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Role of Blood Flow Restriction Training in Injury Prevention and Rehabilitation in Football Players: A Systematic Review

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ADMINISTRATIVE INFORMATION

Support - No support.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 December 2024 and was last updated on 13 December 2024.

INTRODUCTION

Review question / Objective RESEARCH QUESTION:- How BFRT is helpful in preventing injuries and improving rehabilitation outcomes in footballers?
OBJECTIVES:- 1. To analyze the recent literature on BFRT in injury prevention and rehabilitation in football players in an efficient way.
2. To systematically review the efficiency of BFRT in the prevention of injury in football players and improving the rehabilitation outcomes.

Rationale The implication of BFR training has been found to show positive result findings in rehabilitation set ups. For example, it has been shown that by including BFR in rehabilitation protocol it can enhance the recovery times and it also helps in improving functional gains. Additionally, BFRT is related with minimizing pain and improving joint flexibility, which are the crucial characteristics for an athlete while returning to sport.

Besides rehabilitation, BFRT plays a vital role in injury prevention. By establishing BFR into regular training schedule, athletes can be able to develop their strength and muscular endurance without performing high intensity workouts that are related with strength training.. This can be especially helpful for youth players with growing musculoskeletal systems or those coming back from an injury, by gradually gaining strength.

Condition being studied Blood flow restriction training is an intervention which has become popular in recent years due to its ability in increasing muscle strength and promoting recovery while reducing the risk of injuries. This technique typically uses cuffs or bands across the upper or lower limb in such a way that it restricts venous outflow while the arterial inflow is continued. The physiology of BFR is that it creates a hypoxic environment within the muscle which leads to the accumulation of metabolites like lactate from which a metabolic stress is induced within a muscle. This metabolic stress then triggers

a physiological response which promote muscle hypertrophy and also stimulates muscle growth.

METHODS

Search strategy Develop a specific and appropriate search term and apply it in the databases. Example:- Blood Flow Restriction or BFR, Sports Injury, Injury prevention, Rehabilitation and RCTs or experimental studies.

Participant or population Athletes or healthy individuals involved in sports training or patients with any sports injury.

Intervention Studying BFRT by the use of any particular device or protocol.

Comparator Comparing RCTs with BFRT to more appropriate forms of rehabilitation, active placebo or no treatment intervention.

Study designs to be included Includes Randomized control trials (RCTs), and Experimental studies.

Eligibility criteria (1) INCLUSION CRITERIA:-
Type of studies: Includes Randomized control trials (RCTs), Cohort studies, Case control studies and Experimental studies.
Participants: Athletes or healthy individuals involved in sports training or patients with any sports injury.
Intervention: Studying BFRT by the use of any particular device or protocol.
Comparators: Comparing RCTs with BFRT to more appropriate forms of rehabilitation, active placebo or no treatment intervention.
Outcomes: Injury prevention, rehabilitation progress, effectiveness on performance of the individual or athlete and side effects.
Language: Studies printed in English.
(2) EXCLUSION CRITERIA:-
Studies without sports sample or sports without BFRT intervention.
Studies using BFRT for other purposes rather than injury prevention or rehabilitation.
Non English language publications.
Signed articles such as reviews and editorial articles.

Information sources Database: Search articles in different types of databases such as PubMed, Scopus, Web of Sci, Google scholar and Sports Discus database.

Main outcome(s) Findings: Summarize results in an organized manner by using tables and figures to present the findings. Examine the possibilities to prevent or minimize injuries and set a rehabilitation protocol based on BFRT.

Additional outcome(s) No additional outcome.

Data management Data collection: Summarize or extract the content from each study which includes study design, participants details, BFR protocols, outcomes and result findings.
Form: Use of data extraction form should be prepared in a standard format. It include categories like:- Study Characteristics, Intervention Description, Outcomes and overall Result Findings.

Quality assessment / Risk of bias analysis Tools: Evaluate the study's methodological quality by using the tools such as the Cochrane Risk of Bias Tool for RCTs or the New Castle-Ottawa Scale for observational studies.
Assessment: Assess the risk of bias in each study's in the areas such as selection, performance, detection and reporting bias.

Strategy of data synthesis If applicable, use statistical software to perform Meta-analysis. Example:- RevMan or STATA. Analyze pooled data of BFR on injuries and rehabilitation results.

Subgroup analysis Heterogeneity assessment: I2 statistics can be used to assess and report the heterogeneity of the studies with consideration of subgroup analysis if needed.

Sensitivity analysis Summarize reviews of outcomes of each study. Identify similarities and dissimilarities and establish different patterns or trends.

Language restriction Non English language publications.

Country(ies) involved India (Department of Physiotherapy, School of Allied Medical Sciences, India).

Other relevant information RECOMMENDATIONS:- Clinical practices: Highlight recommendations based on BFRT for practitioners by implicating it.
Future research: Identify possible research gaps for future studies by searching areas for further undiscussed topics.

Keywords "BFR", "BFRT", "Sports injury prevention", "Rehabilitation", "Sports Medicine", etc.

Dissemination plans Publication: Write a manuscript on a topic related to peer reviewed journal in sports medicine or rehabilitation.
Presentation: Share the findings of the studies or reviews in appropriate conference or workshops.

Contributions of each author

Author 1 - Riya Sachdeva - Drafting the manuscript.
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