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Effectiveness Of Integrated Neuromuscular Inhibition Technique (Init) As An Adjunct To Conventional Physiotherapy On Forward Head Posture In I.T. Workers By Measuring Craniovertebral Angle.

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Abstract

Introduction : Forward Head Posture is a common habitual postural malalignment often present since a young age and often observed in individual who spend a lot of time sitting and reading or working at a computer. Many cervical muscles are affected in forward head posture. Musculoskeletal disorders are also related to Forward Head Posture. Due to prolonged use of computers and poor ergonomics along with sedentary lifestyle, forward head posture is common among I.T. workers. So for this reason forward head posture should be identified by measuring the craniovertebral angle. Effectiveness of Integrated Neuromuscular Inhibition Technique (INIT) as an adjunct to Conventional Physiotherapy on forward head posture is studied to check whether they can decrease forward head posture in I.T. workers.

Method : 42 I.T. workers both male and female in age group 18-30 years having forward head posture with trigger points at upper trapezius and levator scapulae were included and divided into two groups. People with neuromuscular & musculoskeletal disorders and those with history of shoulder arthroplasty or injury were excluded. Group A (INIT along with Conventional Physiotherapy) Group B (Conventional Physiotherapy) for a period of 2 weeks. For Group A, INIT – Integrated Neuromuscular Inhibition Technique and Conventional Physiotherapy were given for 4 times per week for 2 weeks and for Group B, Conventional Physiotherapy was given for the same period of time i.e. 4 times per week for 2 weeks . After 2 weeks, Craniovertebral angle was measured again of both the groups. Wilcoxon Signed rank test was performed to test the significance within the pairs and Mann-Whitney U test was performed to test the significance between the differences in the two groups.

Result : There was high statistical significance within the pairs of each group (p-value < 0.0001) and there was no significant difference between the differences of each group (p-value 0.212). Mean comparison was done for Craniovertebral angle before and after treatment of each group. It was found that due to additional INIT treatment for one group, mean difference for that group was slightly greater.

Conclusion : There is no as such significant difference between INIT as an adjunct to Conventional Physiotherapy and Conventional Physiotherapy on forward head posture. But clinically, INIT as an adjunct to Conventional Physiotherapy is more effective in reducing forward head posture in I.T. workers.

Index Terms : Integrated Neuromuscular Inhibition Technique, Craniovertebral angle, Forward head posture.

I. Introduction

Forward head posture is characterized by excessively protracted and laterally rotated scapulae, internal rotation of glenohumeral joint, increased kyphosis of upper thoracic spine, decreased lordosis of midcervical spine and increased backward bending of upper cervical spine. [1,2]

Forward Head Posture is a common habitual postural malalignment often present since a young age and often observed in individuals who spend a lot of time sitting and reading or working at a computer.[1,2] The prevalence rate of forward head posture among IT workers is 61.3%.[5]

Many muscles are affected in forward head posture.[1,2] In forward head posture, there is shortening of suboccipital muscles (Cervical extensors) concurrent with lengthening of prevertebral muscles (cervical flexors). FHP is also associated with shortening and overactivity of sternocleidomastoid and anterior scalenes.[1,2]

Deep cervical flexors longus capitus and longus colli are weakened, deep cervical flexors lengthen as chin tilts away from neck. Upper trapezius is tight. Levator scapula are tight along with sternocleidomastoid and anterior scalenus. Middle trapezius is weak.[3,4] FHP, weight of head is maintained in front of the line of gravity, increasing the flexion movement of the spine.[3,4]

Due to prolonged use of computers and poor ergonomics, along with sedentary lifestyle forward head posture is common among IT workers. Craniovertebral angle is identified as the intersection of a horizontal line passing through C7 spinous process and a line joining the midpoint of the tragus of ear to the skin overlying the C7 spinous process.[6]

Normal Craniovertebral angle is 48 to 50 degrees. Craniovertebral angle less than 48 to 50 degrees is indicated as forward head posture.[6]

The angle will be measured by using Universal goniometer (ICC – 0.89[13]) .The craniovertebral angle is measured in degrees between a horizontal line passing through spinous process of C7 and the line joining the tragus of the ear and the spinous process of C7.The tragus of the ear is taken as a reference point as it is visible and it moves in direct relation to the skull.

INIT is effective as it causes sustained or intermittent compression which causes ischemia reduces local circulation until pressure is released, after which a flushing of fresh oxygenated blood occurs. Mechanoreceptors impulses interface with slower pain messages reducing amount of pain messges reaching the brain, releasing pain relieving hormones, decreasing myofascial pain. Stretches the taut bands of muscles fibers. INIT along with strengthening excercises proved to be beneficial in decreasing disability improving Range of motion (ROM).[7]

Conventional Physiotherapy techniques like MET, Strengthening and Stretching were given. Muscle Energy Technique (MET) is a form of soft tissue on joint manipulation or mobilization. MET is effective in increasing cervical Range of Motion (ROM), Myofascial extensibility. MET is also effective in reduction in pain due to mechanism of hypoalgesia stimulation of threshold mechanoreceptors.

MET can improve lymphatic flow and reduce oedema. Improvement of motor control and strengthening of muscle. It has been found that greater improvement in Craniovertebral angles and decrease in neck pain.

Janda's approach developed by Vladimir Janda, neurologist and physiotherapist focusses on neurological aspects of muscle imbalance that are common cause of pain and imbalance. It improves postural alignment and decrease forward head posture.[7]

Stretching is a form of exercise that requires putting a body part in a certain position that will serve in lengthening or elongation of muscle or muscle group and thus enhance its flexibility and elasticity. Stretching improves range of motion of a joint, improves posture, returns normal neuromuscular balance between muscle groups.[8]

Strengthening exercises are designed to increase strength of a specific muscle or group of muscles. Strengthening exercises overload the muscles until the point of muscle fatigue and encourages muscle growth and strength.[8]

II. Need of the study

Due to rising popularity of media devices such as computers, frequent users often exhibit forward head posture. Forward Head Posture is a common habitual postural malalignment often present since a young age and often observed in individuals who spend a lot of time sitting and working at a computer.

Musculoskeletal disorders are related to FHP.[3] Upper cross syndrome, myofascial pain syndrome, temporomandibular joint syndrome can occur due to forward head posture.[3] FHP increases compressive loading on tissues in the cervical spine, particularly facet joints and ligaments. Studies have reported that symptoms including neck pain, headache, temporomandibular pain and cervical radiculopathy.[3] There is decrease in Range of Motion of cervical spine.[3]

In forward head posture, there is shortening of suboccipital muscles (Cervical extensors) concurrent with lengthening of prevertebral muscles (cervical flexors). FHP is also associated with shortening and overactivity of sternocleidomastoid and anterior scalenes.[7]

The studies conducted by Samuel T Lauman, et al (2021) on subjects with Forward Head Posture have shown that INIT has been proved effective in reducing pain and rehabilitation of Forward Head Posture. Also, studies conducted by K Kirupa(2020), Simin Sepehri (2024) have shown that conventional physiotherapy excercises have helped in decrease in Forward Head Posture. So these techniques were included in this study.[14,21]

III. Aim & Objective

III. A. Aim

To study the effectiveness of Integrated Neuromuscular Inhibition Technique (INIT) as an adjunct to conventional physiotherapy on forward head posture in IT workers by measuring Craniovertebral angle.

III. B. Objective

1. To study the effectiveness of Integrated Neuromuscular Inhibition Technique (INIT) as an adjunct to conventional physiotherapy on forward head posture in IT workers by measuring craniovertebral angle by using Universal Goniometer.

2. To study the effectiveness of conventional physiotherapy on forward head posture in IT workers by using Universal Goniometer.

3. To compare the effectiveness of INIT as an adjunct to conventional physiotherapy Vs conventional physiotherapy on forward head posture in IT workers by measuring the craniovertebral angle by using Universal Goniometer.

IV. Research Question

Is there any additional effects of INIT as an adjunct to Conventional Physiotherapy on Forward Head Posture?

V. Literature Reviews

1. Ali Mohammed, Ali Ismail Journal of Manual and Manipulative Therapy conducted a study on Integrated Neuromuscular Inhibition technique versus spray and stretch technique in neck pain patients with upper trapezius trigger points published on 23rd March 2023. Study was conducted on sample of 60 patients with neck pain and active trigger points were recruited from physiotherapy students and allocated randomly to 3 groups. INIT plus stretching exercise, spray and stretch technique plus stretching exercise and stretching exercise only. Treatment was 3 times per week for 4 weeks. Pain intensity by Visual Analog Scale (VAS), neck disability by Arabic Neck Disability Index (ANDI) and muscle amplitude by EMG were measured at baseline and after four weeks. Conclusion : Both INIT and spray and stretch technique had clinical and statistical effects on pain and functions.

2. **Syeda Gillani, Shakil Rehman, Tahir Masood conducted a study on 'Effects of eccentric muscle energy technique versus static stretching exercises in management of cervical dysfunction in upper cross syndrome'** published on 2020. The aim of the study was to compare the effects of eccentric muscle energy technique versus static stretching exercises combined with cervical segmental mobilization in the management of upper cross syndrome in patients having neck pain. Patients of upper cross syndrome who were randomised into 2 equal groups using lottery method . Patients in group A were treated with eccentric muscle energy technique with cervical segmental mobilization. Patients in group B received static stretching excercises with cervical segmental mobilization . 2 sessions per week were given to each patient. Conclusion: Both the techniques used were found to equally effective in decreasing pain, improving cervical range of motion and reducing neck disability.

3. Pooja Wakde, Deepak Anap conducted a study on 'Effectiveness of Integrated Neuromuscular Inhibitory technique in sub-acute trapezitis published in 2016. Study involved A-B-C protocol. A was pre-treatment assessment. B intervention phase. C post-treatment phase. In phase A, outcome measures were Visual Analog Scale (VAS), Manual Muscle Testing (MMT), Range of Motion (ROM). In phase B, INIT with neck exercise like cervical ROM was given for 4 weeks. In phase C, post treatment assessment was recorded. This study demonstrated that beneficial effect of improving range of motion after applying INIT with neck exercise. Also improvement has seen in neck disability and reduction in pain. Conclusion: The study concluded that there was decrease in pain and disability improving muscle strength in participant with sub-acute trapezitis.

4. Rutika Thakur, Prachi Mande, Muskaan Lokwani conducted a study on 'Effectiveness of Integrated Neuromuscular Inhibition Technique and Instrument Assisted Soft Tissue Mobilisation in Management of Upper Trapezius Myofascial Trigger points' published on 2022. Study was conducted on 60 subjects (53 females and 7 males) with active trigger points were divided randomly into 2 equal groups. Group A received INIT 3 times per week while group B received Instrument Assisted Soft Tissue Mobilization (IASTM) once a week for 2 weeks. Numerical Pain Rating Scale (NPRS), Neck Disability Index (NDI) and Active cervical range of motion were used to evaluate subjects at two intervals pre and post treatment. Conclusion: Integrated

Neuromuscular Inhibition Technique is more effective than Instrument Assisted Soft Tissue Mobilization in the management of upper Trapezius Myofacial Trigger points.

5. Samuel T Lauman, David Anderson conducted a study on 'A Neuromuscular Integration Approach to the Rehabilitation of Forward Head and Rounded Shoulder Posture' published on 2021.This study was conducted on 281 subjects who made the inclusion criteria for forward head posture and rounded shoulder posture respectively. Integrated Neuromuscular Inhibition Technique (INIT), McKenzie exercises like head retraction, neck extension, neck rotation, neck flexion in seating position were given. Exercise session lasted for approximately 20 minutes and were given for 3 days per week for four weeks. Significant difference in Craniovertebral angle was found for exercise group while no difference was found in control group. Conclusion: Evidence showed efficiency of neuromuscular techniques for forward head posture but not for rounded shoulder posture. The review also highlighted lack of research in this field.

6. Mrs. B Jyotirmai, K Senthil kumar, S Raghavkrishna conducted a study on 'Effectiveness of Integrated Neuromuscular Inhibitory technique (INIT) with specific strength training exercises in subjects with upper trapezius trigger points ' published in 2015. Study was conducted on 30 subjects with upper trapezius trigger points. The patients were randomly allocated to intervention group N=15 which underwent a 4 week training program of INIT along with specific strength training. Other group received INIT alone. The outcome measures by Visual Analog Scale (VAS), Neck Disability Index (NDI), Cervical range of motion were taken before and after treatment. The comparison of pre and post VAS in experimental and control group showed a significant change in experimental group. Conclusion: INIT along with specific strength training is proved to be effective in reducing pain and improving range of motion in individuals with upper trapezius trigger points.

VI. Hypothesis

- H0 – There will be no effectiveness of Integrated Neuromuscular Inhibition Technique (INIT) as an adjunct to conventional physiotherapy on forward head posture.
- H1 –There will be effectiveness of Integrated Neuromuscular Inhibition Technique (INIT) as an adjunct to conventional physiotherapy on forward head posture.

VII. Material & Methodology.

VII. A. Methodology

- Type of study – Interventional.
- Sampling Technique – Purposive sampling.
- Sample size - 42.
- Study duration – 6 months.
- Study area – Pune.

VII. B. Material

- Universal goniometer (ICC-0.89).[13]
- Pen
- Notebook

VII. C. Inclusion Criteria

IT workers with age group 18 to 30 years, both male and female who have craniovertebral angle less than 48 to 50 degree along with trigger points at upper trapezius and levetor scapulae.

VII. D. Exclusion Criteria

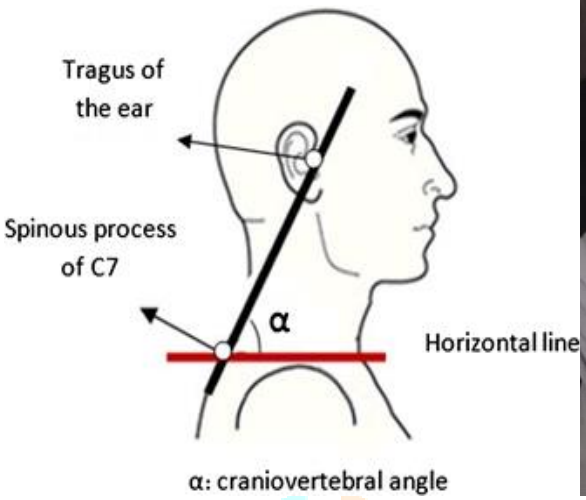
- People with neuromuscular and musculoskeletal disorders.
- Participants with history of shoulder arthroplasty, cervical or thoracic fractures, whiplash injury. People with structural scoliosis, excessive thoracic kyphosis.

VII. E. Outcome Measures

- Universal goniometer. (ICC-0.89).[13]
- Numerical Pain Rating Scale (NPRS) (ICC – 0.72).[22]

VII. F. Procedure

- Ethical approval was taken.
- Consent of IT workers with forward head posture measured by craniovertebral angle working in companies was taken.
  Procedure was explained to both groups one group on which INIT along with Conventional Physiotherapy was given and other group on which Conventional Physiotherapy was given.
- Participants (IT workers) age group 18 to 30 yrs. with forward head posture having trigger points for upper trapezius and levator scapulae were selected.
  Participants were randomly divided into 2 groups.
  Craniovertebral angle is identified as the intersection of a horizontal line passing through C7 spinous process and a line joining the midpoint of the tragus of ear to the skin overlying the C7 spinous process. Normal Craniovertebral angle is 48 to 50 degrees. Craniovertebral angle less than 48 to 50 degrees is indicated as forward head posture.
  The angle will be measured by using Universal goniometer. Reliability of Universal goniometer ICC – 0.89[13]. The universal goniometer is the measuring device which has a protractor and two arms attached to the protractor one of which is fixed to the protractor and other arm is movable at the fulcrum which is the center of the protractor. The craniovertebral angle is measured in degrees between a horizontal line passing through spinous process of C7 and the line joining the tragus of the ear and the spinous process of C7.[13]
  The tragus of the ear is taken as a reference point as it is visible and it moves in direct relation to the skull.[13]
  Trigger points were palpated on upper trapezius and levator scapulae. The degree of pain using NPRS was noted.



- Integrated Neuromuscular Inhibition Technique. (INIT)

First we locate trigger points by means of palpation method on the patient. Then we apply ischemic compression (sustained or intermittent) until the pain changes. Positionally release trigger point tissue. Pressure is applied and patient is asked to ascribe this a value of 10 and tissues are repositioned until patient reports a score of '2' or less. The whole muscle is then contracted isometrically for 7 seconds. This is followed by a stretch of the whole muscle. In stretching, a stretch is given to the muscles.[7] Upper trapezius and levator scapulae are tight along with shortening and overactivity of sternocleidomastoid and anterior scalenes. So INIT was given for these muscles.[7]

- Muscle Energy Technique (MET)

It is a form of soft tissue on joint manipulation or mobilizations. Study whether INIT or stretching and MET is effective on correcting the forward head posture is needed.[7] Basic MET exercise using postisometric relaxation (PIR). Janda's approach. The recommendation for use of MET for chronic fibrotic or indurated tissues, based on the lead author's experience is that following a contraction of between 5 to 7 seconds, commencing from a mid-range position rather than at a barrier, using more than 20% but not more than 35% of the patient's available strength, a short (2-3 seconds) rest period is allowed for complete postisometric relaxation (PIR), before stretch is introduced which takes the tissues to a point just beyond the previous barrier of resistance.[7]

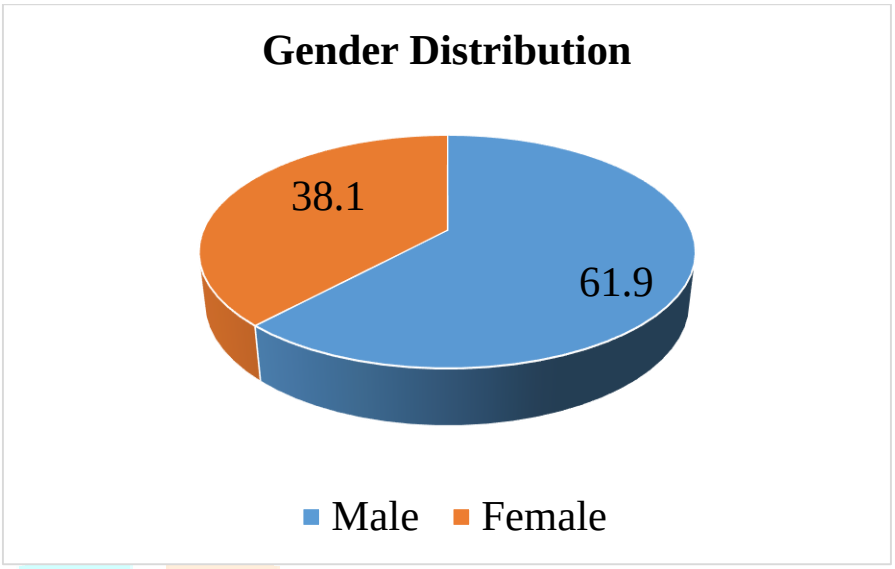
- Stretching

It was given for upper trapezius and levator scapulae muscles as they are tight. Protocol for stretching – 3 repeatations of stretches, per stretch held for 30 seconds. 4 times per week for a period of 2 weeks.[11,12] It is useful to have the patient gently assist in movement of the (now) relaxed area towards and through the barrier. Patient participation in such movement towards stretch activates the antagonists, and therefore reduces the danger of a stretch reflex.

- Strengthening.

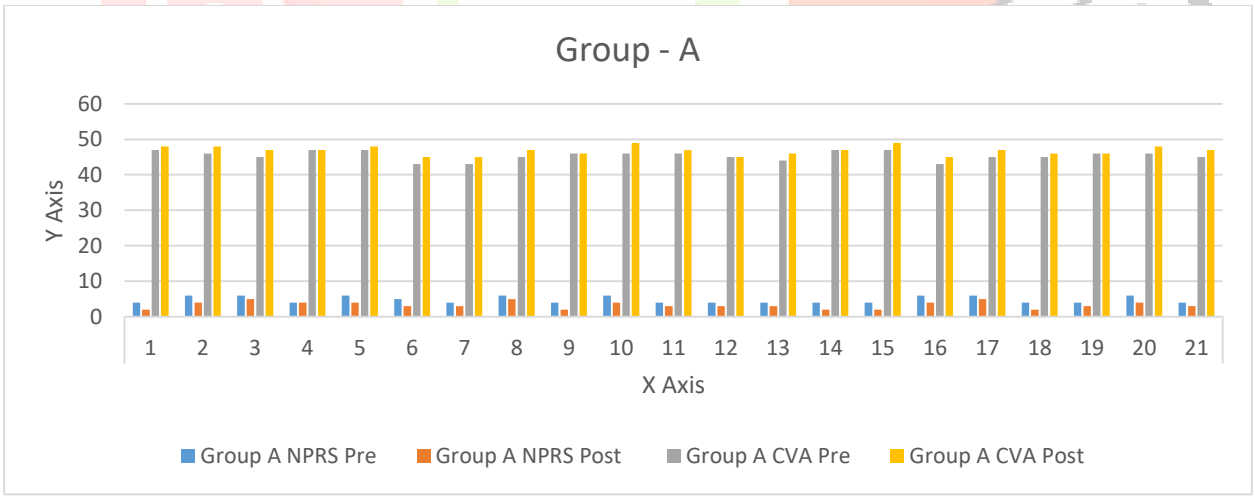
Exercises like chin tucks, neck isometric, scapular sets were given. Deep cervical flexors longus capitus and longus coli, middle trapezius are weak so strengthening was given for these muscles. [11,12] 3 sets each comprising of 12 repeatations were given 4 times per week for 2 weeks.[11,12]

VIII. Data Analysis



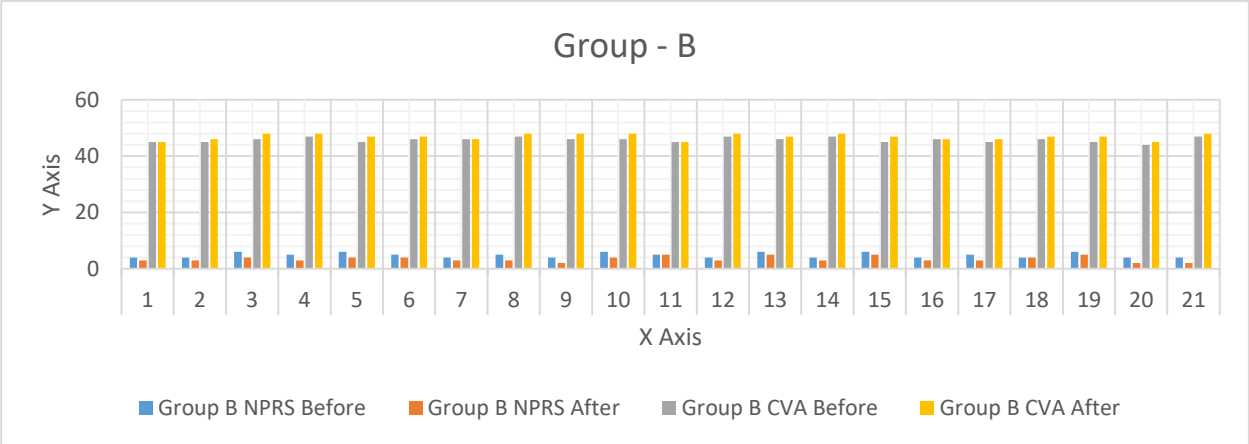
The Pie chart depicts gender distribution of IT workers.

Gender	IT workers
Male	26
Female	16



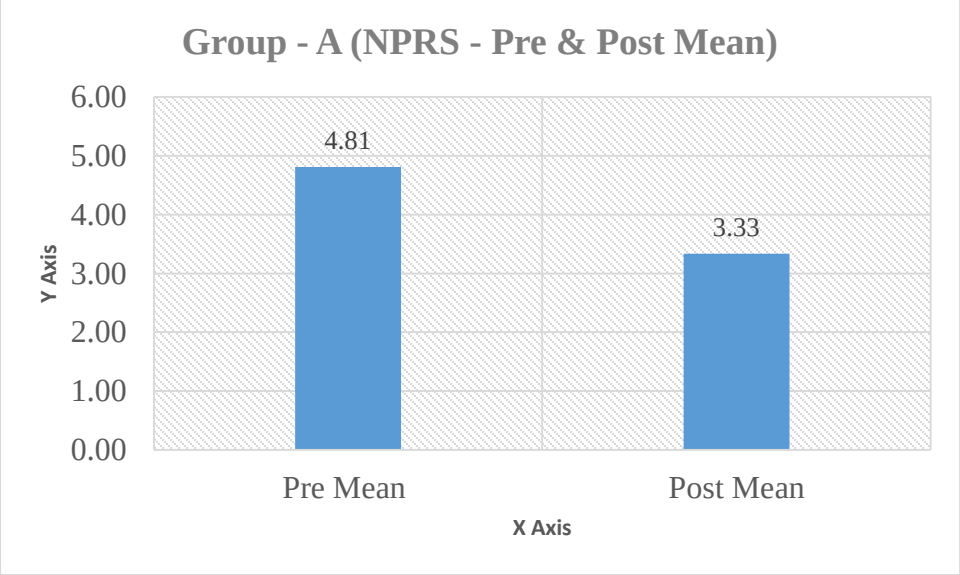
Group A

Sr.No.	Age	Gender	NPRS Pre	NPRS Post	CVA Pre	CVA Post	Diff
1	24	M	4	2	47	48	1
2	30	M	6	4	46	48	2
3	30	F	6	5	45	47	2
4	30	F	4	4	47	47	0
5	29	M	6	4	47	48	1
6	30	M	5	3	43	45	2
7	26	M	4	3	43	45	2
8	30	F	6	5	45	47	2
9	29	M	4	2	46	46	0
10	26	F	6	4	46	49	3
11	26	F	4	3	46	47	1
12	25	M	4	3	45	45	0
13	21	F	4	3	44	46	2
14	30	M	4	2	47	47	0
15	24	F	4	2	47	49	2
16	21	F	6	4	43	45	2
17	30	M	6	5	45	47	2
18	27	F	4	2	45	46	1
19	29	M	4	3	46	46	0
20	30	M	6	4	46	48	2
21	30	M	4	3	45	47	2
							29



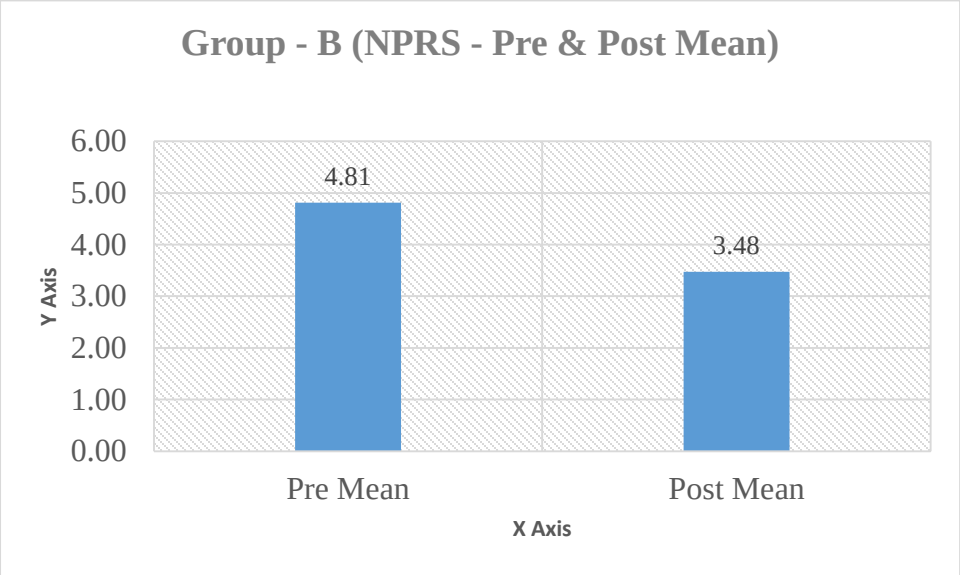
Group B

Sr.No.	Age	Gender	NPRS Before	NPRS After	CVA Before	CVA After	Diff
1	28	F	4	3	45	45	0
2	23	F	4	3	45	46	1
3	30	F	6	4	46	48	2
4	30	F	5	3	47	48	1
5	21	F	6	4	45	47	2
6	29	M	5	4	46	47	1
7	28	M	4	3	46	46	0
8	30	M	5	3	47	48	1
9	24	M	4	2	46	48	2
10	30	M	6	4	46	48	2
11	24	F	5	5	45	45	0
12	29	M	4	3	47	48	1
13	30	M	6	5	46	47	1
14	26	M	4	3	47	48	1
15	30	M	6	5	45	47	2
16	24	M	4	3	46	46	0
17	30	M	5	3	45	46	1
18	30	M	4	4	46	47	1
19	25	F	6	5	45	47	2
20	30	M	4	2	44	45	1
21	30	M	4	2	47	48	1
							23



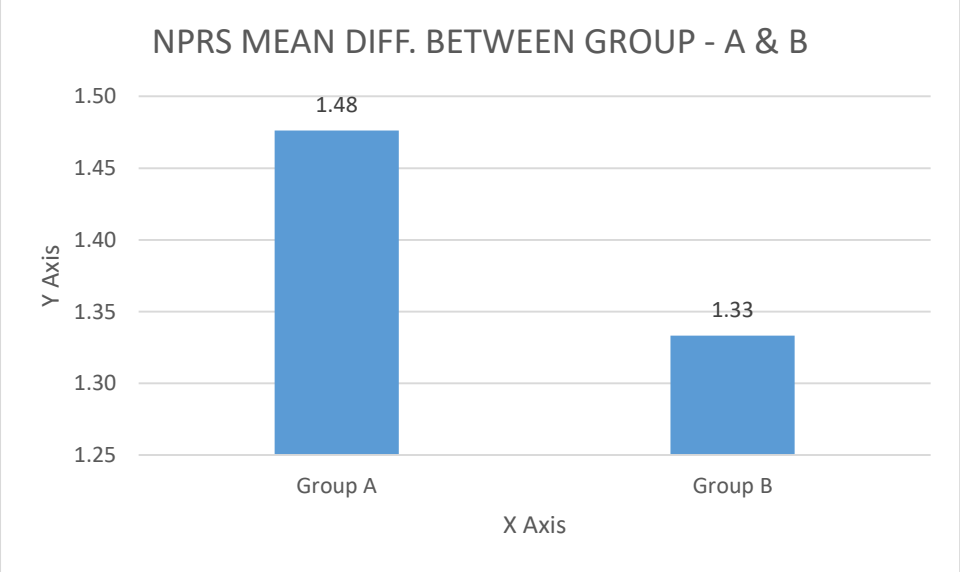
Group - A (NPRS - Pre and Post Mean)

Pre Mean	Post Mean
4.81	3.33



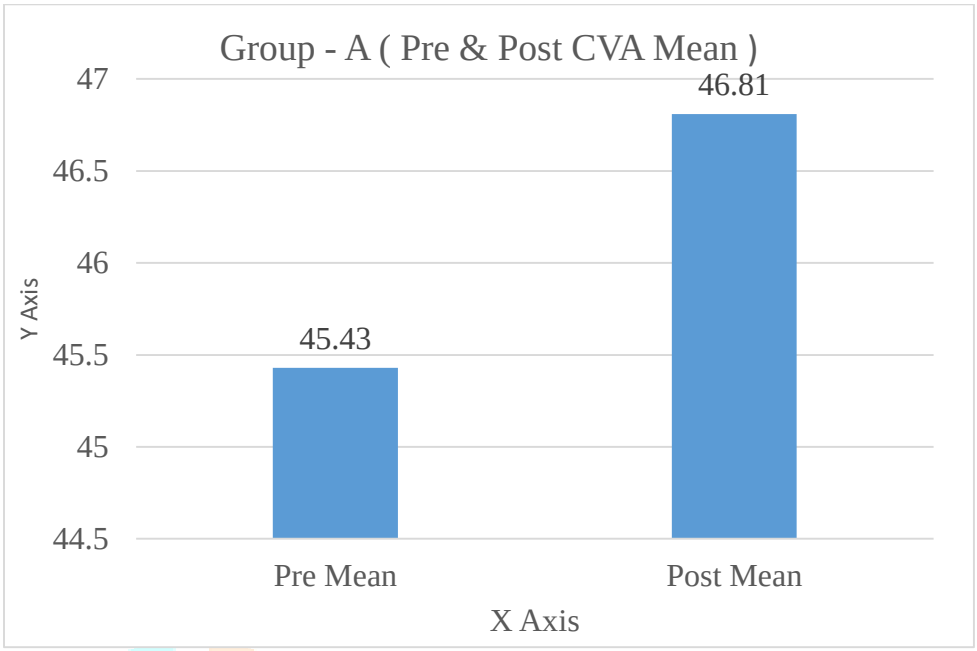
Group - B (NPRS - Pre & Post Mean)

Pre Mean	Post Mean
4.81	3.48



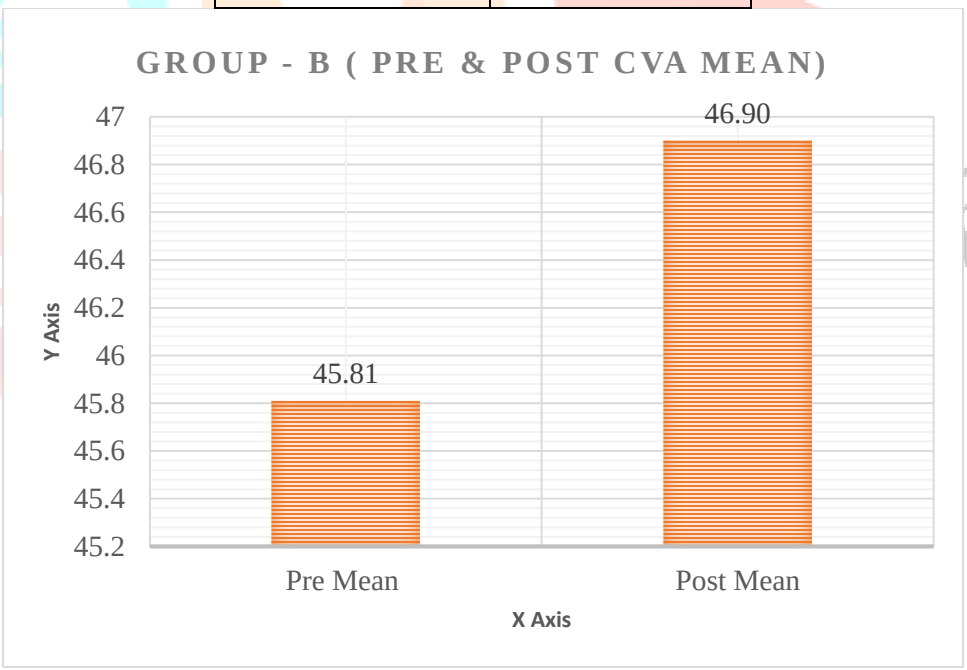
NPRS Mean difference between Group A & Group B

Group A	Group B
1.48	1.33



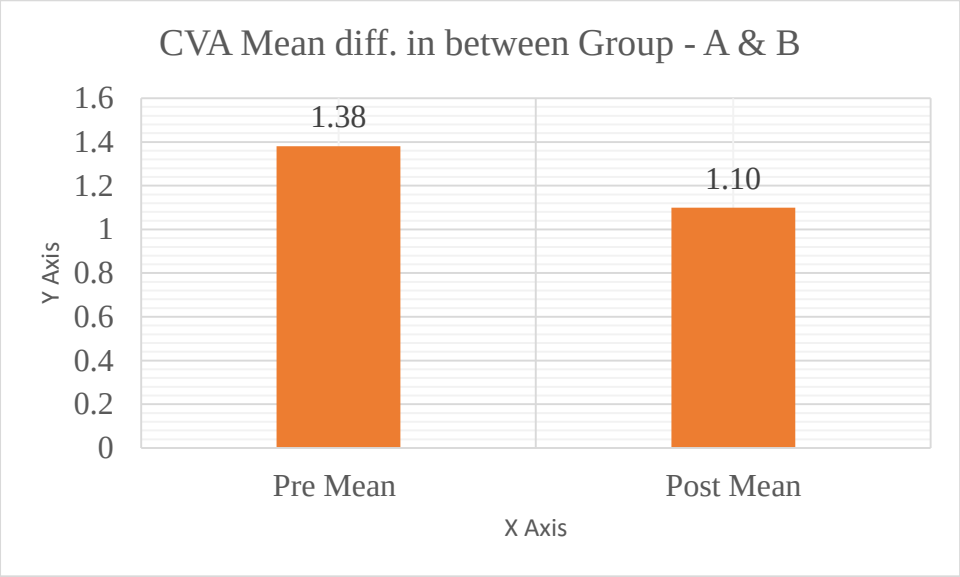
Group - A (Pre & Post CVA Mean)

Pre Mean	Post Mean
45.43	46.81



Group - B (Pre & Post CVA Mean)

Pre Mean	Post Mean
45.81	46.90



CVA Mean diff. in between Group - A & B

Pre Mean	Post Mean
1.38	1.10

	Median		Within the Pair p-value
	Pre	Post	
Group A	46	47	< 0.0001
Group B	46	47	< 0.0001

As the data was not normally distributed, Kolmogrov-Smirnov test was used to test the normality. Wilcoxon-Signed rank test was performed to test the significance with the pairs and it was found that there was high statistical significance within the pairs of each group.

	Median		Difference between groups	Between the group p-value
	Pre	Post		
Group A	46	47	0.212	> 0.0001
Group B	46	47		

Mann- Whitney U test was performed to test the significance between the differences in the two groups and there was no significant difference between the differences of each group.

IX. Result

The result states that there was high statistical significance within the pairs of each group, p-value < 0.0001and there was no significant difference between the difference of each group, p-value 0.212. Mean comparison was done for Craniovertebral angle before and after treatment of each group. It was found that due to additional INIT treatment for one group, Mean difference for that group was slightly greater.

X. Discussion

The study was to find the effectiveness of INIT as an adjunct to conventional physiotherapy on forward head posture in IT workers by measuring Craniovertebral angle. The study was conducted on 42 participants with age group 18-30 years having forward head posture were included in the study. The participants were divided into 2 groups from which group A received additional INIT treatment. Wilcoxon signed rank test was performed to test the significance within the pairs. Mann-Whitney U test was performed to test significance between the difference in the two groups. This study shows that there is no significant difference between INIT as an adjunct to Conventional Physiotherapy and Conventional Physiotherapy on Forward Head Posture. This study also shows that INIT is as effective as Conventional Physiotherapy.

In Group A (INIT along with Conventional Physiotherapy) by Wilcoxon signed rank test, the result was found that there was high statistical significance within the pair ($p < 0.0001$).

Similar kind of result was found in the study done by Shagun Agarwal, et al (2018), stated that INIT is beneficial in reducing tender point in affected muscle by mechanism of automatic resetting of the muscle spindles. INIT along with stabilization exercises in reducing pain, enhancing cervical function by reducing trigger points on upper trapezius muscles and reduction of neck disability.[16]

Another similar kind of study done by Samuel T Lauman, et al (2021), stated that Integrated Neuromuscular Inhibition Technique (INIT), McKenzie exercises like head retraction, neck extension, neck rotation, neck flexion in seating position were given. Significant difference in Craniovertebral angle was found for exercise group while no difference was found in control group. Evidence showed efficiency of neuromuscular techniques for forward head posture but not for rounded shoulder posture. [17]

INIT is effective as it causes sustained or intermittent compression which causes ischemia reduces local circulation until pressure is released, after which a flushing of fresh oxygenated blood occurs.[7] Mechanoreceptors impulses interface with slower pain messages reducing amount of pain messages reaching the brain, releasing pain relieving hormones, decreasing myofascial pain. Stretches the taut bands of muscles fibers. INIT along with strengthening exercises proved to be beneficial in decreasing disability improving Range of motion (ROM).[7]

In Group B (Conventional Physiotherapy) by Wilcoxson signed rank test, the result was found that there was high statistical significance within the pairs ($p < 0.0001$).

Similar kind of result was found in study done by K. Kirupa et al, (2020) conducted on IT workers with forward head posture. The subjects received scapular retraction exercises as a common intervention. This study stated that there was a significant effect of scapular retraction exercises in reducing forward head posture.[14]

Another similar kind of study done by Simin Sepehri et al, (2024) stated that performing therapeutic exercises like stretching & strengthening helped to stretch the shortened muscle of the neck and in decreasing forward head posture in people with upper cross syndrome.[21]

Conventional Physiotherapy Techniques like Muscle Energy Technique (MET) is effective in increasing cervical Range of Motion (ROM), Myofascial extensibility. MET is also effective in reduction in pain due to mechanism of hypoalgesia stimulation of threshold mechanoreceptors. MET can improve lymphatic flow and reduce

oedema. Improvement of motor control and strengthening of muscle. It has been found that greater improvement in Craniovertebral angles and decrease in neck pain.

Stretching is a form of exercise that requires putting a body part in a certain position that will serve in lengthening or elongation of muscle or muscle group and thus enhance its flexibility and elasticity. Stretching improves range of motion of a joint, improves posture, returns normal neuromuscular balance between muscle groups.[8]

Strengthening exercises are designed to increase strength of a specific muscle or group of muscles. Strengthening exercises overload the muscles until the point of muscle fatigue and encourages muscle growth and strength.[8]

On comparison of Group A (INIT along with Conventional Physiotherapy) and Group B (Conventional Physiotherapy) by Mann-Whitney U test, the result was found that there was no significant difference between the groups. On Mean comparison of Group A and Group B, Group A showed better improvement because of physiological effects of INIT. So clinically INIT is effective.

A similar kind of result was found in study done by Dr. Garishma Baveja, et al (2024) stated that both Muscle Energy Technique along with Conventional Physiotherapy and Positional Release Technique (SMI & INIT) showed significant difference in craniovertebral angle, pressure pain threshold and neck functions.[15]

On pain evaluation of Pre and Post treatment also, Group A showed more decrease in pain than Group B. Thus INIT is clinically effective in reducing pain.

XI. Conclusion

This study concluded that there is no as such significant difference between INIT as an adjunct to Conventional Physiotherapy and Conventional Physiotherapy on Forward Head Posture in IT workers. But clinically, INIT as an adjunct to Conventional Physiotherapy is more effective in reducing Forward Head Posture in IT workers.

XII. Limitation of study

- Universal Goniometer was used instead of KINOVEA software.
- The study was conducted for shorter duration.

XIII. Clinical Implications And Future Scope

1. This study will provide knowledge on effectiveness of INIT as an adjunct to Conventional Physiotherapy on Forward Head Posture in IT workers by measuring Craniovertebral angle.

2. It will help in planning of further treatment techniques for management of forward head posture.

3. Study can be conducted for age group above 30 years of age.

XIV. References

1. O'Sullivan, Kirean. University of Limerick, Limerick, Ireland. Physical theory of shoulder. 4th Edition 2004. Edited by Robert A. Donatelli.

2. Cohen, Rajal G. University of Idaho, Moscow, USSR. Physical Therapy of shoulder 4th Edition 2004. Edited by Robert Donatelli.

3. Koseki T, Kakizaki F, Hayashi S, Itoh M. Effect of forward head posture on thoracic shape & respiratory function. Journal of physical therapy science. 2019; 31(1):63-8.

4. Hilla Sarig Bahat, Andrei Levy & Tomer Yona (2022).

The association between forward head posture & non-specific neck pain. A cross-sectional study, Physiotherapy Theory & Practice; DOI : 10.1080/09593985,2022.

5. Fejer R, Kyvik KO, Hartvigsen J. The prevalence of neck pain in world population : a systematic critical review of literature. Europeon Spine Journal 2006;15(6).

6. Salahzadeh Z, Maroufi N, Ahmadi A, Behtash H. Assessment of forward head posture in females: Observational & Photogrammetry methods. Journal of back & musculoskeletal rehabilitation 2014 Jan 1:27(2).

7. Leon Chaitow. University of Westminster, London, UK. Muscle Energy Techniques 4th Edition, 2013.

8. Kisner C, Colby LA, Borstad J, Therapeutic exercises; Foundation & Techniques. Fa Day's; 2017 Oct 18.

9. Maclead CA, Conway BA, Allan DB, Galen SS. Development & Validation of low-cost portable & wireless gait assessment tool. Med Eng Phy 2014:36(4).

10. Mass J, Dallmeijer A, Huijning P, Brunstrom Hernandez J, Van KP, Bolster E, et al. A randomized controlled trial studying efficiency & tolerance of a knee-ankle-foot orthosis used to prevent equinus in children with spastic cerebral palsy. Clin Rehabilitation. 2014;28(10).

11. Katherinc Harman, Cheryl L, Hubley-Kozey, Heather Butler. The Journal of Manual & Manipulative Therapy. Vol 13 No.3(2005),163-176.

12. Harms-Ringdahl K, Schuldt K, Ekholm J. Principles of prevention of neck and shoulder pain. Scand J Rehabil Med Suppl 1995;32:87-96.

13. Levangie PK, Norkin CC. Joint structure and function. A comprehensive analysis, 3rd edition. Philadelphia: K.A. Davis company; 2001.

14. K. Kirupa, S.M. Divya Mary, R. Nithyanisha. Indian Journal of Public Health Research & Development (2020);Vd.11(6), 284-289.

15. Walton DM, et al., Clinical pressure pain threshold testing in neck pain: comparing protocols, responsiveness and association with psychological variables. Phy S Ther, 2014. 94(6):p. 827-37.

16. Alvarez DJ, Rockwell PG. Trigger points: Diagnosis and management Am Fan Physician. 2002; 65:653-60.

17. Naz A, Bashir MS, Noor R. Prevalence of forward head posture among university students. Rawal Med J. 2018 Apr 1; 43(2):260-2.

18. Eltayeb S, Staal JB, Hassan A, die Bie KA. Work related risk factors for neck, shoulder and arms complaints: a cohort study among Dutch computer office workers. J Occup Rehabil 2009; 19(4):315-22.

19. Anderson, J.H. Haahr, J.P. Frost, P: Risk factors for more severe regional musculoskeletal symtoms: a two-year prospective study of a general working population. Arthritis Rheum. 2007 Apr; 56: 1355-1364.

20. Rempel DM, Harrison R, Barnhart S. Work related cumulative trauma disorders of upper extremity. 1992:267:838-842.

21.Muscolino J. Upper crossed syndrome. J Australian Traditional Medicine Soc;2015:21(2):80.

22. Cleland JA, Childs JD, Whiteman JM. Psychometric properties of the Neck Disability Index and Numeric Pain Rating Scale in patients with mechanical neck pain. Arch Phys Med Rehabil 2008; 89:69-74.