et al.* [15].

Also, Bennel *et al.* [16] examined the perception of the Australians and Americans about risk factors and management of anterior cruciate ligament injury. Bennel *et al.* [16] showed that patients required much better education about their injury, especially regarding the long term complications of the injury and their future risk of knee osteoarthritis. In addition, Bennel *et al.* [16] recommended developing educational sessions for patients to improve their awareness about the disease.

In spite of the satisfactory awareness level of the Saudi population about anterior cruciate ligament injury, the present study showed an association between the level of knowledge about the injury and level of education. Therefore, the present study supports Bennel *et al.* [16] proposal of developing educational campaigns, especially in communities with low educational levels.

Additionally, the present study had some limitations; these include the absence of detailed data on the perception of those who had a previous history of anterior cruciate ligament injury about their treatment experience.

Also, the study included responders from the Southern region only, which reduces the external validity of the study, and makes the extrapolation of the findings to other areas difficult. To our knowledge, this is the first study to evaluate the perception towards anterior cruciate ligament injury in the Southern area, Saudi Arabia, among the general population.

CONCLUSION:

The general public in the southern area, Saudi Arabia, showed a satisfactory level of awareness towards anterior cruciate ligament injury. Educational programs and awareness campaigns should be held in high schools, universities, and public events to reduce the incidence of anterior cruciate ligament injury, especially among young adults. Further studies in other regions in the Saudi kingdom should be performed to figure out the real estimation of perception towards anterior cruciate ligament injury.

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