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"Effectiveness of Eldoa (Elongation Longitudinaux Avec Decoaption Osteo Articulaire) Versus PNF (Proprioceptive Neuromuscular Facilitation) Technique on Pain, CV Angle, and Quality of Life in Patients with Text Neck Syndrome"

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Abstract

Background: The cervical spine operates as an integrated system of bones, joints, muscles, and nerves, all regulated by the brain and spinal cord. When neural pathways are irritated, pain may radiate toward the shoulder, arm, or hand. "Text neck" describes neck pain and mechanical strain caused by prolonged forward bending of the head while using smartphones, tablets, or similar handheld devices.

Objective of The Study: The effect of ELDOA (Elongation longitudinaux avec decoaption osteo articulaire) versus PNF (proprioceptive neuromuscular facilitation) exercise on pain, cv angle, and quality of life in subjects with TNS text neck syndrome.

Methodology: A comparative study that included 60 patients; the patients were divided into two groups. Group A received (ELDOA) elongation longitudinaux avec decoaption osteo articulaire and group B received (PNF) proprioceptive neuromuscular facilitation techniques. Treatment duration was 5 to 10 minutes for 3 sessions per week an alternative day for 5 weeks. The numerical pain rating scale, goniometer, and neck disability index questionnaire were used as outcome tools for pain, cv angle, and quality of life, respectively.

Result: The intervention shows significant improvement of ELDOA (elongation longitudinaux avec decoaption osteo articulaire) in patients with text neck syndrome (TNS) compared to the PNF (proprioceptive neuromuscular facilitation) technique.

Conclusion: The study concludes that both the ELDOA and PNF are effective in reducing pain, increasing range of motion, and improving Quality of life in patients with text neck syndrome. In the pre-test and post-test collected data analysis group A shows a superior difference than group B.

Keywords: Text neck syndrome, ELDOA, PNF, pain, cv angle, and quality of life.

INTRODUCTION

Text Neck Syndrome (TNS) is a common musculoskeletal disorder caused by prolonged forward head posture during smartphone and handheld device use. The increasing dependence on mobile devices has led to a rising prevalence of neck pain, particularly among young adults. Sustained cervical flexion increases

mechanical stress on the cervical spine, resulting in pain, increased cv angle, postural abnormalities, and functional disability.[1–6] Conservative physiotherapy interventions are the primary management strategy for TNS. Among these, Elongation Longitudinaux avec Décoaptation Ostéo-Articulaire (ELDOA) and Proprioceptive Neuromuscular Facilitation (PNF) have gained attention for improving pain, cervical mobility, posture, and functional performance. ELDOA aims to decompress the spinal segments and enhance fascial mobility, whereas PNF improves neuromuscular control, flexibility, and muscle activation.[7–18] Pain intensity, cv angle, and disability are commonly assessed using the Numeric Pain Rating Scale (NPRS), universal goniometer, and Neck Disability Index (NDI), respectively. Although both ELDOA and PNF have demonstrated beneficial effects in patients with neck pain, evidence directly comparing their effectiveness in individuals with TNS remains limited. Therefore, this study aimed to compare the effects of ELDOA and PNF on pain, cv angle, and quality of life in individuals with Text Neck Syndrome.[19–24]

METHODOLOGY

The institute ethics committee (IEC), approved the study: RIPT/DT/21/4501. A comparative study was conducted over six months at the Revathi Institute of Physiotherapy and Research, Avinashi, Tirupur. Sixty participants aged 18–40 years with Text Neck Syndrome were recruited using simple random sampling and randomly allocated into two groups (n = 30 each). Group A received Elongation Longitudinaux Avec Décoaptation Ostéo-Articulaire (ELDOA) exercises, while Group B received Proprioceptive Neuromuscular Facilitation (PNF) techniques. Participants with an NDI score >10 and a history of electronic gadget use for at least one year were included. Individuals with cervical fractures, congenital cervical abnormalities, spinal infections, previous cervical surgery, cervical radiculopathy, pregnancy, neoplastic disease, or recent whiplash injury were excluded. The independent variables were ELDOA and PNF interventions, while the dependent variables were pain, cv angle, and quality of life. Outcome measures included the Numeric Pain Rating Scale (NPRS), universal goniometer, and Neck Disability Index (NDI).

INTERVENTION

Group A (ELDOA): Participants performed ELDOA exercises consisting of specific one-minute postural stretching positions designed to produce spinal decompression, improve fascial mobility, enhance posture, and increase cervical mobility. Exercises were performed under physiotherapist supervision throughout the intervention period.

Group B (PNF): Participants received Proprioceptive Neuromuscular Facilitation (PNF) using Dynamic Reversal and Rhythmic Stabilization techniques. In Dynamic Reversal, the therapist applied manual resistance to alternating cervical flexion and extension movements, with each contraction held for 5 seconds and repeated for three repetitions. In Rhythmic Stabilization, participants maintained an isometric cervical position while the therapist applied alternating multidirectional resistance, with each contraction held for 5 seconds and repeated for three repetitions. A rest period of 30–60 seconds was provided between repetitions according to participant comfort. All interventions were administered under the supervision of a physiotherapist for five weeks.

STATISTICAL ANALYSIS

The collected data were tabulated and analyzed using both descriptive and inferential statistics. All the parameters were assessed using the Statistical Package for the Social Sciences (SPSS) version 24, with a significance level of p value less than 0.05 and a 95% confidence interval set for all analyses. The Shapiro-Wilk test was used to determine the normality of the data. In this study, the Shapiro-Wilk test indicated that the dependent values were normally distributed (P > 0.05). Hence, a parametric test was adopted. A paired t-test was used to assess statistical differences within the groups, & Independent t-test (Student's t-test) was used to assess statistical differences between the groups.

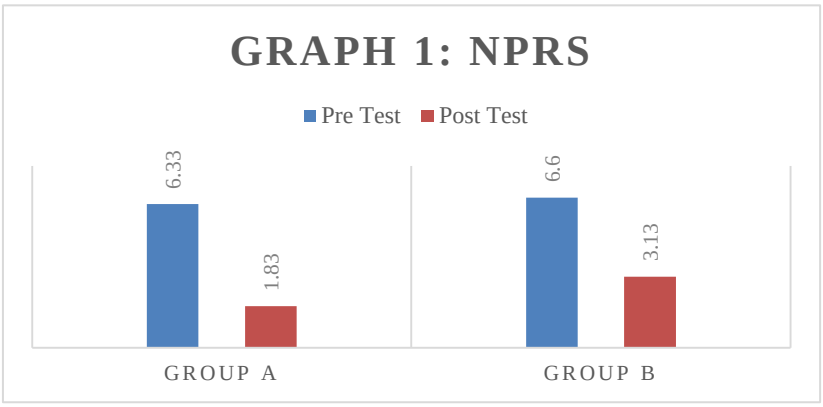
Table 1: Demographic Characteristics of Participants

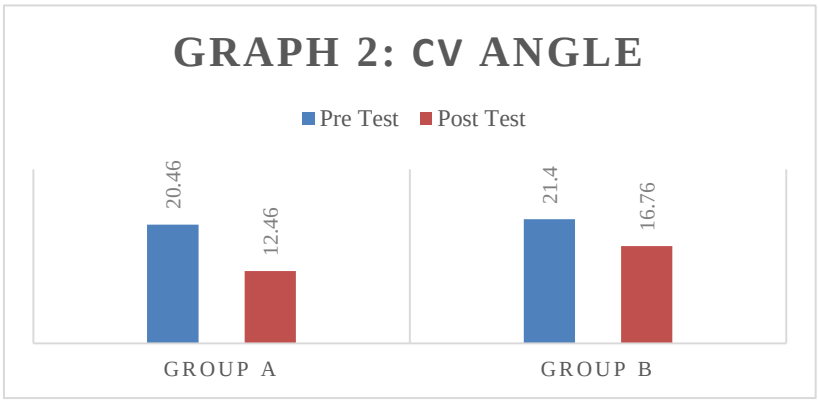
Variables	Group A (ELDOA) (n=30)	Group B	Variables	Group A (ELDOA) (n=30)
Age (years), Mean ± SD	27.8 ± 5.2	28.1 ± 5.0	28.0 ± 5.1	0.81
Male, n (%)	16 (53.3%)	15 (50.0%)	31	0.79

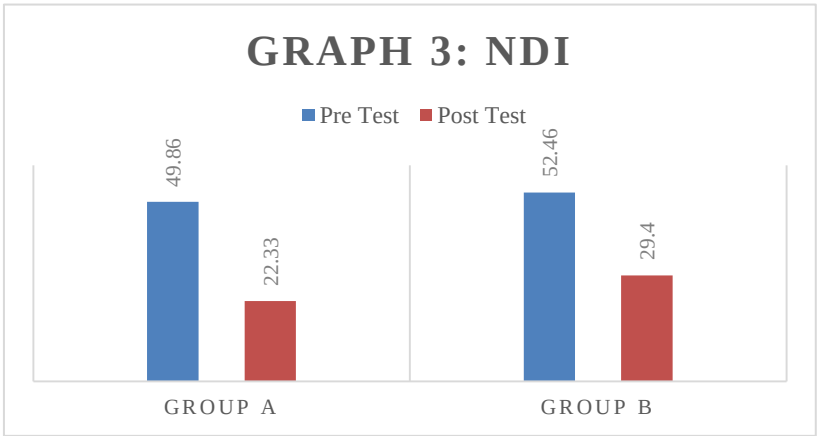
Female, n (%)	14 (46.7%)	15 (50.0%)	29 (48.3%)	-
Daily smartphone use (hours/day), Mean ± SD	6.5 ± 1.4	6.7 ± 1.5	6.6 ± 1.5	0.61
Duration of smartphone use (years), Mean ± SD	4.8 ± 1.9	5.0 ± 2.0	4.9 ± 2.0	0.68

Table 2: Pre-Test and Post-Test

Outcome Measure	Group A		Group B	
	Pre-Test	Post-Test	Pre- Test	Post-Test
NPRS	6.33 ± .958	1.83 ± .874	6.60 ± 1.03	3.13 ± 1.19
CV Angle	20.46 ± 2.34	12.46 ± 1. 99	21.40 ± 2. 22	16.76 ± 1. 35
NDI	49.86 ± 6. 68	22.33 ± 3. 64	52.46 ± 4. 41	29.40 ± 2. 68







RESULTS

Both ELDOA (Group A) and Proprioceptive Neuromuscular Facilitation (PNF) (Group B) produced significant improvements in pain, cv angle, and quality of life after the intervention ($p \leq 0.05$). There were no significant differences between the groups at baseline. However, post-intervention analysis demonstrated significantly greater improvements in Group A compared with Group B. Group A showed a greater reduction in Numeric Pain Rating Scale (NPRS) scores (6.33 ± .958 to 1.83 ± .874) than Group B (6.60 ± 1.03 to 3.13 ± 1.19). Similarly, cv angle reduced significantly in both groups, with Group A (20.46 ± 2.34 to 12.46 ± 1.99) demonstrating superior outcomes compared with Group B (21.40 ± 2.22 to 16.76 ± 1.35). Neck Disability Index (NDI) in Group A (49.86 ± 6.68 to 22.33 ± 3.64) scores also decreased significantly following treatment, indicating improved quality of life, with greater improvement observed in the ELDOA group than PNF Group B (52.46 ± 4.41 to 29.40 ± 2.68). Overall, ELDOA was more effective than PNF in reducing pain, improving cv angle, and enhancing quality of life in individuals with Text Neck Syndrome.

DISCUSSION

The present study compared the effects of Elongation Longitudinaux Avec Décoaptation Ostéo-Articulaire (ELDOA) and Proprioceptive Neuromuscular Facilitation (PNF) on pain, cv angle, and quality of life in individuals with Text Neck Syndrome (TNS). Both interventions produced significant improvements in all outcome measures; however, the ELDOA group demonstrated significantly greater improvements than the PNF group. The superior outcomes observed with ELDOA may be attributed to its ability to promote spinal decompression, improve fascial mobility, enhance proprioceptive input, and restore postural alignment, thereby reducing pain and improving cervical function. In contrast, PNF improved neuromuscular control, flexibility, and muscle coordination through proprioceptive stimulation, contributing to reduced pain and increased ROM. These findings are consistent with previous studies reporting the effectiveness of both ELDOA and PNF in managing neck pain and postural Dysfunction. Overall, ELDOA appears to be a more effective intervention than PNF for reducing pain, reduced cv angle, and enhancing quality of life in individuals with Text Neck Syndrome.

CONCLUSION

Both Elongation Longitudinaux Avec Décoaptation Ostéo-Articulaire (ELDOA) and Proprioceptive Neuromuscular Facilitation (PNF) significantly reduced pain, reduced cv angle, and enhanced quality of life in individuals with Text Neck Syndrome (TNS). However, participants treated with ELDOA demonstrated significantly greater improvements than those receiving PNF. These findings suggest that ELDOA is a more effective physiotherapy intervention for managing TNS and may be considered a preferred treatment approach to reduce pain, restore cervical mobility, and improve functional outcomes.

LIMITATIONS AND RECOMMENDATIONS

This study was limited by its relatively small sample size, inclusion of participants aged only 18–40 years, and the absence of long-term follow-up to evaluate the sustainability of treatment effects. These limitations may restrict the generalizability of the findings.

Future studies should include larger sample sizes, participants from different age groups, and extended follow-up periods to assess long-term outcomes. Further research should also investigate comprehensive rehabilitation programs that combine ELDOA with other physiotherapy interventions to optimize management of Text Neck Syndrome.

INFORMED CONSENT

Written informed consent was obtained from all participants before enrollment in the study. Participants were informed about the study objectives, procedures, potential benefits, and their right to withdraw from the study at any time without any consequences.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest regarding the publication of this study.

AUTHORS CONTRIBUTION

Abinaya J: Conceptualization, methodology, participant recruitment, data collection, statistical analysis, manuscript preparation, and manuscript revision.

Dr. Stanley E, Dr. S Ramkumar & Dr. Prabhuraja R: Study conception and design, supervision, methodology validation, interpretation of results, critical revision of the manuscript, and final approval of the manuscript.

Dr. P Bright Alwin Victor: Administrative support, overall academic guidance, and final approval of the manuscript.

DATA AVAILABILITY STATEMENT

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request.

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