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An integrative review of Football Injuries: Risk factors, preventive strategies – A Literature Review

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ABSTRACT

Introduction: Football, the most played and popular sport at the moment, has a high rate of injuries. avoiding injuries by being aware of their risk is a smart way to concentrate. Players at all levels frequently worry about injuries because of the dynamic nature and strong physical demands.**Objectives:** Reviewing football injuries by understanding their risk factors and reducing injuries by understanding preventive techniques.**Methods:** literature research outlining various football studies on risk factors and associated mitigation techniques. The scientific articles are searched and retrieved using the following databases: PubMed and Scopus.**Results:** observed lowering the football injury rate by the application of preventive measures and an understanding of risk variables.**Conclusion:** This analysis demonstrated the efficacy of identifying risk variables and implementing preventative measures to lower the football injury rate. Nonetheless, the literature analysis mostly offers recommendations for additional study, inquiry, and policy creation to reduce the risk of football-related injuries

INTRODUCTION:

When it comes to football injuries among professional players, injury prevention is crucial, but there are currently insufficient clinical methods and scientific study-related initiatives in place. Ankle and knee injuries are the primary area of deficiency¹.

In order to prevent football injuries, it's critical to be aware of risk factors such as weariness, excessive training, lack of physical fitness and strength, and familiarity with the playing surface. Warm-up, strength and conditioning, and workload monitoring are also crucial components to consider².

Football is a popular sport around the world, but injuries have a significant negative impact on players and their families. By understanding and putting intervention tactics into practice, injury rates can be decreased³.

ACL injuries are prevalent and specifically related to football. ACL injuries are decreased by

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concentrating on risk factor mitigation. The majority of ACL injuries occur from non-contact injuries, which also include the meniscus. By identifying this pattern of injury, injuries can be prevented, especially in young athletes^{4,5}.

According to a study examining injuries sustained during the two seasons of the 2012–2014 Italian league, knee and thigh strains were frequently noted. Older players in series have a greater injury rate. Reducing injuries can be achieved by implementing injury prevention measures on players prior to workouts⁶.

Another major football worry that is on the rise is hamstring injuries. The three muscles that make up the hamstrings each have unique injury mechanisms and preventative protocols. Players from clubs miss roughly 15–21 games due to hamstring issues. It jeopardizes the player's life and game, and it is difficult for the club to have its player off the ground. Hamstring injuries are decreased by employing primary and secondary preventive measures^{7,8}.

In football, muscle injuries are a big problem because they impact players' game, performance, and health. The rate of reinjury is significant during the healing process before returning to play. Age and prior muscle damage are both regarded as risk factors for injury because they cannot be changed. In football, artificial intelligence plays a key role in diagnosing and preventing muscle injuries⁹.

METHODS:

This study uses a descriptive methodology. Its design is consistent with a study of the literature that describes many research on football injuries, their risk factors, and the preventive measures that have been employed.

Search Strategy: A scientific literature study on football injuries was conducted between January 2010 to March of 2025. Using a combination of the following keywords, the following electronic databases, including Scopus and PubMed, are searched to find articles: ("football injuries" AND "risk factors" AND "preventive strategies") OR ("soccer" OR "football").

Study Selection: The selected English-language articles were published between 2010 to 2024. The choices are made using three filters: 1) Database articles are initially selected according to their titles and objectives; irrelevant articles are removed. 2) Full-text publications relevant to work-related interest (football injuries) were extracted after the abstracts were reviewed, and the final filter is 3) Go over each of the selected articles in this phase, give them careful thought, evaluate them, and use

methodology to validate. In the end, duplicate articles were removed, and the main points of a select few articles were extracted.

RESULTS:

The database search found 57 publications in total, which were further divided into 18 Scopus articles and 39 PubMed articles. Of these, 12 articles were selected because the authors provided strong theoretical justification for their conclusions using relevant methodology and scientific significance.

Football Injuries:

Professional football players continue to sustain muscle injuries. Because the general injury incidence in football has declined over time, the rate of muscular injuries has increased¹⁰. In the pre-pandemic era, the rate of football muscle injuries was lower¹¹. Ankle injuries affect more than two-thirds of athletes, and lower limb injuries account for 84.2% of all injuries. Numerous extrinsic and intrinsic elements play a role in football¹².

Fatigue, muscle imbalance, and prior injury are the three main contributing factors to football-related injuries.¹ Football injuries affect players in many ways; some have long-term effects on their health, while others have short-term effects. The majority of athletes are aware of their risk of injury, yet they frequently fail to implement preventative measures. Improved coordination between athletes, coaches, physiotherapists, and other medical professionals can help players avoid injuries. Football is the main activity that is directly connected to ACL injuries, which are widespread in the sport along with other ailments. This harm is lessened with the aid of some preventative techniques. The majority of these injuries resulted from non-contact, and meniscus injuries also occurred indirectly as a result. Football injuries occur more frequently during practices and games.^{5,4}

Football injuries are classified into different sorts based on the player's age, position while playing, and body location from head to toe.⁶ Football players frequently sustain hamstring strains, which are further divided into direct and indirect injuries and graded into four categories.⁷ Football players' games and performance are greatly impacted by muscle injuries, and the rate of re-injuries is very significant after we have completed all the necessary play rehab.⁹

Risk factors:

The primary risk factor for football injuries is muscle reinjury. Risk factors are divided into two categories: extrinsic (such as other player interaction, equipment/environment, and climate) and intrinsic (such as physical condition, muscular

damage, coordination, weariness, diet, prior injury, and attentiveness).¹²

Three primary and significant risk variables are identified. The first is past injury, which leads to a wide range of injuries; the second is fatigue, which results in muscle inactivity and more injuries; and the third is muscle imbalance, which results in structural disruption and altered biomechanics, making the player more vulnerable to injury. There are several ways to assess such risk variables, including functional movement screens (FMS), questionnaires, and isokinetic muscle tests.¹

To prevent injuries, one must be aware of risk factors. There are other risk factors as well, including as weak muscles, insufficient physical fitness, exhaustion, overtraining, and surface type and condition.² Player position, prior injuries, age, heredity, sex, competitive environments, shoe-surface interaction, pre-season knee symptoms, early sports specialization, growth, and leg length are the non-modifiable risk variables. Modifiable: protective factors, load, and neuromuscular variables.³

Risk factors for sports-related ACL injuries include tendon graft type, gender, age, BMI, injury type, and ACL-related injury.⁴ Three sorts of risk variables have been identified for the hamstring muscle in particular. The first is the principal injury risk factor, which includes age, past injury history, ethnicity, competition level, and the duration of soccer matches. The second risk factor for recurring injuries is a history of hamstring injuries, the extent of the damage, an insufficient recovery program, and a shift in the ideal muscle length. The third is the risk factor for bivalent injuries, which includes fatigue, hamstring weakness, loss of extensibility, pelvic muscle coordination issues, and improper or insufficient warm-up.⁸

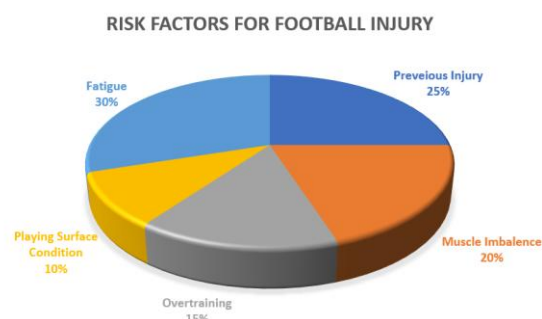


Fig.1: Risk factors

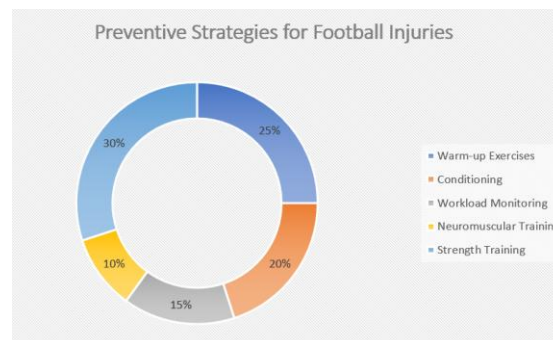


Fig.2: Preventive strategies

Preventive strategies:

Some preventive measures, such as strength and skill training, game play, and a variety of gym exercises, are utilized to lessen muscular injuries.¹⁰ Stretching, certain warm-up and strength exercises, bracing, taping, shoe insoles, face masks, and medical corsets are some other preventive measures that are employed. (Wellmann & Zach, 2017) Certain preventative activities, such as hamstring eccentrics, balance/proprioception exercises, and eccentric workouts, are also utilized to lower injury rates. They lower risk by preventing and altering players' game.¹ Other preventive measures include strength training, conditioning, workload monitoring, and warm-up.² Neuromuscular training program that is age-appropriate, improves movement mechanics, and fosters a secure playing environment.⁴

CONCLUSION AND FUTURE DIRECTIONS:

Because football is such a physically demanding activity, injuries are still a major concern for players at all levels. This review emphasizes how common injuries are, especially to the knee, ankle, and hamstrings, and how they frequently result from risk factors that can be changed, such as lack of exercise, muscle imbalance, and poor conditioning. Although age, genetics, and past injuries are unchangeable, many injuries can be lessened with focused preventative measures.

According to key findings, neuromuscular exercises, strength training, workload management, and organized warm-ups all considerably lower the risk of injury. Even with research advances, injury prevention strategies can still be improved through the use of technology, customized training plans, and improved communication between coaches, athletes, and medical experts.

In the end, this review highlights that although football injuries are somewhat unavoidable, they can be less frequent and less severe with well-informed tactics. Future research should focus on refining injury prevention protocols, leveraging AI for predictive analysis, and ensuring that players are

educated about the risks and best practices for long-term health and performance.

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