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Effects of Elongation Longitudinaux Articular Vertebral and Columnar Decoaption Osteo Articulaire versus Upper Thoracic Mobilization on Forward Head Posture in Upper Cross Syndrome

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DECLARATIONS

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ABSTRACT

Background: Upper-crossed syndrome is a common musculoskeletal disorder characterized by forward head posture. Elongation longitudinaux articular vertebral and columnar decoaption osteo articulaire and upper thoracic mobilization are two manual therapy approaches used to address upper cross syndrome, but their comparative effects on forward head posture are unknown. **Objective:** To compare the effects of elongation longitudinaux articular vertebral and columnar decoaption osteo articulaire and upper thoracic mobilization on forward head posture with upper cross syndrome. **Methodology:** A randomized controlled trial was conducted in Athwal Hospital, Nawan Lahore, involving 38 participants with forward head posture. Participants were randomly allocated to either group A or group B. Group A received elongation longitudinaux articular vertebral and columnar decoaption osteo articulaire, also known as ELDOA, and group B received upper thoracic mobilization treatment. The intervention was given thrice a week for 6 weeks, and outcomes were measured, including cervical range of motion, Targus to wall test, numeric pain rating scale, neck disability index, and craniovertebral angle. Data were analyzed by using ANOVA and a t-test. Both groups showed significant improvement; however, the experimental group demonstrated greater reduction in symptoms ($p<0.05$) at the 6th week. Results: It showed that Group A has a mean age of 34.00 years (SD=7.63) with ages ranging from 22 to 45 years, while Group B has a slightly higher mean age of 34.26 years (SD=7.37) with ages ranging from 20 to 45 years. Both groups experienced a reduction in pain levels over time, with Group B reporting higher pain levels at baseline but showing a similar trend in pain reduction compared to Group A. **Conclusion:** Elongation longitudinaux articular vertebral and columnaire decoaption osteo-articulaire is more effective than upper thoracic mobilization in the reduction of forward head symptoms.

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INTRODUCTION

Right now, one of the physical anomalies with a high prevalence is upper crossed syndrome (UCS).[1] Between 11 and 60% of people in various age groups and populations have UCS.[2] The prevalence of upper cross syndrome among desk workers was 32.43%, following earlier studies. In drivers, the prevalence of upper cross syndrome was 24.325%. Among housewives, the prevalence of UCS was 27.035 percent. Upper cross syndrome was seen in 16.22% of teachers.[3] Janda introduced the neuromotor components of upper body muscle imbalances with the UCS, characterizing postural asymmetries in the sagittal plane as obstacles to recovery from chronic locomotor system pain syndromes. Muscular imbalance is UCS's main adversary.[4] A common postural syndrome called UCS is brought on by imbalances in the muscles of the upper body. Individuals with this syndrome are more likely to experience upper back pain, shoulder tightness, loss of cervical lordosis, and aberrant head carriage. They may also experience tension-type headaches.[5] Tension in the muscles causes headaches. It is usually brought on by incorrect posture.[6]

The UCS may cause the deep cervical flexors, such as the scalenes, middle and lower trapezius, serratus anterior, and rhomboids, to lengthen while simultaneously shortening the upper trapezius, levator scapulae, and pectoralis major muscles.[7] Tightness in the trapezius muscle, a big superficial back muscle, can cause pain, discomfort, and limited range of motion.[8] The head posture of an individual with upper cross syndrome will be forward. There are numerous causes of forward head posture (FHP), but the most common one is a persistently aberrant neck posture.[9] The FHP is the most common cervical postural disorder in the sagittal plane that is detected with different severity levels in practically all populations.[10] Elongation longitudinaux articular vertebral and columnar decoaption osteo articulaire (ELDOA) is a set of exercises and motions that use the body's center of gravity to identify a specific region of the spine that requires strain on the fascia to be either realigned or mobilized. The goal of ELDOA is to help reduce stress and increase space in the vertebral joints so that muscles can move freely. The benefits of these stretches include joint mobility, increased fluid absorption in the discs of the spine, flexibility, improved muscle tone, postural alignment, body-mind connection, and coordination. The tension and release created by these stretches help normalize the posture.[11]

Upper thoracic mobilization, often known as joint mobilization, is a common technique in manual therapy. To preserve or restore joint mobility, this approach glides and uses distraction on the joint surfaces. A prior study showed that the cervical region's range of motion could be effectively increased by upper thoracic spine mobilization.[12]. A 2023 study by Farooq M and Bashir MS examined the effects of ELDOA and post-facilitation stretching on neck pain and functional disability in text neck syndrome among COVID-19-affected mobile users. This single-blinded, randomized control trial conducted at Safi Hospital, Faisalabad, included 40 smartphone users aged 18 to 35 years with a Neck Disability Index (NDI) score >10. Participants were randomly assigned to the ELDOA group (n=20) or post-facilitation stretching group (n=20), receiving three sessions per week for six weeks. Pain, functional impairment, and smartphone addiction were assessed at baseline and after 18 sessions using the Numeric Pain Rating Scale (NPRS), NDI, and Smartphone Addiction Scale (SAS). SPSS version 22 was used for statistical analysis. The ELDOA group showed significantly greater improvement in pain ($p<0.03$, 95% CI [−1.33, −0.068]) and functional impairment ($p<0.05$, 95% CI [−4.44, 0.143]) than the post-facilitation stretching group. However, smartphone addiction levels showed no significant difference ($p=0.35$, 95% CI [−28.6, 10.4]) between groups. Both techniques effectively reduced neck pain and disability, but ELDOA was superior for improving functional outcomes in text neck syndrome patients.[13].

In 2024, a study by Faiza Khalid compared the effectiveness of Upper Thoracic Mobilization and Mobility Exercises (UTMME) and ELDOA in treating FHP. This randomized clinical trial included 36 patients aged 20-40 years, randomly assigned to two groups (n=18 each). Over four weeks, Group A received ELDOA, while Group B underwent UTMME, with three sessions per week. Outcome measures included cervical range of motion (ROM), Craniovertebral Angle (CVA), NDI, and NPRS. Data were analyzed using the Friedman and Mann-Whitney U tests. Results showed that while both interventions led to significant

improvements, ELDOA demonstrated superior effectiveness in reducing pain and disability and improving postural alignment. At week four, the ELDOA group showed greater improvements in CVA (54.22 vs. 50.05), NDI (9.00 vs. 12.50), and NPRS (4.00 vs. 5.00) ($p<0.05$) compared to the UTMME group. The study concluded that ELDOA is more effective than UTMME in enhancing postural alignment, reducing pain, and minimizing disability in individuals with FHP.[14]

In 2024, a study conducted by Rafique RJJoH evaluated the effectiveness of sub-occipital muscle inhibition techniques and ELDOA in reducing pain among patients with text neck syndrome. This randomized controlled trial included 44 participants experiencing chronic neck pain for at least three months. Participants were randomly assigned to two groups: Group A (n=22) received ELDOA, while Group B (n=22) underwent sub-occipital muscle inhibition techniques combined with baseline treatment. Pain levels were assessed using the NPRS, while neck isometric exercises and hot packs were included as part of baseline treatment. SPSS Version 16 was used for statistical analysis. The results indicated that both interventions significantly reduced pain, but ELDOA was slightly more effective. The ELDOA group showed a mean pain reduction of 3.5 points, whereas the sub-occipital muscle inhibition group showed an average reduction of 2.8 points on the NPRS. The study concluded that both ELDOA and sub-occipital muscle inhibition techniques are effective for managing pain in text neck syndrome. However, ELDOA demonstrated slightly greater pain relief, making it a preferred approach for improving patient outcomes.[15]

METHODOLOGY

This randomized controlled trial was conducted at Athwal Hospital, Nai Lahore, over six months following synopsis approval. Using a non-probability convenience sampling technique, 42 participants with FHP and upper cross syndrome were recruited, with four patients excluded. The final sample size included two groups of 19 participants each, assigned to either ELDOA or UTM. The study assessed cervical ROM using goniometry, forward head posture with the CVA and Tragus-to-Wall Test (TWT), pain intensity using the NPRS, and functional disability using the NDI. Ethical considerations included informed consent, data confidentiality, participant safety, and Institutional Review Board approval. Interventions were administered by a trained physiotherapist, with each session lasting 30 minutes, three times per week for six weeks. Baseline, mid-point (third week), and post-treatment (sixth week) assessments were conducted. Before each session, both groups received a 10-minute hot pack application. ELDOA exercises focused on the cervical and thoracic spine (C1–C2, C4–C5, C7–T1, T2–T5), promoting postural correction and spinal decompression. UTM techniques, including posterior-anterior, transverse, and rotational mobilization (T1–T6), aimed to enhance thoracic mobility and reduce stiffness. Data analysis was conducted using SPSS Version 16, with pre- and post-intervention comparisons to determine the efficacy of each approach. The study aimed to evaluate the effectiveness of ELDOA versus UTM in reducing pain, improving cervical mobility, and enhancing postural alignment in patients with FHP.

RESULTS

Group A has a mean age of 34.00 years (SD=7.63) with ages ranging from 22 to 45 years, while Group B has a slightly higher mean age of 34.26 years (SD=7.37) with ages ranging from 20 to 45 years. Both groups show similar age distributions (Figure 1). The frequency and percentage distribution of gender in the two groups. In Group A, males constitute 52.6% (10 participants), and females 47.4% (9 participants). In contrast, Group B has a higher proportion of females at 73.7% (14 participants), with males comprising 26.3% (5 participants). This indicates a notable difference in gender distribution between the groups. Table 1 shows the descriptive statistics for cervical vertebral angle (CVA) in Groups A and B across baseline, 3rd week, and 6th week. Both groups showed comparable improvements over time.

Table 2 presents the descriptive statistics for the Tragus to wall test (TWT) at baseline, the 3rd week, and the 6th week for both groups. In Group A, the mean TWT decreased from 14.23 (SD = 2.94) at baseline to 13.28 (SD = 1.94) in the 3rd week and 11.50 (SD = 0.90) in the 6th week, with values ranging from 6.90 to 19.08 at baseline and 10.11 to 12.96 at the 6th week. Similarly, Group B showed a decrease in mean TWT from 15.05 (SD = 2.25) at baseline to 13.53 (SD = 2.02) in the 3rd week and 11.94 (SD = 1.88) in the 6th week, with values ranging from 11.13 to 18.04 initially and 8.33 to 15.74 at the final time point. Both groups demonstrated a decrease in TWT over time, with

Group B starting with a higher mean TWT compared to Group A but showing a similar trend in the reduction of TWT. Table 3 presents the descriptive statistics for the Numerical Pain Rating Scale (NPRS) at baseline, the 3rd week, and the 6th week for both groups. In Group A, the mean NPRS decreased from 7.81 (SD = 2.78) at baseline to 6.21 (SD = 2.50) in the 3rd week and 5.45 (SD = 3.03) in the 6th week, with values ranging from 4.14 to 14.39 at baseline and -0.95 to 11.13 at the final time point. Similarly, Group B showed a decrease in mean NPRS from 10.90 (SD = 3.03) at baseline to 8.90 (SD = 2.95) in the 3rd week and 8.04 (SD = 2.68) in the 6th week, with values ranging from 4.07 to 17.51 initially and 2.93 to 12.58 at the 6th week. Both groups experienced a reduction in pain levels over time, with Group B reporting higher pain levels at baseline but showing a similar trend in pain reduction compared to Group A.

Table 2 presents the descriptive statistics for the NDI at baseline, the 3rd week, and the 6th week for both groups. In Group A, the mean NDI decreased from 20.46 (SD = 4.38) at baseline to 18.18 (SD = 3.52) in the 3rd week and 13.18 (SD = 3.59) in the 6th week, with values ranging from 13.15 to 27.50 at baseline and 7.80 to 18.89 at the final time point. Similarly, Group B showed a decrease in mean NDI from 24.64 (SD = 5.71) at baseline to 19.44 (SD = 4.12) in the 3rd week and 18.10 (SD = 2.85) in the 6th week, with values ranging from 12.86 to 36.58 initially and 13.62 to 22.45 at the 6th week. Both groups showed a reduction in disability over time, with Group B starting with a higher mean NDI at baseline but showing a similar trend in improvement compared to Group A. The Shapiro-Wilk test results show that all variables have p-values greater than 0.05, indicating that the data for each variable follows a normal distribution. Therefore, the null hypothesis of normality is not rejected for any of the variables. Table 3 presents the between-group and within-group differences for various variables measured over time using one-way and repeated-measures ANOVA.

Figure 1: Histogram for age of participants by Groups

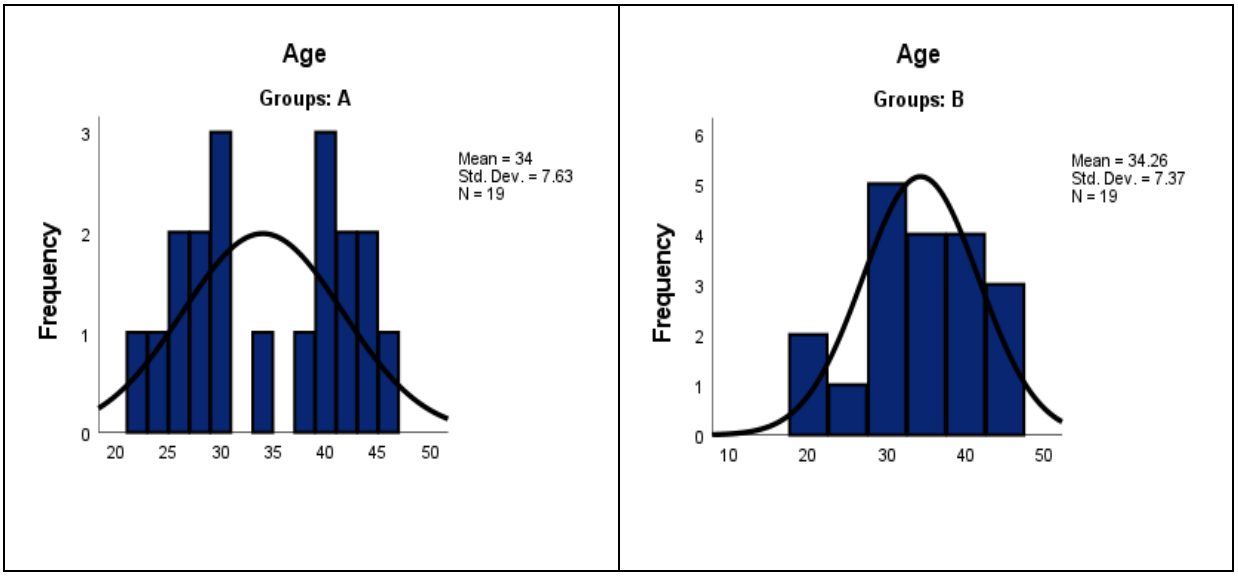

Table 1: Descriptive Statistics of CVA

CVA	Group A					Group B				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Baseline	19	47.59	2.400	42.81	51.43	19	47.33	2.27	41.04	50.90
3rd week	19	50.29	2.047	47.64	54.64	19	49.69	1.89	47.21	53.52
6th week	19	51.92	1.373	49.76	54.57	19	51.41	1.76	48.60	54.28

Table 2: Descriptive statistics of TWT, NPRS, and NDI

Variables	Follow-up	Group A	Group B
TWT	Baseline	14.23±2.93	15.05±2.24
	3rd Week	13.27±1.93	13.52±2.02
	6th Week	11.50±1.93	11.94±1.87
NPRS	Baseline	7.80±2.77	10.90±3.03
	3rd Week	6.21±2.50	8.89±2.95
	6th Week	5.44±3.03	8.04±2.67
NDI	Baseline	20.45±4.38	24.64±5.71
	3rd Week	18.18±3.52	19.44±4.11
	6th Week	13.18±3.58	18.10±2.85

Table 3: Between and within group differences (One-way & Repeated Measure ANOVA)

Variables	Group A		Group B		F- Value	Between-Group p-value	Within Group p-value
	Mean (SD)	Median	Mean (SD)	Median			
Pre-CVA	47.59 (2.400)	47.7	47.33 (2.27)	47.71	.234	.730	0.001
Mid-CVA	50.29 (2.047)	49.6	49.69 (1.89)	49.51	0.245	.356	
Post-CVA	51.92 (1.373)	51.5	51.41 (1.76)	51.6	1.221	.331	
Pre-TWT	14.23(2.94)	14.6	15.05 (2.25)	15.35	.496	.340	0.001
Mid-TWT	13.28 (1.94)	13.6	13.53 (2.02)	13.55	.035	.697	
Post-TWT	11.50 (0.90)	11.5	11.94 (1.88)	11.41	4.699	.364	
Pre-NPRS	7.81 (2.78)	9.4	10.90 (3.03)	11.41	.000	.002	0.001
Mid-NPRS	6.21 (2.50)	7.3	8.90 (2.95)	8.74	1.231	.005	
Post-NPRS	5.45 (3.03)	6.7	8.04 (2.68)	7.8	.071	.008	
Pre-NDI	20.46 (4.38)	23.6	24.64 (5.71)	23.89	.282	.016	0.001
Mid-NDI	18.18 (3.52)	18.8	19.44 (4.12)	19.51	.014	.318	
Post-NDI	13.18 (3.59)	16.1	18.10 (2.85)	19.14	1.056	.000	

Significant within-group improvements were observed across all variables (p=0.001), indicating positive progress in both groups over time. For CVA, both groups improved significantly within-group, but no significant differences were noted between groups. Flexion showed significant between-group differences at baseline (p=0.003), favoring Group A, with both groups improving over time. Similarly, extension exhibited significant within-group improvements, with Group A outperforming Group B at the 6th week (p=0.019). Side-bending and rotation (both right and left) showed significant within-group improvements, though between-group differences

were mostly non-significant. The Tragus to wall test (TWT) demonstrated significant within-group improvements without significant between-group differences. The numeric pain rating scale (NPRS) showed substantial improvement within groups, with significant between-group differences at all time points, favoring Group A. Similarly, the NDI revealed significant improvements within groups, with Group A showing better results at baseline ($p=0.016$) and the 6th week ($p<0.001$). Overall, while both groups experienced notable improvements, Group A consistently outperformed Group B in reducing pain, improving mobility, and enhancing functionality. This suggests that the intervention used for Group A may be more effective in achieving these outcomes.

DISCUSSION

The purpose of this study was to evaluate the effects of upper thoracic mobilization and ELDOA on forward head position in upper cross syndrome. This discussion aims to give a thorough analysis of the study's findings, including how forward head posture is affected by ELDOA and upper thoracic mobilization, as well as the implications of the findings for future research and clinical practice. This study examined the impact of ELDOA and upper thoracic mobilization. This research has 42 individuals in total. There were 38 volunteers in all, but five had to withdraw from the research. Group B receives upper thoracic mobilization therapy, whereas Group A receives ELDOA treatment. Participants provided information such as age, BMI, CVA, cervical range of motion, pain severity, and disability index after being randomly assigned to groups A and B. Treatment was given 3 times per week for 6 weeks. Group A has a mean age of 34.00 years (SD = 7.63) with ages ranging from 22 to 45 years, while Group B has a slightly higher mean age of 34.26 years (SD = 7.37) with ages ranging from 20 to 45 years. Both groups show similar age distributions, and in Group A, males constitute 52.6% (10 participants), and females 47.4% (9 participants). In contrast, Group B has a higher proportion of females at 73.7% (14 participants), with males comprising 26.3% (5 participants).

This indicates a notable difference in gender distribution between the groups. The ELDOA techniques have proven effective in pain management, as supported by previous research. A 2024 study by Naveera Maqsood demonstrated a statistically significant reduction in pain among patients treated with ELDOA techniques. Additionally, ELDOA incorporates myofascial stretching, aiming to strengthen and decompress the spine. By performing targeted movements for one minute per spinal segment, ELDOA has been associated with stress reduction, increased intervertebral disc space, enhanced vertebral joint proprioception, and improved hydration of the annulus fibrosus. Although less commonly used in therapeutic settings, ELDOA may serve as an effective approach to enhancing spinal health, alleviating pain, and correcting posture.[16] The results of group B's upper thoracic mobilization also support the body of research that backs up the use of thoracic mobilizations to treat thoracic and cervical musculoskeletal conditions.

Juchul Cho conducted a study in 2017 that indicated that, in comparison to upper cervical spine mobilization and stabilization exercises, upper thoracic spine mobilization produced superior overall short-term outcomes in CVA (standing posture), cervical extension, NPRS, and NDI in people with Forward head posture.[17] In addition, a 2013 study by Park, Sin Jun, Finding out how upper thoracic mobilization affected cervical alignment in stroke patients with forward head posture was the aim of this study. The cervical curve angle was positively impacted by upper thoracic mobilization, as these findings show. These data imply that PA mobilization on the upper thoracic spine helped restore cervical curve angle in stroke patients with Forward head posture.[18] The results of this study have several therapeutic ramifications for the management of upper cross syndrome and forward head position. To enhance forward head position and lessen upper cross syndrome symptoms, the study first suggests that elongation longitudinaux articular vertebral & columnar decoaption osteo articulaire may be a more successful treatment than upper cross mobilization.

CONCLUSION

This study found that both ELDOA and upper thoracic mobilization effectively improve forward head posture and upper cross syndrome. However, ELDOA was more effective in enhancing the craniovertebral angle, reducing pain, and lowering disability. The results suggest ELDOA may be particularly beneficial for patients with severe cervical stiffness and muscle tension.

Further research is needed to compare long-term outcomes and better understand the mechanisms behind these therapies. This study highlights the importance of ELDOA and UTM in managing FHP and UCS while emphasizing the need for continued research.

DECLARATIONS

Consent to participate: Written consent had been obtained from patients. All methods were performed following the relevant guidelines and regulations.

Availability of data and materials: Data will be available on request. The corresponding author will submit all dataset files.

Competing interests: None

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Authors' contributions: All authors read and approved the final manuscript.

CONSORT Guidelines: All methods were performed following the relevant guidelines and regulations.

REFERENCES

1. Babaei H, Alizadeh MH, Minoonezhad H, Movahed A, Maher RJPT-SPTJ. Effectiveness of the Alexander Technique on quality of life in young men with upper crossed syndrome. 2024; 14(2): 125-36.
2. Sepehri S, Sheikhhoseini R, Piri H, Sayyadi PJBmd. The effect of various therapeutic exercises on forward head posture, rounded shoulder, and hyperkyphosis among people with upper crossed syndrome: a systematic review and meta-analysis. 2024; 25(1): 105.
3. Naseer R, Tauqeer SJPJoPT. Prevalence of upper cross syndrome in different occupations. 2021: 03-7.
4. Morris CE, Bonnefin D, Darville CJJob, therapies m. The Torsional Upper Crossed Syndrome: A multi-planar update to Janda's model, with a case series introduction of the mid-pectoral fascial lesion as an associated etiological factor. 2015; 19(4): 681-9.
5. Mocke RCF. A Comparison of Cervical and Thoracic Manipulation, Kinesio™ Abdominal Core Taping and the Combination of the Two in the Management of Upper Cross Syndrome: University of Johannesburg (South Africa); 2019.
6. Qamar MM, Basharat A, Kiran QJPJoR. Effects of Bowen therapy in patients with tension-type headache: a randomized controlled trial. 2023; 12(1): 28-34.
7. Gillani S, Rehman S, Masood TJJotPMA. Effects of eccentric muscle energy technique versus static stretching exercises in the management of cervical dysfunction in upper cross syndrome: a randomized control trial. 2020; 70(3): 1.
8. Kiran Q, Ramzan R, Siddiq Z, Tariq A, Tahir MJJoH, Education. Association of Stress-Induced Upper Trapezius Tightness and Burnout Syndrome in Physical Therapy Interns of Lahore. 2024; 1.
9. Waqar S, Khalid M, Khalid NJTRJ. Effectiveness of elongation longitudinaux avec decoaption osteoarticulaire in correcting forward head posture: soi: 21-2017/re-trjvol06iss01p284. 2022; 6(01): 284-9.
10. Mahmoud NF, Hassan KA, Abdelmajeed SF, Moustafa IM, Silva AGJCrimm. The relationship between forward head posture and neck pain: a systematic review and meta-analysis. 2019; 12(4): 562-77.
11. Clement AAL. The prevalence of playing-related injuries in collegiate violinists and the physical, emotional, and mental effects of ELDOA. 2016.
12. Zaghloul HMS, Ghally SAO, Abdelkhalek MMT, Mohamed MT, Mahmoud LSE-D, Ghaly LAOJST-REdCdD. Comparison between upper thoracic spine mobilization and the Ergon technique in the treatment of mechanical neck pain. 2022: 3-.
13. Farooq M, Bashir MS, Arif A, Kashif M, Manzoor N, Abid FJM. Effects of elongation longitudinale avec decoaption osteo-articulaire and post-facilitation stretching technique on pain and functional disability in mobile users with text neck syndrome during the COVID-19 pandemic: A randomized controlled trial. 2023; 102(12): e33073.
14. Khalid FK, Musharaf M, Ijaz U, et al. Comparative Effects of Elongation Longitudinal Avec Decoaptation Osteo Articulaire Versus Upper Thoracic Mobilization and Mobility Exercise for Treatment of Forward Head Posture: Comparative Effects of ELDOA vs. Thoracic Mobilization for FHP. 2024; 4(3): 1-6.
15. Rafique RJJoH, Research R. Comparison of the Effects of ELDOA Technique and Sub-occipital Muscle Inhibition Technique on Pain in Patients with Text Neck Syndrome. 2024; 4(ICIC1).

16. Maqsood N, Zulfqar R, Zahir S, et al. Comparative effects of elongation longitudinaux avec decoaption osteo articulaire and sustained natural apophyseal glide on pain, range of motion and disability in patients with unilateral cervical radiculopathy: a randomized clinical trial. 2024; 2(2 (Health & Allied)): 496-504.
17. Cho J, Lee E, Lee SJBmd. Upper thoracic spine mobilization and mobility exercise versus upper cervical spine mobilization and stabilization exercise in individuals with forward head posture: a randomized clinical trial. 2017; 18: 1-10.
18. Park SJ, Park SEJJoiaoptr. Effect of upper thoracic mobilization on cervical alignment in stroke patients with forward head posture: A case study. 2018; 9(2): 1513-6.