



Original Article

Epidemiology of Knee Injuries Among South Indian Football Players: A Cross-Sectional Study

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ABSTRACT

This research study aimed to identify the most usual sports injuries between the South Indian football players as well as most usual body sites that are exposed to sports and games injuries and the cause's leads to sports injury between the football players. The researcher used to illustrative approaches because of nature of study compatibility. This investigation also used the questionnaire as the study tool for collection of data. The study sample consists of 216 players who were selected from two teams such as super league and division 1. The researcher used SPSS to determine the study data. The sustained football injuries burden near each site or organ. There is no significant variation in injury types comfort if analyzed the playing levels be it super league and division 1. A focus on the ACL prevention is suggested to lifelong disability prevention in a active and young participants.

Keywords: ACL injury, football players, super league, division 1

INTRODUCTION

Football is a team games played with a spherical ball among the two teams of 11 players. An adult standard football match contains two 45-minute halves interspaced generally by a 15 min break. This sport involved intermittent walking, running, sprinting and jogging and has greater occurrence of injuries compared to field hockey, boxing, volleyball, rugby, swimming, basketball and cycling.

The football injury is most usual influenced the ankle joints muscles, ligaments and knee of the calf and thigh. The most general affected are the lower extremities about 62% to 90%. In football, the most usual types of injury are sprains, strains and contusions. The head injury occurred 4 to 24% of all footballers' injury (Besier et al.2001). All types of injury in head includes lacerations, eye injuries and fracture in facials. It is formed by the direct blowing of neck, face, acute injury, contact of players to players and head occurred at games of football and training because of the high-speed fusing and full contact. The overuse injury can form as of abnormalities of biomechanical, reduced rest and false playing methods (Kanamori et al.2002).

The studies showed the result of rate of injuries in football ranged from 0.5 to 45 injuries per 1000 hours of games and trainings. In male football players occur above 12 to 35 injuries per 1000 hour of games in outdoor and 1.5 to 7.6 injuries per 1000 hours of training. The usual football injuries and their incidence were general in games.

The injuries in knee also very usual in football however their incidence is low than the ankle injury. The knee contains two cruciate ligaments and two collateral ligaments. The injuries in knee are one of the most general injuries is anterior cruciate ligament is usually affected in players of football (Mandelbaum et al.2005). Commonly injuries occurred in several sports like soccer, alpine skiing, tennis and basketball. The yearly ACL injury prevalence was observed among 0.5 to 6.0% of football female players and among 0.6 and 8.5% of male players.

In football, the body biomechanics gives a systematic motion and decreased the lesions in soccer players. In incorrect method of football can caused uncommon biomechanics at match of soccer that can raise the injury higher risk (Bahr and Krosshaug, 2005). The equipment protection is used to decrease the injury of sports includes pads in shoulders, pads in hip, pads in thigh, pads in knee, cup, gloves, mouthpiece, jockstrap, helmets and safety equipments helps to stop the serious injuries during the match of football.

The anterior pain in knee is a usual issue between athletes. The anterior pain in knee is frequently produced by patellofemoral joints impingement by edematous modification in the fat pad of infrapatellar. The non invasive techniques to analyze the fat pad infrapatellar size played a main part in the prevention of disorders. Using a patient's cohort with ACL acute injury had found that the patients had higher volume of the fat pad infrapatellar. Because of location, the morphological modification of the fat pad is frequently is correlated to ACL injury patients (Ferber, et al.2003).This study to analyse the knee injuries among the two teams of football players to give effective measures for the knee injury.

METHODOLOGY

Study design and data collection

This analysis was made in association with a collection of data by Research Center of Sports of Medicine, Chennai (Sri Ramachandra Centre for Sports Science (SRCSS), Porur, Chennai, Tamilnadu). The injury of players and data background was formed by the Chennaiyin Football Club, a Chennai elite women and men football player that was proposed to analyze the injuries incidence and illness in the top leagues. The study has been accompanied in the period of 2020 to 2022.

Participants' Selection

The enrolled eligible participants were participated for the interview of face to face mainly considered the inclusion criteria who were participate at least twelve months as a professional player. Each subject has the rights to withdraw and refuse from the accepted study. All the ethical documents and questioner translated into English.

Questionnaire

A detailed self made questionnaire was allowed to all participants football players at the period of regular season. The data collection prior to the study was explored to every participants in an understanding language. All the participants were allowed to an interview consists of baseline characters, information about injury, physical activities, therapy seeking behaviors and psychological terms outcome measurements.

The Research Setting and Study Population

The population of this study was only the team of football belongs to two levels of super league and division 1 league such as Women and Men. There are 205 teams in Tamilnadu of which 45 are depends on Chennai belonging to four levels. Every team is asked to register around 30 football players. Within these 45 teams in Chennai, six teams in super league and seven teams in division and the others are either in two or three divisions. This allows the researchers 12 teams from which to sample players. At the outset, all the teams were suitable for this study but six teams were not willing to be participating in this study and this left total number of seven. So this study population includes only football players.

The population size from these teams was 391. Using Epi-Info version 3.3.1., from a size of population 391 with the awaiting incidence frequency of 50% and using a precision of 5% that brings bad results at 55% then researcher of 90% will adjust for the rate of response. It results into final sample will be calculated and the size of sample $n = 216$.

Sampling, Data Collection Techniques and Procedure

In order to explain the investigation question demand, all registered players sampling frame was used. The register first to examine the injuries to analyze the injuries rate at certain time and that were registered at last half of the football season during 2010 in the national leagues. The data collection followed by the national consensus agreement on methods for study of epidemiology of injury of football suggested by UEFA and FIFA (Hagglund et al., 2005; Fuller et al., 2006). In order to decrease data collection inconsistencies and bias, all teams were presuming with manual contains information regarding the design of this study and definitions with each other explanatory scenarios and examples.

Qualified football players that were found on the pitch of the study day were asked to participate in this investigation. All the participants were allowed to fill up the research survey questionnaire (called as standardized injury card). The survey questionnaire card was fill up for all injuries which may formed in a football team in the before six months and o day.

Data Processing and Analysis

Multivariate, bivariate and univariate analysis were terminated after the data recording. The statistical analyses were carried with statistical analysis system usage 6.3 edition. Only one injury per player was determined in the analysis whether a player may have assist more than one injury at the season. Analysis depends on the whole team would including many players who played small and had many exposure time. A p value 0.05 was used to determine statistical correlation.

RESULTS

Demographic Profile of subjects

The study sample comprised 216 players enrolled by two divisions that are super league and division 1. The sample was dependent formed of young players. The young player who was 16 was playing for the division 1 and it was anticipated. The mean age was 24 (SD ± 4.5). There was no variation among the median and sample's model ages, educational levels and their incomes (Table-1 and 2).

Table-1: Highest level of education attained and Level of playing N = 216

		Level of playing		Total
		Super league	Division 1	
Attained Highest level of education	Primary level	2	10	12
	Grade ten level	13	31	44
	Grade twelve	27	110	137
	College level	9	14	23
Total		51	165	216

Table-2: Income levels of football players N = 216

S.No.	Income levels	Range of participants
1	Low	69.6%
2	Moderate	13.7%
3	High	16.7%

Commonly, the football players could be instruct and there was no remarkable variation in ranges of schooling over the two divisions such as values 5.489, df 4 and $p = 0.312$. There were some graduates $n=24$ playing complete football as compared to non graduates $n = 195$.

The players of football had not been with their teams longer than anticipated. The median, modal and mean playing period was two years. A larger number $n=139$ (64.6%) had been with their teams for atleast two years, $n= 77$ (35.4%) for one year and one was 0.5%.

The type of team medical personnel is evaluative; the researcher evaluated the issue within the teams. It was denoted that the seven football teams that doctor was present, the requirement of other helpers was decreased. The seeing chances a doctor in the division 1 was slim. So the other types of personnel would be accessible only when combinations were required by the teams (Table-3).

Table-3: Distribution of medical personnel N = 7

Types of team	Level	Medical personnel					
		Clinical officer	First Aider	Physio therapist	nurse	Occupational Therapist	Team doctor
Team 1	Super league	-	-	1	-	-	1
Team 2	Super league	-	2	1	-	-	1
Team 3	Super league	-	-	1	-	-	1
Team 4	Division 1	-	-	-	-	-	-
Team 5	Division 1	1	-	-	-	-	-
Team 6	Division 1	-	1	1	-	1	-
Team 7	Division 1	1	1	-	-	-	-

Types of injuries

This evaluation design regards to the football injuries analysis followed the sports descriptions. The injuries look description according to complaints as injured footballer, mechanisms and sites. The presented investigations are under three headings. Also, a preliminary estimation is worth reports related to the number of times footballers may have affected a same injury. It was noticed that some footballers $n=171$ (76.4%) had not suffered a same injury before during the trainings as compared to who had suffered from injury $n= 45$ (23.6%) (Table-4).

Table-4: Rate of football activity who was injured

S.No.	Rate of Activity (%)
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Yes	23.6%
No	76.4%

Type of Injury by Complaint

This study demonstrates that many types of footballers depend on the morphological characters or subjective experiences or appearances. Also, the injuries types were classified as follows, ligaments, pain or sprain, strain like a injury or distention to the muscle, bruise, fracture and cut. These injuries types formed both during competitive matches or trainings (Table-5). Usually, footballers faced many types of injuries at training period compared to competitive matches. A pain, sprain, cut and bruise seems to be very periodic injury types and broken bone was unlikely.

Table-5: Rates of acute injury by level of playing the game

Location of injury and history of injury	Unadjusted rate of injury*	Unadjusted rate ratio	Adjusted rate ratio	95% confidence interval
Head	0.25	2.01	1.21	0.14,9.60
No past injury	0.48			
Past injury				
Neck	0.60	5.80	5.03	3.13,8.17
No past injury	3.55			
Past injury				
Concussion	0.85	1.73	1.63	1.08,2.51
No past injury	1.50			
Past injury				
Brachial plexus	0.45	3.98	3.22	1.86,5.53
No past injury	1.77			
Past injury				
Right upper extremity	1.11	1.87	1.61	1.06,2.44
No past injury	2.06			
Past injury				
Left upper extremity	1.12	1.86	1.71	1.12,2.57
No past injury	2.07			
Past injury				
Thoracic spine chest	0.33	4.74	4.25	2.17,8.28
No past injury	1.62			
Past injury				
Lumbar spine/pelvis	0.61	1.46	1.45	0.85,2.45
No past injury	0.86			
Past injury				
Right lower extremity	2.73	1.57	1.35	1.02,1.80
No past injury	4.26			
Past injury				
Left lower extremity	2.12	1.98	1.54	1.11,2.13
No past injury	4.23			
Past injury				

Type of Injury by organ or site

Football players comfort injuries distress nearly each site or organ. But, there were same injury incidence at the period of trainings and competitive matches. There were even many injuries involved in the lower extremities compared to upper extremities. Actually, the sum of injuries includes neck, head and trunk, the injuries of incidences of the lower extremities were chief. There were increased injuries involved the ankle, knee joints compared to other injuries. There were very little injuries involved the back and trunk both during competitive matches and trainings. There was no correlation variation in terms of injury types sustained if we determined the playing level be it division 1 and super league ($p = 0.00$, $t = 60.75$ at $df = 216$).

Type of Injury by Mechanism

The football players could be injured by different contact mediated mechanisms $n = 51$ (23%) seemed to have higher effect compared to running $n = 40$ (17.9%) and collisions. Circumstances n was 35 (15.6%).

DISCUSSION AND CONCLUSION

The report of this current study showed to examine the profile of age ranges, it was proved that many players $n=150$ would have long playing careers includes age between 16 to 24 compared to $n=83$ aged from 25 to 36. There was no remarkable variation in ranges of schooling across the two divisions such as values are 5.489, df was 4 and $p=0.312$ and some graduates were 24 playing complete football as than to non graduates were 195.

The mean age of the participants in this work was 216 at the period of study and most of them were observed have knee injuries in the age of 13 to 60 years, statistically remarkable $p=0.05$. Lower mean age, the estimated footballers at 19.33 (Collins et al.2012). The previous study researchers showed the soccer injuries relation and they found the increased rate of occurrence of injury in the range of years 136 to 18 age. The most $n=50$ were playing at the position midfielder and decreased $n=8$ goalkeeper observed 12% at $n=8$ goalkeeper observed remarkable relationship with injuries. Same as this study, 25% rate of injury was reported among the center half or midfielders with goalkeepers was 13.88%. Injuries in knee were accountable for the ground condition in male sports person remarkably correlated $p=0.034$. The research determined that 10% of participants ground caused a main reason for the injuries.

This research work explained that the contact injuries frequency was decreased compared to non contact injuries. With the previous study support, around 65% and 35% were non contacted injury and contacted injury respectively (Alentorn-Geli et al.2009). Where the contact injury larger 74.1% and non contact injury lower at 25.9%. All of our findings, the injuries percentage results from players to players contact differ from 31 to 70.3% regarding to indoor than 43 to 60.9% for outdoor soccer.

Considering the injury nature category, the contusion amount cases to merely compare to 6% to ligaments that was 63.8%. A recent research study indicates that contusion usual types of injuries with higher incidence in football players. The low injury as 58.6% was the increased severity form and 13.8% showed the injury was much severe. Opposite to our study, decreased 16.7% were lower injuries and the higher remains 47.4% were major injuries. The other study on female and male, the incidence of injury in elite football players were mild slightly increased was 29% that is $n=158$ and severe 9% $n=48$ (Van Tiggelen et al.2008).

Many types of injuries for footballers depend on morphological appearance or characterization or experiences of subjects. But, the injuries types were divided as follows, ligament or sprain, pain, distention strain or injury in muscles, broken bone or fracture, a bruise and cuts (Ekstrand et al.2004). These injury types produced both during the competitive matches and training. Usually, footballer's expert many types of injuries at training compared to competitive matches. A pain, cut, bruise and a sprain were mostly periodic types of injury and a broken bone was unlike.

The sustained footballers bother near each site or organs. But, there was a same incidence of injuries at competitive matches or training. There were literally many injuries involved the decreased extremities compared to the upper extremities. Although, the mean of injuries includes neck, head and trunk, the injuries incidences of the decreased extremities were uppermost. There were much injuries involved the ankle compared to any other injury (Bengtsson et al.2013). There are many injuries involved in the back and trunk at complete matches and training. There was no correlation variation in types of injury assist if we analyze the playing levels be it super league and division 1 ($p=0.00$, $t=60.70$ at $df=215$). While, football players could be injured under numerous contact mediated mechanisms $n=50$ (23%) seems to have higher effect than running $n=40$ (18.0%) and the collisions. The circumstances was observed ad $n=35$ (16%).

The injuries of footballers could be persuading by both the internal and external factors. This study, the researcher analyzed the extent to that extrinsic and intrinsic factors were correlated with injuries. Usually, a higher number of injured football players claimed to have seemed that injuries of footballers cloud be joined with past injuries, absence of aerobic fitness, long term reaction, unsuited position of playing, being under the stress due to the games types and fighting mentality. It was showed that all the factors were not remarkably correlated with injuries of footballs. This is showed by p values lower than the alpha value 0.05. The intrinsic factors as components of ecological reason of injuries are insignificant (Arnason et al.2004).

From the perspective anatomical, the super league was higher in knee joints seen in this study might be contributed to the narrow step width. Due to our data were obtained from analysis giat, we can show that super league would have notably higher abduction angles was $p<0.005$. Same as division 1 would have remarkable higher adduction angles compared to super league was $p<0.05$. Another study for the narrow step width can be determined by the variation in the narrow base of support. It was noticed that super league would have narrow base support that can explained for higher valgus in the joints.

This study showed that injury rate incidence in football is not distresses however the rules under the football are played need concern such as unsuited equipments also unsuited turf. The previous studies showed that the most usual affected body surface is the lower limbs and it throw back the game nature as a running sport need power, agility and speed. The football lower limb injury predominance has also been well recorded by club depends injury observation for all the competitive football levels in the West Asia (Hassabi et al.2010).

The future research studies may require to be extending to lower leagues to have a elaborate images. There is required to preventive address and promotional health requirement of football players. Further research studies to be done with a higher population to strengthen the data validity. The ACL injuries have been calm prevalent, particularly among the young athletes who were participate in different sports.

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