



ABSTRACTS August 2024

Exploring the association between adherence to home-based exercise recommendations and recovery of nonspecific low back pain: a prospective cohort study

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Abstract

Background: Adherence to home-based exercise (HBE) recommendations is critical in physiotherapy for patients with low back pain (LBP). However, limited research has explored its connection with clinical outcomes. This study examined how adherence to HBE relates to changes in physical function, pain intensity, and recovery from LBP in patients undergoing physiotherapy treatment.

Methods: Data from a multicenter cluster randomized controlled trial in the Netherlands involving patients with LBP from 58 primary care physiotherapy practices were used. Adherence to HBE was assessed with the Exercise Adherence Scale (EXAS) at each treatment session. Previously identified adherence trajectories served as a longitudinal measure of adherence and included the classes "declining adherence" (12% of participants), "stable adherence" (45%), and "increasing adherence" (43%). The main outcomes included disability (Oswestry Disability Index), pain (Numeric Pain Rating Scale), and recovery (pain-free for > 4 weeks), which were measured at baseline and after three months. Linear and binomial logistic regression analyses adjusted for confounders were used to examine adherence-outcome relationships.

Results: In the parent trial, 208 participants were included. EXAS scores were available for 173 participants, collected over a median of 4.0 treatment sessions (IQR 3.0 to 6.0). Forty-five (28.5%) patients considered themselves to have recovered after three months. The median changes in the Oswestry Disability Index and Numeric Pain Rating Scale were - 8 (IQR - 1 to -20) and - 2 (IQR - 0.5 to -4), respectively. The mean EXAS scores varied

among patient classes: "declining adherence" (46.0, SD 19.4), "stable adherence" (81.0, SD 12.4), and "increasing adherence" (39.9, SD 25.3), with an overall mean of 59.2 (SD 25.3). No associations between adherence and changes in physical functioning or pain were found in the regression analyses.

Conclusions: No association between adherence to HBE recommendations and changes in clinical outcomes in patients with LBP was found. These findings suggest that the relationship between adherence to HBE recommendations and treatment outcomes may be more complex than initially assumed. Further research using detailed longitudinal data combined with qualitative methods to investigate patient motivation and beliefs may lead to a deeper understanding of the relationship between adherence and clinical outcomes in patients with LBP.

The prevalence of cervical contribution in patients reporting shoulder pain. An observational study

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Abstract:

Background: Shoulder pain is the third most common musculoskeletal disorder yet diagnosis remains challenging. In some cases, shoulder symptoms can be partially attributed to a cervical origin.

Objectives: To estimate the prevalence of cervical contribution in patients presenting with shoulder pain. To determine symptom reproduction and symptom modification (i.e., pain intensity and pain location) after cervical spine screening (CSS) and compare these changes between patients with and without cervical contribution.

Design: Observational study.

Method: Sixty patients were included. Cervical contribution was present if a $\geq 30.0\%$ change in shoulder pain intensity on active movement was recorded after CSS. The CSS consisted of several tests and shoulder symptom modification or reproduction was noted. The presence of a centralization phenomenon was also noted and was considered to be present if the location of pain diminished from more distal areas after the CSS.

Results: A 50.0% prevalence of cervical contribution (CI95% 37,35-62,65) was found. Cervical contribution was more likely in those that demonstrated centralization of their pain after the CSS ($p = 0.002$) and



those that had a history of previous neck pain ($p = 0.007$). Symptom reproduction occurred for 23 out of the 60 participants (38.3%), being present in 18 of those with cervical contribution (60.0%). After the CSS, a statistically significant decrease of shoulder pain intensity was found for those classified as having cervical contribution ($p < 0.001$).

Conclusions: Cervical contribution is prevalent in 50% of patients presenting with shoulder pain; this was evidenced as shoulder symptom modification and, to a lesser extent, symptom reproduction following a CSS.

Free-Weight and Machine-Based Training Are Equally Effective on Strength and Hypertrophy: Challenging a Traditional Myth

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Abstract:

Purpose: This study aimed to compare the effects of free-weight and machine-based resistance training on strength, hypertrophy, and joint discomfort.

Methods: Thirty-eight resistance-trained men participated in an 8-wk resistance program allocated into free-weight ($n = 19$) or machine-based ($n = 19$) groups. Training variables were identical for both modalities, so they only differed in the use of barbells or machines to execute the full squat, bench press, prone bench pull, and shoulder press exercises. The velocity-based method was implemented to accurately adjust the intensity throughout the program. Strength changes were evaluated using eight velocity-monitored loading tests (four exercises \times two modalities) and included the relative one-repetition maximum (1RM Rel), as well as the mean propulsive velocity against low (MPV Low) and high (MPV High) loads. Ultrasound-derived cross-sectional area of quadriceps (proximal and distal regions), pectoralis major, and rectus abdominis was measured to examine hypertrophy. Complementarily, Western Ontario and McMaster Universities and Disabilities of the Arm, Shoulder and Hand questionnaires were administered to assess changes in lower- and upper-limb joint discomfort. Outcomes were compared using ANCOVA and percentage of change (Δ) statistics.

Results: Each group significantly ($P < 0.001$) increased 1RM Rel, MPV Low, and MPV High for both modalities tested, but especially in the one they trained. When considering together the eight exercises tested, strength



changes for both modalities were similar (Δ differences $\leq 1.8\%$, $P \geq 0.216$). Likewise, the cross-sectional area of all the muscles evaluated was significantly increased by both modalities, with no significant differences between them (Δ difference $\leq 2.0\%$, $P \geq 0.208$). No between-group differences ($P \geq 0.144$) were found for changes in stiffness, pain, and functional disability levels, which were reduced by both modalities. **Conclusions:** Free-weight and machine-based modalities are similarly effective to promote strength and hypertrophy without increasing joint discomfort.

Associations between lifestyle-related risk factors and back pain: a systematic review and meta-analysis of Mendelian randomization studies

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Background: Mendelian randomization (MR) studies have an advantage over conventional observational studies when studying the causal effect of lifestyle-related risk factors on back pain. However, given the heterogeneous design of existing MR studies on back pain, the reported causal estimates of these effects remain equivocal, thus obscuring the true extent of the biological effects of back pain lifestyle-risk factors.

Purpose: The purpose of this study was to conduct a systematic review with multiple meta-analyses on the associations between various lifestyle factors and low back pain.

Methods: We conducted a PRISMA systematic review and specifically included MR studies to investigate the associations between lifestyle factors-specifically, BMI, insomnia, smoking, alcohol consumption, and leisure sedentary behavior-and various back pain outcomes. Each meta-analysis synthesized data from three or more studies to assess the causal impact of these exposures on distinct back pain outcomes, including chronic pain, disability, and pain severity. Quality of studies was assessed according to STROBE-MR guidelines.

Results: A total of 1576 studies were evaluated and 20 were included. Overall, the studies included were of high quality and had a low risk of bias. Our meta-analysis demonstrates the positive causal effect of BMI (OR IVW-random effects models: 1.18 [1.08-1.30]), insomnia(OR IVW-random effects models: 1.38 [1.10-1.74]), smoking(OR IVW-fixed effects models: 1.30 [1.23-1.36]), alcohol consumption(OR IVW-fixed effects models: 1.31



[1.21-1.42]) and leisure sedentary behaviors(OR IVW-random effects models: 1.52 [1.02-2.25]) on back pain.

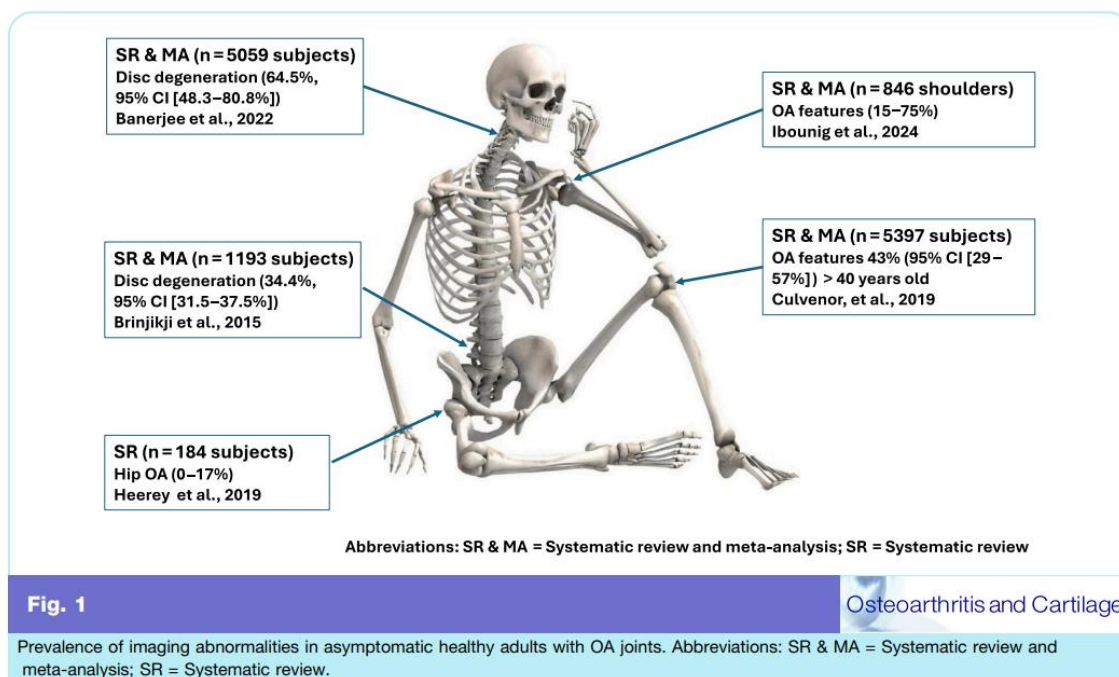
Conclusion: In light of the disparate designs and causal effect estimates presented in numerous MR studies, our meta-analysis establishes a compelling argument that lifestyle-related risk factors such as BMI, insomnia, smoking, alcohol consumption, and leisure sedentary behaviors genuinely contribute to the biological development of back pain.

Prevalence of osteoarthritis-related imaging abnormalities in asymptomatic healthy adults

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It has been recognized that imaging findings associated with osteoarthritis (OA) are common in asymptomatic healthy joints, including the knee, hip and spine as shown in Fig. 1.



These incidental imaging findings, if not interpreted in the appropriate clinical context, may result in unnecessary and possibly harmful additional imaging tests and treatments. In addition, when an osteoarthritic joint is symptomatic, the extent of radiographic markers of OA does not always correlate well with the severity of patient symptoms. As is the case in all areas of medical imaging, OA management should not be dictated by imaging results alone. Despite these limitations, imaging continues to be frequently used in the investigation of clinically suspected OA, with



resultant resource implications and potential for delays in commencing management.

The 2022 National Institute for Health and Care Excellence (NICE) guidance recommended that there is no evidence to support the use of imaging in addition to clinical assessment for people with typical initial clinical presentations with OA. Under this scenario, Ibounig et al. reported in their systematic review that 17% of asymptomatic shoulders had imaging findings consistent with shoulder OA when the data from 2 population studies [846 shoulders; 846 X-ray, 20 Magnetic resonance imaging (MRI)] were pooled (low certainty evidence). When pooling nine studies with asymptomatic non-population-based samples (633 shoulders; 258 Xray, 375 MRI), 15% of shoulder joints had OA-relevant findings. The study samples of these papers included various study populations such as volunteers, athletes and healthcare populations.

The review's findings are constrained by the limited quality of available studies for review, i.e., high risk of bias and very low certainty even in 2 included population-based samples. The first study includes a substantial sample size with 826 asymptomatic shoulders from Japanese participants > 40 years of age and 15.3% had radiographic evidence of glenohumeral joint OA, with a greater prevalence of 31.6% in people 80–89 years (n = 76) increasing from 2.2% at 40–49 years of age (n = 90). In a cohort of symptomatic participants, 22.7% revealed imaging findings related to OA. The original study has several limitations, such as using the Samilson-Prieto classification for diagnosing shoulder OA, although the classification criteria were originally developed for the radiographic evaluation of the shoulder joint after surgery for instability and having only one radiographic view, requiring caution in interpreting the study results. The risk-of-bias assessment, with a tool for evaluating risk of bias in prevalence studies, it revealed a high risk of bias in sample selection (no reporting on random selection or consecutive series) and non-response bias (the response rate < 75%) with resultant overall high risk of bias.

The second study includes 20 asymptomatic shoulders from a longitudinal cohort study of 4056 randomly selected adults (aged between 55 and 74 years) in Adelaide, South Australia and reported the presence of radiographic glenohumeral joint OA in 55% and an MRI-determined prevalence of 75% in asymptomatic participants. As a note, only 40% and 60% of symptomatic shoulders revealed OA consistent imaging findings on X-rays and MRI, respectively, 12 which is lower than those percentage rates in asymptomatic participants, highlighting little association between clinical symptoms and the presence of pathology on X-rays or MRI. On risk of bias assessment, it showed overall a high risk of bias due to lack of close



representation of the national population and a high risk of bias in sample selection and non-response bias.

The review authors reported inconsistencies in defining glenohumeral joint OA, especially on MRI, leading them to use their own criteria for diagnosing OA. Development of an international consensus statement on the MRI definition of shoulder OA, similar to that developed for knee OA in 2011, would facilitate the comparability among future studies.

As imaging abnormalities are prevalent in asymptomatic healthy people, health service providers should be cautious in making causal inferences from these imaging findings to avoid overdiagnosis and overtreatment in clinical practice. Imaging tools may be helpful in correlating with the clinical symptoms but should not replace clinical evaluation. Imaging is not required for index diagnosis of patients presenting with typical clinical features of OA. It is worth noting that adhesive capsulitis-frozen shoulder can mimic glenohumeral joint OA and that there is definitely a place for imaging in patients with suspected adhesive capsulitis-frozen shoulder to distinguish between this entity and glenohumeral joint OA. It should also be noted that imaging features do not predict non-surgical treatment response in patients with OA. Despite these limitations, this systematic review provides useful data to share with clinicians and patients when explaining the clinical significance of OA-consistent imaging findings for asymptomatic shoulder joints. As an example, the inclusion of simple epidemiologic information in lumbar MRI reports reduced the referral to a spine specialist by 12% and undergoing repeat imaging by 7%, leading to decreased healthcare utilization (n = 375)¹⁴ and reduced opioid prescriptions (n = 238 886). In addition, further longitudinal studies may be helpful to evaluate whether the imaging abnormalities of asymptomatic participants will become symptomatic and then progress at a faster rate over time, compared with those without imaging abnormalities. The findings of such studies may guide closer surveillance and prevent future disease progression in asymptomatic patients with imaging abnormalities.

Tendinopathic Plantaris but Normal Achilles Tendon Found in About One-Fifth of Patients Not Responding to Conservative Achilles Tendon Management – Results from a Prospective WALANT Surgical Case Series on 105 Tendons

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Purpose: Midportion Achilles tendinopathy is a relatively common condition. This study aimed to investigate the presence of a normal Achilles tendon, but a tendinopathic plantaris tendon, in a large and consecutive prospective sample of patients referred to a specialised tendon clinic for midportion Achilles tendon pain not responding to non-surgical treatment.

Patients and methods: A total of 105 consecutive tendons were operated on in 81 patients (62 males) suffering from painful midportion Achilles tendon pain. Clinical examination, ultrasound (US) and colour Doppler (CD) examination, and wide awake local anaesthetic no tourniquet (WALANT) surgery were performed in all patients.

Results: For 19/105 (18%) tendons from 14 patients, clinical examination suspected plantaris tendinopathy alone as there was a distinct tenderness on the medial side, but no thickening of the Achilles tendon. US examination followed by surgery confirmed the diagnosis.

Conclusion: Midportion Achilles tendon pain is not always related to Achilles tendinopathy since pain related to the plantaris tendon alone was found in almost every fifth patient. Consequently, there is an obvious need for proper examination to identify the pain source and establish a correct diagnosis before treatment.

