SHORT COMMUNICATION

©2023 The Academy of Environmental Biology, India

Journal of Ecophysiology and Occupational Health, *Vol 25(2), DOI: 10.18311/jeoh/2025/46456, 171-177, June 2025*

ISSN (Online) : 0972-4397
ISSN (Online) : 0974-0805

Prevalence of Ankle Instability in Football Players in Kolhapur City

Rushikesh Patil* **and Aditi Jadhav**

D. Y. Patil college of physiotherapy, D.Y. Patil Medical College Deemed to be University, Kolhapur - 416005, Maharashtra, India; patilrushi2233@gmail.com

Abstract

Background: Sprained ankles are a frequent injury that happens when exercising, mainly when jumping and landing. After sprains, residual ankle instability may lead to, and repeated ankle sprains may last longer while engaging in physical activity. Functional Ankle Instability (FAI) can be caused if the injury is ignored. **Aim:** The primary aim of this research is to check how many football players have an incidence of functional or chronic ankle instability. **Methods:** The subject reported with ankle evaluation, ankle joint functional assessment tool questionnaire, consent form, and visual analogue scale, this study is an observational, crosssectional study, method used for this study is simple random sampling. **Result:** Ankle instability can be seen more in females than males. Ankle instability is likely to be more in more experienced players. The rate of such a condition is high in individuals who play football. Mean vas is greater in females than males. **Conclusion:** According to this research, ankle instability among 72 football players is determined by AJFAT, ADT and PDT and are reported as 62.5%, 13.88%, and 9.72% respectively.

Major Findings: From this study it has been seen that the football players who have participated showed previous as well as currently suffering ankle sprains. Ankle sprain is more common in football players. The prevalence is about 62.5% according to the standardized tool AJFAT. Majorly females are having more ankle instability than males.

Keywords: Ankle Sprain, Ankle Instability, Football Players

1. Introduction

The most common sports-related injury is an ankle sprain[1]. It helps to distinguish between instability and laxity because they are frequently used synonymously in the literature[1]. During a clinical evaluation, laxity is a physical indicator[1]. One of the patient's complaints or symptoms is instability[1]. The patient experiencing instability may describe ankle "giving way" sensations[1]. The term "chronic ankle instability" describes recurring periods of instability that cause recurrent ankle sprains[1]. The anatomical structure of this joint, the lateral ankle ligament complex, and the medial deltoid ligament stabilize it[1].

This can happen when exercising, particularly when jumping and landing[2]. Secondary to ankle sprain, residual ankle instability may remain, and repeated ankle sprains may persist while engaging in physical activity[2]. The most frequent type of ankle sprain suffered by football players is ankle inversion sprain[2]. Football leads to various injuries in which the possibility of an ankle sprain is between 11% and 18%[2].

External rotation of the lower leg about excessive rear-foot supination immediately after the rear foot makes first contact with the ground during walking or landing from a jump is the most common cause of lateral ankle sprain[3]. Rearfoot internal rotation, external rotation of the lower leg, and severe inversion all cause strains on the lateral ankle ligaments[3]. When any one of the ligaments experiences strain greater than the tensile strength of the surrounding tissues, ligamentous damage results[3].

**Author for correspondence*

Article Received on: 17.10.2024 Revised on: 2.12.2024 Accepted on: 05.12.2024

It seems that increasing plantar flexion at first contact increases the likelihood of developing a lateral ankle sprain[3].

Athletes most commonly get injuries to their ankle complex's lateral ligaments[4]. Ankle joint stability is primarily influenced by three primary factors: congruity of the articular surfaces under load, static ligamentous limitations, and musculotendinous units, which allow for dynamic joint stabilization[4]. When walking or landing from a jump, the most prevalent root of lateral ankle strains is excessive rearfoot supination about an outside-rotating lower leg immediately after the rearfoot makes first contact with the ground[4]. Following a primary injury, adverse changes are predicted to make a person more susceptible to repeated sprains; nonetheless, the mechanism underlying recurrent ankle injuries is thought to be like that of acute initial sprains[4].

Ankle instability can be caused by various reasons, and nowadays it has been the most prevalent condition. Being an athlete, an individual can face many problems related to the ankle joint. Football players have all body weight shifted to their ankle joint while playing or kicking the football. If the mechanism of any movement while playing goes in a different or opposite direction, an ankle sprain can occur, which leads to ankle instability. While playing football, it is mandatory to maintain the correct alignment. The prevalence can be higher, according to various studies.

FAI is a frequent reason for sprained ankles[5]. FAI may result from one or more of the following reasons, albeit the exact process is yet unknown: There are four main causes of ankle joint dysfunction: (1) ligament injury; (2) weak ankle muscles; (3) delayed muscular reaction time; and (4) abnormal proprioception[5]. Patients with CAI have four characteristics: Their first ankle sprain occurs a few months back, they have a habit sustain a repeated injury, they consequently experience as though their ankle is moving away, and repetitive pain, swelling, diminished range of motion, weakness, and decreased daily function can occur[5].

Football players commonly sprain their ankles when they collide with other players, jump off objects, land on one foot, and change directions suddenly[6]. The ankle joint was discovered to be the lower limb joint that sustains injury the most frequently when football players' injuries were examined[6]. The frequent pathology, shows 67% of injuries related to the ankle are connected to soccer, is sprains[6]. To variable degrees, forceful ankle inversionsupination causes the ATFL to rupture in a normal sprain[6]. As the injured ankle bears weight when the incidence occurs, the damage is likely to be more serious[6]. To maintain a neutral position, the peroneal tendons are also susceptible to mechanical strain and stress[6].

Once ligaments are unable to reshape to their usual length, mechanical instability results, enabling motion that is beyond normal physiological constraints[7]. The proprioceptive nerve fibers which travel from the soft tissue and ankle joint are frequently strained or torn during an injury[7]. When a player adopts a unilateral foot stance, this might result in functional instability[7]. Any athlete may have both mechanical and functional instability, which, if left untreated, can exacerbate further sprains and the development of chronic ankle instability[7].

Football players usually produce more friction between their ankle joints and the ground while performing the game[8]. If the stress increases, there are high chance that the instability can occur at that moment[8]. To avoid such incidents, players should have to use proper footwear as well as learn the correct form of playing[8].

Football players most frequently get injuries to their lower limbs, especially to the ankle and knee[9]. Most cases of ankle sprains are brought on by forces acting on the foot or ankle, respectively, that result in severe eversion or inversion[9]. Strength, proprioception, neuromuscular, and postural control deficits have been linked with ankle instability[9].

The self-reported questionnaire used for ankle instability is the Ankle Joint Functional Assessment Tool (AJFAT)[10]. The AJFAT intends to evaluate ankle instability[10]. The twelve questions on the AJFAT address walking on uneven surfaces, swelling in the ankle joint, pain in the ankle joint, and stair climbing and descending[10]. The discriminative power of the AJFAT in establishing a cut-off value of 26 points has only been examined with CAI[10].

2. Materials and Methods

The study was approved by the Ethical Committee and Protocol Committee (protocol no. IEC.243/2023). Seventy-two participants were chosen using the formula of $n=Z^2pq/L^2$ for the observational study using a survey approach the researchers established via questionnaires. The purpose of the study was to evaluate how many football players are having ankle instability. Individual

questions were asked of each participant, and self-reported questionnaires used for ankle instability were AJFAT, anterior drawer test and posterior drawer test which were used to assess their comprehension. For documentation purposes, a case sheet with the names, ages, genders, and email addresses of the participants was made. A random sampling method was used in the Kolhapur city. The inclusion criteria include both male and female participants between the ages of 18 to 30 in Kolhapur city, participants willing to participate in the study and players practicing football for more than 3 years. Participants with ACL reconstruction, participants with a recent history of ankle fracture, visual analogue score more than 7, and participants with open wounds at ankle joints were among the exclusion criteria.

a. Anterior drawer test
b. Posterior drawer test.

3. Results

Table 1 and Figure 3 indicate the prevalence of ankle instability in females is 75% and in males is 36% by AJFAT score values and the posterior drawer test is positive in 25% in females and 6.66%. The anterior drawer is positive in 33.33% of females and 10% of males.



Figure 1. A therapist is performing an anterior drawer test on a participant who is a football player at Kolhapur.



Figure 2. A therapist is performing a posterior drawer test on a participant who is a football player at Kolhapur.

Table 1. Demographic differences in football players with ankle stability and without ankle stability

a. Gender

Gender	Female n=12	Male n=60
AJFAT	9 (75%)	21 (36%)
Posterior drawer test	3 (25%)	4 (6.6%)
Anterior drawer test	4 (33.33%)	6 (10%)

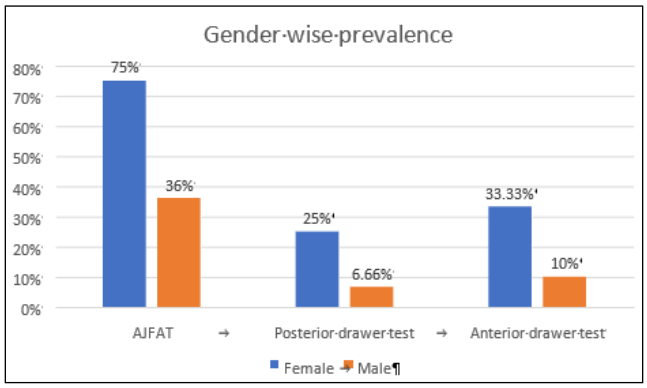


Figure 3. Gender-wise prevalence among female and male football players.

Inference: Females have a higher prevalence of ankle instability than males.

Table 2 concludes the patients in this research had an average age of 20.55±2.50 years, with a range of 18 to 30 years. The subject's maximum age was thirty years, while their lowest age was eighteen.

Inference: The percentage of ankle instability is also high in the 18-30 years of age group.

Table 3 shows the participants playing football for more than 3 years. The minimum number of years playing football in our study is 3 years and the maximum is 9 years. The mean number of years playing football with ankle instability is 5.55 ± 1.76 and without ankle instability is 4.84 ± 1.74.

Inference: Ankle instability is likely to be more in more experienced players.

Table 4 and Figure 4 indicate a total of 72 football players 10 (83.33%) had previous ankle sprains in the female category and 36 (60%) in the male category, while 2 (16.66%) football players in female and 24 (40%) had no history of an ankle sprain. Inference: The history of ankle sprain is more in females than males.

Table 2. Demographic differences in football players with ankle stability and without ankle stability

b. Age

Demographic data	Mean (SD) with Ankle Instability	Mean (SD) without Ankle Instability
Age (in years)	20.42 ± 2.29	20.77 ± 2.84
No. of years playing football	5.55 ± 1.76	4.84 ± 1.74

Table 3. Demographic differences in football players with ankle stability and without ankle stability

c. Number of years playing football

Number of Years	Mean (SD) with Ankle Instability	Mean (SD) without Ankle Instability
Minimum 3 years and maximum 9 years	5.55 ± 1.76	4.84 ± 1.74

Table 4. Prevalence of history of ankle sprain in male and female football players

History of Ankle Sprain	Female n=12	Male n=60
Previous ankle sprain	10 (83.33%)	36 (60%)

Table 5 and Figure 5 shows the Ankle Joint Functional Assessment Tool, the overall frequency of ankle instability is 9 (75%) in female football players and 36 (60%) in male football player's drawer test results. 9 females and 36 males show score less than or equal to

26. Anterior and posterior drawer test -There are 4 (33.33%) female and 6(10%) male football players that have a positive anterior drawer test. Additionally, 3 (25%) of female football players and 4 (6.66%) of male football players had positive posterior drawer test results.

Table 5. Prevalence of ankle instability in male and female football players

a. Overall prevalence for AJFAT, ADT, PDT:

Gender	n	AJFAT n (%)	ADT n (%)	PDT n(%)
Female	12	9 (75%)	4 (33.33%)	3 (25%)
Male	60	36 (36%)	6 (10%)	4 (6.66%)
Total	72	45(62.5%)	10(13.88%)	7(9.72%)

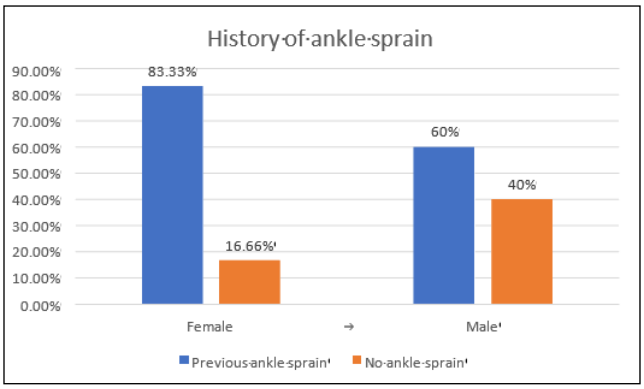


Figure 4. Prevalence of a history of ankle sprain in male and female football players.

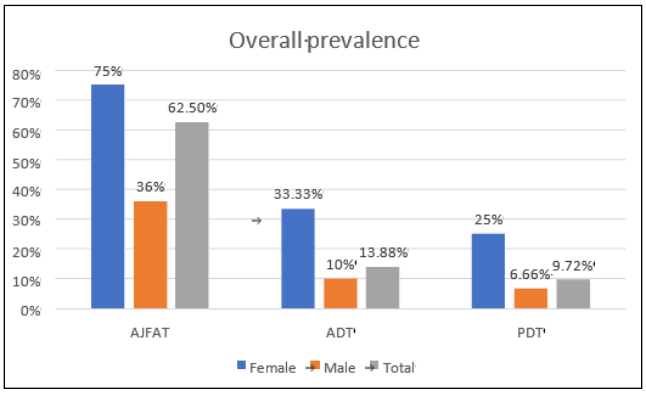


Figure 5. Overall ankle instability prevalence for AJFAT, ADT, and PDT.

Table 6. Visual analogue scale interpretation

b. The overall prevalence for VAS:

Gender	n	VAS Mean (SD)
Female	12	6±1.85
Male	60	4.30±1.89
Total	72	4.30±1.89

Inference: Ankle instability is high in female football players. The findings demonstrate that a percentage of football players experiencing ankle instability had positive anterior drawer and posterior drawer tests, indicating issues with the anterior and posterior talofibular ligaments[11].

Table 6 indicates visual analogue scale that interprets the mean visual analogue scale of female football players is 6±1.85 and in males is 4.30±1.89 and in total both male and female it is 4.30±1.89. (p=0.0057) for VAS considered very significant. Inference: Mean VAS is greater in females than males.

4. Discussion

This study looked at the frequency of ankle instability in 72 football players from Kolhapur City. Ankle inversion sprains are prevalent among athletes and physically active people alike, with recurrence rates as high as 80%. Highlighted differentiating incidences of ankle instability were there between the gender categories. Compared to male football players, ankle instability was significantly more common among female players. The purpose of this study was to find out the prevalence of ankle instability. We seek to ascertain whether ankle instability affects football players in Kolhapur City, taking into consideration that most previous articles focused on the general population. Using inclusion and exclusion criteria, we investigated the incidence of ankle instability in football players. The patients in this research had an average age of 20.55±2.50 years, with a range of 18 to 30 years. The subject's maximum age was thirty years old, while their lowest age was eighteen. The prevalence of ankle instability according to one study reported an age group of 19-29 years[12].

Male football players were predominantly higher than female football players in this research. This predominance can be shown because of the higher population of males participating in football than females[13]. Our study found that female football players had a higher prevalence of ankle instability than male football players. Ankle sprain risk factors include variations in neuromuscular control, increased joint laxity, and decreased postural control. Female football players may be more susceptible to ankle injuries due to their larger range of motion in the tibial varum and calcaneum eversion.

In a recent study which is done by Raymond J Walls, and Keir A Ross, 2016 Jan, it has been seen that for physicians and trainers, preventing injuries and avoiding missed playtime is paramount. Accurate diagnosis, efficient treatment, and appropriate postoperative care may all help achieve this aim[14]. Although player-to-player contact accounts for most injuries sustained in soccer, there are also a considerable number of non-contact injuries[15]. Encouraging ankle and knee proprioception through in-season neuromuscular training programs may reduce the likelihood of non-contact lower limb injuries. Sufficient recovery and rehabilitation programs, appropriate equipment, favourable field conditions, consistent cool-down after training or competition, and efficient warm-up routines with a focus on stretching can all help avoid injuries[16].

In our study, we included participants playing football for more than 3 years. The minimum number of years participants playing football in our study is 3 years and the maximum is 9 years. Most football players begin training before 3 years or more. Hence, these players are more susceptible to overuse injuries[17]. Also, the right leg was more dominant than the left leg. The right leg was 93.05% dominant and the left leg was 6.94 % dominant. Leg dominance increases the chance of developing symptoms of instability or sustaining an ankleligament sprain.

Most athletes apply more strain on their dominant limb during high-demand sports that put the ankle in danger, thereby raising the frequency and severity of instances about the ankle[18]. Limb predominance has been connected to risk factors for lower extremity injuries[19]. Any previous injury caused while playing is stated up to 63.80% and experienced an ankle sprain in the past years. Ankle sprain develops into ankle instability in the chronic time frame, which can cause recurrence of ankle sprain with loss of proprioception. Compared with the uninjured side the injured side is at risk of injury five times more to cause ankle instability.

Also, in another study which was done by Alison Suzanne Attenborough, and Claire E. Hiller in 2014, the sports were examined for information on characteristics of CAI and/or symptoms that remained after an ankle

sprain or injury. No single research provided information on every facet of CAI. Data on perceived instability, mechanical instability, and recurrent sprain were only reported for dance as a sport. It is revealed that across their respective cohorts, 5% of ankle injuries acquired during dancing were recurring, 27% of dancers had injured their ankles more than once, and no dancers experienced perceptual or mechanical instability[20].

5. Conclusion

The intent of this research was to ascertain the frequency of ankle instability among football players in Kolhapur city. According to our research, 62.5% of football players (45 out of 72 players) reported having ankle instability, and 63% of football players (46 out of 72 players) have previously sprained their ankles. Ankle instability was much more common in female football players than in male football players.

6. Abbreviations

JFAT: Ankle Joint Functional Assessment Tool
ADT: Anterior Drawer Test
PDT: Posterior Drawer Test
CAI: Chronic Ankle Instability
FAI: Functional Ankle Instability

7. References

1. Ferran NA, Oliva F, Maffulli N. Ankle instability. Sports Med Arthrosc Rev. 2009; 17(2):139-145. https://doi.org/10.1097/JSA.0b013e3181a3d790 PMid:19440141
2. Ross SE, Guskiewicz KM, Gross MT, Yu B. Assessment tools for identifying functional limitations associated with functional ankle instability. J Athl Train. 2008; 43(1):44-50. https://doi.org/10.4085/1062-6050-43.1.44 PMid:18335012 PMCid: PMC2231396
3. Cloak R, Nevill A, Day S, Wyon M. Six-week combined vibration and wobble board training on balance and stability in footballers with functional ankle instability. Clin J Sport Med. 2013; 23(5):384-391. https://doi.org/10.1097/JSM.0b013e318291d22d PMid:23657122
4. Hertel J. Functional anatomy, pathomechanics, and pathophysiology of lateral ankle instability. J Athl Train. 2002; 37(4):364.
5. Kim JH, Uhm YH. Effect of ankle stabilization training using biofeedback on balance ability and lower limb muscle activity in football players with functional ankle instability. J Korean Phys Ther. 2016; 28(3):189-194. https://doi.org/10.18857/jkpt.2016.28.3.189
6. Walls RJ, Ross KA, Fraser EJ, Hodgkins CW, Smyth NA, Egan CJ, *et al.* Football injuries of the ankle: A review of injury mechanisms, diagnosis and management. World J Orthop. 2016; 7(1):8. https://doi.org/10.5312/wjo.v7.i1.8 PMid:26807351 PMCid: PMC4716575
7. Al Adal S, Mackey M, Pourkazemi F, Hiller CE. The relationship between pain and associated characteristics of chronic ankle instability: a retrospective study. J Sport Health Sci. 2020; 9(1):96-101. https://doi.org/10.1016/j.jshs.2019.07.009 PMid:31921485 PMCid: PMC6943759
8. Cruz A, Oliveira R, Silva AG. Functional ankle instability prevalence and associated risk factors in male football players. Open J Orthop. 2020; 10(4):77. https://doi.org/10.4236/ojo.2020.104010
9. Donovan L, Hetzel S, Laufenberg CR, McGuine TA. Prevalence and impact of chronic ankle instability in adolescent athletes. Orthop J Sports Med. 2020; 8(2):2325967119900962. https://doi.org/10.1177/2325967119900962 PMid:32118082 PMCid: PMC7029541
10. Li J, Qiu F, Legerlotz K. Cross-cultural adaptation and validation of the Chinese version of the Ankle Joint Functional Assessment Tool (AJFAT) questionnaire. J Foot Ankle Res. 2023; 16(1):22. https://doi.org/10.1186/s13047-023-00622-2 PMid:37098578 PMCid: PMC10131472
11. Zhang C, Chen N, Wang J, Zhang Z, Jiang C, Chen Z, *et al.* The prevalence and characteristics of chronic ankle instability in elite athletes of different sports: A crosssectional study. J Clin Med. 2022; 11(24):7478. https://doi.org/10.3390/jcm11247478 PMid:36556094 PMCid: PMC9783869
12. Hershkovich O, Tenenbaum S, Gordon B, Bruck N, Thein R, Derazne E, *et al.* A largescale study on epidemiology and risk factors for chronic ankle instability in young adults. J Foot Ankle Surg. 2015; 54(2):183-7. https://doi.org/10.1053/j.jfas.2014.06.001 PMid:25135102
13. Attenborough AS, Hiller CE, Smith RM, Stuelcken M, Greene A, Sinclair PJ. Chronic ankle instability in sporting populations. Sports Med. 2014; 44:1545-1556. https://doi.org/10.1007/s40279-014-0218-2 PMid:24981244
14. Santos MJ, Liu W. Possible factors related to functional ankle instability. J Orthop Sports Phys Ther. 2008; 38(3):150-7. https://doi.org/10.2519/jospt.2008.2524 PMid:18383650
15. Gribble PA. Evaluating and differentiating ankle instability. J Athl Train. 2019; 54(6):617-627. https://doi.org/10.4085/1062-6050-484-17 PMid:31161943 PMCid: PMC6602389
16. Gribble PA, Hertel J, Denegar CR, Buckley WE. The effects of fatigue and chronic ankle instability on dynamic postural control. J Athl Train. 2004; 39(4):321.

17. Hintermann B, Valderrabano V, Boss A, Trouillier HH, Dick W. Medial ankle instability: An exploratory, prospective study of fifty-two cases. Am J Sports Med. 2004; 32(1):183-190. https://doi.org/10.1177/0095399703258789 PMid:14754742
18. Strauss JE, Forsberg JA, Lippert FG 3rd. Chronic lateral ankle instability and associated conditions: A rationale for treatment. Foot Ankle Int. 2007; 28(10):1041-1044. https://doi.org/10.3113/FAI.2007.1041 PMid:17923051
19. Tanen L, Docherty CL, Van Der Pol B, Simon J, Schrader J. Prevalence of chronic ankle instability in high school and Division I athletes. Foot Ankle Spec. 2014; 7(1):37-44. https://doi.org/10.1177/1938640013509670 PMid:24287210
20. Wikstrom EA, Tillman MD, Chmielewski TL, Cauraugh JH, Naugle KE, Borsa PA. Discriminating between copers and people with chronic ankle instability. J Athl Train. 2012; 47(2):136-142. https://doi.org/10.4085/1062-6050-47.2.136 PMid:22488278 PMCid: PMC3418124.

Access this journal online	
Website: www.informaticsjournals.co.in/index.php/JEOH/index	**Quick Response Code**