Insights into Meniscal Injuries Among Young Football Athletes: A Scoping Review

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Abstract: This comprehensive literature review delves into the prevalence, risk factors, management strategies, and outcomes related to meniscal injuries, particularly focusing on young football athletes. Drawing from eight scholarly articles, it covers various aspects of meniscal injuries, including incidence rates, treatment options, rehabilitation techniques, and long-term implications. Meniscal injuries are highlighted as significant in sports, notably in high-mobility activities like football, where sudden movements and twisting motions increase the likelihood of such injuries. The review explores common treatment methods such as meniscal repair, transplantation, and partial meniscectomy, along with tailored rehabilitation approaches aimed at facilitating athletes' return to play. Research indicates that while meniscal injuries are common among athletes, particularly in contact sports like football, early detection and proper treatment are crucial to mitigate lasting effects. Understanding knee joint anatomy and biomechanics is emphasized, along with the implementation of effective rehabilitation protocols to enhance joint stability and prevent re-injury. In summary, this literature review offers valuable insights into the multifaceted nature of meniscal injuries among young football athletes. By synthesizing evidence from diverse sources, it contributes to a deeper understanding of the epidemiology, management, and rehabilitation of meniscal injuries, informing clinical practices and guiding future research in sports medicine.

Keywords: Football athletes; Meniscal injuries; Rehabilitation strategies; Young Football

Introduction

The participation of adolescents in sports has dramatically increased (Aira et al., 2021; Howie et al., 2020; Strandbu et al., 2020). Physical activity plays a crucial role in the physical and emotional well-being of adolescents. Over the past 15 to 20 years, there has been an increase in youth sports participation, providing numerous health benefits, including character development such as confidence and team spirit, along with socialization among peers. However, the involvement of adolescents and children in professional sports has led to an increase in trauma incidents, particularly knee injuries, underscoring the need for awareness of injuries, especially knee injuries, among the young population. (Herdea et al., 2022). One of the most common injuries among football players is meniscus injury. Meniscal injury is one of the most common orthopedic issues worldwide. Research indicates that stenosis in the intercondylar notch of the femur and small medial tibial spine are associated with an increased risk of meniscal injury. (Wang et al., 2022). Meniscal injuries commonly occur in sports that involve twisting and sudden changes in direction, such as football, basketball, handball, and skiing. (Sari & Kurniawati, 2022). The common mechanism of meniscal injury involves a varus or valgus force directed at the

How to Cite:
Meniscal injury is a condition where the meniscus, a piece of cartilage in the knee, experiences a tear or rupture (Perkins et al., 2021). Hence, meniscal injury is also referred to as a torn meniscus. The consequence of this injury is impaired mobility, as the knee can become very painful, and in some cases, individuals may be unable to walk at all (Kopf et al., 2020). Meniscal injury is a common occurrence among athletes, especially football players. It causes pain in the knee and difficulty walking. Football players are particularly susceptible to meniscal injuries due to the high mobility required in the game, especially in the knee area (Redler et al., 2021). Young Football players are highly susceptible to meniscal injuries, highlighting the importance of coaches’ understanding of the various risk factors that can lead to such injuries. In this study, the researchers aim to conduct an in-depth examination of meniscal injuries in young football athletes through a literature review. The purpose of this research is to educate both athletes and coaches on understanding meniscal injuries and how to address them effectively, thus providing an alternative approach to reducing the risk of meniscal injuries.

Method

This literature review uses literature that can be accessed fulltext in pdf format and scholarly (peer reviewed journals). The criteria for the reviewed journals are English-language research journal articles with the subject Meniscus Injury. Journals that match the criteria are then reviewed. Research articles that are in accordance with the criteria are then collected and made a journal summary including the name of the researcher, article title, year published, research design, samples, research content, and research results. The summary of the research journal is included in the table, as a way to further clarify the analysis of the abstract and full text of the journal. The summary of the journal is then analyzed on the contents contained in the research objectives and research results / findings. The analysis method used uses journal content analysis. The stages of this research are presented in Figure 1.

Figure 1. The Stages of the Research
Result and Discussion

This literature review delves into the realm of meniscal injuries among football players, drawing insights from a collection of eight articles sourced from international journals via a Google Scholar search using the keyword "Meniscus Injury." Employing Critical Appraisal analysis, the literature was scrutinized to address the research problem comprehensively. Through this method, the core of each journal and the study results were meticulously examined to discern both commonalities and disparities among the articles. By consolidating findings from diverse sources, this review aims to contribute to a deeper understanding of the prevalence, risk factors, management strategies, and outcomes associated with meniscus injuries in the context of football, potentially informing future research directions and clinical practices in sports medicine. For more details, please refer to the Table 1.

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<th>Table 1. Literature Review Summary of Results</th>
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<td>(Pichler et al., 2022)</td>
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Sports injuries pose a threat to both athletes and coaches. This is because the risk of sports injuries is prevalent among individuals with high mobility, such as young football athletes. Sports injuries cannot be avoided. In this study, the researcher elaborates on how to implement efficient rehabilitation training techniques to not only aid in the quick recovery of injured joints but also maximize the functionality of intact knee joints to prevent sports injuries. Suspension training methods are considered more effective in the targeted rehabilitation of injured joints, thereby enhancing knee joint flexibility and stability. (Block et al., 2022). Suspension set training focuses on athletes’ core muscle strength, thereby enhancing flexibility and reducing the risk of sports injuries. (Makki et al., 2022). Flexibility and joint muscle stability training help athletes recover from injured areas as quickly as possible, maximize joint and muscle strength, enhance joint flexibility, improve musculoskeletal system dysfunction, reduce sports injury disturbances in athletes, and enhance on-field performance. (Zhang, 2023).

In cases of athletes experiencing sports injuries, particularly meniscal injuries, there is no difference between athletes who sustain injuries before or after surgery. Clinical outcomes resulting in degenerative changes in the knee joint are influenced by variations in joint stability training help athletes recover from injured areas as quickly as possible, maximize joint and muscle strength, enhance joint flexibility, improve musculoskeletal system dysfunction, reduce sports injury disturbances in athletes, and enhance on-field performance. (Zhang, 2023).

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require more rehabilitation exercises (Testa et al., 2021). A study on ice hockey players in university sports leagues found that they could return to play more quickly with a rehabilitation training program. Rehabilitation treatment focusing on functional performance was reported to provide positive long-term outcomes and accelerate athletes' return to the sports arena (Kang et al., 2023).

Athletes who have undergone previous meniscal surgery typically have a better understanding of meniscal injuries and their management compared to those who haven't. (Marigi et al., 2021). Compared to meniscectomy, meniscal repair is considered the most commonly performed treatment. (Bhan, 2020). Athletes' primary concern when it comes to meniscal injuries is the possibility of needing more surgeries and the potential for joint inflammation after meniscal surgery (Brophy et al., 2015). Meniscal injuries are associated with early symptoms such as discomfort, swelling, decreased function, and activity levels. Professional and amateur athletes experience meniscal tears at a rate of 1.58 to 2.98 injuries per 10,000. Football is one of the sports that most commonly causes meniscal tear injuries among its athletes. (Nicholls et al., 2021). Additionally, medical issues or side effects may occur following meniscal tear surgery. (Sonnery-Cottet et al., 2020). Many orthopedic surgery sources explain that during meniscal surgery, mesenchymal stem cells are often selected and differentiated into various types of tissue, including fat, muscle, bone, and cartilage. (Willinger et al., 2022). Improved healing rates, better tissue quality, long-lasting functional improvements, and better clinical outcomes have been reported with stem cell transplantation. (Tomihara et al., 2023). Scientists propose that stem cell therapy can provide an additional option for patients with meniscal tears and other orthopedic injuries, which may shorten healing time, improve function, and reduce degenerative osteoarthritis. (Andrews & Gallicchio, 2022).

In physically active youth, especially those engaged in level 1 contact sports like football, which often involve rotational movements, it's crucial to make an accurate diagnosis and provide appropriate treatment when someone suffers a meniscal injury. Given the high level of physical activity at a young age and the necessity of both the medial and lateral meniscus for proper knee function, it's imperative to ensure timely and proper diagnosis and treatment for meniscal injuries. (Kilcoyne et al., 2012). Understanding the anatomy and function of the meniscus, the epidemiology of meniscal tears, and the mechanisms of injury are crucial for coaches to minimize the occurrence of injuries. (Martinez-Silván et al., 2021).

Significant concomitant injuries will also be discussed. Relevant patient history, comprehensive physical examination, and appropriate imaging procedures are required to make a diagnosis. When young athletes experience meniscal tears, non-operative treatment is rarely effective, hence meniscal repair is often required. (Hietamo et al., 2023). When diagnosing and treating injuries, doctors must consider all aspects related to meniscal injury. For physically active individuals who want to maintain knee function, it's crucial to identify and treat meniscal tears correctly.

Meniscal tears commonly occur in young patients participating in sports. Accurate diagnosis requires relevant patient history, physical examination, and necessary imaging studies. In young athletes, non-operative therapy for meniscal injuries is rarely effective (Tachibana et al., 2021). For young athletes, every effort should be made to repair meniscal tears, with partial resection only considered if repair is not feasible. (Laboudie et al., 2022). When diagnosing and treating meniscal injuries, which are often complex, doctors must consider aspects related to the athlete's injury issues. (Poulsen & Johnson, 2011).

Currently, meniscal tears are increasingly common injuries across all age groups, stemming from both trauma and osteoarthritis. A comprehensive investigation into the patient's history, physical examination, and characteristics of the meniscal tear will facilitate a better understanding of pathogenesis and therapy. The vascular supply to the knee joint plays a crucial role in tissue healing and repair. Therefore, identifying the correct location of the tear will contribute to the treatment and rehabilitation plan for athletes with meniscal injuries.

Conclusion

The provided image appears to be a part of a literature review on meniscal injuries, particularly focusing on young athletes, such as football players. The review highlights the increasing participation of adolescents in sports and the corresponding rise in sports-related injuries, especially meniscal injuries. It delves into the anatomy, mechanisms, and implications of meniscal tears, emphasizing the importance of timely and appropriate diagnosis and treatment to prevent long-term disabilities. The literature reviewed indicates that meniscal injuries are common in sports involving twisting and sudden changes in direction, such as football and basketball. The treatment options discussed include meniscal repair, meniscal transplantation, and partial meniscectomy, alongside rehabilitation methods aimed at restoring knee function and preventing further injuries.

The review also underscores the role of rehabilitation in enhancing recovery and preventing re-
injury. It suggests that advanced rehabilitation techniques, such as suspension training and specific core muscle strengthening exercises, can improve knee joint flexibility and stability. The importance of a multidisciplinary approach involving physiotherapists during the rehabilitation process is highlighted, with a focus on functional performance and readiness for return to sports. Additionally, the potential of stem cell therapy in improving healing outcomes for meniscal injuries is mentioned, offering a promising avenue for future treatment. Overall, the literature review aims to educate athletes and coaches about meniscal injuries and provide insights into effective management and prevention strategies to enhance the well-being of young athletes.

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This article was written by seven contributors. Riki Likardo contributed to the writing of the introduction, methodology, literature review, results, and conclusions. Hendri Neldi, Roma Irawan, Willadi Rasyid, Dally Rahman contributed to the process of conceptualization, methodology, review, and finalization of articles. Yovhanda Ockta contributed to the finalization and improvement of the content of the article. Firunika Intan Cahyani contributed to reviews in different thought sections.

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References


