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Application of self-massage foam rolling in individuals with myofascial pain, musculoskeletal pain, and those exposed to post-exercise muscle soreness (DOMS) - scoping review

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ADMINISTRATIVE INFORMATION**Support** - No support.**Review Stage at time of this submission** - Formal screening of search results against eligibility criteria.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY2026100071

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 October 2026 and was last updated on 15 October 2026.

INTRODUCTION

Review question / Objective The objective of this scoping review is to map what utilisation of self-massage foam rolling on pain in individuals with myofascial pain, acute and chronic musculoskeletal pain, as well as in healthy individuals experiencing post-exercise muscle soreness (DOMS) based on available evidence. Scoping review encompassed competitive and recreational sports, rehabilitation and physical therapy and biomechanical research. This scoping review will be designed and conducted following Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR). The PRISMA-ScR checklist will be provided.

Background In the search for non-invasive methods to support recovery and pain reduction following intense physical exertion, foam rolling (roller massage / foam rolling) has gained popularity as a technique of self-myofascial

release. Research has shown that this method may improve range of motion (ROM) and reduce Pressure Pain Threshold (PPT). However, its effects are unlikely to result from lasting structural changes in the fascia; rather, they may be attributable to increased tolerance to pain and stretching, as well as modifications in the neurobiological processing of nociceptive stimuli (Young et al., 2018).

Foam rolling is primarily used by athletes and recreationally active individuals engaged in resistance training to reduce delayed-onset muscle soreness (DOMS) induced by physical exercise (Xin Zhang et al., 2025). In recent years, scientific studies have investigated the effects of foam rolling on acute pain, such as postoperative pain (Yokochi et al., 2023), chronic pain associated with musculoskeletal disorders (Ozsoy et al., 2019), and the reduction of symptoms associated with myofascial trigger points (Wilke et al., 2018; Aggarwal et al., 2024).

Rationale The available literature evaluating the effectiveness of foam rolling in pain reduction

appears to be inconclusive (Santos et al., 2024) and does not provide consistent conclusions regarding its effects on pressure pain sensitivity in healthy individuals (Habscheid et al., 2024). Therefore, we aimed to synthesize the available literature on foam rolling protocols and identify adverse effects that may limit the use of foam rolling as a standalone self-massage technique for the management of pain. The aim of this scoping review is to describe the principles of foam rolling and synthesize the available scientific evidence on the use of this method to reduce pain intensity in patients with myofascial pain, acute and chronic musculoskeletal pain, and in healthy individuals experiencing exercise-induced muscle soreness (DOMS).

The aim of this scoping review is to outline the application principles of foam rolling and to synthesize the available scientific evidence regarding the efficacy of this method in reducing pain intensity among patients with myofascial pain, acute and chronic musculoskeletal pain, with a particular focus on the back and lumbosacral region, as well as in healthy individuals experiencing post-exercise muscle soreness (DOMS).

METHODS

Strategy of data synthesis Two reviewers with experience in systematic review methodology independently searched the databases for potentially relevant publications using predefined keywords.

For PubMed, the search strategy was as follows: ((Pelvic floor) OR (pelvic floor[MeSH Terms])) OR (pelvic floor disorder[MeSH Terms] AND pain[MeSH Terms]) OR ((pain[MeSH Terms] AND ((back[MeSH Terms])) OR (torso[MeSH Terms])) OR (Lumbosacral Region[MeSH Terms])) OR (Sacrococcygeal Region[MeSH Terms])) OR (core)) OR (back)) OR (torso)) OR (lumbosacral Region)) OR (Sacrococcygeal Region)) AND ((Foam rolling) OR ("Foam rolling") OR (Roller massage) OR ("Roller massage").

MEDLINE (PubMed, EBSCOHost), EMBASE (Elsevier) databases were searched. To minimize the risk of omitting relevant sources, the academic search engine Google Scholar was searched, with screening restricted to the first 200 hits. The databases were searched from inception until July 2026.

Eligibility criteria The research question was defined according to the PCC (Population, Concept, Context) framework, and the eligibility criteria were developed by two independent reviewers.

Inclusion criteria:

Population

Studies will be eligible for inclusion if they involved adult participants (18 years of age) of both sexes. This encompassed physically active individuals and athletes who underwent exercise protocols designed to induce delayed-onset muscle soreness (DOMS), in whom pain or pressure pain threshold (PPT) was evaluated.

Furthermore, studies investigating individuals presenting with acute (<3 months) or chronic (≥3 months) musculoskeletal pain of diverse etiologies were included, as well as individuals with myofascial pain syndrome (MPS) and/or active/latent trigger points (MTrPs), and those with degenerative joint pain (e.g., peripheral joint and spinal osteoarthritis).

Concept

The core concept evaluated in this review was the application of self-massage using a foam roller (foam rolling – FR) aimed at reducing pressure pain perception during post-exercise recovery, as well as decreasing nociceptive pain associated with musculoskeletal disorders, myofascial pain syndrome (MPS), and/or the presence of trigger points (MTrPs). Eligible studies had to evaluate the effects of rolling on pain intensity (e.g., using visual analog scales [VAS] or numerical rating scales [NRS]), the perception of post-exercise muscle soreness (DOMS), and/or the pressure pain threshold (PPT) measured via algometry as a primary or secondary outcome measure.

Context

The review considered studies conducted in any environment or setting, including competitive and recreational sports, rehabilitation centers, physical therapy clinics, and research or biomechanics laboratories, with no geographical or cultural restrictions.

Types of Evidence Sources

Primary interventional studies—including randomized controlled trials (RCTs), non-randomized controlled trials, pre-post experimental studies, and single-arm crossover trials—published in English in peer-reviewed journals will be included.

Exclusion criteria

Studies will be excluded if they involved children and adolescents (<18 years of age), animal models, or in vitro investigations. Regarding the study population, asymptomatic individuals who were not subjected to a DOMS-inducing exercise protocol and did not undergo pain or pressure pain threshold (PPT) assessments were excluded, as were individuals without a diagnosis of myofascial pain syndrome (MPS) or trigger points (MTrPs), and those without acute or chronic pain. Furthermore,

studies addressing pain of systemic origin (e.g., oncological pain, central neuropathic pain, or acute flare-ups of rheumatoid arthritis) or cases involving fresh bone fractures prior to consolidation were excluded.

In terms of the intervention concept, studies will be excluded if they exclusively utilized passive rolling devices (such as "roller massagers" or constant pressure devices), static sustained compression without a rolling phase (isolated ischemic compression), or vibration foam rolling (VFR) exclusively without a non-vibration rolling comparator.

Additionally, studies featuring therapist-administered or investigator-applied massage, multimodal protocols where rolling was combined simultaneously with other therapeutic interventions precluding the isolation of the independent effect of foam rolling (FR), as well as studies lacking a quantitative or qualitative assessment of pain or pressure pain sensitivity (PPT) as an outcome measure, will be excluded.

Studies evaluating exclusively motor parameters (e.g., range of motion [ROM], strength, power), biomechanical properties, trophic changes (e.g., blood flow, temperature), biochemical markers, or quality of life parameters without a formal pain assessment were also omitted.

Regarding the context, studies conducted in intensive care units (ICUs), acute postoperative care settings, or involving life-threatening conditions will be excluded. Finally, secondary literature and review articles (including systematic reviews, scoping reviews, narrative reviews, and meta-analyses), conference abstracts without full text, single-case reports, letters to the editor, commentaries, editorials, and study protocols lacking published results will be omitted from the review.

Source of evidence screening and selection

The selection of literature search results will be carried out in two stages. In the first stage, two independent reviewers will independently screen titles and abstracts for inclusion. Any disagreements between the reviewers regarding whether a record meets the inclusion criteria will be resolved through consultation with a third reviewer. Subsequently, the records deemed eligible will undergo full-text screening (the second stage of selection). Two reviewers will independently assess the full text of potentially relevant articles based on the predefined inclusion and exclusion criteria. Any discrepancies between the reviewers at this stage will likewise be resolved by the third reviewer.

The reference lists of studies meeting the inclusion criteria in the second, i.e., full-text screening level,

will be searched to identify additional relevant studies. Two researchers will perform the screening independently.

Data management A draft charting table will be developed by two review leads to determine which variables and key information relevant to the review question should be extracted. Two independent reviewers will first perform a calibration exercise using a random sample of 10% of the included articles to test and refine the draft data-charting form. The results of this calibration phase will be discussed collaboratively, and the form will be updated through an iterative process. Once full consensus is reached, two reviewers will independently extract data from all included studies. The final extracted data will subsequently be categorized and grouped to facilitate summary and charting purposes.

Reporting results / Analysis of the evidence

Synthesis of the results describing the details of the self-massage foam rolling procedure will be presented in the narrative summary. It will contain the following data extraction and charting categories:

1. Study Metadata and Objectives: Bibliographic details (authors and year of publication) along with the primary aim or objective of the study.
2. Group-Specific Characteristics: Detailed demographic and anthropometric data (sex distribution, age, height, body mass, and Body Mass Index (BMI) broken down separately for the foam rolling (FR) intervention group(s) and the comparison/control group(s).
3. Intervention Parameters and Protocol Details: Specifics regarding the comparators, any additional therapies applied, the exact type of foam roller used, the rolling technique employed, duration per targeted muscle segment, rolling frequency, and the specific anatomical body parts subjected to the intervention.
4. Quantitative Findings and Conclusions: Baseline (pre-intervention) and post-intervention scores for pain or sensitivity outcomes in both the FR group(s) and comparator group(s) across various time points, alongside the main qualitative conclusions reported by the authors.

Presentation of the results The results will be presented in tables as summarized extracts. The results synthesis will be made in the narrative format.

Language restriction es. Only papers published in English will be included.

Country(ies) involved Poland.

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strategies on volleyball athletes using thermal imaging and biochemical assessments. *Sci Rep.* 2025 Feb 22;15(1):6443. doi: 10.1038/s41598-025-91193-8. PMID: 39987358; PMCID: PMC11846910.

Keywords foam roll, massage, pain, musculoskeletal pain.

Contributions of each author

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