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Effects of Myofascial Manual Therapy at Remote Sites along Superficial Back Line on Flexibility and Pain Intensity in the Lumbo-Pelvic-Hip and Neck Regions: A Systematic Review and Meta-Analysis of Randomized Controlled Trials with Subgroup Analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data extraction.

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 25 July 2025 and was last updated on 25 July 2025.

INTRODUCTION

Review question / Objective To evaluate the effects of remote myofascial manual therapy, such as myofascial release and stretching applied along the superficial back line, on flexibility and pain outcomes in the lumbo-pelvic-hip and neck regions, and to explore potential moderating factors through subgroup analyses.

Rationale The fascial system is a continuous connective tissue network that envelops muscles, bones, and organs, contributing to force transmission, postural control, and pain modulation. Recent concepts emphasize the inseparable anatomical and functional integration between muscles and fascia—termed myofascia—highlighting its continuity across distant regions. Myers' theory of myofascial meridians, particularly the superficial back line, suggests that mechanical input at one site may affect mobility or symptoms at remote locations. Although remote myofascial manual therapy (RMFMT), such as myofascial release or stretching, has gained interest for

treating flexibility and pain along the SBL in the neck and lumbo-pelvic-hip (LPH) regions, evidence from randomized controlled trials (RCTs) remains inconsistent. Prior reviews have largely excluded pain outcomes and have not examined potential effect modifiers such as treatment parameters or anatomical region. Therefore, this systematic review and meta-analysis aimed to investigate the effects of RMFMT on flexibility and pain in the LPH and neck regions, with additional subgroup analyses to explore potential moderators.

Condition being studied Therefore, we would like to perform The PICO (population, intervention, comparison, outcome) setting of the current meta-analysis included: (1) P: human participants; (2) I: involved RMFMT; the Comparison; (3) C: control conditions without RMFMT; and (4) O: included changes in flexibility and pain intensity in the LPH and cervical regions.

METHODS

Search strategy Two authors made independent electronic searches in the PubMed, Medline-Ovid,

and ClinicalTrials.gov with keyword of ("superficial back line" OR "myofascial chain" OR "myofascial meridian" OR "myofascial continuity") AND ("myofascial release" OR "stretch" OR "foam rolling") AND ("remote effect") through the earliest record to July 2025.

Participant or population Asymptomatic individuals, neck pain or low back pain.

Intervention RMFMT.

Comparator Other treatment.

Study designs to be included Randomized controlled trials.

Eligibility criteria (1) RCTs investigated the effects of RMFMT (defined as the application of myofascial release or stretching techniques to anatomical regions distant from the site of outcome assessment) and administered along the superficial back line, with outcomes including flexibility and/or pain intensity; (2) enrolling adults with no symptoms or pain originating from LPH or the neck region; (3) the intervention groups were treated with RMFMT alone or plus other treatments; (4) at least one comparator group using treatments other than RMFMT.

Information sources Two reviewers, namely L.-H.L. and L.T.-M.L., conducted screenings across multiple databases, including PubMed, ClinicalTrials.gov, Medline-Ovid, and Physiotherapy Evidence Database (PEDro). The search employed the following keywords: ("superficial back line" OR "myofascial chain" OR "myofascial meridian" OR "myofascial continuity") AND ("myofascial release" OR "stretch" OR "foam rolling") AND ("remote effect").

Main outcome(s) Main outcome: Flexibility was the primary outcome, assessed using region-specific tests such as the Finger-Floor Distance Test, Modified Schober Test, Sit-and-Reach Test for the LPH region, and cervical flexion range of motion for the neck.

Secondary outcome: Pain intensity served as the secondary outcome and was measured using the Visual Analog Scale (VAS).

Additional outcome(s) Secondary outcome: Pain intensity served as the secondary outcome and was measured using the Visual Analog Scale (VAS).

Data management Two independent authors extracted data from the recruited studies, encompassing demographic data, study design,

details of RMFMT and control protocol, and values of the outcomes. The evaluators paid special attention to the effect direction of the scale used in each trial to avoid mis-interpretation.

Quality assessment / Risk of bias analysis The methodological quality of the included RCTs was appraised using the PEDro scale, which comprises 11 items assessing aspects such as random allocation, blinding, and outcome assessment. As the first item is not included in the final score, the maximum achievable score is 10. Trials were categorized as high quality (≥ 6), moderate quality (4–5), or low quality (≤ 3).

Strategy of data synthesis Due to variability in treatment protocols among the included studies, a random-effects model was applied for data synthesis using Comprehensive Meta-Analysis software (version 3; Biostat, Englewood, NJ, USA). Statistical significance was set at a two-tailed p-value of < 0.05 . Effect sizes were calculated using Hedges' g, with thresholds of 0.2, 0.5, and 0.8 interpreted as small, moderate, and large effects, respectively. Between-study heterogeneity was assessed using Cochran's Q and the I^2 statistic, with I^2 values of 25%, 50%, and 75% representing low, moderate, and high levels of heterogeneity, respectively.

Subgroup analysis Subgroup analyses were conducted based on the assessment region, RMFMT protocol, and type of control group. In addition, meta-regression was performed to examine whether the total number of treatment sessions was associated with the effects of RMFMT on flexibility and pain reduction.

Sensitivity analysis To assess the robustness of the meta-analysis findings, sensitivity analyses were conducted using a leave-one-out approach, whereby each study was sequentially removed to determine its impact on the overall effect size.

Language restriction No language limit.

Country(ies) involved Taiwan.

Keywords Fascia, Manual Therapy, Musculoskeletal System, Meta-Analysis.

Contributions of each author

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