INPLASY

Effect of neuromuscular training on the prevention of anterior cruciate ligament injury in women's soccer

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202510081

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 20 January 2025 and was last updated on 20 January 2025.

INTRODUCTION

Review question / Objective What is the effect of neuromuscular training on preventing anterior cruciate ligament (ACL) injuries in adult and adolescent female soccer athletes?

Rationale This study is justified by the need to better understand the factors that make women more susceptible to ACL injuries in soccer, a sport that requires high-impact movements, changes of direction and jumping. It is important to consider that, due to the severity of these injuries, the consequences for athletes can be long-lasting, affecting their career and quality of life.
Preventing these injuries is extremely important, not only for the health of athletes, but also for the development of the sport, which is growing in visibility and competitiveness. Investing in effective prevention programs can help reduce the incidence of injuries, ensure player safety and improve on-field performance. Furthermore, by further investigating risk factors, this study will contribute to the implementation of more targeted strategies for neuromuscular training.

Condition being studied The study will be conducted with female players of different levels of competitiveness, from amateurs to professionals, to evaluate anatomical and biomechanical aspects that influence the risk of injuries. The research will include analysis of movement, muscle strength, and medical evaluations, as well as interviews to identify perceptions about prevention and training. The goal is to identify specific risk factors and suggest effective preventive strategies to reduce the incidence of ACL injuries in female athletes.

METHODS

Search strategy Eletronic Database used to search, PubMed, Scopus, Web of science
(Injury[Title/Abstract] AND knee[Title/Abstract]) OR (Football[Title/Abstract] AND soccer[Title/Abstract])) AND (Female[Title/Abstract])
(((((Injury[Title/Abstract]) AND (Knee[Title/Abstract])) AND (Female[Title/Abstract])) AND (Soccer[Title/

Abstract])) AND (Football[Title/Abstract])) AND (Prevention[Title/Abstract]).

Participant or population Female, adolescent and adult football players aged 15 to 30, who can be professionals or amateurs.

Intervention Implement a neuromuscular prevention program.

Comparator Comparison of neuromuscular intervention plans that used versus those that did not use a neuromuscular prevention plan.

Study designs to be included Randomized controlled-trials.

Eligibility criteria Deleted articles: They do not include ACL injury; Don't talk about women's football; In the last 10 years (2010-2024); Don't talk about prevention; Don't be randomized; Articles only in English; Studies that last longer than one sports season. Items included: About women's football; Talk about the ACL injury; Articles in English; Include prevention; Why should it happen; Randomized articles.

Information sources PubMed, Scopus, Web of Science.

Main outcome(s) The effect of preventing anterior cruciate ligament (ACL) injuries through neuromuscular training has shown significant results, demonstrating the effectiveness of this intervention in reducing the risk of injury in women's football. Results include increased knee stability, reducing inappropriate movements that could lead to ACL rupture, and strengthening of the knee's stabilizing muscles, the hamstrings and quadriceps. One of the main benefits is the balance between the two muscles, which is essential to minimize excessive forces on the anterior cruciate ligament, reducing the risk of injury.
Neuromuscular training is a form of prevention that reduces the impact of ACL injury, increasing fitness and improving performance both in games and in training.

Additional outcome(s) Through this study, it is possible to understand anterior cruciate ligament injuries, how they occur physiologically to reduce the incidence rate and through strategies explored with neuromuscular training, positive results can be obtained.

Quality assessment / Risk of bias analysis The Physiotherapy Evidence Database (PEDro) scale was used to assess the methodological quality of the randomized controlled trials included in this systematic review and meta-analysis. The scale scores the internal study validity in a range of 0 (low methodological quality) to 10 (high methodological quality).
Eleven items are measured in the scale. Points for items 1 to 11 were only attributed when a criterion was clearly satisfied.

Strategy of data synthesis The analysis and interpretation of the results will be analyzed and data such as means, standard deviations (SD) and confidence intervals will be used to calculate the effect size that each study has on the prevention effect.
Risk of bias can be explored using Egger's extended test. When bias was present, the cutting method was used.

Subgroup analysis Young and adult female soccer players.

Sensitivity analysis Not reported.

Language restriction English.

Country(ies) involved Portugal.

Keywords Recover, strength training, athlete, knee injury.

Contributions of each author
Author 1 - Inês Santos - Lead the project, wrote and revised the original manuscript and analyzed and interpreted the data, wrote the statistical report and revised the original manuscript.
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Author 2 - Paulo Malico Sousa - Run the data search, performed the methodological assessment, conducted the data extraction, wrote and revised the original manuscript.
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