

# INPLASY

## The effects of exercise therapy on proprioception in patients with multiple sclerosis: a systematic review

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### ADMINISTRATIVE INFORMATION

**Support** - None.

**Review Stage at time of this submission** - Risk of bias assessment.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY2024110076

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 November 2024 and was last updated on 18 November 2024.

### INTRODUCTION

**Review question / Objective** Does engaging in muscle-strengthening activities in isolation have a direct impact on proprioception, and thus, resulting in a reduction in falls and an enhancement in the quality of life among individuals with Multiple Sclerosis?

**Rationale** MS has a direct impact on the body's sensory systems, including proprioception. Implementing exercise therapy, which encompasses both proprioception specific exercises and traditional muscle strengthening exercises, has been shown to effectively mitigate the risk of falls among individuals with MS. To date, an overall review of all researched data on exercise therapy for proprioception in MS patients has not been published highlighting the need to critically review studies available on this topic. Moreover, understanding the relationship between proprioception and MS will allow therapists to better the exercise management plan for MS patients.

**Condition being studied** Multiple Sclerosis and proprioception.

### METHODS

**Search strategy** Studies are sourced from PUBMED, CINAHL ultimate, ProQuest Central, ScienceDirect, and SCOPUS. Search terms used were exercise therap/ies, rehabilitation exercise/s, Multiple Sclerosis, MS, and proprioception. Searching all databases took place between November 2023 and 31 July 2024. Restrictions on the search include articles that are written in English and available in full text. Studies need to be peer-reviewed and reputable. The publication period is January 2003 to December 2023.

**Participant or population** Human participants 18 years and older that have been diagnosed with relapsing remitting, primary progressive or secondary progressive MS.

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**Intervention** Exercise therapy and/or proprioception input that provided improvements in proprioceptive acuity, balance, and quality of life of MS patients.

**Comparator** The intervention will be compared to a control that either did not participate in any exercise therapy and/or proprioceptive training, or a control group that only did exercise therapy compared to the other groups.

**Study designs to be included** Randomized control trials, and clinical case control studies.

**Eligibility criteria** Research papers that are written in English, available in full text, peer-reviewed and reputable, conducted between 2003 and 2023, provide the outcomes/results of what was being tested, and investigate the effect of exercise on proprioception, balance and/or fall risk in adult Multiple Sclerosis patients worldwide.

**Information sources** Electronic databases PUBMED, CINAHL ultimate, ProQuest Central, ScienceDirect, and SCOPUS were the only information sources.

**Main outcome(s)** Main outcome measures are proprioception and exercise therapy in MS patients, looking specifically at proprioception through the change in posture and/or positioning of the participant's joints mainly seen during standing and/or walking.

**Additional outcome(s)** Additional outcome measures are quality of life (QoL) and balance in MS patients, looking specifically at Tinetti Assessment Tool (TAT), Berg Balance Scale (BBS), Activities-specific Balance Confidence Scale (ABC), Mini-BESTest test, and Sensory Organization Balance Test (SOT), Multiple Sclerosis Impact Scale (MSIS-29), Modified Fatigue Impact Scale (MFIS), Multiple Sclerosis International Quality of Life (MusiQoL), Modified Barthel Index (MBI), MS Quality of Life 54-item version (MSQoL-54), and number of falls.

**Quality assessment / Risk of bias analysis** All eligible studies will be screened further using the JBI critical appraisal tool for randomized control trials, and clinical case control studies. This was accompanied by the Black's and Down's and Consensus on Exercise Reporting Template checklist.

**Strategy of data synthesis** Descriptive narrative summary will be used.

**Subgroup analysis** No subgroups to be analyze.

**Sensitivity analysis** The reliability and validity of each study will be noted to assess the quality of this review.

**Language restriction** English.

**Country(ies) involved** South Africa.

**Keywords** Multiple Sclerosis (MS), Quality of life (QoL).

**Contributions of each author**

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