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University of Plymouth

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Can we go wrong with getting strong?

Myles Whitbread-Jordan¹

¹Physiotherapist, Royal Cornwall Hospitals NHS Trust, TRURO, TR1 3LJ, UK.

Email: myles.whitbread@nhs.net

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Background

Nearly 20% of all primary care visits in England are related to painful musculoskeletal conditions (Keavy, 2020) and exercise is often the first-line treatment for managing musculoskeletal pain. Strengthening the muscles around the symptomatic region is a common rationale given by physiotherapists for incorporating exercise in conditions like subacromial pain syndrome (Powell *et al.*, 2022), knee and hip osteoarthritis (Holden *et al.*, 2009; Haber *et al.*, 2023), greater trochanteric pain syndrome (GTPS) (French *et al.*, 2020), low back pain (Gaskell *et al.*, 2019; Cuddy and Gaskell, 2020) and patellofemoral pain (Smith *et al.*, 2017).

Methods

A structured literature search was undertaken on PubMed to identify mediation analysis studies using the terms “mediation analysis”, “mediation”, “pain” and “tendinop*”. Seven-hundred and eighty studies were identified, with seven mediation studies being selected for inclusion after review.

Discussion

Prospective studies highlight strength deficits are not the cause of musculoskeletal conditions like patellofemoral pain syndrome (Rathleff *et al.*, 2014; Neal *et al.*, 2019) with mediation studies establishing that neither knee extensor or hip abduction strength are responsible for reductions in pain in this population group (Holden *et al.*, 2021; 2023) or hip abduction strength in those suffering with GTPS (Mellor *et al.*, 2022). A recent systematic review did not identify any studies examining if improving muscle strength is responsible for reductions in pain in Achilles tendinopathy (Murphy *et al.*, 2023).

Furthermore, strength of the trunk or leg muscles in pain-free populations does not predict the onset of low back pain in the future (Sadler *et al.*, 2017) with mediation studies showing an absence in relationship between muscle strength and pain in people with subacromial pain syndrome (Hotta *et al.*, 2022).

There is a paucity of research into the mediating variables of painful musculoskeletal conditions despite entrenched beliefs held by physiotherapists around the role of exercise as a medium to improve muscle strength to reduce pain. The small number of mediation studies to date appear to contradict the common belief that increasing muscle force will reduce musculoskeletal pain. Instead, pain catastrophising, self-efficacy, sleep, cognitive reappraisal, depression, anxiety, and diet are consistently identified as mediating variables for improving pain in musculoskeletal conditions (Alaiti *et al.*, 2022).

Conclusion

Contemporary pain science and phenomenology stress viewing musculoskeletal pain as an embodied-embedded experience; unable to separate out the biological, psychological, and social constructs unlike the biomedical or biopsychosocial approach (Stilwell & Harman, 2019). As a team we are now reviewing the delivery of in-service training to address and identify approaches to musculoskeletal rehabilitation that incorporate goal-orientated movement within the embodied-embedded pain paradigm.

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