INPLASY

Effects of the Strain–Counterstrain Technique on Pain Intensity and Range of Motion in Individuals with Non-specific Low Back Pain: Protocol for a Systematic Review and Meta-Analysis of Randomized Controlled Trials

Corresponding author:
Long-Huei Lin

cosx9954022@gmail.com

Author Affiliation:
School of Physical Therapy and Graduate Institute of Rehabilitation Science, College of Medicine, Chang Gung University, Taoyuan, Taiwan.

Lin, LH; Li, YL.

INTRODUCTION

Review question / Objective This study aims to examine the effectiveness of the strain–counterstrain technique in reducing pain intensity and improving lumbar mobility among individuals with non-specific low back pain. Furthermore, subgroup analyses and meta-regression will be conducted to investigate whether specific study characteristics or treatment-related factors moderate the observed effects.

Rationale Low back pain is a prevalent global health problem, and up to 85% of cases are classified as non-specific, with no identifiable pathological cause. Manual therapy is commonly used for management, among which strain–counterstrain is an indirect technique targeting tender points to reduce neuromuscular dysfunction. Although strain–counterstrain is theoretically supported by proprioceptive and circulatory mechanisms, evidence regarding its effectiveness for non-specific low back pain remains inconsistent. Moreover, existing meta-analyses have not specifically examined strain–counterstrain in this population or have evaluated it only as part of broader manual therapy interventions. Therefore, this study aims to systematically evaluate the effects of strain–counterstrain on pain intensity and range of motion in individuals with non-specific low back pain.

Condition being studied This meta-analysis was conducted using the PICO framework as follows: Population (P): non-specific low back pain; Intervention (I): strain–counterstrain; Comparison (C): the control group who did not undergo strain–counterstrain; Outcomes (O): pain intensity and lumbar range of motion.

METHODS

Search strategy Two authors made independent electronic searches in the PubMed, Cochrane Library, MEDLINE-Ovid, and the Physiotherapy Evidence Database with keyword of ("Strain Counterstrain" OR "Positional Release Therapy"

OR "Jones Technique") AND ("Non-specific Low Back Pain" OR "Mechanical Low Back Pain") through the earliest record to December 2025.

Participant or population Non-specific low back pain.

Intervention Strain–counterstrain.

Comparator Other physical therapy programs or manual therapies.

Study designs to be included Randomized controlled trials.

Eligibility criteria The inclusion criteria were as follows: (1) randomized controlled trials investigating changes in pain intensity and/or range of motion before and after strain–counterstrain; (2) studies enrolling adults (≥18 years) diagnosed with non-specific low back pain; (3) intervention groups performing strain–counterstrain alone or in combination with other physical therapies or manual therapies; and (4) at least one control group receiving treatments that did not include any form of strain–counterstrain.

Information sources Two reviewers conducted a literature search through PubMed, Cochrane Library, MEDLINE-Ovid, and the Physiotherapy Evidence Database using the keywords ("Strain Counterstrain" OR "Positional Release Therapy" OR "Jones Technique") AND ("Non-specific Low Back Pain" OR "Mechanical Low Back Pain").

Main outcome(s) Pain intensity, the primary outcome, was evaluated before and after the intervention using either the Visual Analogue Scale (VAS) or the Numeric Pain Rating Scale (NPRS).

Additional outcome(s) Active lumbar range of motion was assessed using a BROM II device, the Modified Schober's method, and an inclinometer.

Data management Two reviewers independently extracted data from each included study, covering publication details, sample size, participant characteristics, study design, intervention protocols, outcome measures, and follow-up time points. When information was incomplete or ambiguous, attempts were made to contact the original authors for clarification or access to raw data. If multiple follow-up assessments were reported, only data collected at the end of the intervention period were included in the analysis.

Quality assessment / Risk of bias analysis Methodological quality was assessed using the PEDro scale (0–10), with higher scores indicating better quality. Based on Cashin and McAuley (2020), scores were classified as poor (≤3), fair (4–5), good (6–8), or excellent (9–10).

Strategy of data synthesis Given expected clinical heterogeneity, a random-effects model was applied using Comprehensive Meta-Analysis (version 4; Biostat, USA). Statistical significance was defined as $p < 0.05$ (two-tailed). Effect sizes were expressed as Hedges' g and interpreted as small (0.2), moderate (0.5), or large (0.8). Heterogeneity was assessed using Cochran's Q and the I^2 statistic, with thresholds of 25%, 50%, and 75% representing low, moderate, and high heterogeneity, respectively.

Subgroup analysis Subgroup analyses were performed according to treatment protocols and types of control group. Strain–counterstrain interventions were classified as strain–counterstrain only or strain–counterstrain plus (combined with other physical therapy programs or manual therapies), and the impact of the different control groups was assessed. Meta-regression analyses further examined treatment duration, symptom stage, and strain–counterstrain region as potential moderators of treatment effects.

Sensitivity analysis Sensitivity analyses were performed using a leave-one-out method to evaluate the stability of the pooled results, with each study omitted in turn to assess its influence on the overall effect estimate.

Language restriction No language limit.

Country(ies) involved Taiwan.

Keywords strain–counterstrain, ositional release therapy, meta-analysis, non-specific low back pain.

Contributions of each author
Author 1 - Long-Huei Lin - Conceptualization; Data curation; Investigation; Literature search; Methodology; Formal analysis; Software; Visualization; Writing – Original Draft; Writing – Review & Editing; Risk of bias assessment; Project administration; Supervision; Validation.
Email: cosx9954022@gmail.com
Author 2 - Yue Long Li - Literature search; Investigation; Validation; Risk of bias assessment; Writing – Review & Editing.
Email: ylmlshsh610@gmail.com