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**Persistent Disability Associated with Chronic Ankle Instability in
Soccer Players and Functional Assessment Tool Interventions to
Improve Ankle Stability**

Anjer Yahya Shaya'a

Master student at Capital University of Physical Education and Sports- Beijing.

yahya.anjer@outlook.com

Abstract

Throughout life, regular physical activity has numerous health benefits. However, engaging in physical activity entails a risk of both acute and chronic musculoskeletal injury. Chronic ankle instability is frequently linked to lesions that develop as a result of contributing variables. Soccer uses both anaerobic and aerobic energy systems, and a number of factors, such as muscular endurance, cardiorespiratory endurance, flexibility, speed, strength, agility, balance, and coordination, can have a significant impact on an athlete's performance. As a result, soccer players frequently have ankle instability, which can lower their level of physical performance. The current research aims to investigate the relationship between persistent disability associated with chronic ankle instability in soccer players and functional assessment tool interventions to improve ankle stability. The researcher used the qualitative approach by referring to previous studies theoretically to obtain information that covers the variables of the current research will be adopted. The researcher recommended that even though there isn't much research that supports ankle injuries, it is critical to incorporate techniques to prevent injury repetition, as well as, while preventing chronic ankle instability, factors such as age, limb dominance, position played, and the quality of training protocols should be taken into consideration. Given that prevention is currently the most important factor in clinical work in sports, more specialized clinical and

physical work ought to be organized to address more detailed framing for various athletes. Further research is necessary to determine the precise, meaningful relationships between various elements and injuries to avoid player absences and the onset of chronic problems.

Keywords: *Physical Activity, Soccer Players, Chronic Ankle Instability, Functional Assessment Tool, Ankle Stability*

المخلص

طوال الحياة، النشاط البدني المنتظم له فوائد صحية عديدة. ومع ذلك، فإن ممارسة النشاط البدني تنطوي على خطر الإصابة بالعضلات الهيكلية الحادة والمزمنة. غالبًا ما يرتبط عدم الاستقرار المزمن في الكاحل بالآفات التي تتطور نتيجة للمتغيرات المساهمة. تستخدم كرة القدم أنظمة الطاقة اللاهوائية والهوائية، ويمكن لعدد من العوامل، مثل التحمل العضلي، والتحمل القلبي التنفسي، والمرونة، والسرعة، والقوة، وخفة الحركة، والتوازن، والتنسيق، أن يكون لها تأثير كبير على أداء الرياضي. ونتيجة لذلك، يعاني لاعبو كرة القدم في كثير من الأحيان من عدم استقرار الكاحل، مما قد يقلل من مستوى أدائهم البدني. يهدف البحث الحالي إلى دراسة العلاقة بين الإعاقة المستمرة المرتبطة بعدم استقرار الكاحل المزمن لدى لاعبي كرة القدم وتدخلات أداة التقييم الوظيفي لتحسين استقرار الكاحل. في هذا البحث فقد تم اعتماد المنهج النوعي من خلال الرجوع إلى الدراسات السابقة نظرياً للحصول على معلومات تغطي متغيرات البحث الحالي. وقد اوصى الباحث أنه من المهم دمج تقنيات لمنع تكرار الإصابة، مما قد يؤدي إلى عدم استقرار مزمن في الكاحل. أثناء منع عدم الاستقرار المزمن في الكاحل، يجب أن تؤخذ في الاعتبار عوامل مثل العمر، وهيمنة الأطراف، والمركز الذي يتم اللعب فيه، وجودة بروتوكولات التدريب. نظرًا لأن الوقاية هي العامل الأكثر أهمية حاليًا في العمل السريري في الرياضة، فيجب تنظيم عمل سريري وبدني أكثر تخصصًا لمعالجة تأخير أكثر تفصيلاً لمختلف الرياضيين. من الضروري إجراء المزيد من الأبحاث لتحديد العلاقات الدقيقة والهادفة بين العناصر المختلفة والإصابات لتجنب غياب اللاعبين وبداية المشاكل المزمنة.

الكلمات المفتاحية: *النشاط البدني، لاعبو كرة القدم، عدم الاستقرار المزمن للكاحل، أداة التقييم الوظيفي، استقرار الكاحل*



1. Introduction

Throughout life, regular physical activity has numerous health benefits. However, engaging in physical activity entails a risk of both acute and chronic musculoskeletal injury (Jung, 2017). Injuries to the musculoskeletal system, especially those affecting the lower limbs, can result in temporary impairment, hinder physical activity, and increase the risk of joint problems down the road. Therefore, it is highly desirable to prevent both acute and chronic musculoskeletal injuries and to lessen the burden that goes along with them. To identify high-risk populations for injury, evaluate the effectiveness of injury-prevention measures, and support the need for additional study, it is imperative to quantify the consequences of these injuries. One of the most frequent musculoskeletal injuries is an acute ankle sprain, which is more likely in people who engage in physical activity. Furthermore, there is a significant likelihood of recurrence for acute ankle sprains, and this is linked to the emergence of chronic ankle instability (CAI) (Roos, 2016).

Previous research claimed about 2 million cases of acute ankle sprains per year. An incidence rate of two to seven acute ankle sprains/1000 person-years is suggested by data from visits to emergency rooms; however, this is probably a considerable underestimate, as many injured individuals may not visit an ER or seek medical attention at all (Roos, 2016; Herzog, 2019).

Chronic ankle instability is frequently linked to lesions that develop as a result of contributing variables (Gribble, 2019). These lesions do not always occur in conjunction with persistent ankle instability, if at all. Chronic regional pain syndrome, neuropraxia, sinus tarsi syndrome, tendon disorders like peroneal



tendinopathy, dislocation or subluxation, impingement syndromes, fractures like anterior calcaneal process, fabula and lateral talar process, loose bodies, and osteochondral lesion of talar dome or distal tibia are examples of associated lesions that may accompany chronic ankle instability (Herzog, 2019).

Soccer and other popular sports have good social, cultured, and economic impacts. Soccer uses both anaerobic and aerobic energy systems, and several factors, such as muscular endurance, cardiorespiratory endurance, flexibility, speed, strength, agility, balance, and coordination, can have a significant impact on an athlete's performance (Ünver, 2023).

According to prior studies, the foot and ankle are significant and very active body parts for the soccer branch. Various microtraumas can cause loads on the foot area, resulting in ankle injuries for soccer players. Ankle instability can arise from injury-related situations in soccer players with a history of ankle problems. As a result, soccer players frequently have ankle instability, which can lower their level of physical performance. As a result, football players need to have very high levels of functional ankle stability (Herzog, 2019; Gribble, 2019; Ünver, 2023).

Al-Mohrej (2016) asserted that clinically, severe inversion injuries and recurring ankle sprains in the past are revealed in the medical histories of patients with chronic ankle instability. Wearing braces would only somewhat alleviate the risks associated with weight bearing, vigorous activities, and walking on uneven ground. Chronology: Chronic ankle instability occurs when an injury is too persistent to heal in the first few weeks, causing the ankle to lose its capacity to function both mechanically and functionally.



Ligament laxity is the source of mechanical ankle instability, whereas deficiencies in postural control, neuromuscular function, muscle weakness, and proprioceptive function are the causes of functional ankle instability. The International Ankle Consortium has changed the selection criteria for chronic ankle instability, and it now includes the possibility of seven subcategories, such as mechanical instability interaction, frequency of multiple sprains, and subjective instability (Ünver, 2023).

To determine whether there is any hind foot varus misalignment, a physical examination of the lower extremities should be performed for chronic ankle instability. A foot-high arch problem called midfoot cavus and ligamentous laxity should also be evaluated during the physical examination. It is important to evaluate hind foot mobility and peroneal muscle strength. Since proprioception is frequently faulty in patients with chronic ankle instability, Romberg's maneuver should be used. It also aids in evaluating ankles that are typical. It is important to evaluate the range of motion at the ankle, subtalar, and midtarsal joints. It is also important to evaluate the tendoachilles ligamentous complex to rule out subluxation, weakness, or pain, according to (Al-Mohrej, 2016; Norasteh, 2022)

Studies on ankle instability in soccer players (Al Mohrej, 2016; Herzog, 2019; Kolokotsios, 2021), are important because they can help identify risk factors and create effective preventative techniques for many types of injuries, particularly those involving the foot. However, it is important to highlight that there is a dearth of research on functional ankle instability in soccer players. The current study, which is extending the body of research in this field, will provide insightful information that will improve athlete safety and maximize athletic performance.



The purpose of this study was to assess male soccer players' functional ankle instability.

2. Research Problem and Questions

Ankle sprains are extremely common in the general public as well as in sports. Conservative methods are usually used to treat acute ankle sprains, however many patients may experience chronic ankle pain and instability. Despite having a high recurring occurrence, chronic ankle instability is still poorly understood. Increased ligamentous laxity and very probable proprioceptive abnormalities are the impairments associated with chronic ankle instability. Sports, walking, jumping, and involvement in the workforce can all be impacted (Cruz, 2020).

Kolokotsios (2021) confirmed that performance flaws in athletes result in injury lost playing time, and financial gains. Athletes who have these persistent flaws may potentially stop participating in sports, particularly professional sports, or experience negative psychological impacts. To prevent re-injury and create rehabilitation programs, it is also critical to discover an efficient method for identifying and measuring functional ankle instability.

Functional exams help athletes heal and resume their exercise regimens (Roos, 2016). A review of earlier research, however, indicated that no thorough study had been conducted to gather functional tests for the assessment of ankle instability in athletes. The studies give an overview of ankle instability, so it is critical to ascertain what kind of functional tests are utilized to assess ankle instability in athletes. This summary can help with more thorough and superior assessments of various tests to identify the ones that provide more accurate and trustworthy data



regarding ankle instability in athletes (Lin, 2021). Regarding this, the study seeks to answer the following main question; **“What is the relationship between persistent disability associated with chronic ankle instability in soccer players and functional assessment tool interventions to improve ankle stability?”**

The main questions are subdivided into the following sub-questions:

1. What are the factors that lead to chronic ankle instability in soccer players?
2. What is the level of functional assessment tool intervention to improve ankle instability in soccer players

3. Research Objectives

The study aims **“to investigate the relationship between persistent disability associated with chronic ankle instability in soccer players and functional assessment tool interventions to improve ankle stability”**

This main objective is subdivided into the following sub-objectives:

- Investigate the factors that lead to chronic ankle instability in soccer players.
- Investigate the level of functional assessment tool intervention to improve ankle instability in soccer players.

4. Research Significance

The importance of this study stems from the importance of awareness of the prevalence of chronic ankle instability in soccer players. There are many studies centered on the current research topic. Therefore, conducting such a study on this



topic is expected to have a great positive impact and importance, which can be summarized as follows:

- This study will be a useful source of information about factors that lead to ankle instability in soccer players and functional assessment tool interventions to improve ankle stability in soccer players.
- Referring to previous studies centered on the research topic will be crucial. It can be referred to determine the level of functional assessment intervention to improve ankle stability in soccer players.
- On the other hand, the results of this research may help in preparing awareness sessions about the persistent disability associated with chronic ankle instability in football players. It may also help guide soccer players and their coaches on reducing the factors that lead to chronic ankle instability in soccer players.
- Given the scarcity of previous studies related to the current field of research, this research will represent a good reference for future studies as long as it will provide subsequent researchers and scholars interested in the field of chronic ankle instability in soccer players with valuable literature, important recommendations and suggestions for their proposed studies.

5. Methodology

The researcher will adopt the qualitative approach by referring to previous studies theoretically to obtain information that covers the variables of the current research.



6. Literature Review

6.1 Chronic Ankle Instability in Soccer Players

Important and highly active body parts for the soccer branch are the foot and ankle. Soccer players may sustain ankle injuries from loads on the foot area containing different types of microtraumas (Zhang, 2022). Soccer players who have a history of ankle injuries may experience ankle instability as a result of injury-related circumstances. Thus, ankle instability is a regular occurrence among soccer players and may result in a decline in their level of athletic performance. Football players must, therefore, maintain a high degree of functional ankle stability (Mandarakas, 2014).

Popular sports like soccer have positive social, cultural, and economic effects. Both anaerobic and aerobic energy systems are used in soccer, and an athlete's performance can be greatly influenced by a variety of elements, including muscular endurance, cardiorespiratory endurance, flexibility, speed, strength, agility, balance, and coordination (Al-Mohrej, 2016).

Ankle ligament tearing or stretching is a characteristic of acute ankle sprains. The most prevalent kind of ankle sprain is a lateral ankle ligament complex sprain, which has an incidence rate of 0.93/1000 athlete exposures, according to the authors¹⁴ of a meta-analysis. By contrast, the incidence rates of high/syndesmotic and acute medial ankle sprains were reported to be roughly 0.38 and 0.06/1000 AEs, respectively (Mandarakas, 2014).

Anterior talofibular ligament injuries account for roughly 73% of lateral ankle sprains, which account for more than three-quarters of all acute ankle sprains. Medial (deltoid ligament) or high ankle/syndesmosis (anterior-inferior tibiofibular



ligament or posterior-inferior tibiofibular ligament injuries) account for approximately 25% of all acute ankle sprains. This review focuses on the general category of acute ankle sprains, which includes high/syndesmotic, medial, and lateral sprains (Lin, 2021).

According to (Norasteh, 2022; Gribble, 2016), up to 50% of individuals who suffer from an ankle sprain are thought to forego seeking medical advice or treatment. After an ankle sprain, not getting treatment increases the risk of developing chronic symptoms, such as CAI. When it comes to letting go and getting back into sports, surgical therapy for acute ankle sprains was associated with better stability and a quicker recovery time than non-operative treatment. The benefits of this surgical procedure should be weighed against the expenses and possibility of problems, though. Compared to immobilization, functional treatment after acute ankle sprain (with early proprioceptive rehabilitation) allows for better outcomes and faster recovery.

One of the most frequent musculoskeletal ailments, ankle sprains is frequently sustained during competitive sports. The high recurrence incidence of acute ankle sprains frequently results in the development of chronic ankle instability (CAI). Patients with CAI typically report recurrent ankle sprains, a tendency toward them, and frequent sensations of the ankle giving way, decreased range of motion, weakness, and decreased daily function. They also frequently experience repetitive pain, edema, and restricted ROM (Gribble e. , 2016).

The history of at least one prior lateral ankle sprain is the primary risk factor for the development of chronic ankle instability (CAI). The prevalence of residual instability is unrelated to the initial sprain's severity as determined at the scene of



the injury. One severe ankle sprain carries the same chance of developing CAI as one or more moderate sprains. Thus, the development of CAI is influenced by additional factors (Kolokotsios, 2021).

According to Gribble (2019), the repetitive damage, limited mobility, and imbalance brought on by CAI result in more injuries, which have a major impact on the athletes' expectations for practice and competition throughout their careers. Long-term effects of the high incidence of re-injury and the ensuing development of CAI include an elevated risk of ankle joint degeneration, particularly ankle joint post-traumatic osteoarthritis.

6.2 Factors that Lead to Chronic Ankle Instability in Football Players

Ankle sprains provide a serious clinical challenge. Numerous factors, including deficiencies in balance, postural control, kinematics, muscle activity, strength, range of motion, ligament laxity, and bone/joint features, have been found to contribute to the occurrence of repeated ankle sprains (Thompson, 2016).

Football-related injuries mostly affect the lower extremities, with the ankle and knee regions being the most commonly damaged. Ankle sprains are among the most frequent sports injuries, according to studies, occurring 15% to 45% of the time throughout the football season (Cruz, 2020; Nery, 2016; Norasteh, 2022). The majority of ankle sprains are caused by excessive inversion or eversion of the ankle or foot, respectively, as a result of lateral or medial stresses. More than 70% of all ankle injuries are sprains, and 80% to 90% of them cause inversion (Cruz, 2020) .

The existing knowledge of chronic ankle instability (CAI) shows that, while mechanical laxity, recurrent lateral ankle sprains, and perceived instability all



contribute to CAI, each of these characteristics might manifest alone or in combination in a given person. Given the detrimental effects on one's health and finances, including diminished quality of life, missed work, and early-onset osteoarthritis, CAI is important (Thompson, 2016).

According to previous studies, ankle joint instability encompasses a broader spectrum of potential dysfunctions along with both mechanical and functional instability. While functional instability is a subjectively reported phenomenon defined by recurrent episodes of "giving way" or ankle instability during daily activities and sports, as well as the frequency of symptomatic, recurrent ankle sprains, mechanical instability refers to objective measurements of ligament laxity. Patients with chronic ankle instability are believed to have altered neuromuscular control of the ankle due to injury to muscles, receptors, or nerves from the initial ankle inversion injury, in addition to increasing laxity. Ankle instability is linked to deficiencies in strength, neuromuscular and postural control, and decreased proprioception (Cruz, 2020; Miller, 2015; Roos, 2016)

Perceptions and behaviors will also be influenced by specific personal characteristics, such as a history of musculoskeletal injuries and self-efficacy level. The way a patient reacts to limitations affects how they see the injury and how they behave, including how they move, both during and after the injury (Gribble e. , 2016). Athletes from regional teams face less competition than those in national leagues, but they also train in subpar environments, with less emphasis on intensity or organized warm-ups, and, in contrast to elite teams, are probably not supported in the event of an injury by a dedicated medical staff at their club. These elements may be involved in increased incidence of persistent ankle instability (Lin, 2021).



Recurrence of the sprain was found to be significantly correlated with the feeling of further giving way and instability, strengthening the possibility of a cascade leading to chronic ankle instability. Recurrent ankle sprains and giving way episodes are likely to cause more secondary tissue injury, which will degrade pathomechanics even more (Cruz, 2020).

6.3 The Level of Functional Assessment Tool Intervention to Improve Ankle Stability in Soccer Players

The intricate and useful anatomy of the foot permits a wide range of physical activities. The ankle joint, which is situated between the talus and tibia bones, is categorized as a trochlear-type joint. The capacity to keep the ankle in the proper position and adjust to changing circumstances is known as ankle stabilization. Both static and dynamic elements contribute to ankle stabilization. The term "functional ankle instability" refers to an involuntary joint movement that stays within normal physiological bounds (Herzog, 2019).

The laxity brought on by ligament rips is the cause of mechanical instability. Following an ankle sprain, proprioceptive and muscle impairments cause functional instability. It can be challenging to evaluate or discern between mechanical and functional instabilities, and they frequently coexist in the development of CAI (Miller, 2015).

Functional instability can be brought on by tibiofibular sprains, proprioceptive deficits, traction neuropathy of the nervus suralis or peroneus superficialis, a loss in muscle strength, and capsule injury (Nery, 2016). Radiography, joint range of motion measurements, clinical evaluation scales, and muscular strength tests can



all be used to diagnose ankle instability. Scales are one of these techniques that have been more and more popular recently. They are designed especially to assess ankle injuries and the degree and presence of instability (Zhang, 2022).

Both mechanical and functional instability might be present in chronic ankle instability. While mechanical instability can be determined by physical examination, functional instability is dependent on patient-generated reports or complaints, which may be accompanied by clinical laxity. Surgery is typically the sole choice for people with chronic ankle instability if conservative management and physical therapy are unable to resolve their condition (Al-Mohrej, 2016).

According to Ünver (2023), one significant extrinsic element affecting the impact of CAI in day-to-day living is exercise level. After an ankle sprain, determining each patient's activity level is helpful not just in identifying those who are more or less likely to develop CAI, but also in determining the best course of action and enabling comparison of functional outcomes. When asking the patient questions, it's important to consider a variety of things, including the patient's occupation, shoes, and degree of athletic activity.

Recent research indicates that elite athletes with severe ankle sprains and significant ankle instability may benefit from early surgical repair of the ligaments in the acute stage (Cruz, 2020). This is because non-operative management typically results in a 20% incidence of significant symptoms, which lowers the risk of CAI. Ankle sprains and CAI can be predisposed by anatomical changes in the tibiotalar joint, such as the axis of rotation, talar dome radius, or retroposition of the lateral malleolus. Anterior impingement, short gastrocnemius, chondral issues (ankle osteochondral abnormalities, loose bodies), and bimalleolar diastasis are



examples of pathological disorders of the tibiotalar joint that can cause or worsen CAI (Kolokotsios, 2021).

Risk factors for CAI include subtalar joint diseases (talocalcaneal coalition, subtalar joint laxity due to lesions of the cervical ligament, talocalcaneal ligament, or interosseous ligament) and anatomical abnormalities (hindfoot varus, axis of rotation). Important intrinsic risk factors for CAI include abnormalities in the collateral lateral ligament's anatomy and histology, such as the number of bands, insertion zones, and collagen disorders. Diseases with a proprioceptive deficiency or imbalance in neuromuscular control are common causes of CAI, and diseases involving the peroneal tendon can cause or exacerbate a CAI (Thompson, 2016).

Research from peer-reviewed literature indicates that people with chronic ankle instability do not all have the same characteristics. Anatomic diversity and a spectrum of pathologic states make up the etiological components of CAI. Having a thorough understanding of these traits will help in making better treatment selections (Guillo, 2014).

Previous studies indicated that an evaluation of both ankles in comparison must be part of the physical exam. While standing, one must examine gait and assess lower leg and hind foot alignment. It is necessary to pinpoint the exact area that is delicate. To test gastrocnemius tightness, active and passive ankle range of motion (ROM) is measured with the knee extended and subsequently in a sitting posture with the legs down and the knees flexed to 90°. The opposite side is compared to hindfoot inversion/eversion. It is appropriate to grade hind foot mobility as normal, abnormal (increased or decreased), or nonexistent due to the difficulty in making accurate assessments (Guillo, 2014; Norasteh, 2022)



It is crucial to evaluate generalized joint laxity using the Beighton scale. Following specialized testing of the tibialis posterior and personal tendons' strength and discomfort in their resistive function, the lower limbs' neurovascular condition is evaluated. Comparative ankle ligament testing is carried out on a calm patient who is seated with their knee flexed. Since it could be challenging for different examiners to explain the anterior drawer test's degree of ankle laxity, a straightforward statement of stable, unstable, or unstable with a sulcus sign might be suggested (Lin, 2021).

It is often difficult to determine whether varus tilt is present, and it is also desired if there is laxity or none at all about the other side. The patient can be evaluated for stability and proprioceptive control of the ankle by standing in a single-leg stance and opening and closing their eyes. This test could assist in distinguishing between functional and mechanical instability (Guillo, 2014).

As well, according to Nery (2016), when there is deep discomfort, magnetic resonance imaging can be useful in evaluating the possibility of osteochondral lesions and tendon injuries. It can also confirm the existence of persistent ligamentous injury. Assessing tendon pathology may be aided greatly by ultrasonography. While not always recommended, computed tomography/MRI-arthrogram scanning can be useful for accurately assessing chondral lesions.

6.4 Previous Studies

In the study conducted by Roos et al (2016), entitled “**The Epidemiology of Lateral Ligament Complex Ankle Sprains in National Collegiate Athletic Association Sports**”, this study aimed to describe the epidemiology, including the



estimated yearly national incidence, of LLC sprains among National Collegiate Athletic Association (NCAA) athletes. A descriptive epidemiology study was used by injury surveillance data for 25 sports from the NCAA Injury Surveillance Program (NCAA-ISP) for the academic years 2009-2010 to 2014-2015 were used for analysis. The study found that LLC sprains were United States collegiate student-athletes most commonly reported injury diagnosis. Continued examination of interventions that aim to reduce the incidence, severity, and recurrence of LLC sprains, specifically in women, is warranted.

Another study entitled “**2016 consensus statement of the International Ankle Consortium: Prevalence, impact and long-term consequences of lateral ankle sprains**” conducted by Gribble et al (2016), this study sought to introduce recommendations to serve as a mechanism to promote efforts to improve the prevention and early management of LAS. This study reduced the prevalence of CAI and associated sequelae that have led to the broader public health burdens of decreased physical activity and early onset ankle joint post-traumatic osteoarthritis. Ultimately, this contributed to healthier lifestyles and the promotion of physical activity.

Another study conducted by Jung et al (2017), entitled “**Magnetic Resonance Imaging and Stress Radiography in Chronic Lateral Ankle Instability**”, this study aimed to classify the lateral ankle ligament MRI findings of the anterior talofibular ligament (ATFL) and calcaneofibular ligament (CFL) in chronic lateral ankle instability (CLAI) and correlated these findings with ankle stress radiographs. The study included 132 ankles with CLAI that underwent ligament reconstructions from 2006 to 2013. The distributions of the ATFL and CFL



morphologies were evaluated using the following categories: (1) the amount of thickness: normal/thickened/attenuated/non-visualized, (2) the presence of discontinuity, (3) wavy or irregular contour, and (4) increased signal intensity on T2-weighted images. Conclusions: The MRI findings of CLAI showed several morphologies and specific incidences for each morphology. The attenuated, wavy appearance was the most frequent MRI pattern. Thickness was related to the degree of instability.

A study entitled “**Anterolateral Drawer Versus Anterior Drawer Test for Ankle Instability: A Biomechanical Model**” conducted by Miller et al (2015), hypothesized that a simulated anterolateral drawer test allowing unconstrained internal rotation of the ankle would provoke greater displacement of the lateral talus in the mortise versus the anterior drawer test. The study used ten cadaveric lower extremities that were tested in a custom apparatus designed to reproduce the anterior drawer test and the anterolateral drawer test, in which the ankle was allowed to internally rotate about the intact deep deltoid ligament while being subluxed anteriorly. The study found that in an ankle instability model, the anterolateral drawer test provoked almost twice the lateral talus displacement found with the anterior drawer test.

A study entitled “**Examination of functional ankle instability in soccer players: a prospective study**” conducted by Ünver, et al (2023), aimed to evaluate functional ankle instability in soccer players and examine it in terms of some variables. The study used a total of 175 male soccer players were included in the present study. The ankle instability of soccer players was evaluated with the Identification of Functional Ankle Instability (IdFAI) scale. It was determined that



35.4% of the soccer players had functional ankle instability in their right foot, 29.7% in their left foot, and 46.3% on at least one side. The average IdFAI total score of all players was 9.39 ± 6.18 for the right side and 8.20 ± 5.55 for the left side. When the soccer players were evaluated regarding the position they played, it was determined that the mean of the IdFAI total score for both feet was higher in the midfielders.

Another study entitled **“An Updated Model of Chronic Ankle Instability”** conducted by Hertel (2019), aimed to describe how primary injury to the lateral ankle ligaments from an acute LAS may lead to a collection of interrelated pathomechanical, sensory-perceptual, and motor-behavioral impairments that influence a patient's clinical outcome. With an underpinning of the biopsychosocial model, the concepts of self-organization and perception-action cycles derived from dynamic systems theory and a patient-specific neurosignature, stemming from the Melzack neuromatrix of pain theory, are used to describe these interrelationships.

Mandarakas, et al (2014) conducted a study entitled **“Systematic review of chronic ankle instability in children”** sought to systematically review the prevalence of CAI in children. Studies were retrieved from major databases from the earliest records to March 2013. 14,263 papers were screened for eligibility against inclusion and exclusion criteria. Nine full papers were included in the review. Symptoms of CAI evaluated included perceived and mechanical ankle instability along with recurrent ankle sprain. A history of recurrent ankle sprain was found in 22% of children. Due to the long-lasting impacts of CAI, future research into the measurement and incidence of ankle instability in children is recommended.



7. Conclusion and Recommendations

In order to improve ankle instability, we have provided an explanation of CAI that attempts to both summarize our current knowledge of the causes influencing CAI in soccer players and provide a framework for functional evaluation tool solutions. The model explains how an acute ankle sprain may cause initial tissue damage to the lateral ankle ligaments, which may then result in a range of interconnected pathomechanical, sensory-perceptual, and motor-behavioral deficits that affect a patient's clinical outcome.

The training methods or outcomes are the discussions surrounding variables that can be a potential risk factor for ankle injuries sustained in sports is crucial. Even though there isn't much research that supports ankle injuries, it is critical to incorporate techniques to prevent injury repetition, which can result in chronic ankle instability. While preventing chronic ankle instability, factors such as age, limb dominance, position played, and the quality of training protocols should be taken into consideration. Given that prevention is currently the most important factor in clinical work in sports, more specialized clinical and physical work ought to be organized to address more detailed framing for various athletes. Further research is necessary to determine the precise, meaningful relationships between various elements and injuries to avoid player absences and the onset of chronic problems.



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