Official Title:
Effectiveness of Adding Neurodynamic Mobilization to Conventional Physiotherapy in Patients with Cervical Radiculopathy: A Randomized Controlled Trial

Short Title:
Neurodynamic Mobilization in Cervical Radiculopathy Trial

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Responsible Party:
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1. STUDY PROTOCOL

1.1 Background and Rationale

Cervical radiculopathy is a common neuromusculoskeletal condition characterized by neck pain radiating to the upper limb, often associated with sensory and motor deficits. Although conventional physiotherapy is widely used, treatment outcomes remain variable. Neurodynamic mobilization has been proposed as an adjunct intervention to improve neural mobility and reduce mechanosensitivity, potentially enhancing clinical outcomes.

1.2 Objective

To evaluate the effectiveness of adding neurodynamic mobilization to conventional physiotherapy on pain intensity and functional disability in patients with cervical radiculopathy.

1.3 Study Design

This study is a parallel-group, assessor-blinded randomized controlled trial with a 1:1 allocation ratio.

1.4 Participants

Participants were adults aged 18–65 years diagnosed with cervical radiculopathy. Inclusion required neck pain radiating to the upper limb with at least one neurological sign. Exclusion criteria included cervical surgery, myelopathy, fractures, tumors, inflammatory disorders, or contraindications to physiotherapy.

1.5 Interventions

- Control group: conventional physiotherapy (therapeutic exercises, manual therapy, physical modalities)
- Experimental group: conventional physiotherapy + neurodynamic mobilization
  Duration: 5 weeks (10 sessions)

1.6 Outcomes

Primary outcomes:

- Pain intensity (Visual Analogue Scale, VAS)
- Functional disability (Neck Disability Index, NDI)

Secondary outcomes:

- Time to 50% pain reduction
- Correlation between pain and disability

1.7 Data Collection Timepoints

- Baseline (pre-intervention)
- Post-intervention (5 weeks)

1.8 Ethics

The study was approved by the Institutional Review Board of Lebanese German University. All participants provided written informed consent. The study was conducted in accordance with the Declaration of Helsinki.

2. STATISTICAL ANALYSIS PLAN

2.1 Sample Size

A total of 50 participants were included (25 per group), based on power analysis ($\alpha = 0.05$, power = 80%).

2.2 Data Analysis

Data were analyzed using appropriate statistical methods.

- Descriptive statistics were used for baseline characteristics.
- Independent t-tests were used for between-group comparisons.
- Paired t-tests were used for within-group comparisons.

2.3 Outcome Analysis

Primary outcomes (VAS and NDI) were analyzed as:

- Mean differences
- 95% confidence intervals
- p-values (< 0.05 considered statistically significant)

2.4 Effect Size

Cohen's d was used to estimate effect size.

2.5 Missing Data

No missing data handling was required as all participants completed the study.

2.6 Software

Statistical analysis was performed using standard statistical software.