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**Karishma Bhandari**  
Department of Orthopedic  
Physiotherapy, Pravara  
Institute of Medical Sciences,  
Dr. APJ Abdul Kalam College of  
Physiotherapy, Loni,  
Ahmednagar, Maharashtra,  
India

**Dr. Pradeep Borkar**  
Department of Orthopedic  
Physiotherapy, Pravara  
Institute of Medical Sciences,  
Dr. APJ Abdul Kalam College of  
Physiotherapy, Loni,  
Ahmednagar, Maharashtra,  
India

**Corresponding Author:**  
**Karishma Bhandari**  
Department of Orthopedic  
Physiotherapy, Pravara  
Institute of Medical Sciences,  
Dr. APJ Abdul Kalam College of  
Physiotherapy, Loni,  
Ahmednagar, Maharashtra,  
India

## Epidemiology of lower limb injuries in football players: A systematic review

**Karishma Bhandari and Dr. Pradeep Borkar**

### Abstract

**Purpose of the study:** Football Players are required to have repetitive skill, advanced level of physical fitness and are known to suffer from relatively high rates of lower limb injury. These injuries and their residual effects have impact on sports participation, performance and health related problems of players. Early identification of epidemiology and stratification of lower limb injuries will help the therapist and coaches to plan for prevention strategies. Hence, the study aimed to identify “Epidemiology of lower limb injuries in football players”.

**Methodology:** A systemic review was conducted using scientific electronic database from for PubMed, Google Scholar, Science Direct, and Cochrane for time frame of 10 yrs. April 2012 to March 2022. Total of 65 articles, 14 were excluded on basis of duplicates. 13 were excluded as per eligibility. 12 were excluded on basis of quality assessment on STROBE scale and final 10 articles were included in data synthesis.

**Result:** Among all lower limb injuries, the knee injuries was highest (16.06%) followed by hip and Thigh injuries (13.53%) and ankle and foot injuries. (12%).

**Conclusion:** Epidemiological studies on the occurrence of injuries are of key importance to highlight risk factors for injuries and to guide trainers and coaches to better programme their activities.

**Keywords:** Football injuries, musculoskeletal problems in football players

### Introduction

Football is the most popular sport in the world. Players are required to perform sudden accelerations and decelerations repetitively, rapid changes of directions, and jumping and landing tasks, as well as to be involved in several tackling situations in order to keep possession of or to win the ball <sup>[1]</sup>. They are known to suffer from relatively high rates of injury compared with participants in other sports and occupations. Injuries of football players not only threaten their health but also can be an economic burden to the individual and/or social medical expenses <sup>[2]</sup>.

It is estimated that more than 250 million men and women, from children to elderly, with different socioeconomic backgrounds and levels of expertise, play football. Besides the well-known health benefits of sports participation, there is an increased risk of musculoskeletal injuries. Injury rate among professional and amateur players may vary. Previous research has shown that injury rates among amateurs and professionals are 9.6 and 8.1 per 1000 hours of exposure, respectively, and up to half of these injuries are muscle injuries. Although football is a sport with frequent physical contact, occurrence of non-contact musculoskeletal injuries, such as hamstring strain and anterior cruciate ligament (ACL) rupture, is common <sup>[3]</sup>.

The risk of injury in football was shown to vary according to players’ characteristics like age and positional role, but the literature showed contrasting results. Some authors found that older people are more prone to injury, while others reported that the opposite was true, especially during the preseason <sup>[4]</sup>.

Women’s football is one of the fastest growing sports worldwide. However, the known physiological, psychological and social benefits of sports participation can be offset by the risk of injury. Injury, fear of injury, lack of physical skills or strength are barriers to sport and physical activity participation in adolescent girls, hence the need to know whether programmes that aim to reduce injury in women’s football are effective or not. When it comes to sport injury prevention, van Mechelen’s “sequence of prevention” has been recognized as the most

influential model in the past 25 years [5].

Studies has showed increase in prevalence of musculoskeletal injuries in football players and these injuries and its residual effects has impact on sports participation and health related problems with the players.

Early identification of risk factors, injury profile will help the coaches and therapist to plan appropriate preventive strategies. Hence, study is aimed to identify the epidemiology of lower limb injuries in football players.

### Methodology

Literature Search: Articles are gathered from the sources of information

1. PubMed., 2 Google Scholar, 3. Science Direct

**Study Design:** Systematic Review

**Type of Study:** Descriptive

**Data Extraction:** Articles are searched from all eligible search engine.

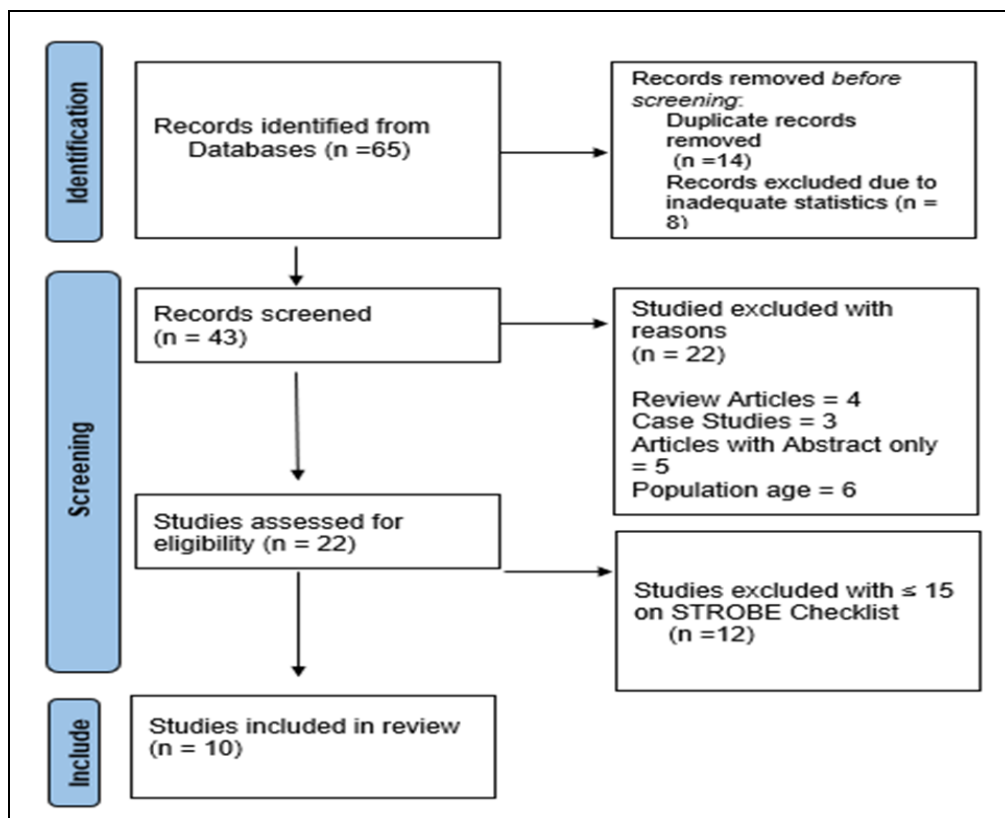
### Inclusion Criteria

- Full text article, Articles which are published in last 10 years, Cross-sectional studies

Population included both genders, Include age group 20-40 years

### Exclusion Criteria

Case reports, Studies which have only abstract, Studies which did not present specific percentage of injuries.



Prisma 2020 Flow Chart For Systematic Review

**Table 1:** Quality Assessment of Articles on STROBE Scale<sup>6-15</sup>

SR. No	Title of Study	Strobe Score $\geq 15$
1.	Epidemiology of Knee Sprains in Youth, High School, and Collegiate Football Players.	15
2.	Epidemiology of American Football Injuries at Universities in the United Kingdom	15
3.	Females Sustain More Ankle Injuries than Males	16
4.	Hip and groin injury is the most common non- time loss injury in female amateur football	18
5.	Epidemiology of injuries among Italian footballers: The role of the playing field	19
6.	Injury incidence and prevalence in Finnish top-level Football – one-season prospective cohort study.	17
7.	Prevalence and severity of hip and groin pain in sub-elite male football: a cross-sectional cohort study of 695 players	16
8.	The incidence, prevalence, severity, mechanism and body region of injury in elite junior Australian football players: A prospective cohort study over one season Timothy	18
9.	Epidemiology of football injuries in the 2012/2013 and 2013/2014 seasons of the Italian Serie A	15
10.	Injuries in formal and informal non-professional Soccer – an overview of injury context, causes, and Characteristics	19

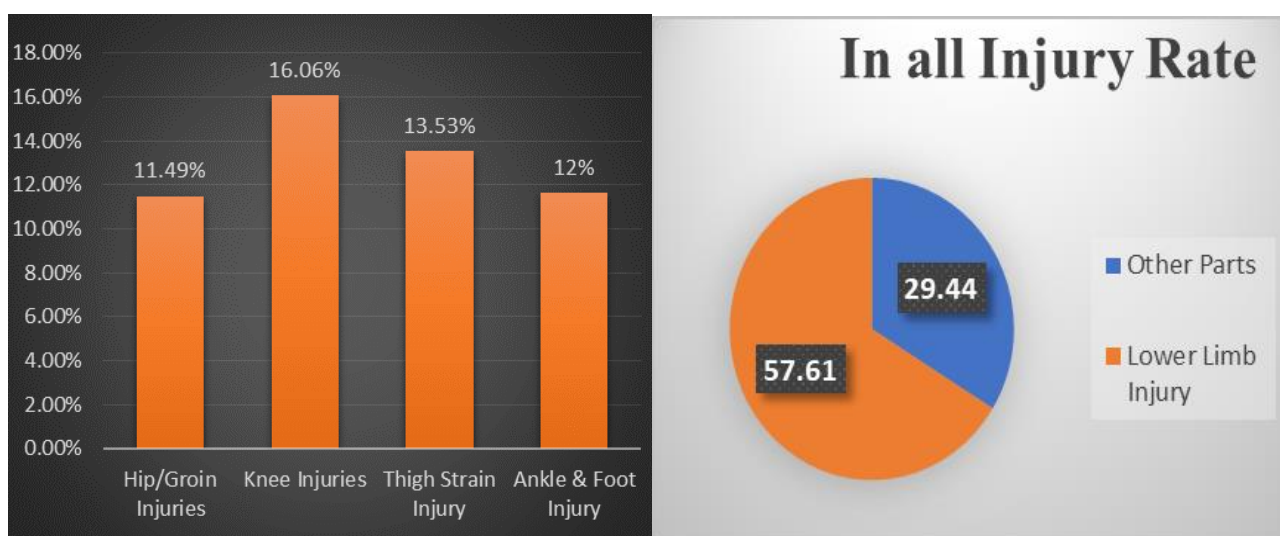
**Table 2:** Characteristics of Studies Included in The Review

Sr. No.	Study Title	Name of Journal	Country	Sample size and gender ratio	Outcome Measure	Result and Conclusion
1.	Epidemiology of Knee Sprains in Youth, High School, And Collegiate American Football Players	Journal of Athletic Training	United states	310 youth, 184 High school, and 71 collegiate football team-seasons were	Injury rate ratios (irrs) and risk ratios (rrs) Injury proportion ratios (iprs)	Knee-sprain incidence was highest in collegiate Football. However, level-specific variations in the distributions Of knee sprains by injury activity may highlight the need to Develop level-specific policies and prevention strategies that Ensure safe sports play.
2.	Epidemiology of American Football Injuries At Universities in the United Kingdom	The Orthopaedic Journal of Sports Medicine	United Kingdom	410 players from 56 UK university teams	Online survey tool	710 injuries and 204 concussions were self-reported among the 410 participants, of which 334 (81.5%) were Injured and 131 (32.0%) experienced concussion symptoms. The rate of injury per 100 athlete-seasons was greater in defensive Players (195.3) than offensive players (155.1). The most common injuries were knee and ankle ligament injuries. Most injuries were Classified as severe
3.	Females Sustain more Ankle Injuries than Males in Youth Football	Training and testing Journal	Finland	730 players (567 males, 163 females)	Online survey	278 players (38%) sustained 410 acute injuries. The overall injury incidence for males and Females was 6.47 injuries per 1000 h of Football exposure. Most injuries (40%) caused minimal absence From sports. Eighty-four percent of the injuries affects the Lower extremities, with the ankle (30%), knee (17%), and thigh (16%) being the most commonly injured body sites. Females significantly higher ankle injury rate (IRR) 1.85 and non-contact ankle injury rate IRR 2.78 than males.
4.	Hip and groin injury is the most common non-time-loss injury In female amateur football	Knee Surgery, Sports Traumatology, Arthroscopy	Dutch	434 Dutch female amateur football players	Hip and groin outcome score (HAGOS)	Prevalence of hip/groin injury was 40%, non-time-loss hip/groin injury was 36% and time-loss hip/groin injury Was 11%. The preseason prevalence of hip/groin injury was 27%, non-time-loss hip/groin injury was 25%, and time-loss hip/Groin injury was 4%.
5.	Epidemiology of injuries among Italian footballers: The role of the playing field	BJM Journal	Italy	267 players	Self-administered Questionnaire.	Overall incidence of injury was 40.1 For ankle and knee injuries. Ankle injuries were associated with playing on natural grass As a protective factor, while playing on natural grass Seemed to be a risk factor for muscular injuries.
6.	Injury incidence and prevalence in Finnish top level Football – one-season prospective cohort Study.	Science and Medicine in Football	United Kingdom	236 players	Injury incidence.	Thigh and ankle were the most commonly injured body parts for acute injuries and Hip/groin were the most commonly injured body part for overuse injuries. Lower limb muscle injuries were the most prevalent injuries in the study. Collecting data directly From the players enabled to report more injuries compared to what was reported only by the medical staff.
7.	Prevalence and severity of hip and groin pain in sub-elite male Football: a cross-sectional cohort study of 695 players	Scandinavian Journal of Medical and Science in Sports	Denmark	695 respondents from 40 teams	A self-reported paper Questionnaire on hip and/or groin pain during the previous Season and HAGOS	This study documents that half of sub-elite male adult Football players report pain in the hip and/or groin during A football season. The football players with the longest Duration of pain in previous season displayed the lowest HAGOS scores in the beginning of the new season.
8.	The incidence, prevalence, severity, mechanism and body region of injury in elite junior Australian football players: A	Journal of Science and Medicine in Sport	Australia	562 players	Online survey	1192 football-related injuries sustained during the season; the majority were new, occurred during competition and led to 4–7 missed days in sever. Injury incidence was 37.2 injuries per 1000 h of exposure. Over half of injuries were con-tact in mechanism. Most injuries were to the lower limb with the thigh representing the highest proportion of

	prospective cohort study over one season timothy					these
	9. Epidemiology of football (soccer) injuries in the 2012/2013 and 2013/2014 seasons of the Italian Serie A	Research in sports medicine	Italy	286 players.	Online survey	Common reported injuries were thigh-strain and knee injury, Results suggest that injury prevention strategies Should be introduced from the preseason to reduce the risk of Injuries, especially muscle strains Which accounted for 42% and 19% of all injuries, respectively.
10.	Injuries in formal and informal non-professional Soccer – an overview of injury context, causes, and Characteristics	European Journal of Sport Science	Switzerl and	1055	A retrospective telephone survey was carried out	Better understanding of injury situations leading to severe injuries is needed to improve injury prevention

**Results**

Overall, there was 57.61% of footballers suffering from the lower limb injuries



**Fig 1:** Area Wise Distribution

**Discussion**

The aim of present systematic review was to summarise current knowledge of injury occurrence in football. Included studies contained the information on injury epidemiology and injury-inciting events. The presentation of epidemiological information in terms of injury prevalence and incidences provides an overview of injury occurrence genders, performance levels and will enable researchers as well as practitioners to set priorities concerning injury prevention<sup>19</sup>. Regarding the injured body location, the present review confirms the finding of previous reviews that injuries of lower limbs are still the main problem in football across all genders, age groups and performance levels. In contrast to earlier findings, more recent studies have reported that the biggest problem regarding frequency and resulting burden are knee and thigh muscle injuries, rather than ankle injuries.

When accounting for football exposure, women have a different injury risk profile than men. The risk of serious knee injury (such as ACL rupture) is at least double in women than in men, regardless of exposure or participation level. Women have a higher risk of concussion, knee and ankle injuries than men, with men at greater risk of hamstring and groin injuries. Football codes have a higher incidence of ACL rupture and associated burden, than do other sports. Lower-limb injuries

occur due to a dynamic interaction of multiple risk factors, some that may be addressed with injury prevention programmes. Many programmes have been investigated (eg, insoles or external joint supports), but mostly exercise-based strategies<sup>2</sup>

The repetition of sports specific activities such as jogging, repeated sprinting and jumping without the appropriate recovery duration, can bring development of fatigue, systemic inflammation as well as oxidative stress, which are risk factors for muscle damages. Studies have also reported that sudden change in direction and multidirectional run, side shifts, accuracy and training errors etc are proven to be extrinsic risk factors for injury to players. Also, lack of appropriate strength, endurance, flexibility and other skill related components are other intrinsic risk factors. Thus, the information gathered can contribute to establish the preventive measure aimed in reducing the occurrence of injury during participation of the players.

As per the reviews, major injuries occurring in hip are hip pain, groin injuries, muscle strain hip dislocations, fractures etc. are usually due to noncontact, overuse/gradual, and player contact among which overuse followed by contact injury. Major injuries in knee are ligament injuries of medial co-lateral, lateral co-lateral, anterior cruciate, posterior cruciate

ligaments, also there can be meniscal injuries leading to sprain. The occurrence is by maximal ground reaction force, structures of knee are fully tensed by the impact load, which favours the injury. Common ankle injuries occurred in footballers are anterior talo-fibular ligament leading to lateral ankle sprain, medial ankle sprain, high ankle sprain, tarsal tunnel syndrome, impingement of tibial nerve, calcaneal fracture, stress fracture. The occurrence is caused by the impact with the football ground, especially during cutting through during the hit.

Our study has several limitations: first, the data available did not allow us to distinguish between training injuries and match injuries. Second, “light” injuries or those that were non-time loss, we’re not recorded in the archives consulted.

### Conclusion

Epidemiological studies on the occurrence of injuries are of key importance to highlight risk factors for injuries and to guide trainers and coaches to better programme their activities.

### Clinical Implication

Injury prevention strategies should be introduced in the beginning in order to reduce the risk of injuries, especially those to the lower limbs.

**Conflicts Of Interest:** None

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