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Anterior Cruciate Ligament (ACL) Injury in Sports: Focusing Elite Athletes Knowledge, Attitude, and Reporting Behavior

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Abstract: The current study was conducted to determine the relationship among knowledge, attitude and reporting behavior of elite athletes, those who were injured of an ACL injury in their sporting career. A sample of n=332 (male=270 (81.30%); female=62 (18.70%)) was selected and participated in the cross-sectional survey. A self-made structured questionnaire was developed and used for the collection of the required information. The collected data was properly tabulated and analyzed with the help of appropriate statistical tests. The analyzed data revealed a moderate correlation of knowledge and attitude with reporting behaviours of elite athletes. Pertaining to attitude towards ACL injury, athletes reported statistically significantly more unsafe attitudes regarding the management of ACL injury during a practice session and competition. The analyzed data revealed that athletes prefer to use play with an ACL in jury a behavior embedded in competitive sports culture. These findings suggest an intentional education program that could the attitude of athletes towards ACL injury.

Key Words: Anterior Cruciate Ligament, Knowledge, Reporting Behavior, Elite Athletes

Introduction

Pakistan is a developing country with having a tiny budget that leaves less space for human, financial, and material resources pertaining to sports and athletes' sports injuries (Ali et al., 2017). By utilization of rarely available resources, we want to get maximum benefit regarding health-promoting activities for the youth of the nation, by bringing improvement in the sports and injuries department which supports the activities to produce an active, healthier, and stronger nation in long run. Ensure the availability of necessary information in the concerned field can be very much advantageous in the inseparable departments of sports and injuries at any level of competition.

In many developed countries of the world like the United States of America (USA) have estimated approximately 200,000 Anterior Cruciate Ligament (ACL) injuries. Currently, however, only Norway, Denmark, and Sweden are those countries having web-based registries, which accurately record nationwide ACL reconstruction, presumably reflecting the occurrence of ACL injuries (Granan et al, 2009). In another study, it is found that 350,000 ACL reconstructions are performed annually in the USA (Wojtys et al., 2010). Another study shows that around 150,000 Anterior Cruciate Ligament (ACL) injuries occurred annually in the sports-related population in the United States of America (Mihata et al., 2006). Universally, sports injuries are considered one of the factors effecting athlete performance in the shape of physical, mental as well as sociological, and economic loss. The majority of sports injuries are associated/ concerned with major sports events such as football, rugby, netball, etc (Finch et al, 1998).

In Pakistan, it is reported that sports are significantly affected by injuries particularly ACL injury. A study of 67 badminton players about 53.73% of players got an injury in the right knee while 46.26 %

have on the left. Damage to Anterior Cruciate Ligament (ACL) nearly 38.81% of the players were injured during the hot weather while 61.19% during the cold-weather climate. The majority of the players 92% was reported that the injured intrinsically while only 8% of players injured extrinsically with collision. Among injured players, only 42% utilized the X-ray procedure in the diagnosis of the accurate pace of injury. About 76.9% got the physiotherapy while only 23.1% did not as rehabilitation (Shah, Ansari, & Jhatial 2018).

Sports are considered as physically-oriented activities in which injuries are common happening. Different injuries like muscle cramp, muscle soreness, muscle spasm, strain and sprain of ligaments like Anterior Cruciate Ligament Injury occurs in sports participation (Hewett et al, 2005). Sports injuries may be defined as an injury which directly or indirectly results in sports participation. Adversely it affects the physiological and psychological performance of an athlete, to avoid the severity/ seriousness of the injury, it is considered important to provide treatment or to rehabilitate the injured athlete (Van Mechelen et al., 1992). Furthermore, injuries that occur during competitive sport or training, virtually injury can happen to any part of the body and therefore athlete needs a planned approach to properly analyze and efficiently supervise sports injuries (Borg-Stein., 2009; Anderson., 2003). The human body consists of bones and muscles, any injury in the human body occurs when any change in the anatomical or physiological state of the human body caused some tissues or organs damage, which may be external or self-influence, that change leads to disruption of the work function of that tissue (Al Hashemi, 2019).

It has been reported that ACL is the most recurrent injury of the knee ligament which counts for approximately 50% of all injuries of the ligament that happen in all sports (Kendall, 2010). There are numerous injuries in sports and work but one of the most feared is an anterior cruciate ligament tear (ACL), which has finished or derailed the careers of various high-status professional athletes. A rupture in ACL is very painful and can enfeeble a person for quite a few months and maybe for life, although recuperation for some is possible (Brees et al., 2010).

ACL injury typically occurs during sports, such as jumping, pivoting and sudden lateral change occur. Many sports considered to have high rates of ACL injury are football, basketball, lacrosse, soccer, and skiing (Acevedo, Rivera-Vega, Miranda, & Micheo, 2014). This non-contact injury happens more frequently in women athletes (Allen et al., 2016). It is suggesting that the proper knowledge of the use of safety gear, changes to the playing environment and, causative factors for the occurrence of injuries can have a positive effect on the prevention and control of sports injuries (Silvers-Granelli et al., 2015; Deitch et al., 2006).

Yet information alone is not equivalent to behaviour. However, a better understanding is significant in reporting ACL injury, specifically among those individuals who actually have an ACL. In many activities attitude is an important factor (Bagram & Khan, 2012; Raudsepp, Viira, & Hannus, 2012). Basically attitude has two basic components. One is an individual's belief that a particular behavior leads to a certain outcome. Secondly, a person's evaluation of the outcome of that behavior (Register-Mihalik et al., 2013). Therefore, those individuals who have a positive attitude towards ACL may be more likely to take decision while reporting ACL injuries. Furthermore, if they also feel that their colleagues or coaches may challenge their injury reporting or that they may lose significant play time, they can still choose not to report the injury. It shows a negative attitude towards reporting the incident which is a conduct of concern. Such principles not only provide the basis for growing awareness and knowledge but also for addressing attitudes.

Athletes are the real assets of the nation they present a proper image of the nation at the national as well on the international level, hence it is necessary to give them facilities regarding sports-injuries because these injuries become long-lasting with longer recovery periods where some injuries have serious consequences that may lead to the end of the career. Keeping in mind, this research study will facilitate the serious effects of sport injuries. The study focuses on the knowledge, attitude, and reporting behavior of the athlete in Punjab (Pakistan) who are taking part in sports competition at different level toward sports injuries especially ACL injury.

Materials and Methods

The methods and materials portion of the research thesis not only focus on the steps to be taken to examine a research problem but also explains the justification for applying a specific technique used to identify, select, process, and analyze collected information applied to comprehend and understand the problem (Åkerlind, 2012).

As the study is focused on assessing and

describing the knowledge and decision-making behavior of athletes. The researcher was therefore used a cross-sectional survey research design to ensure evidence that could meet the study's set objectives and research questions. The results of the study in quantitative research can be illustrated in tables, graphs and pie charts (Watson, 2015). Consequently, the researcher was adopted a quantitative research design for illustrations of the data in the shape of numeric, graphs, and tables.

Population in research refers to the sum of all objects, subjects or members that adhere to the requirements (Rossi, Wright, & Anderson, 2013). In this study, the population was comprised of athletes of all sports and residential areas, who had Anterior Cruciate Ligament (ACL) injuries of Punjab, Pakistan.

The method of selecting a portion of the whole population, which represents the characteristics of the entire population, is called sampling (Etikan, Musa, & Alkassim, 2016). It is difficult to collect the required data from a whole population within the stipulated time and available financial resources. The researcher therefore was picked a group of athletes, who experienced ACL injuries in the vicinity of Punjab, a province of Pakistan. Snowball sampling is a non-probability sampling in which current subjects of study recruit potential subjects from among their acquaintances. Snowball sampling was used where potential participants was hard to find (Anieting& Mosugu, 2017).

Data in research is any information gathered, observed, generated, or created to validate the original findings of the research (Zohrabi, 2013). The researcher in the present study was collected data through a questionnaire for accordingly obtaining the proposed objectives.

The literature suggests that the two most commonly used survey questionnaires such as closed-ended questionnaire and open-ended questionnaire. Closed-ended questions are usually preferred in survey research, as the frequency of each answer is easy to count (Müller, Sedley, & Ferrall-Nunge, 2014). The closed-ended questionnaire was designed and used to capture the athletes ' awareness and perceptions towards ACL injuries. The closed-ended questionnaire was comprised of the following parts.

i.   Part 1. Questions regarding the demographic profile of the participants.
ii. Part 2. Questions pertaining to attitude and knowledge regarding ACL injuries.
iii. Part 3. Questions about reporting behavior pertaining to ACL injuries.
iv. Part 4. Questions related to influence of athletes' attitude and knowledge on their intention to report ACL injuries.

The extent to which a research instrument measures exactly what it intends to measure is known as validity (Burton & Mazerolle, 2011).

The questionnaire was subjectively checked with the help of content and face validity for clarification and relevancy of the questions. The questionnaire was given to field experts to check for the relevance, unambiguity and clarity of the questions. The supervisor and supervisory committee member was further critically evaluate the questionnaire, and their recommended suggestions was incorporated accordingly.

Reliability refers to the degree to which, under similar circumstances, separate administration of the same instrument produces the same performance (Heale & Twycross, 2015). To ensure the reliability of the data collection instrument, the responses was processed through Cronbach's Alpha reliability method.

The Statistical Package for Social Sciences (SPSS), version 24, was used in this research to explain and demonstrate, condense, collect, and analyze data. Statistical tests like, multiple co-relations and multiple linear regressions were used.

Result and Discussion

Correlation Analysis

Correlation refers to, any empirical relationship between two different variables or different data sets, having a relationship or dependence on each other. Correlation is any quantitative connection in the broadest sense, but it usually refers to the degree to which a pair of variables is related linearly with each other (Cohen et al., 2013).

Table 1. Multiple Correlations

		Knowledge	Attitude	Behavior
Knowledge	Pearson Correlation	1	.428**	.405**

		Knowledge	Attitude	Behavior
	Sig. (2-tailed)		.000	.000
	N	332	332	332
Attitude	Pearson Correlation	.428**	1	.507**
	Sig. (2-tailed)	.000		.000
	N	332	332	332
Behavior	Pearson Correlation	.405**	.507**	1
	Sig. (2-tailed)	.000	.000	
	N	332	332	332

**. Correlation is significant at the 0.01 level (2-tailed).

The above table was established to check the relationship among variable such as knowledge, attitude, and behavior regarding the reporting of ACL injury among athletes their results have been shown in the table. The table 4.1 indicate that the coefficient of correlation between knowledge and behavior is (r =.405 & p = .000) and the coefficient of correlation between attitude and knowledge is (r =.428 & p = .000). Likewise the coefficient of correlation between attitude and behavior of athletes is (r =.507 & p = .000). The analyzed data revealed the attitude of athletes reported higher correlation with behavior compared with knowledge.

Regression Analysis

Analysis of regression is a mathematical approach that allows the researcher to evaluate and interpret the relationship of interest between two or more variables. The approach of regression analysis is designed to execute and explain that, which variables are important and how they affect each other (Cohen et al., 2013).

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.548a	.300	.296	.19587

a. Predictors: (Constant), Attitude, Knowledge

The knowledge and attitude were taken here as the independent variable whereas the reporting behavior was taken as the dependent variable. The table of model summary reports the strength of the relationship between the model and the dependent variable. The "R" in the first column is a linear correlation between knowledge, the attitude of the independent variable and values of the dependent variable reporting behavior. The value of R (.548) indicates a moderate relationship between the dependent and independent variables. In the next column, the R Squared value of the multiple correlation coefficient. The value of R Square shows that 30% of the variation in ACL reporting behavior is explained by the independent variable of knowledge and attitude in the model.

Table 3. ANOVAa

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.413	2	2.706	70.542	.000b
	Residual	12.623	329	.038		
	Total	18.036	331			

a. Dependent Variable: Reporting Behavior
b. Predictors: (Constant), Attitude, Knowledge

The second output obtained from SPSS shows whether the estimation is statistically significant. The table shows the F is 70.542 and the significant value is .000. Hence, it can be said that obtained F-value is significant at p-value (p < .005).

Table 4. Coefficients[a]

Model		Unstandardized	Coefficients	Standardized Coefficients	t	σ
		B	Std. Error	Beta		
1	(Constant)	1.796	.203		8.834	.000
	Knowledge	.233	.052	.230	4.512	.000
	Attitude	.352	.044	.408	7.999	.000

a. Dependent Varia.ble: Behavior

The above table of regression analysis is coefficient. The coefficient table presented shows that the EXACT RELATIONSHIP between the independent (attitude and knowledge) has a significant effect on the dependent variable (behavior). The value of the standard regression coefficient Beta (β) .230 and .408 respectively knowledge and attitude of athletes indicated that the model is significant. The t-value (knowledge= 4.512 & attitude= 7.999) and p-values (.000 and .000) indicated that the independent variable (attitude and knowledge) are statistically significant.

Discussion

This survey is aimed to determine the relationship between predictor variables (attitude and knowledge) and a criterion variable (reporting behavior) among elite athletes of Punjab (Pakistan) who had faced anterior cruciate ligament injury in sports throughout their sporting career. Similarly, the analyzed statistical inferences depict a positive significant correlation between the variables because showing a significant at 0.01 levels (2-tailed) respectively for attitude, knowledge and reporting behavior (table-2). Likewise, the statistical inferences indicated that all variables have significant predictive power so that its predictability is lower than the significant level .05. However, the current study has several limitataion. In this study the sample size consisted of (n=332) having different attributes such as age, gender, qualification, nature of the sport, and level of sports participation. Besides, each participant is approached and contacted once in different time duration to get the most relevant, appropriate, and suitable data. Basically, the questionnaire was validated by national and international level of experts in the relevant field, so the language adopted in the instrument was in the medium English, but for convenience in understanding the athletes and keeping in mind some factors like traditional coaching, traditional physiotherapist, lower level of qualification and difficult key terms related to injury, the researchers mentor suggest to narrate the entire questionnaire into the medium of at least national language i.e. Urdu. The researchers have a firm belief that vast data by including other geographical areas of the country would provide better results that assist in maintaining a strong positive relationship between predictors and criterion variables of the study.

Conclusion

The present study was conducted to know about the reporting behavior of elite athletes based on their attitude and knowledge regarding ACL injury during their entire professional sporting career. The athletes consisted of those who participated in different level of sports such as national and international sports events such as rugby, football, volleyball, hockey, and badminton. Different types of opinion seeing in demographics, the format of sports, and the level of sports.

The analyzed data indicated a moderate positive correlation attitude (predictor) of athletes and ACL injury-reporting behavior (criterion). The moderate positive correlation means that an increase in the attitude of the athlete can increase the behavior with respect to ACL injury reporting. Based on the analyzed data, it has been interpreted that the attitude of athletes has a significant profiling of reporting behavior of elite athletes.

The prescribed data also show a moderate positive significant relationship between the knowledge (predictor) of the athletes regarding ACL injury and their injury reporting behavior (criterion). The positive relationship show a significant change as one variable depends upon the other, as an increase in the amount of knowledge leads to an increase in the reporting behavior.

As the increase in the attitude and knowledge of the athlete, the reporting behavior very much improved to be reported. Sports coaches, physiotherapists, and orthopedics related to sports are working to develop injury awareness models and occasion-based scenarios and researchers are continuing to find ways to develop and maintain new methods regarding injury preventions and giving on

the spot treatment. It is the responsibility of the sports coaches, physiotherapists, and sports orthopedics to motivate the athlete to develop their attitude regarding any sorts of injury to prevent themselves from the serious consequence of injury. If an athlete can't report the injury to their sporting staff then it may cause serious health issue, which need prolonged rest to recover, and in some circumstances end the playing career.

In the future, it is hoped that this research will lead to a decrease in the rate of injuries by improving athletes attitude and knowledge which also improve the physical as well as psychological aspects of athletes.

More research and innovative observations are necessary to keep the athletes fit and healthier in their elite sports by providing them enough cushion in the field of sports injuries. As Pakistan is a developing country by having limited sporting environments and participation at the international level, these athletes are the real assets, research is required to prevent from injuries and provide helpful literature to sustain their position for a prolonged period of time.

This type of research will provide enough guidance to the young, emerging, and energetic players to follow the validated and reliable statistical conclusion of the study.

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