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Effectiveness of PNF technique versus cervical stabilization exercises in reducing pain and improving cervical range of motion among it professionals with mechanical neck pain

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Abstract
The study compared the effects of Proprioceptive Neuromuscular Facilitation (PNF) techniques and cervical stabilization exercises on pain reduction and cervical range of motion (ROM) among IT professionals with mechanical neck pain. Twenty participants were randomly assigned into two groups (PNF vs. stabilization). Pain (VAS) and ROM (goniometer) were measured pre- and post-intervention. Both groups showed significant improvements, but the PNF group demonstrated greater reduction in pain and superior gains in ROM, particularly in the neck extensor muscles. The findings suggest that PNF is more effective than cervical stabilization exercises for managing mechanical neck pain in IT professionals.

Keywords: Mechanical Neck pain, proprioceptive neuromuscular Facilitation technique, Neck pain, Range of motion

Introduction
Neck pain is a major global health issue and the fourth leading cause of disability, with an annual prevalence exceeding 30%. Nearly half of affected individuals continue to experience recurrent or persistent pain. Office and computer workers show the highest incidence (36-57.5%), making neck pain particularly common among IT professionals due to prolonged sitting, poor posture, and repetitive tasks.

Mechanical neck pain (MNP), also called nonspecific neck pain, is provoked by sustained postures or neck movements without underlying pathology. It leads to muscle imbalance, reduced range of motion, and functional limitations, which negatively affect quality of life and productivity.

Among physiotherapeutic interventions, Proprioceptive Neuromuscular Facilitation (PNF) techniques and cervical stabilization exercises are widely used. PNF improves flexibility, neuromuscular control, and range of motion, while stabilization exercises strengthen deep cervical muscles and enhance postural stability. Both approaches have shown effectiveness in reducing pain and disability, but comparative evidence remains limited.

This study aims to evaluate and compare the effectiveness of PNF techniques versus cervical stabilization exercises in reducing pain and improving cervical range of motion among IT professionals with mechanical neck pain.

Materials and Methodology
Materials
- Pillows, chair, towel, measuring tape, couch
- Universal goniometer, visual analog scale (VAS)
- Data collection and recording sheets

Methodology

Study Design

- Comparative study

Study Setting

- Conducted at Sri Ramakrishna Hospital, Coimbatore, under staff supervision.

Sampling Method

- 20 IT professionals with mechanical neck pain were selected based on inclusion/exclusion criteria.
- Randomly divided into two groups (Group A: PNF, Group B: Cervical stabilization), each with 10 subjects.

Parameters

- **Pain**: Visual Analog Scale (VAS)
- **Range of Motion (ROM)**: Universal Goniometer

Duration of Study

- **Total duration:** 6 months
- **Intervention:** 30 min sessions, 6 days/week, for 2 weeks

Tools for Data Collection

- **VAS**: measures pain intensity
- **Goniometer**: measures cervical ROM

Criteria for Sample Selection

- **Inclusion**: Age 25-35 years, male/female, moderate mechanical neck pain
- **Exclusion**: Neck surgery, trauma, malignancy, disc prolapse, spondylosis, cervical fractures, migraines, spinal deformities, radiculopathy, neuromuscular entrapment

Variables

- **Dependent**: Pain, ROM
- **Independent**: PNF technique, cervical stabilization exercises

Procedure

- Baseline assessment: history, subjective/objective exam, orthopedic screening.
- Pre- and post-intervention measurements: VAS and ROM.
- Sessions: **6 times/week for 2 weeks**.

PNF Techniques

1. **Dynamic Reversal (Slow Reversal)**:

- Seated position, therapist resists head flexion/extension.
- Hold extension for ~5 sec.
- 3 repetitions, 30 sec-1 min rest.

2. **Rhythmic Stabilization**:

- Seated position, therapist applies gentle isometric resistance in different directions.
- Hold ~5 sec, repeated 3 times with rest breaks.

Cervical Stabilization Exercises

- Performed sitting or standing, 3 times/day, 10-15 reps each, hold 5-10 sec.
- Duration: 10-20 min per session.

Exercises

- Chin Tuck
- Chin Tuck with Towel
- Cervical Extension
- Shoulder Shrugs
- Shoulder Rolls
- Scapular Retraction

RESULT

Pre-test and post-test values of the study were collected and assessed for variations in improvement and their results were analysed using independent t test and parried t test. The statically analysis of the study showed that there is a significant difference between the groups in VAS scale and ROM with a t value VAS scale and ROM was 2.101.

Comparison of Results

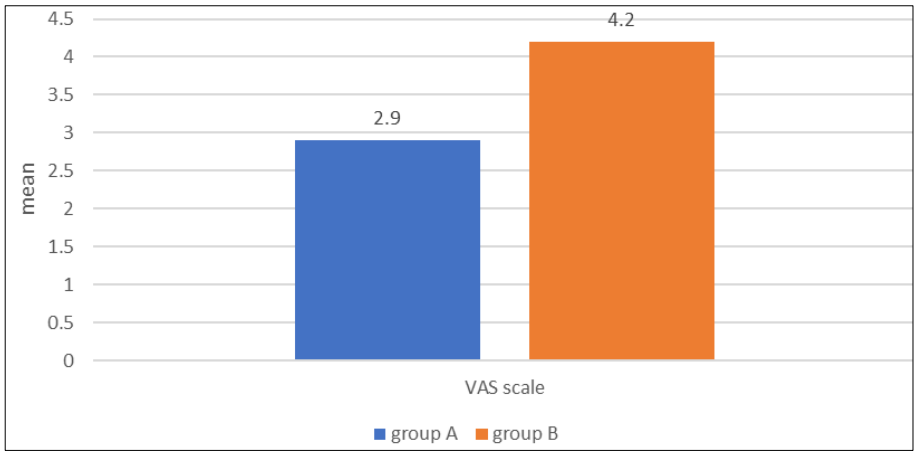

Fig 1: VAS scale

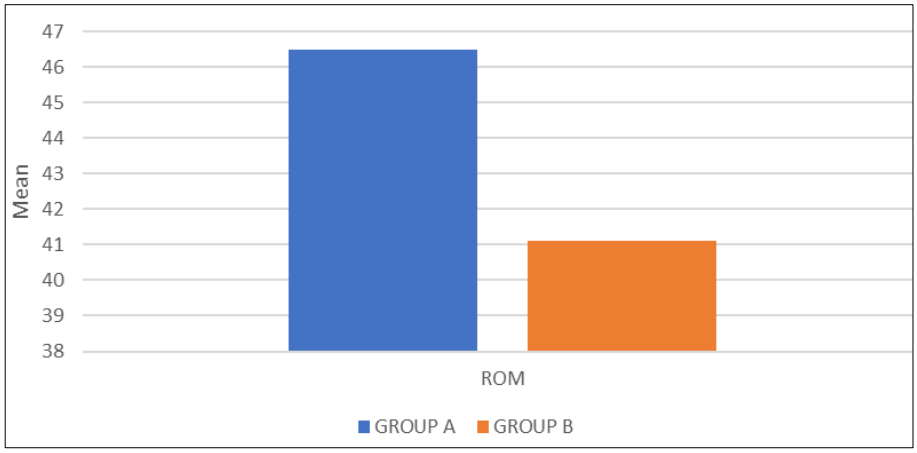

Fig 2: Range of Motion

Discussion

Mechanical neck pain, commonly seen in IT professionals due to prolonged sitting, poor posture, and repetitive tasks, leads to muscular imbalance, reduced ROM, and pain. This study compared the effects of PNF techniques and cervical stabilization exercises in reducing pain and improving cervical extension among 20 IT professionals with mechanical neck pain.

Both groups showed significant improvements in pain reduction (VAS) and cervical ROM (goniometer) following intervention. However, statistical analysis using ANOVA revealed that the PNF group demonstrated superior outcomes compared to cervical stabilization exercises.

PNF was found to be more effective because it not only improves flexibility and ROM but also enhances neuromuscular control, joint stability, and muscle coordination. While cervical stabilization exercises are beneficial for postural correction and muscle endurance, their effect was comparatively less in improving cervical extension and reducing pain.

Thus, the findings suggest that PNF techniques are more effective than cervical stabilization exercises for IT professionals with mechanical neck pain.

Conclusion

The study concluded that PNF Technique will be more effective in reducing pain and improving ROM of cervical extension in subjects with mechanical neck pain than the cervical stabilization exercises. Hence the study suggested that this technique can be effectively used to reducing pain and improve cervical range of motion especially cervical extensors.

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