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Effectiveness of radial shockwave therapy versus other electrophysical modalities on pain and functionality in patients with plantar fasciitis: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

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 27 July 2025 and was last updated on 27 July 2025.

INTRODUCTION

Review question / Objective This study aims to synthesize available evidence on the effectiveness of radial shockwave therapy compared to other electrophysical modalities for improving pain and functionality in patients with plantar fasciitis.

Rationale Plantar fasciitis (PF) is one of the most common causes of chronic heel pain in adults, leading to significant functional limitations and reduced quality of life. Although traditionally considered an inflammatory disorder, current histopathological and biomechanical evidence has redefined PF as a degenerative fasciopathy, characterized by collagen disorganization and a failed tissue healing response. This paradigm shift has driven the development of therapeutic approaches aimed at promoting tissue regeneration rather than merely controlling inflammation. Despite the growing use of radial extracorporeal shockwave therapy (rESWT) in clinical settings, many previous systematic reviews have not distinguished between radial and focused ESWT modalities, potentially obscuring relevant differences in therapeutic outcomes. rESWT presents distinct physical properties and biological mechanisms that justify its independent evaluation. Furthermore, the current body of evidence remains heterogeneous in terms of study designs, treatment protocols, and outcome measures. Therefore, it is necessary to synthesize the existing data to clarify the specific clinical role of rESWT in the management of PF and to support evidence-based decision-making in physiotherapy practice.

Condition being studied Plantar fasciitis, a degenerative musculoskeletal condition characterized by chronic heel pain and functional limitation, commonly affecting adults and

associated with impaired tissue healing at the plantar fascia.

METHODS

Search strategy Search terms combined using Boolean operators (OR and AND) and organized as follows:
i. Population: "plantar fasciitis", Fasciitis, Plantar [Mesh], "chronic plantar fasciitis", "plantar heel pain", "plantar fasciopathy", "painful heel", "plantar fasciosis", fasci*.
ii. Intervention: "radial extracorporeal shock wave", "radial shock wave", "radial shockwave", "radial shock-wave", Extracorporeal Shockwave Therapy [Mesh], "extracorporeal shock wave", "extracorporeal shockwave", "extracorporeal shock-wave", "radial pressure wave", shock wave*, shockwave*, shock-wave*.
iii. Comparator: ultrasound, Ultrasonic Therapy [Mesh], thermotherapy, Diathermy [Mesh], Cryotherapy [Mesh], TECAR, Hydrotherapy [Mesh], electrotherapy, Electric Stimulation Therapy [Mesh], Transcutaneous Electric Nerve Stimulation [Mesh], "Functional electrical stimulation", "Neuromuscular electrical stimulation", Interferential, Lasertherapy, Laser Therapy [Mesh], "low-level light therapy", magnetotherapy.
iv. Outcome: Pain [Mesh], Physical Functional Performance [Mesh], Disability Evaluation [Mesh], function*, disabilit*.

Participant or population Adults with plantar fascitis.

Intervention Radial extracorporeal shockwave therapy.

Comparator Electrophysical modalities.

Study designs to be included Randomized controlled trials.

Eligibility criteria
- Adult patients (18 years or older) diagnosed exclusively with plantar fasciitis in its acute or chronic stage.
- Radial shockwave therapy administered either as a standalone treatment or combined with other interventions that do not involve electrophysical modalities.
- Comparison with any electrophysical therapeutic (excluding shockwave therapy) modality that is not combined with topical or injectable treatments.
- Randomized controlled trials published in English with no date restriction.

Information sources Electronic search in five databases (PubMed, CINAHL, Scopus, Web of Science, and PEDro) from inception to the present without applying filters. In addition, manual screening of reference lists from included articles and a complementary search in Google Scholar.

Main outcome(s) Pain intensity and functional disability (measured through physical tests or self-reported).

Additional outcome(s) Adverse events.

Data management Two authors will independently extract data using a standardized form, resolving any discrepancies through consensus. The form will collect information on (i) author and year of publication, (ii) sample characteristics, (iii) intervention protocols, (iv) measurement instruments, (v) main outcomes, and (vi) adverse events.

Quality assessment / Risk of bias analysis Assessment of risk of bias using Cochrane RoB-2, which considers five domains and classifies them as “low risk,” “some concerns,” or “high risk.”

Strategy of data synthesis Qualitative synthesis and quantitative synthesis using the MetaAnalysisOnline.com platform. Effect sizes will be expressed as mean differences (MD) or standardized mean differences (SMD), depending on the homogeneity of the measurement instruments. A random-effects or fixed-effects model will be used according to the level of statistical heterogeneity. Heterogeneity will be assessed using the inconsistency index (I^2), categorized as follows: 'might not be important' (0–40%), moderate (30–60%), substantial (50–90%), and considerable (75–100%).

Subgroup analysis Subgroups will be created according to the type of outcome measure (pain or function) and the type of electrophysical modality.

Sensitivity analysis It may be conducted to assess the robustness of the results by exploring the influence of the methodological and clinical characteristics of the included studies.

Language restriction Only studies published in English will be included.

Country(ies) involved Chile.

Keywords Plantar fasciitis; Radial extracorporeal shock wave; Pain; Functionality.

Dissemination plans Indexed scientific journal.

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