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Corresponding author:
Shengyao Luo

syluol993@gmail.com

Author Affiliation:
School of Physical Education and Art, Jiangxi University of Science and Technology.

Effect of plyometric training combined with electrical muscle stimulation vs. traditional Resistance Training on jump performance among athletes: a systematic review and meta-analysis

Luo, SY; Zhou, ZH; Li, ZX; Zhang, XY; Qiu, JB; Zhong, Y; Xu, TL.

ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Preliminary searches.

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 23 April 2026 and was last updated on 23 April 2026.

INTRODUCTION

Review question / Objective This review aims to compare two types of training. The first type is plyometric training combined with electrical muscle stimulation (EMS). The second type is traditional resistance training. We want to see which method is better for improving jump performance in athletes.

Rationale Jumping ability is very important for athletes in many sports. Coaches use different methods to improve jump height and power. Plyometric training and resistance training are common methods. Some people also combine plyometric training with electrical muscle stimulation. They think this combination might work better. However, current research findings are not clear. Some studies show that the combined method is better. Other studies do not show a big difference. A systematic review and meta-analysis is needed. This work will put together all the current evidence. It will help us understand which training method is more effective.

Condition being studied This review will study two training methods. The first method is plyometric exercises combined with electrical muscle stimulation. The second method is traditional resistance training. We will look at their effects on jump performance in athletes. Jump performance includes tests like vertical jump height, standing long jump distance, and other jump-related power tests.

METHODS

Search strategy We will search several electronic databases. These databases include PubMed, Web of Science, Scopus, and EBSCOhost. We will also search Google Scholar. We will check the reference lists of relevant studies. The main search terms will include combinations of the following words:(“electromyostimulation” OR “superimposed electrical stimulation” OR “neuromuscular electrical stimulation” OR “electrical stimulation” OR “EMS” OR “NMES” AND ("plyometric training" OR "plyometric exercise*" OR "stretch-shortening cycle" OR "jump training") AND (“jump”).

Participant or population This review will include athletes. These athletes take part in organized sports training. Participants can be from team

sports or individual sports. They can be male or female. They can be youth or adult athletes.

Intervention The main intervention is a structured training program. This program combines plyometric exercises with electrical muscle stimulation. Plyometric exercises may include jumps, hops, and bounds. Electrical muscle stimulation is applied during or around the exercise.

Comparator The comparator is traditional resistance training. This training uses weights, machines, or body weight to build strength. Examples include squats, deadlifts, and leg presses.

Study designs to be included This review will include randomized controlled trials. It may also include other controlled experimental studies. We will not include observational studies, case reports, reviews, or conference abstracts without full data.

Eligibility criteria Studies will be included if they meet these points. First, participants must be athletes. Second, the intervention must combine plyometric training with electrical muscle stimulation. Third, the comparison group must use traditional resistance training. Fourth, the study must report results on jump performance tests. Studies will be excluded if they do not meet all these points.

Information sources Information will come from electronic databases. These include PubMed, Web of Science, Scopus, and EBSCOhost. We will also use Google Scholar and check reference lists of included studies. We will review full-text articles when we can get them.

Main outcome(s) The main outcome is jump performance. This includes measurements like vertical jump height (in centimeters or inches) and standing long jump distance (in meters or centimeters). It also includes scores from other standardized jump tests.

Additional outcome(s) This review may also report other results. These results relate to athletic performance. They may include measures of lower-body strength, power output, or rate of force development. We will describe these results if the studies provide the data.

Data management Two reviewers will work independently. They will screen the records and extract the data. The review team will organize study information in a table. If the two reviewers disagree, they will discuss to resolve it.

Quality assessment / Risk of bias analysis We will check the quality of the included studies. We will use the PEDro scale for this. The scale looks at items like random allocation, group similarity at the start, blinding, and complete reporting of results.

Strategy of data synthesis This review will use a meta-analysis to combine the findings. We will summarize the effects of the training methods on jump performance. We will compare results across different studies. If the studies are too different, we will use a narrative synthesis to describe the findings instead.

Subgroup analysis We may do subgroup analysis. This could be based on the athlete's sport, gender, age, or training level. We will decide this after we see the data from the included studies.

Sensitivity analysis We may do sensitivity analysis. This is to check if our main findings are strong. We might remove studies with a high risk of bias and analyze the data again.

Language restriction We will only include studies published in the English language.

Country(ies) involved China.

Other relevant information None.

Keywords Plyometric training; electrical muscle stimulation; resistance training; jump performance; athletes.

Dissemination plans The findings of this review will be submitted to a peer-reviewed journal.

Contributions of each author

Author 1 - Shengyao Luo.
Email: syluo1993@gmail.com
Author 2 - Zihong Zhou.
Email: 2910273096@qq.com
Author 3 - Zongxiang Li.
Email: 1179764031@qq.com
Author 4 - Xinyuan Zhang.
Email: zhangdede15@sina.com
Author 5 - jianbin Qiu.
Email: 2603479387@qq.com
Author 6 - Yun Zhong.
Email: yunz11963@gmail.com
Author 7 - Tailong Xu.
Email: 19146603342@163.com