

# Physical Therapies for Delayed Onset Muscle Soreness (DOMS): Umbrella Review Protocol

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## Abstract

Delayed Onset Muscle Soreness (DOMS) is a common condition characterized by muscle pain, stiffness and tenderness that typically occurs 24 to 72 hours after intense or unaccustomed exercise. While DOMS is self-limiting and resolves within a few days, it can significantly impair physical performance and quality of life. Physical therapies, including various modalities such as massage, stretching, cryotherapy and electrotherapy, are commonly used to alleviate DOMS symptoms and facilitate recovery. However, the evidence base supporting the effectiveness of these interventions remains heterogeneous and inconclusive. This umbrella review protocol outlines the methodology for systematically synthesizing and evaluating existing systematic reviews and meta-analyses on physical therapies for DOMS. The review aims to provide a comprehensive overview of the current evidence, identify gaps and inconsistencies in the literature and generate recommendations for clinical practice and future research. By synthesizing high-quality evidence from multiple systematic reviews, this umbrella review protocol seeks to inform healthcare professionals, researchers and policymakers about the effectiveness and safety of physical therapies for managing DOMS.

**Keywords:** Delayed onset muscle soreness • Physical therapy • Exercise-induced muscle damage

## Introduction

Delayed Onset Muscle Soreness (DOMS) is a common phenomenon experienced by individuals following strenuous or unaccustomed exercise. It is characterized by muscle pain, stiffness and tenderness that typically peak within 24 to 72 hours after exercise and gradually subside over the following days. While DOMS is considered a normal physiological response to eccentric exercise and muscle overloading, it can significantly impair physical performance, limit range of motion and impact quality of life. Physical therapies play a crucial role in the management of DOMS, aiming to alleviate symptoms, promote recovery and enhance exercise tolerance. Various modalities are utilized in clinical practice, including massage, stretching, cryotherapy and electrotherapy, among others. These interventions are hypothesized to mitigate DOMS symptoms through mechanisms such as improved blood flow, reduction of inflammation, modulation of pain perception and promotion of tissue repair [1].

Despite the widespread use of physical therapies for DOMS, the evidence supporting their effectiveness remains heterogeneous and inconclusive. While some studies report positive effects of certain interventions on DOMS symptoms and recovery, others show conflicting results or lack sufficient methodological rigor. Systematic reviews and meta-analyses offer a comprehensive synthesis of the available evidence, but the conclusions drawn from individual studies may vary depending on factors such as study design, participant characteristics, intervention protocols and outcome measures. Given the complexity and variability of the existing literature on physical therapies for DOMS, there is a need for a systematic review of systematic reviews and meta-analyses, known as an umbrella review, to provide a comprehensive overview of the current

evidence landscape. This umbrella review protocol outlines the methodology for synthesizing and evaluating existing systematic reviews and meta-analyses on physical therapies for DOMS, with the aim of identifying gaps and inconsistencies in the literature, assessing the overall quality of evidence and generating recommendations for clinical practice and future research [2].

## Literature Review

A review of the literature reveals a substantial body of research examining the effectiveness of physical therapies for DOMS. Systematic reviews and meta-analyses investigating various interventions, including massage, stretching, cryotherapy and electrotherapy, have been conducted to evaluate their impact on DOMS symptoms and recovery outcomes. Massage therapy, including techniques such as Swedish massage, deep tissue massage and myofascial release, has been proposed as a promising intervention for alleviating DOMS symptoms and improving muscle function. Several systematic reviews and meta-analyses have reported positive effects of massage therapy on reducing pain intensity, improving muscle flexibility and enhancing perceived recovery following exercise-induced muscle damage [3].

Similarly, stretching exercises aimed at improving muscle flexibility and range of motion have been widely advocated for the prevention and management of DOMS. However, the evidence regarding the efficacy of stretching in alleviating DOMS symptoms remains inconclusive, with some studies reporting beneficial effects while others show no significant differences compared to control interventions. Cryotherapy, including cold water immersion, ice packs and cryocompression, has been proposed as a popular intervention for reducing inflammation, pain and swelling associated with DOMS. While some systematic reviews and meta-analyses support the use of cryotherapy for attenuating DOMS symptoms and accelerating recovery, others suggest limited or inconsistent evidence for its effectiveness.

Electrotherapy modalities such as Transcutaneous Electrical Nerve Stimulation (TENS) and Neuromuscular Electrical Stimulation (NMES) have also been investigated for their potential to alleviate DOMS symptoms and improve muscle function. However, the evidence regarding the efficacy of electrotherapy for DOMS management remains mixed, with conflicting findings reported in the literature. Overall, while individual systematic reviews and meta-analyses provide valuable insights into the effectiveness of specific physical therapies for DOMS, the variability in study methodologies, participant characteristics, intervention protocols and outcome measures contributes

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to inconsistencies and heterogeneity in the evidence base. An umbrella review approach offers the opportunity to synthesize and critically evaluate existing systematic reviews and meta-analyses, identify commonalities and discrepancies in the findings and provide a comprehensive overview of the current state of evidence on physical therapies for DOMS [4].

## Discussion

The discussion of this umbrella review protocol on physical therapies for Delayed Onset Muscle Soreness (DOMS) aims to contextualize the importance of synthesizing existing systematic reviews and meta-analyses, highlight key findings and controversies in the literature and outline implications for clinical practice and future research. Firstly, the synthesis of existing systematic reviews and meta-analyses provides a comprehensive overview of the current evidence landscape on physical therapies for DOMS. By aggregating findings from multiple studies, this umbrella review protocol can identify commonalities and discrepancies in the literature, elucidate trends in treatment effects and assess the overall quality of evidence. Through rigorous methodological assessment and critical appraisal, this umbrella review protocol aims to enhance the reliability and validity of conclusions drawn from the existing literature [5].

Secondly, the discussion addresses key findings and controversies in the literature regarding the effectiveness of physical therapies for DOMS. While some systematic reviews and meta-analyses report positive effects of certain interventions, such as massage therapy or cryotherapy, on DOMS symptoms and recovery outcomes, others show conflicting results or lack sufficient evidence to support their efficacy. Factors such as variability in study methodologies, participant characteristics, intervention protocols and outcome measures contribute to heterogeneity and inconsistency in the evidence base. Through a nuanced examination of the literature, this umbrella review protocol aims to identify gaps, limitations and areas of uncertainty in the current evidence, guiding future research directions and clinical decision-making. Thirdly, the discussion explores implications for clinical practice and future research in the management of DOMS. Despite the heterogeneity and inconclusiveness of the existing evidence, physical therapies remain widely utilized in clinical practice for alleviating DOMS symptoms and promoting recovery. However, the selection of appropriate interventions should be guided by considerations such as patient preferences, treatment availability and individual response to therapy. Additionally, future research efforts should prioritize high-quality randomized controlled trials with standardized methodologies, larger sample sizes and longer follow-up periods to provide robust evidence on the effectiveness and safety of physical therapies for DOMS. Moreover, comparative effectiveness studies and cost-effectiveness analyses are needed to inform optimal treatment strategies and resource allocation in DOMS management [6].

## Conclusion

In conclusion, this umbrella review protocol outlines the methodology for systematically synthesizing and evaluating existing systematic reviews and meta-analyses on physical therapies for Delayed Onset Muscle Soreness (DOMS). By aggregating findings from multiple studies, this umbrella

review aims to provide a comprehensive overview of the current evidence landscape, identify gaps and inconsistencies in the literature and generate recommendations for clinical practice and future research. Through a nuanced examination of the existing evidence, this umbrella review protocol seeks to inform healthcare professionals, researchers and policymakers about the effectiveness and safety of physical therapies for managing DOMS, ultimately improving patient outcomes and enhancing the quality of care in DOMS management.

## Acknowledgement

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## Conflict of Interest

There are no conflicts of interest by author.

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