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The Effectiveness of Proprioceptive Training in Preventing Re-injury in Football Athletes

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Abstract

Background: Ankle sprain is a common injury among football athletes and is associated with a high recurrence rate.
Objectives: . This study explores the effectiveness of proprioceptive training in preventing re-injury through a qualitative phenomenological approach.
Methods: This study adopts a qualitative approach with a phenomenological design, aiming to explore the subjective experiences of football athletes regarding the effectiveness of proprioceptive training in preventing recurrent injuries
Results: The findings, based on interviews with athlete, indicate that proprioceptive exercises such as single leg stance, balance board training, and small jump drills significantly improve ankle stability, reduce pain, and enhance functional movement. Beyond physical recovery, the training also contributed to improved psychological well-being, particularly by reducing fear of re-injury and restoring confidence during gameplay. This study concludes that proprioceptive training is effective in lowering the risk of recurrent ankle sprain among athletes with previous injury history and plays a crucial role in both physical and mental recovery, supporting optimal return to sport performance.

Conclusion: Proprioceptive training is an exercise to train balance and coordination, the better the proprioceptive the possibility of injury will be very small. Proprioceptive training reduces the risk of ankle sprains among sports populations especially in football.

Keywords: Ankle sprain; proprioceptive training; football; injury prevention; athlete recovery.

INTRODUCTION

Football is a fast and high-energy sport that involves a variety of motor movements such as sprinting, changing direction, special ball skills, jumping, and player-to-player contact, which are associated with a high risk of injury (Gurau et al., 2023). In the world of soccer, injuries commonly occur in the Lower Extremity , including the knee and ankle joints, as well as muscle and ligament tissue in the thigh and calf. Especially in professional male soccer athletes, the lower extremities are the most injury body part (Gurau et al., 2023). Ankle sprains are a common injury in soccer. Ankle sprains can increase by 15% to 45% during a season, and account for 16% to 40% of all acute lower limb injuries (Cruz, Oliveira, & Silva, 2020). Even in major competitions such as the FIFA World Cup (1998–2012), the ankle is the most frequently injured body part (19%). The recurrence rate of lateral ankle sprains among professional male soccer athletes is also quite high, approximately 17.11% of the season, with an average of 16–24 days of absence per injury (Cruz et al., 2020).

Indonesian football also presents a high injury incidence. Football has the highest injury rate (42.2%) compared to other sports, with recurrent injuries reaching 36.3% being recurrent injuries (Fredianto, 2024). Lower extremity injuries comprise nearly 50% of sports injuries, with ankle ligament sprains at 15% (Fredianto, 2024). A study on elite young Indonesian football athletes similarly indicated increased ankle injuries, Every player usually has their favorite playing position, and each position will affect the types of injuries. highest injury occurred to the defender (35%) (Prianto, Apriantono, Ray, & Solikah, 2024). Critically, athletes with a history of ankle injury are 3.5 times more likely to suffer re-injury. This research identified the 21-25 age group as most affected by injuries (55.6%), with 98.8% (80 players) having a history of ankle sprain. Only 48.1% (39 players) received treatment, and 71.6% (58 players) still reported pain post-recovery. The most common training frequency was 3-4 times weekly

(55.6%) (Daga, Yuliana, Karmaya, & Wardana, 2023). Previous scholarly work has explored various approaches to prevent ankle sprains and their recurrence. Proprioceptive exercises, designed to improve neuromuscular control and joint stability, have proven highly beneficial.

A recent systematic review and meta-analysis indicated a notable reduction in ankle sprain incidence among athletes engaging in proprioceptive training, particularly for those with a history of ankle injuries (showing a 35-36% decrease in risk) (Schiftan, Ross, & Hahne, 2015). Further studies underscore the strong effectiveness of proprioceptive training in averting ankle injuries, especially repeat occurrences, in team sports participants (Manojlović, 2021). Additionally, broader injury prevention initiatives, such as the FIFA 11+ program, which integrates proprioception and stability exercises, have demonstrated a 30-70% reduction in ankle injuries among football players (Alhazmi et al., 2025).

Nevertheless, despite the significant body of evidence supporting proprioceptive training's efficacy, certain gaps in the research warrant deeper investigation. For example, research infrequently explores athletes' subjective experiences and profound insights into how proprioceptive training impacts their holistic well-being, encompassing their psychological and emotional states after an injury. Studies within the Indonesian context are also relatively sparse, particularly focusing on youth athletes or those in local leagues.

To address these identified limitations, this study seeks to conduct an in-depth exploration of the effectiveness of proprioceptive training in preventing ankle sprain re-injury among football athletes. Concurrently, it will analyze the influence of this training on the athletes' overall well-being from their unique perspectives. Utilizing a qualitative methodology, this research will delve into the experiences, perceptions, and views of football players who have completed proprioceptive training after an ankle sprain,

specifically examining its role in re-injury prevention and its effects on their physical, emotional, and psychological well-being.

METHODS

This study adopts a qualitative approach with a phenomenological design, aiming to explore the subjective experiences of football athletes regarding the effectiveness of proprioceptive training in preventing recurrent injuries The method used in this case was to interview an athlete who had experienced an ankle sprain and had done proprioceptive training (Pandjaitan & Aripin, 2017). To analyze the data, thematic analysis was employed, guided by the framework proposed by Gaddefors & Cunningham (2024), which is particularly suitable for identifying patterns of meaning within rich qualitative data (Gaddefors & Cunningham, 2024).

The analysis process began with the verbatim transcription of in-depth interviews, allowing for immersion in the participants' narratives. This was followed by open coding, where recurring expressions, experiences, and reflections related to proprioceptive training were identified (Mezmir, 2020). Special attention was given to aspects such as balance, bodily control, self-confidence, and perceived risk of reinjury. These codes were then clustered into broader themes that captured the core dimensions of the athletes' embodied experiences.

In the final stage, the researcher conducted a process of essence extraction, interpreting the deeper meanings behind the themes in order to reveal the phenomenological essence of the participants' lived experiences (Hamilton & Finley, 2020).To ensure the trustworthiness and credibility of the findings, the study applied triangulation of data sources and member checking, where participants reviewed the interpretations to ensure they reflected their true experiences accurately (Mezmir, 2020).

RESULTS AND DISCUSSION

Based on the results of interviews with student athletes, An individual suffered a severe ankle sprain during sports due to improper footing when changing direction, resulting in significant swelling and severe pain, requiring immediate withdrawal from the game. "At that time, when I was playing against PSMS Medan, I suffered an ankle injury in the second half. I wanted to cut off the opponent but made the wrong move, then my ankle sprained and twisted inward, I immediately fell and couldn't continue playing. When I fell, it immediately swelled, it was very painful, even walking was quite difficult. At that time I was immediately replaced and had to leave the field" Initial medical interventions involved the use of ice, anti-inflammatory medication, and complete rest. "I was immediately given an ice compress on the sidelines, then after that I was taken to physiotherapy from Persikota, then given medication to reduce the swelling and pain. On the first day, I had to rest completely, I wasn't allowed to practice yet" However, residual symptoms persisted, including ankle instability, stiffness, and pain during rapid movements, jumping, or turning.

As part of the continued rehabilitation, the individual engaged in a four-week proprioceptive balance training program, led by the team physiotherapist. The exercises included: Single-leg standing, balance board exercises, catch-and-throw activities while maintaining balance, small jumps with a stable landing (Rongcai, Guoxiong, & Ming, n.d.). "There was standing on one leg, then practicing on the wobbly board, sometimes throwing too, practicing small jumps but having to land steadily. At first it was a bit difficult to move my legs to maintain balance, standing on one leg and shaking all the time, but over time it got more and more normal, I became more focused when practicing." Each session lasted around 30-40 minutes and was done consistently. After consistently implementing these balance exercises, the individual reported significant

positive changes in the condition of his ankle. The ankle felt more stable, less wobbly, and more comfortable during activities such as running or fast movements on the field. The strength felt when running and turning also improved. "I can feel it, now it's more stable, it's not easy to shake when running or turning the body, I'm not afraid of spraining it anymore, so it's easier to move. The ankle feels better, more stable, it's not as easy to shake as before, running or making sudden turns is also easier, I'm more confident." In addition to physical and functional improvements, balance training has a big impact on the individual's psychological well-being.

There is a real increase in self-confidence, driven by the loss of fear of re-injury that was previously experienced. This fosters a greater sense of security and confidence in movement on the field, which ultimately contributes to improved athletic performance. "So it's clear that I'm much more confident, if previously I was still hesitant, afraid of spraining it again, now I don't think about that anymore, I can move freely anywhere, it also feels safer and more comfortable." The individual also expressed the intention to diversify the exercises and use video guidance to maintain engagement and effectiveness of the program. "Maybe if the training can be varied more so it's not boring, it would be just as good if there was a video guide, for example, if there was one, the movements could be more confident and not make mistakes." Furthermore, balance training is thought to improve the ankle's response to sudden pressure or changes in direction during play, thereby reducing the risk of recurrent injury.

The evidence for proprioceptive training as a primary prevention method for athletes who've never had an ankle sprain is unclear. While a combined analysis of studies showed a significant result, this finding should be viewed cautiously as it came from only two trials that individually weren't conclusive. However, for athletes who have a history of ankle injuries, proprioceptive training appears effective primarily due to its rehabilitative benefits. It's thought that this type of training helps

correct the underlying weaknesses that make athletes vulnerable to repeated ankle sprains after their first injury. Essentially, it acts as a protective mechanism for the ankle joint (Schiftan et al., 2015).

Ankle injury characterized by improper footing during directional changes and subsequent post-injury instability aligns with documented prevalence rates of ankle sprains in football and the common issue of chronic instability stemming from proprioceptive deficits. While initial management with ice compression and rest adheres to standard protocols, the persistence of residual symptoms underscored the necessity for more targeted rehabilitation. The balance training program, guided by a physiotherapist and incorporating exercises such as single-leg stance, balance board activities, and jumping drills, is consistent with evidence-based recommendations for proprioceptive training. The reported improvements in ankle stability and functional movement after four weeks of consistent training provide micro-empirical evidence supporting findings that proprioceptive exercises significantly reduce the incidence of ankle sprains and reinjury in athlete (Manojlović, 2021).

The success of comprehensive injury prevention programs like FIFA 11+, which integrate proprioception, further reinforces the importance of this type of training (Alhazmi et al., 2025). A significant contribution of this case study is its in-depth exploration of proprioceptive training's impact on athlete well-being, an aspect often underrepresented in quantitative studies. The observed increase in self-confidence and reduction in re-injury anxiety are crucial components of psychological well-being (Sato et al., 2023). Fear of re-injury is a significant psychological factor that can impede an athlete's return to optimal performance, even after physical recovery (Suttmiller, 2022). Proprioceptive training has demonstrably not only restored physical function but also mitigated this fear, thereby enhancing athlete self-efficacy and mental well-being (Sato et al., 2023). The reported sensations of comfort and security during on-field activities,

coupled with improved ankle responsiveness to sudden movements, serve as vital indicators of comprehensive functional and psychological recovery. The individual's stated intention to diversify exercises and utilize video guidance also demonstrates a high degree of ownership and self-motivation in the rehabilitation process—factors critical for long-term program adherence.

CONCLUSION

Proprioceptive training is an exercise to train balance and coordination, the better the proprioceptive the possibility of injury will be very small and the athlete can back to sport without worrying about getting an ankle sprain again. Proprioceptive training reduces the risk of ankle sprains among sports populations especially in football. The preventive effect has been established in mixed populations and in those with a history of ankle injury.

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CONFLICT OF INTEREST

The researcher declares that there is no conflict of interest in the conduct or reporting of this paper.

AUTHOR'S CONTRIBUTION

Muhammad Ijlal Firdaus, Mohammad Akbar Haidar, Faqih Rozin Ishomil and Evania Yaffa responsible for the introduction, methods, data collection, and analysis of the results, Rizky Patria Nevangga assisted in manuscript writing, final editing, and reference preparation.

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