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EFFECTIVENESS OF DEEP CERVICAL FLEXOR EXERCISES WITH POSTURAL AWARENESS FOR NECK PAIN IN SCHOOL TEACHERS

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ABSTRACT

Introduction: Neck pain affects approximately 70% of the world population at some point in life. It is one of the most common cause of occupation disorder and the physical nature of the job is the risk factor for its development(7) Deep cervical flexor muscle have an important postural function in supporting the cervical lordosis(7). The objective of the study was to investigate the effect of deep cervical flexor muscle training with postural awareness on pain and range of motion for school teachers with neck pain(2) .

Aim of the study: This study examine the effectiveness of 10 weeks of deep cervical flexor muscle strengthening exercises with postural awareness in improving pain and range of motion for school teachers with neck pain(2) .

Materials and methodology: In this study, Fifteen school teachers were selected between 20 to 40 years of age group based on inclusion and exclusion criteria. For all the patients, Deep cervical flexor exercises was given for 10 weeks, 3 sessions per week. After 10 weeks the post test values was noted. The results were measured in terms of pain and range of motion. Pre test and post test values were calculated using paired t-test(2) .

Conclusion: This study was statistically significant improvement in pain and range of motion for school teachers with neck pain(5) .

Key words: Deep cervical flexor exercises , school teachers, ROM,VAS.

Neck pain that persists for three months or longer is defined as chronic neck pain and its appears particularly in the neck region between the occipital condyle and c7(8). It can also orginate from any structure in the neck including intervertebral dics, ligaments, muscles, facet joints, dura and nerve roots(9) . The daily duties of the school teachers involve Head-down postures while reading, writing, use of computers, laptops and mobile phones(2). Prolonged use of computers leads to adaptions of static posture for long duration that causes neck pain(8)

Deep cervical flexor (DCF) muscle have an important postural function in supporting the cervical lordosis(10). Deep cervical flexor muscle mainly strengthening the longus colli and longus capitis are important in supporting the cervical lordosis(7) Research recommends the deep cervical flexor training emphasizes the correct use of deep cervical flexor, before introducing 11 strengthening of the cervical spine musculature, is more effective in the rehabilitation of the cervical spine than non specific strengthening of neck muscles(11) ..

The prevalence of neck pain in the world's working population has been estimated as between 15.4 and 41.1%, apporximately 50% of people reported recurrent pain. It may also affect both male (23%) and female (34%). In adults, prevalence of neck pain is 16 to 75%(9) . Teaching is one such occupation where the prevalence of neck pain is high with reports suggesting that atleast 69% of school teachers suffer from neck pain(2) .

NEED FOR THE STUDY: Ahmad H Alghadir et .al(2021) concluded that effect of deep cervical flexor muscle training using pressure biofeedback on pain and forward head posture in school teachers with neck pain. The present study concluded that 6 weeks of interventions of deep cervical flexor exercise improvement in pain and improved forward head posture (2) . The duration of the study is increased by 10 week. For the gender distribution, this study involves only females, whereas the present study, involves both male and female subjects with neck pain.To decrease the pain ,To improve the range of motion(2) .

DEEP CERVICAL FLEXION EXERCISES The deep cervical flexors are a muscle group consisting of the longus capitus and longus colli . The deep cervical flexor muscles helps to flex the neck forward as well as stabilize the cervical spine. Deep cervical flexor exercises strengthening the muscles can help to improve posture and get the head closer to neutral position. This concept was introduced by Edmondston et al.2008(2) .

SAMPLE SIZE: 15 subjects are selected for the study

SAMPLING TECHNIQUE : Purposive sampling
INCLUSION CRITERIA: Age of 20 to 40 years , Male and female , School teachers ,Neck flexion range of motion (ROM)restricted ,Upper trapezius tightness.
EXCLUSION CRITERIA; Above 40 years of age , Cervical spondylosis , Cancer ,History of Trauma or Accidental injury ,Neurological involvement like CVA and Parkinson etc. Severe cardiac patients.
RESEARCH DESIGN: Pre test – post test experimental study design
DURATION OF THE STUDY: 5 months
DURATION OF STUDY FOR EACH PATIENT: 10 weeks (thrice weekly)
STUDY METHOD: Deep cervical flexor exercises with postural awareness.
TECHNIQUE OF THE STUDY:
PROCEDURE: WEEK-1(10 mintues) A. NECK ROM EXERCISES:such as Neck flexion,extension,lateral flexion,Rotation (2minutes) THRICE WEEKLY DURATION : Do each exercises 2 times (2 minutes)(3) . EXERCISE : B. ISOMETRIC CERVICAL FLEXION: (5minutes) POSITION : SITTING POSITION. PROCEDURE : Press your palm against your forehead. Resist with your neck muscles. DURATION : Hold for 20 seconds, Relax 10 seconds and Repeat 10 sets(3) . C. TRAPEZIUS STRETCH: (3minutes) POSITION : SITTING POSITION. PROCEDURE : Apply pressure to your head with your left hand, gently pulling your head to the side towards your shoulder. DURATION : Hold the stretch for 20 seconds, Relax for 10 seconds and Repeat for other side(3) . - Repeat for 6 sets POSTURAL AWARENESS : - Use head supported chair - Shoulder should be relaxed Do shoulder shrugging 10 sets for every 1 hour: PROCEDURE : Begin in a seated position. - Raise both of your shoulder as high as you can, as if you were trying to touch them to your ears. - Keep your head and neck still relaxed - Hold for 10 seconds and repeat 10 sets for every one hour. Do shoulder bracing 10 sets for every 1 hour WEEK-2(10 mintues) A. IN ADDITION TO WEEK 1 PROTOCOL (Each exercises for 1minute) THRICE WEEKLY EXERCISE : A. ACTIVE ASSISTED NECK FELXION: (3minutes) in SUPINE LYING POSITION Hold for 20 seconds , Rest 10seconds and Repeat for 6 sets. EXERCISE : B. STERNOCLEDOMASTOID STRETCH: (2 minutes) POSITION : SITTING POSITION PROCEDURE : Tuck your chin in and downward. - Tilt your to the left. - Place your left hand on the right side of your head. Apply a downward pressure. slowly turn your to the right. - Aim to feel a firm stretch in the right sternocleidomastoid. DURATION : Hold for 20 seconds , Rest 10seconds and Repeated for other side - Repeat for 4 sets(3) . WEEK-3 (10 mintues) A. IN ADDITION TO WEEK 2 PROTOCOL (Each exercises for 1minute) THRICE WEEKLY EXERCISE : SUPINE CHIN TUCK (5 MINUTES) in supinePOSITION Hold 20 seconds, rest 10 seconds, and repeat 10 sets .WEEK -4 (10 mintues) A. IN ADDITION TO WEEK 3 PROTOCOL (Each exercises for 1minute) THRICE WEEKLY EXERCISE : A. SUPINE DYNAMIC CERVICAL FLEXION (2 minutes) POSITION : SUPINE LYING POSITION PROCEDURE : Patient can't tuck the chin - And curl the next to lift the head of the mat, begin with the patient on a slant board or large wedge shaped bolster under the thorax and head. DURATION : 2minutes(3). LEVATOR SCAPULAE STRETCH: (2MINUTES) POSITION : SITTING POSITION PROCEDURE : Place right hand on same side shoulder blade. - With other hand, gently stretch head down and away. DURATION : Hold 20 seconds , rest 10 seconds and repeat on other side and repeat 4 sets(3) . WEEK -5 (13 minutes) A. IN ADDITION TO WEEK 4 PROTOCOL (Each exercises for 1minute) THRICE WEEKLY EXERCISE : CHIN TUCK IN COBRA POSITION (3minutes). POSITION : PRONE POSITION PROCEDURE : Lie down in a prone position. Lie faced down on your with your entire body extended. - Bring your hands under neath the shoulder blades. - Begin to lift your upper body - Use lower back muscles to lift higher and looks slightly forward. - Slowly tuck your chin in. DURATION : Hold 20 seconds, rest 10 seconds, and repeat 6 sets(3) . WEEK -6 (15 minutes) A. IN ADDITION TO WEEK 5 PROTOCOL (Each exercises for 1minute) THRICE WEEKLY EXERCISE : CHIN TUCK IN CAT POSITION (4minutes). POSITION : CAT POSITION PROCEDURE : Begin on your hand and knees. - Tuck your chin and left your head and neck. So its in line with your body. - Now rotate your head and neck. - Slowly rotate to the other side. DURATION : Hold 20, rest 10 seconds and repeat 8 sets(3) . WEEK -7 (16 minutes) A. IN ADDITION TO WEEK 6 PROTOCOL (Each exercises for 1minute) THRICE WEEKLY EXERCISE : CHIN TUK IN PRONE POSITION POSITION : PRONE POSITION PROCEDURE : Lie on your front - Arms should be relaxed at side. - And tuck your chin backward. DURATION : Hold 20 seconds, rest 10 seconds and repeat 8 sets(3) WEEK -8 (18 minutes) A. IN ADDITION TO WEEK 7 PROTOCOL (Each exercises for 1minute) THRICE WEEKLY EXERCISE : DYNAMIC CHIN TUCK IN POSITION : SUPINE LYING PROCEDURE: Lie down on your back with your knees on a wedge or pillows to relax your lower back. - Tuck your chin toward your neck to create a double chin in the front. - The back of your head will slide up toward the top of your head . DURATION : Hold 20 seconds, rest 10 seconds and repeat 10 sets. WEEK -9(20 minutes) A. IN ADDITION TO WEEK 7 PROTOCOL (Each exercises for 1minute) THRICE WEEKLY EXERCISE : CHIN TUCK IN MID TRAP POSITION (5 MINUTES). POSITION : PRONE POSITION PROCEDURE : Lie on your front - Place your arms out straight to your sides with your elbow straight and thumb towards the ceiling. - Tuck your chin in. DURATION : Hold 20 seconds, rest 10 seconds and relax 10 sets(3) .

WEEK -10 (30 minutes) THRICE WEEKLY EXERCISE : All the above exercise for 20minutes+ chin tuck in cobra position for 10 minutes DURATION : 30minutes(3)

DURATION OF TREATMENT: 10 weeks of training program which includes deep cervical flexor exercises with postural awareness and the entire study took about 5 months.

STUDY SETTING: Subjects will be selected from physiotherapy department in Meenakshi faculty of physiotherapy according to inclusion and exclusion criteria.

TOOLS USED:

1.PAIN INTENSITY VISUAL ANALOG SCALE (5) .

2.RANGE OF MOTION GONIOMETERY

Axis of Goniometry : External auditory meatus Stationary Arm : Vertical Moving Arm : Aligned with nostrils(6)

DATA ANALYSIS AND RESULTS

Pain: Mean value for pre-test is 7.6 and post-test is 4.2.For 14 degrees of freedom and at a 0.05 level of significance and the table value is 2.093. The calculated value is 12.5 which is greater than the table value of 2.093. Since the alternate hypothesis is accepted there is an improvement in the neck pain in school teachers as depicted in Table 2,Graph 1,3.

Range of motion: Mean value for pre-test is 34 and post-test is 41.33. For 14 degrees of freedom and at a 0.05 level of significance an the table value is 2.093. The calculated value is 8.84 which is greater than the table value of 2.093. Since the alternate hypothesis is accepted there is an improvement in the range of motion for school teachers with neck pain as depicted in Table 2,Graph 2,3.

DISCUSSION

Neck pain is the work related disorder with high prevalence in the profession of teaching. The daily duties of a school teacher involve head down posture while reading writing use of computers, laptop and mobile phone that cause of neck pain. This study was designed to determine the effect of deep cervical flexor muscle exercise with postural awareness in school teachers with neck pain. In this study subjects were assessed for pain and range of motion using VAS scale and goniometry respectively. In this study subjects were assessed for neck pain deep cervical flexor strengthening exercise which are performed for 10 weeks. The parameter were assessed before and after exercise training. LEE SC et.al 2018 concluded that deep cervical flexor muscle training is more effective in reducing the pain and improve forward head posture in school teachers with neck pain(3) . Chawla C et.al 2017 concluded that deep cervical flexor training is more effective in forward head posture, neck pain and functional status in aldolescent with neck pain(4) . Deep cervical flexor exercise and postural awareness is effective to Improve Neuromuscular coordination ,Improve Head and cervical posture(12) , Improve Strength and endurance ,Reduce head ache and neck pain.

LIMITATIONS AND SUGGESTIONS : age group above 40 years can be selected ,Duration can be longer , other methods of intervention such as myofascial release can be compared. Further study can be done with more than 10 weeks or 12 weeks.

CONFLICT OF INTEREST: The author declares no conflict of interest.

FUNDING: This Research received no external funding .

ETHICAL DECLARATION: Ethical standards were followed in patient volunteering. Procedures were non-invasive. Informed Consent Statement was obtained from every participant .

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TABULATION:

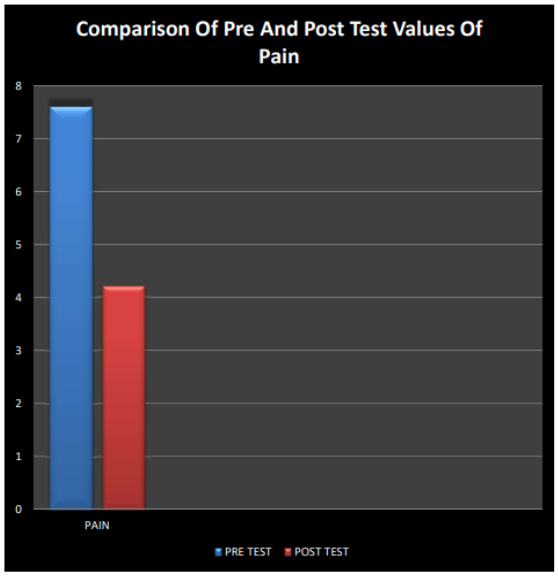
Table 1

S NO	PAIN		RANGE OF MOTION	
	PRE TEST	POST TEST	PRE TEST	POST TEST
1.	9	7	30	40
2.	6	4	40	45
3.	7	4	35	40
4.	10	5	25	35
5.	8	3	40	45
6.	6	2	40	45
7.	9	6	35	40
8.	5	1	40	45
9.	8	6	35	40
10.	9	5	30	40
11.	10	6	25	40
12.	7	3	35	45
13.	5	3	35	40

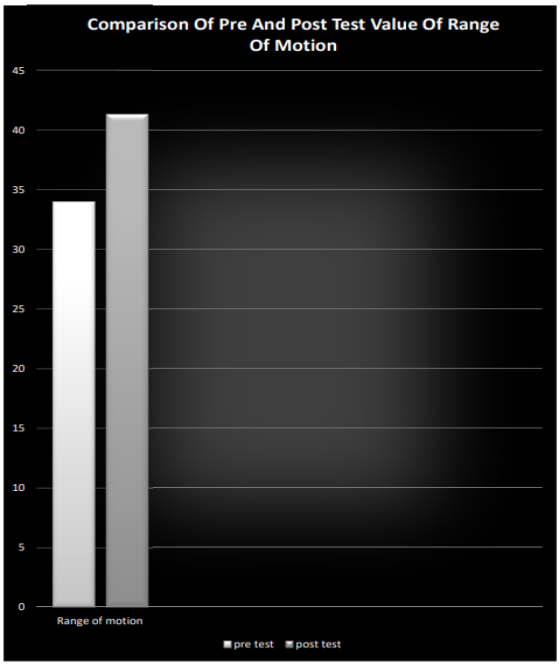
Table 2

S NO	VARIABLE	DAYS	MEAN		T-VALUE	LEVEL OF SIGNIFICANCE
			PRE TEST	POST TEST		
1	PAIN	Days 1&75	7.6	4.2	12.5	P <0.05
2	RANGE OF MOTION	Days 1&75	34	41.3	8.84	P <0.05

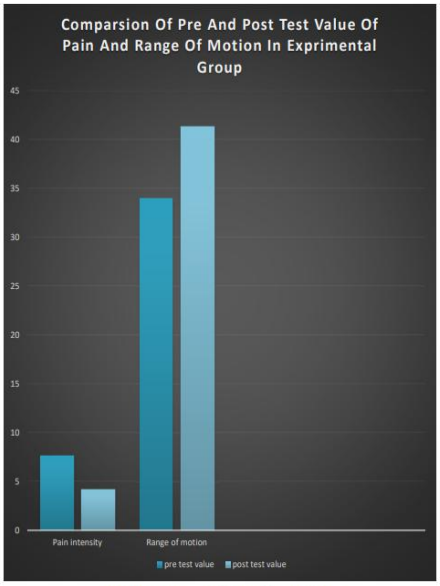
GRAPHICAL REPRESENTATION



GRAPH – 1 PAIN



GRAPH-2 RANGE OF MOTION



GRAPH- 3 PAIN AND RANGE OF MOTION