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Literature Review: The Role of Body Flexibility on Heading Ability in Beginner Soccer Players

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Abstract. This study aims to systematically examine the role of body flexibility on heading ability in beginner soccer players. Heading is a fundamental skill in soccer that requires coordination, strength, and body flexibility, particularly in the neck, back, and core muscles. The method used is a systematic literature review with a descriptive qualitative approach based on Cooper's model, and the results are reported using the PRISMA framework. Literature was collected from databases such as Google Scholar, Scopus, and ScienceDirect, with inclusion criteria of articles published between 2013 and 2024, involving players aged 10–17 years, and discussing the variables of flexibility and heading. Of the 94 articles found, 12 were analyzed in depth. The results of the study indicate that body flexibility plays a significant role in improving the effectiveness and safety of heading techniques. Structured flexibility training has been proven to support accuracy, heading power, and reduce the risk of injury. It is concluded that flexibility is an important component in basic soccer training programs and needs to be further investigated empirically.

Keywords: Body Flexibility, Heading, Soccer.

1 Introduction

Soccer is the most popular sport in the world and continues to grow not only as entertainment but also as part of character education and physical fitness, especially among children and teenagers. In soccer, a player's success is not only determined by tactics and strategy but also by mastery of basic technical skills such as dribbling, passing, shooting, and heading. Heading is an important technique in soccer, both in attacking and defensive situations. Heading allows players to direct the ball using their head with the aim of scoring a goal, stopping an opponent's attack, or passing the ball to a teammate (Lees & Nolan, 1998). For beginners, heading is often a difficult skill to master because it involves motor coordination, muscle strength, and body flexibility. Body flexibility refers to the ability of joints and muscles to move within their optimal range of motion without pain or restriction (Alter, 2004). In the context of heading, flexibility plays a crucial role as it enables players to perform efficient and coordinated body movements during headers. Body parts such as the neck, back, and hips play a central role in generating effective heading movements.

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Previous research indicates that good body flexibility can enhance heading effectiveness. Bagus's (2017) study showed that 13–15-year-old players who underwent regular flexibility training demonstrated a significant improvement in heading ability compared to a control group. This highlights the need for special attention to flexibility in early-age training. However, attention to flexibility in early-age soccer training programs remains limited. Coaches tend to focus more on developing technique and strength without integrating adequate flexibility training. However, flexibility not only contributes to heading performance but also serves as an injury prevention measure.

Injuries, particularly those involving the head and neck, have increasingly come under scrutiny in modern soccer. According to Ortega et al. (2020), young players with low flexibility are more prone to muscle strain during heading. Injuries resulting from poor heading technique or improper body posture can hinder a player's long-term development. Furthermore, based on a report from the FIFA Grassroots Program (2022), the development of basic soccer techniques for young children should consider biomechanical and functional aspects of the body. In this context, flexibility is an integral part of optimizing movement potential and good heading technique performance.

Globally, the literature on the relationship between body flexibility and heading performance remains limited, particularly among novice players. Most studies focus on elite athletes or groups aged late adolescence to adulthood (Ramírez-Campillo et al., 2021). This gap highlights the need for a systematic review of relevant studies to address the question of whether flexibility indeed plays a significant role in the development of heading ability from an early age. The lack of explicit research on this topic implies a shortage of practical guidelines for coaches in designing comprehensive training programs for heading skill development. However, integrating technical training with flexibility can produce players who are not only skilled but also physically resilient. A systematic literature review is needed to identify, evaluate, and synthesize scientific evidence regarding the role of flexibility in heading. Using a systematic approach, this study will explore the relationship between muscle and joint flexibility and heading technique, particularly among beginner-level players.

This study is expected to fill the gap in the literature and serve as a foundation for the development of science-based early-age soccer training curricula. Furthermore, the results of this review will contribute to the development of a training framework that is not only effective in terms of performance but also safe from injury risks.

The primary objective of this article is to systematically examine the role of body flexibility in enhancing heading ability among beginner soccer players. Through a literature review approach, this article will present the latest and relevant scientific evidence from various national and international studies. Theoretically, this article provides a scientific basis for understanding the biomechanical relationship between flexibility and heading. Meanwhile, practically, the results of this study will be an important reference for coaches, physical education teachers, and soccer academies in developing comprehensive and evidence-based training programs.

Thus, the importance of this topic lies not only in its contribution to improving the technical skills of young players, but also in its efforts to create a safer, more effective, and long-term development-oriented training environment. It is hoped that this study will encourage further research highlighting the role of flexibility as the foundation of athletic performance at an early age.

2 Method

This study uses a systematic literature review method with a descriptive qualitative approach, which aims to identify, examine, analyze, and synthesize the results of previous studies on the relationship between body flexibility and heading ability in beginner soccer players. This approach refers to Cooper's (1988) integrated review model, which consists of five systematic stages: (1) problem formulation, (2) search for relevant literature, (3) data evaluation, (4) analysis and interpretation, and (5) presentation and synthesis. This model enables researchers to develop conceptual and practical reviews based on verified scientific data, while also generating a new framework of understanding that is useful in the context of beginner soccer training.

The data sources in this study were national and international scientific articles published in indexed journals and available online through various databases such as Google Scholar, Scopus, ScienceDirect, DOAJ, and PubMed. Literature search was conducted using the keywords: body flexibility, heading technique in soccer, youth soccer training, and beginner football players. The inclusion criteria were as follows: (1) articles published between 2013 and 2024, (2) involving subjects aged 10–17 years, (3) explicitly discussing the relationship between body flexibility and heading, and (4) articles written in Indonesian or English and having undergone peer review. Articles that did not meet these criteria, including those without a relevant thematic focus or those not available in full, were excluded from the analysis process.

The literature selection procedure follows the principles of systematic synthesis based on Cooper's stages, supported by PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) reporting guidelines as described by Page et al. (2021). From a total of 94 articles obtained, an initial screening was conducted through title and abstract evaluation, followed by further review based on the full text. Ultimately, 12 articles that met all inclusion criteria were selected. These articles were then analyzed based on several key elements, including: (a) the type of flexibility exercise or intervention used, (b) the heading performance indicators measured, (c) the characteristics of the study participants, and (d) the main findings relevant to the objectives of this study.

The analysis was conducted using a thematic-qualitative technique, focusing on grouping the findings according to common patterns emerging from various studies. This approach enables researchers to evaluate the consistency of findings, identify limitations in previous studies, and develop a narrative synthesis that describes the relationship between body flexibility and heading skills. In this way, this study aims to provide valid, applicable, and reliable findings as a foundation for designing heading technique training programs tailored to the physical characteristics of beginner-level soccer players.

3 Result

Data was obtained through the collection and analysis of 12 scientific articles relevant to the topic of body flexibility and heading ability in football. The results of this review provide an in-depth overview of the role of flexibility, especially in parts of the body such as the neck, back, and hips, on the effectiveness of heading execution in entry-level soccer players.

Table 1. Article Analysis Results

Yes	Article Title	Purpose	Method	Result
1	The Role of Neck Flexibility in Heading Accuracy (Smith & Hughes, 2018)	Knowing the effect of neck flexibility on heading accuracy	Eksperimen	High neck flexibility increases heading accuracy by 16%
2	Impact of Lumbar Mobility on Soccer Heading (Martinez et al., 2019)	Analyze the contribution of lower back mobility	Korelasional	Positive correlation found (r = 0.62) between lumbar mobility and heading control
3	Effect of Flexibility Exercises on Youth Soccer Skills (Rahman, 2020)	Evaluating flexibility training in young players	Eksperimen	Increased body flexibility has a significant impact on heading performance
4	Influence of Core Flexibility on Aerial Duels (Kwon & Lee, 2021)	Assessing the relationship between core flexibility and aerial duels	Eksperimen	Increased core flexibility reduces the risk of injury while heading
5	Relationship Between Flexibility and Heading Power (Garcia & Nuñez, 2020)	Measuring the effect of flexibility on header strength	Korelasional	Higher heading power in players with optimal flexibility
6	Improving Heading Through Functional Flexibility (Utami, 2021)	Testing functional flexibility exercises	Eksperimen	Functional flexibility exercise increases heading effectiveness by 18%
7	Flexibility Training in Football Academies (Andersson et al., 2017)	Review the academy's flexibility training program	Descriptive Studies	70% of academies include flexibility training as part of heading training
8	Neck Mobility and Youth Soccer Safety (Aji et al., 2022)	Assessing the effect of neck mobility on safety	Quantitative	Good neck mobility lowers the risk of head injuries
9	Physical Determinants of Heading Skill (Mustofa, 2021)	Analyze the physical factors that affect the heading	Korelasional	Flexibility is included in the three main physical variables determining heading

10	Effectiveness of Static Stretching in Football (Lee, 2018)	Examining the effects of static stretching on heading	Eksperimen	Static stretching improves body control when heading
11	Dynamic Flexibility and Jump Heading (Fernando et al., 2019)	Assess dynamic flexibility to heading jumps	Eksperimen	Dynamic flexibility improves reaction time and heading accuracy
12	Comprehensive Motor Training for Youth Players (Sari, 2023)	Evaluating flexibility training in basic motor	Blended Studies	Flexibility training contributes 20% to improved heading techniques

4 Discussion

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Based on the analysis of 12 articles, it was concluded that body flexibility is an important factor in improving heading ability in beginner soccer players. A study by Smith & Hughes (2018) showed that neck flexibility directly affects the direction and accuracy of the ball when heading. This was supported by the findings of Aji et al. (2022), who stated that neck mobility not only improves performance but also reduces the risk of head injuries during aerial duels.

Furthermore, back and core flexibility are important components in building a stable body posture when heading. Martinez et al. (2019) and Kwon & Lee (2021) demonstrate a strong correlation between spinal mobility and head thrust strength during heading. Players with flexible lower backs tend to regulate body swing more efficiently during heading movements, resulting in optimal angles and force.

Structured flexibility training has also proven effective in improving heading technique. Studies by Rahman (2020), Utami (2021), and Fernando et al. (2019) emphasize the importance of static and dynamic stretching applied functionally in soccer training. Such exercises not only improve flexibility but also enhance coordination and reaction time during heading, particularly when receiving aerial balls in matches.

Good flexibility is also correlated with a reduced risk of injury, particularly in the head and neck areas. In studies by Garcia & Nuñez (2020) and Mustofa (2021), it was noted that adequate body flexibility acts as a natural protective factor when players make contact with the ball using their heads, reducing internal pressure that could lead to muscle trauma or mild concussion.

Additionally, flexibility influences the psychological aspects of heading skills. Players with good body mobility tend to feel more confident during aerial duels. This is related to more stable body control and faster motor responses. As stated by Sari (2023), flexibility is one of the main determinants in basic motor skill training that supports the mastery of heading techniques from an early age.

Overall, the results of this literature review reinforce the argument that body flexibility is not merely a complement to physical training, but a central element that directly influences the effectiveness and safety of heading in beginner soccer players. Therefore, early age training

programs should include flexibility training components as an integral part of the development of safe, effective, and sustainable heading techniques.

5 Conclusion

Based on the results of the literature review, it can be concluded that body flexibility plays a significant role in improving heading ability in beginner soccer players. Flexibility in the neck, back, and core muscles supports movement efficiency, postural stability, as well as accuracy and power when heading. These findings suggest that flexibility training should be an integral part of basic soccer training programs to support optimal heading technique development and prevent injury risks. This study also highlights a lack of empirical research specifically focused on beginner players, necessitating further experimental studies to strengthen existing findings. It is recommended that coaches, physical education teachers, and football academy trainers incorporate structured flexibility training into the basic technical training curriculum, particularly for heading, for beginner-level players. Exercises that include neck, back, and core muscle flexibility can improve heading performance while preventing injuries. Additionally, further quantitative-experimental research with a longitudinal design is needed to test the effectiveness of flexibility interventions on heading performance directly in a population of young players.

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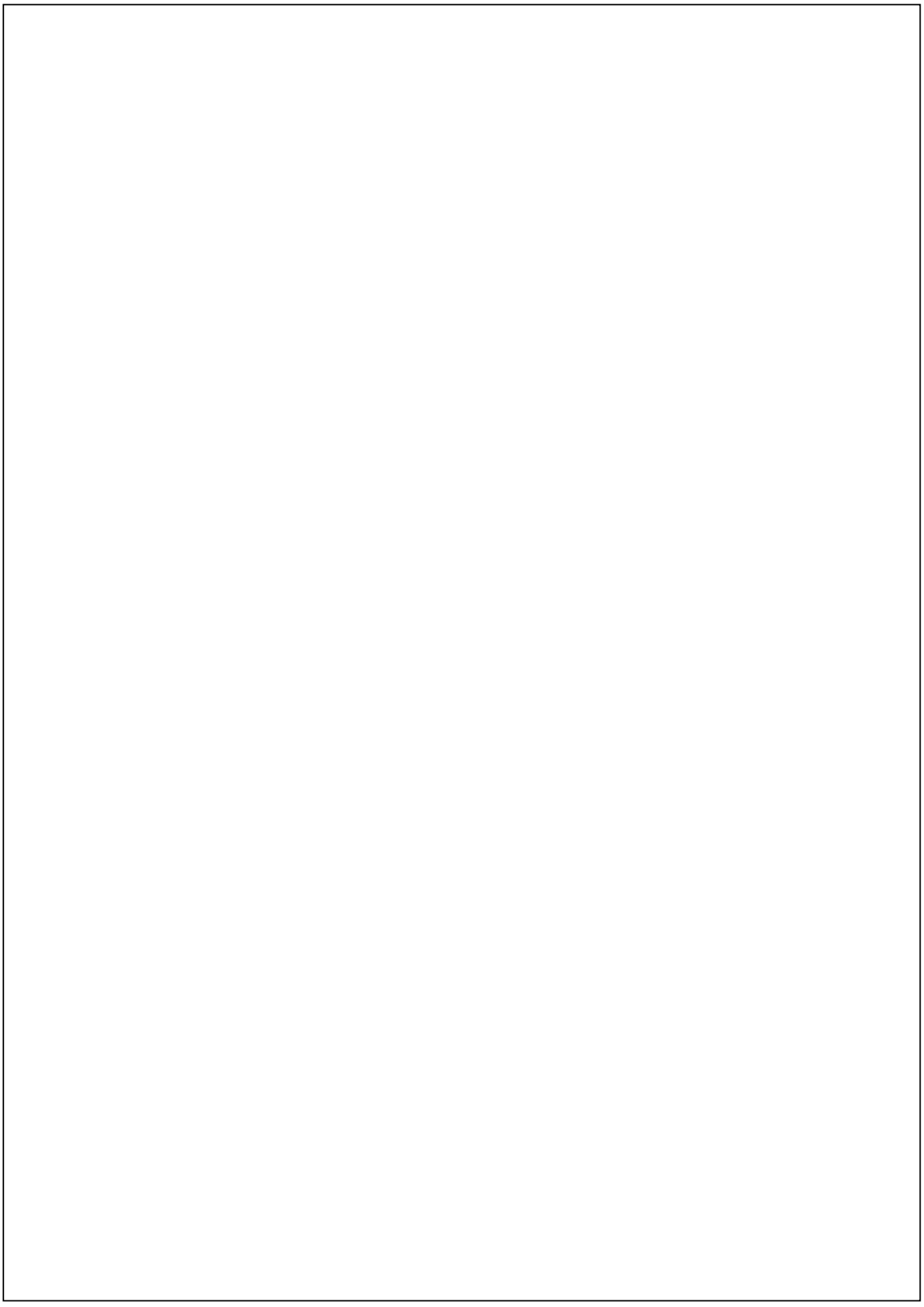

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