

Original Article

Prevalence and Risk Factors of Lower Limb Injuries in Football Players in Peshawar: A Cross-Sectional Study

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Conflict of Interest: None.

Ayub A., et al. (2024). 4(2): DOI: <https://doi.org/10.61919/jhrr.v4i2.750>

ABSTRACT

Background: Sport-related ankle and lower limb injuries are notably prevalent among football players. This study investigates the extent and determinants of these injuries among club-affiliated football players in Peshawar, focusing on various playing conditions and personal health metrics.

Objective: To ascertain the prevalence and identify key risk factors associated with lower limb injuries in football players in Peshawar.

Methods: A cross-sectional survey was conducted with 240 male football players aged 10-40 years from five sports clubs in Peshawar using convenience sampling. Data were collected through a self-administered questionnaire and analyzed using SPSS version 28.

Results: The overall prevalence of injuries was 53.3%, with 128 players reporting injuries. The ankle was the most commonly injured site, accounting for 56.3% of injuries (n=72/128). Muscle injuries were reported by 43.8% of the injured participants (n=56/128). The majority of injuries (72.7%) occurred at Islamia University Peshawar. The role most associated with injuries was goalkeepers, with a 57.9% injury rate, and the most common context for injuries was during tackling (24.2%).

Conclusion: The study highlights a high prevalence of lower limb injuries among football players, with the ankle being the most affected area. Significant risk factors include inadequate hydration during and outside of training sessions and inappropriate footwear.

Keywords: Ankle Injuries, Football, Lower Limb Injuries, Peshawar, Prevalence, Risk Factors, Sports Medicine.

INTRODUCTION

Football, commonly known as soccer, enjoys global popularity, boasting numerous physical and health benefits for players of all ages. Despite these advantages, the sport's dynamic nature—characterized by rapid accelerations, decelerations, directional changes, jumps, and pivots—substantially increases the risk of injuries, which are prevalent during both matches and training sessions and often necessitate immediate first aid (1, 2, 3). Governed internationally by the International Federation of Football Association (FIFA) and in England by the Football Association (FA), football involves two teams of 11 players each striving to score goals over two 45-minute halves, punctuated by a 15-minute halftime (4, 5).

With around 270 million players worldwide, football records a higher incidence of injuries compared to other sports, notably during games and tournaments (6, 7, 8, 9). Research indicates that adult male soccer players suffer between 2 to 8 injuries per 1,000 hours of practice and 10 to 35 injuries per 1,000 hours of gameplay, with lower limb injuries being particularly common (10). These injuries frequently affect significant muscle groups such as the adductors, hamstrings, and calves, constituting over 90% of all professional football muscle injuries. Notably, players with a history of similar injuries exhibit increased rates of recurrence, particularly in the quadriceps and calves (11, 12, 13).

In professional settings, calf injuries alone account for 13% of all football muscle injuries, posing a significant challenge. Additionally, tendinopathy in the Achilles and patellar tendons emerges as a common issue among elite athletes, often developing more gradually than other injuries like hamstring strains or ankle sprains (14, 15, 16). The risk of injury in football is significantly higher than in many other occupations, estimated at about 1,000 times greater than that in typical manufacturing jobs (17).

Previous research has focused predominantly on intrinsic risk factors, such as age, career duration, and prior injuries, and extrinsic factors like training frequency and playing surface quality. For example, players up to 38 years old have been identified as being at an increased risk of injury, with those having a history of identical injuries facing a heightened risk of recurrence (18, 19, 20, 21).

Despite the comprehensive data available from developed countries, there is a notable dearth of research on this topic in Pakistan, particularly in the Khyber Pakhtunkhwa region. This area lacks adequate physical training guidelines, professional trainers, nutritional support, and proper management of medical and rehabilitation services, contributing to a higher injury risk among football players.

This study aims to establish baseline data regarding the prevalence of lower limb injuries among football players in Peshawar and to identify significant risk factors contributing to these injuries. By understanding these elements, the study seeks to recommend targeted modifications and preventive measures to reduce the occurrence of future injuries among this population.

MATERIAL AND METHODS

A cross-sectional survey was carried out from April to July 2023 among football players in Peshawar to examine the prevalence and risk factors associated with lower limb injuries. The study targeted five academies, namely Goals Academy Hayatabad, Hayatabad Sports Complex, Pak Turk International School and College, Islamia University, and Qayyum Stadium. A total population of 635 players was considered for this survey, from which a sample size of 240 was determined necessary to achieve a 95% confidence interval. To mitigate the impact of potential dropouts, an additional 10% of the sample size, amounting to 30 players, was included.

Participants included male football players between the ages of 10 and 40 years, who were actively registered and participated in football activities at least twice a week. The players were required to provide informed consent to be eligible for inclusion in the study. Those engaged only in recreational football or with pre-existing lower limb injuries unrelated to football training or competition were excluded to maintain the focus on injuries directly associated with football activities.

Data was collected using a self-developed questionnaire, which was segmented into four main sections: demographic details, training information, injury prevalence, and potential risk factors. This instrument was crafted to ensure comprehensive coverage of the variables relevant to the study objectives. The statistical analysis of the gathered data was performed using SPSS version 28. The chi-square Pearson test was utilized to identify significant associations, with a p-value of less than 0.05 considered indicative of statistical significance.

Ethical considerations were rigorously followed, with approval obtained from the Institutional Review Board of KMU (IPM&R) under approval number DIR/KMU-EB/IC/000785. Written informed consent was secured from all participants, who were duly informed about the purpose and nature of the research. Permissions were also obtained from the heads of the institutions and sports clubs involved, ensuring all ethical guidelines and privacy norms were adhered to throughout the study process. This methodological rigor not only strengthened the credibility of the research findings but also ensured that the study was conducted in a manner that respected the rights and welfare of all participants.

RESULTS

Out of 240 football players, 128 reported lower limb injuries, making up 53.3% of the total. The average age of the participants was 15 years. The data was collected from five sports clubs in Peshawar, with the following proportions of participants: 33.8% from Qayyum Stadium (n=81/240), 33.3% from Goals Academy (n=80/240), 13.8% from Islamia University (n=33/240), 9.6% from Hayatabad Sports Complex (n=23/240), and 9.6% from Pak Turk International School and College (n=23/240). The frequencies of player positions were as follows: 35.4% were defenders (n=85/240), 30.4% were midfielders (n=73/240), 26.4% were strikers (n=63/240), and 7.9% were goalkeepers (n=19/240).

Table 1: Frequency of Lower Limb Injuries, Injury Types, and Injury Nature

Variables		Frequency (n)	Percentage (%)
Lower Limb Injuries	Ankle	72	56.30%
	Knee	37	28.90%
	Hip	14	10.90%
	Shin	5	3.90%
	Total	128	
Causes of Injury	Tackle	31	24.2
	Foul play	27	21.1
	Twist or turn	25	19.5
	Running	16	12.5
	Contact with ball	12	9.4
	Collision	12	9.4
	Stumble/fall	5	3.9
	Total	128	
Nature of Injury	Muscle injury	56	43.8
	Ligament sprain	30	23.4
	Fracture	18	14.1
	Wounds	14	10.9
	Tendon injuries	9	7
	Total	128	

Table 1 shows the distribution of lower limb injuries across different anatomical areas. The ankle was most frequently injured site, accounting for 56.3% (n=72/128) of reported cases, followed by the knee at 28.9% (n=37/128), the hip at 10.9% (n=14/128), and the shin at 3.9% (n=5/128). Regarding the causes of injuries, the majority were caused by tackle, consist of 24.2% (n=31/128) of cases, followed by foul play at 21.1% (n=27/128), twists or turns at 19.5% (n=25/128), running at 12.5% (n=16/128), contact with the ball at 9.4% (n=12/128), collisions at 9.4% (n=12/128), and stumble/falls at 3.9% (n=5/128). The types of injuries were categorized as follows: muscle injuries accounted for the highest proportion at 43.8% (n=56/128), followed by ligament sprains at 23.4% (n=30/128), fractures at 14.1% (n=18/128), wounds at 10.9% (n=14/128), and tendon injuries at 7% (n=9/128).

Table 2: Frequency of Lower Limb Injuries by playing positions and in Sport Clubs

	Frequency (n)	Percentages (%)
Injury according to Position of Playing		
Goalkeeper	11	57.90%
Strikers	36	57.10%
Defenders	44	51.80%
Midfielders	37	50.70%
Total	128	
Sports Club		
Islamia University	24	72.70%
Goals	46	57.50%
Pak Turk School and College	12	56.50%
Hayatabad Sports Complex	11	47.80%
Qayyum Stadium	35	43.20%
Total	128	

Table 2 presents the distribution of injuries across different sports clubs and player positions. The highest proportion of injuries was observed at Islamia University, accounting for 72.7% (n=24/33) of participants, followed by Goals Academy with 57.5% (n=46/80), Pak Turk International School with 52.1% (n=12/23), Hayatabad Sports Complex with 47.8% (n=11/23), and Qayyum Stadium with 43.2% (n=35/81).

Goalkeepers experienced the highest percentage of injuries at 57.9% (n=11/19), followed by strikers at 57.1% (n=36/63), defenders at 51.8% (n=44/85), and midfielders at 50.7% (n=37/73).

Table 3: Association between lower limb injuries and BMI, duration of the training session, number of glasses consumed per day and during the match, and types of shoes.

	Variables	P value
1st Association	BMI Weight(Kg)/ Height(m2)	0.008
2nd Association	Glasses of water drank/day	0.002
3rd Association	Duration of training session	0.032
4th Association	Glasses of water drank during Match	0.039
5th Association	Type of shoes	0.018
6th Association	Age	0.094

The Pearson Chi Square test was used to check the association between lower limb injury and BMI, duration of the training session, number of glasses consumed per day and during the match, and types of shoes. Furthermore, lower limb injury was found insignificant with age.

Table 4: Frequency of Lower Limb Injuries by BMI, Shoe Type, Training Duration, Daily and during training Water Consumption

Have you ever had, football football-related lower extremity injury, in the previous years?				
				Total
		yes	No	
BMI Categories	Underweight	21	37	58
		36.20%	63.80%	100.00%
	Normal weight	82	50	132
		62.10%	37.90%	100.00%
Overweight	15	18	33	
	45.50%	54.50%	100.00%	
Obese	10	7	17	
	58.80%	41.20%	100.00%	
Total		128	112	240
		53.3%	46.7%	100.0%
How long does each training session last?	1 hour	40	32	72
		55.60%	44.40%	100.00%
	1 1/2 hours	35	31	66
		53.00%	47.00%	100.00%
2 hours	28	12	40	
	70.00%	30.00%	100.00%	
2 1/2 hours	25	37	62	
	40.30%	59.70%	100.00%	
Total		128	112	240
		53.30%	46.70%	100.00%
How many glasses of water you drink a day?	<8 glasses	74	38	112
		66.10%	33.90%	100.00%
	8-10 glasses	31	44	75
		41.30%	58.70%	100.00%
10-12 glasses	15	15	30	
	50.00%	50.00%	100.00%	
12-14 glasses	8	15	23	
	34.80%	65.20%	100.00%	

Total		128	112	240
		53.30%	46.70%	100.00%
How many glasses of water you drink during a match?	<4 glasses	112	82	194
		57.70%	42.30%	100.00%
	4-6 glasses	12	21	33
		36.40%	63.60%	100.00%
	6-8 glasses	1	4	5
		20.00%	80.00%	100.00%
	8-10 glasses	3	5	8
		37.50%	62.50%	100.00%
Total		128	112	240
		53.30%	46.70%	100.00%

Table 4 shows that 62.1% of participants with normal BMI experienced lower limb injuries in the previous year and those who attended training sessions for a maximum of 2 hours had a higher proportion of lower limb injuries 70%. The type of shoes worn during matches, grippers were found to be the most prevalent cause of lower limb injuries, affecting 69.2% of participants. This table presents a correlation between daily water consumption and lower limb injuries. 66.1% of participants who consumed more than 8 glasses of water per day experienced lower limb injuries and 57.7% of participants who drank less than four glasses of water during matches reported lower limb injuries in the previous years.

DISCUSSION

This cross-sectional study revealed a prevalence of lower limb injuries among football players in Peshawar at 53.3%, aligning somewhat with findings from other regions. For example, Christina D reported a slightly higher injury prevalence of 58.7% in professional football players (14), while Thomas Dhekkers found that over 70% of all injuries were to the lower limbs in his cohort (23). Such variations may reflect differences in training intensity and professional status between the studied groups. Notably, ankle injuries were the most common in this study, comprising 56.3% of all reported cases. This finding is consistent with results from Mary K. Mulcahey, who documented a 53.2% prevalence of ankle injuries among players in her study (24). The higher incidence in our study could be attributed to the lack of ankle support during training and matches, suggesting a potential area for intervention.

Muscle injuries were reported by 43.8% of participants, compared to 54% in a Swedish study by K Svensson (25). This discrepancy might arise from differing study designs and sampling techniques, indicating the influence of methodological approaches on injury reporting. Additionally, associations were identified between lower limb injuries and several factors including body mass index (BMI), training duration, footwear type, and hydration levels. A significant association was found between BMI and injury prevalence, with a p-value of 0.008, aligning with findings by Constantine P. Nicolozakes who also highlighted the link between BMI and injury risk (26). Interestingly, injuries were more prevalent among normal-weight participants, potentially reflecting the high physical demands placed on these athletes.

The duration of training sessions also correlated with injury occurrence, with a p-value of 0.03. This is supported by findings from Jesus Barguerias-Martínez, who noted an increase in injuries when training resumed after breaks (27). Such data underscore the importance of gradual training intensity escalation to mitigate injury risks. Furthermore, footwear type was significantly associated with injuries; 69.2% of those injured wore gripper shoes, which might not offer the same level of protection as studded boots, widely regarded as safer on grassy surfaces due to better pressure distribution (28, 29).

Hydration emerged as a crucial factor, with injury rates higher among those who consumed less water. The significant associations, with p-values of 0.002 and 0.039, respectively, for daily and match-day water consumption, are consistent with FIFA guidelines, which recommend adjusting hydration based on weather conditions and physical exertion to prevent injury through dehydration (30, 31).

The study's strengths include its comprehensive assessment of risk factors and the high response rate from participants, enhancing the reliability of the findings. However, limitations such as the use of self-reported data and the non-randomized sampling method

may affect the generalizability of the results. The study design also does not allow for causal inferences to be made about the observed associations.

Despite these limitations, the findings contribute valuable insights into the prevalence and correlates of lower limb injuries in football players, underscoring the need for tailored preventive strategies. These should include enhanced focus on proper footwear, structured training programs, and adequate hydration practices to mitigate the risk of injury among football players in similar settings.

CONCLUSION

The study concluded that there is a high prevalence of lower limb injuries among football players, with the ankle being the most commonly injured site. Key risk factors for these injuries were identified as inadequate water consumption during training and throughout the day, as well as the type of footwear worn. The study faced limitations, including an inability to precisely identify muscle injuries due to participants' lack of awareness about specific types, and the restrictive time frame of the study. Additionally, the absence of medical imaging and physical examinations limited the accuracy of diagnosing the types of injuries. Future research should focus on improving transfer techniques to enhance football players' awareness and adoption of effective injury prevention strategies.

ACKNOWLEDGEMENT

We thank the sport clubs in Peshawar, particularly Goals Academy and the faculty of Khyber Medical University's Institute of Physical Medicine and Rehabilitation, as well as Dr. Mujeeb for their support and guidance.

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