Sports Injuries in Football Athletes: A Review of Injury Risk and Injury Prevention

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Abstract. This literature review aims to propose a new paradigm regarding injury prevention and injury risk in football athletes.The study materials used in this research were taken from electronic databases and international papers published from 2021 to 2024 related to sports injuries which were searched using the following keywords: injury risk, football athletes, and injury prevention. Sports injuries in soccer athletes are a big problem because of their high frequency and the significant physical, psychological and financial impacts they cause. Various studies have explored risk factors for injury and prevention strategies to reduce these effects. Functional injury prevention programs, which include sports injury prevention and functional training that are able to prevent injuries and improve sports performance by addressing intrinsic causes of injury which include decreased physical ability and neuromuscular function. Sports-based prevention programs have demonstrated a 23% reduction in non-contact musculoskeletal injuries among football players, although the quality of the evidence is low, requiring further high-quality trials. MRI technology has been used to develop risk prevention methods, effectively reducing injury rates during training sports by providing accurate injury predictions.The FIFA 11+ injury prevention program is highly effective in reducing knee injuries by up to 47% compared to traditional warm-up exercises as well as. Overall, various strategies and technologies show potential in reducing injuries in soccer athletes. There needs to be further research and high-quality trials to establish more effective prevention methods.

Keywords: “Football athletes”,” Injury risk”, “Injury prevention”, “Sports injuries”

1. INTRODUCTION

Football athletes are susceptible to various injuries. Injuries to soccer athletes need serious attention. This is due to the high incidence and potential long-term health consequences that can occur in athletes. Football is a high-speed, full-

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contact sport which has an injury incidence ranging from 0.5 to 45 injuries per 1000 hours of practice and play. Common injuries include the lower extremities, especially the knee and ankle joints [1]. The prevalence of injury in football athletes is very high, with around 66.4% of young football athletes experiencing injuries during competition, with muscle cramps being the most common type of injury. [2]. Risk factors for injury include low muscle strength, lack of physical fitness, and fatigue, as well as other factors such as overtraining and the type and condition of the playing surface. [3]. In order to reduce the risk of injury in football athletes, various evidence-based strategies and interventions have been proposed. This includes pre-participation screening, appropriate training programs, equipment modifications, and a comprehensive injury prevention program [4].

Multi-component sports-based injury prevention programs have demonstrated some efficacy in reducing the number of injuries overall, particularly lower extremity injuries, although the quality of the evidence varies and further high-quality trials are needed to confirm these findings [5] [6]. Overall, injury prevention strategies need to be implemented to reduce the incidence of injuries in football athletes.

Research Objectives

This literature review aims to propose a new paradigm regarding injury prevention and injury risk in football athletes.

2. METHODS

We reviewed articles on injury prevention and injury risk in football athletes that have been published in electronic databases and international papers from 2021 to 2024. A comprehensive search was carried out in the online databases Springer link, Pubmed, Taylor & Francis, Researchgate and ScienceDirect.

Research was included in the inclusion criteria if (1) it was published in a peer-reviewed journal; (2) published between 2021 and 2024; (3) research on sports injury prevention; (4) researching the risk of sports injuries and (5) the population sample is soccer athletes. Abstract review identified additional studies that failed to meet inclusion criteria leaving 10 studies. These studies were read, and 3 studies were excluded because they did not meet one or more inclusion criteria. The following 7 papers were used for this observation" (see Table 1).

3. RESULTS

Table 1. Research Matrix

Author & Published Year	Article Title	Objective	Result	Conclusions
Eetvelde et al., 2021)[13]	Machine learning methods in sport injury prediction and prevention: a systematic review	Machine learning methods help in the prediction and prevention of sports injuries and identify athletes at high risk of injury	11 studies met inclusion/exclusion criteria. Machine learning methods can identify athletes at high risk of injury	Machine learning methods can improve sports injury predictions and identify important injury risk factors.
(K.-O. An and K.-J. Lee, 2021)[11]	SIP and FT: A Literature Review	• Proposing a new functional injury prevention paradigm based on Sport Injury Prevention and Functional Training. • Functional Injury Prevention (FIP) combines Sport Injury Prevention (SIP) and Functional Training (FT) to effectively prevent sports injuries.	• Functional Training (FT) and Sport Injury Prevention (SIP) correlate in training for sports performance. • Functional Injury Prevention is proposed as a new paradigm that combines Sport Injury Prevention and Functional Training.	Functional Injury Prevention (FIP) is proposed as a new paradigm that combines Sport Injury Prevention (SIP) and Functional Training.
W.S.A. Al Attar, 2022)[9]	The FIFA 11+ injury prevention program reduces the incidence of knee injury among soccer players: a systematic review and meta-analysis of randomized controlled trials	To conduct a systematic review and meta-analysis of randomized controlled trials to assess the impact of the FIFA 11+ program on the prevention of knee injuries in football players.	The FIFA 11+ injury prevention program was found to significantly reduce the incidence of knee injuries among soccer players.	The FIFA 11+ injury prevention program has been shown to significantly reduce the incidence of knee injuries among football players based on the findings of a systematic review and meta-analysis of randomized controlled trials.
(Lakshakar, et all, 2022)][1]	Common Sports Injury in Football	To review and analyze common sports injuries in soccer players, with a focus on the rate of	The results of the paper show that ankle injuries are the most common injury in soccer players, followed by knee ligament tears, groin injuries, hamstring strains,	The most common injuries in soccer players identified in this paper include ankle sprains, knee ligament tears, groin strains, hamstring strains, shin

	Players: A Review	occurrence and body regions affected.	shin splints, rotator cuff injuries, dislocations, fractures, and Achilles tendon ruptures.	splints, rotator cuff injuries, dislocations, fractures, and Achilles tendon ruptures.
(Brown, et all, 2022)][7]	Traumatic Brain Injury in High School and College American Football Athletes, 2002-2019: Increasing Risk of Injury and Fatality	The research objectives of this paper include updating the profile of traumatic brain injury (TBI) in high school (HS) and college football players from 2002 to 2019, aiming to evaluate the efficacy of state laws implemented to reduce brain injuries.	The study found that the incidence of traumatic brain injury (TBI) increased by 29% during the 2002-2019 period compared to the previous 13-year period, with a significant increase of 440% in college cases and 22% in high school cases.	The study found that the incidence of traumatic brain injury (TBI) increased by 29% during the 2002-2019 period compared to the previous 13-year period, with a significant increase of 440% in college cases and 22% in high school cases.
(Lemes, et all, 2021)[10]	Do exercise-based prevention programmes reduce non-contact musculoskeletal injuries in football (soccer)? A systematic review and meta-analysis with 13 355 athletes and more than 1 million exposure hours	Investigate the effect of a sports injury prevention program in preventing non-contact musculoskeletal injuries among soccer players compared to a control group.	A systematic review and meta-analysis of 10 original randomized controlled trials involving 13,355 soccer players and more than 1 million hours of exposure found that exercise-based prevention programs reduced the risk of non-contact musculoskeletal injuries by 23% compared with a control group.	An exercise-based prevention program was found to reduce the risk of non-contact musculoskeletal injuries by 23% among soccer players compared to a control group.
(Akabr, 2021)][2]	Survey Of Sports Injuries In Young Football Athletes In Football Competitions	Identify the incidence and types of injuries commonly experienced by young soccer players during matches.	• In the 2022 Kediri Football Cup match, 33.6% (121 players) were not injured, and 66.4% (239 players) were injured. • The most common type of injury among players was muscle cramps, affecting 33.1% (79 players) of participants.	• In the 2022 Kediri Football Cup match, 33.6% (121 players) were not injured, and 66.4% (239 players) were injured. • The most common type of injury affecting players is muscle cramps, with 33.1% of injured players experiencing this type of injury, highlighting

				the importance of proper conditioning and preparation to minimize such injuries during football matches.

4. DISCUSSION

The results obtained from a meta-analysis conducted on injury risk variables in soccer athletes include the most common injuries in soccer players such as ankle sprains, knee ligament tears, groin injuries, hamstring strains, shin splints, rotator cuff injuries, dislocations, fractures. bones, and rupture of the Achilles tendon [1]. Another injury, namely muscle cramps, is experienced by football players around 33.1% [2]. The incidence of traumatic brain injury (TBI) increased by 29% during the 2002-2019 period in high school and college football athletes followed by a 432% increase in the risk of death compared to the previous 13 year period. [7].

Factors that influence injuries in athletes are intrinsic factors and extrinsic factors. Intrinsic factors include strength deficits, lack of flexibility, poor balance, and previous injuries, while extrinsic factors consist of type and level of activity, type of shoe, and strengthening equipment. [8]. Other factors that have the potential to result in injury include inappropriate surfaces, training errors, lack of proper warm-up or stretching exercises before sporting events, and inadequate cool-down phases. [1].

Various preventive strategies are carried out to reduce injuries to football athletes. The FIFA 11+ injury prevention program has been shown to significantly reduce the incidence of knee injuries among soccer players so it is important to incorporate such injury prevention programs into athletes' training routines [9]. Sports-based prevention programs were found to reduce the risk of non-contact musculoskeletal injuries by 23% among soccer players [10]. Functional Injury Prevention (FIP) which combines Sport Injury Prevention (SIP) and Functional Training is proven to be able to reduce the incidence of injury in athletes [11]. MRI technology has been used to develop risk prevention methods, effectively reducing injury rates during training sports by providing accurate injury predictions [12].

5. CONCLUSIONS

Various strategies and technologies show potential in reducing injuries in soccer athletes. FIFA 11+ injury prevention program, Functional Injury Prevention (FIP) which combines Sport Injury Prevention (SIP) and Functional Training, a sports-based prevention program and MRI technology. Therefore, it is necessary to carry

out further research and high-quality trials to determine the most effective method for preventing injuries in football athletes.

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