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Effect Of Pain Neuroscience Education And Motor Control Exercise Versus Core Stability Exercise On Pain And Disability In Women With Chronic Low Back Pain: A Comparative Study

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Abstract

Background: Chronic low back pain (CLBP) is a frequent issue, particularly among middle-aged women. Objective: This study compares the effectiveness of combining Pain Neuroscience Education (PNE) with Motor Control Exercise (MCE) against Core Stability Training (CST) in reducing pain and disability in women with CLBP. Methods: Thirty women aged 50–60 years with CLBP were randomly assigned into two groups: PNE/MCE (n=15) and CST (n=15). The intervention lasted eight weeks. Pain and disability were evaluated using the Visual Analogue Scale (VAS) and the Roland Morris Disability Questionnaire (RMDQ). Results: Both groups improved, but the PNE/MCE group showed significantly greater progress ($p < 0.05$). Conclusion: The combination of PNE and MCE was more effective than CST alone in addressing CLBP.

Keywords

Chronic low back pain, Pain neuroscience education, Motor control exercise, Core stability training, VAS, RMDQ

Introduction

Chronic low back pain (CLBP) is highly prevalent among adults and is a common reason for disability. Traditional treatments often fail to address central pain processing and motor control deficits. This study explores whether an approach incorporating cognitive education and movement control offers superior results.

Methodology

Study Design: Randomized comparative study

Sample: 30 women with CLBP

Inclusion Criteria: Women aged 50–60 with CLBP for more than 3 months

Exclusion Criteria: Prior spinal surgery, significant comorbidities, or concurrent treatments

Interventions:
- CST Group: Participated in core stability exercises for eight weeks
- PNE/MCE Group: Received three sessions of PNE followed by sixteen MCE sessions

Outcome Measures: Visual Analogue Scale (VAS), Roland Morris Disability Questionnaire (RMDQ)
Statistical Analysis: Paired and unpaired t-tests, with significance at $p < 0.05$

Results and Discussion

Both groups exhibited improvement in VAS and RMDQ scores. The PNE/MCE group demonstrated superior outcomes:
- VAS reduced from 6.7 to 2.33 ($p = 0.0328$)
- RMDQ reduced from 13 to 5.53 ($p < 0.0001$)

These findings support that combining PNE with MCE, which targets central sensitization and motor retraining, is more beneficial than CST alone. The results align with existing evidence favoring multifactorial treatment strategies for CLBP.

Conclusion

Combining Pain Neuroscience Education with Motor Control Exercise significantly reduces pain and disability compared to Core Stability Training alone. Nevertheless, both interventions are valuable and safe options in clinical practice.

Limitations and Recommendations

Limitations:
- Small sample size
- Short duration of intervention
- Lack of direct measures for central sensitization

Recommendations:
- Future studies with larger sample sizes
- Incorporation of neuroimaging and sensitization metrics
- Comparisons across multiple intervention modalities over longer durations

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