Health Care Professionals Performance of Deep Cervical Flexor Training for Neck Pain

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ABSTRACT

Aim:

The study aim is to determine the effectiveness of deep cervical flexor training in treating neck pain in health care professionals.

Objectives of the study:

-To determine the presence of neck pain in dental professionals.

-To assess the symptoms of neck pain in dental professionals using the neck disability index.

-After grouping them based on the presence of neck pain, random allotment in the experimental group will be performed.

-To evaluate the effect of deep cervical flexor training in the study group

Method:

The study included 50 dentists diagnosed with neck pain at Rajah Muthiah dental college and hospital. The neck disability index score was used to categorize 50 subjects as moderate and mild. There were 30 subjects in the moderate group and 20 subjects in the mild group. The subjects were divided into two groups at random: experimental and control. The experimental group received deep cervical flexor training, while the control group did not receive the training.

Results:

The mild group's pre-therapy (10.40) score had a higher mean value than the 8th week (1.20). For this group, the calculated 't' value is 19.82 and the Probability value is 0.001 at the 0.01 level of significance. Pre test (31.33) score in moderate group was higher with mean value than 8th week (2.80). For the moderate group, the calculated 't' value is 27.92 and the probability value is 0.001 at the 0.01 level of significance. As a result, the effectiveness of deep cervical flexor training has been proved.

Conclusion:

According to the findings of this study, there was a highly significant improvement in the experimental group due to the effectiveness of deep cervical flexor training, but little improvement in the control group, which did not receive deep cervical flexor training. This exercise has been shown to be an effective intervention for reducing neck pain in dental professionals. Less pain may allow for better ergonomically good posture, to work better.

Keywords:

Neck pain (NP), occupational therapy (OT), neck disability index scale (NDI), deep cervical flexor training (DCF).

INTRODUCTION

NECK PAIN:

Pain in the neck and shoulder that varies in intensity may feel achy or like an electric shock from shoulder to arm. Neck pain is a common complaint. Neck muscles can be strained by poor posture. Neck pain can range from being minor and easily ignored to excruciating and interfering with daily activities, such as in ability to dress, concentrate on work, or sleep. Sometime neck pain can lead to a stiff neck and reduced range of motion. Neck pain is currently the leading cause of years lived with a disability internationally. Most work to data has focused the neck flexor, deep longus capitis, and colli muscles, and the superficial muscle, sternocleidomastoid and anterior scalenes as they have some functional specificity in supporting the weight of the head, the cervical segment and cervical curve .

NECK PAIN IN DENTISTS:

Neck pain is a common problem in dentist affecting 70% of the people at some point in their life. In comparison with any other professionals, dental professionals report a higher incidence of work related musculoskeletal disorder. Chronic neck pain appears early in dental professional. The changed muscle behaviour in patients with neck pain presents as impaired (reduced) deep flexor muscle activity associated with increased activity in sternocleidomastoid and anterior scalenes.

CAUSES OF NECKPAIN IN DENTISTS:

The dental team is at high risk of neck and problems due to the limited work area and impaired vision associated with the oral cavity. These working restrictions frequently cause a clinician to assume stressful body positions to achieve good access and visibility inside the oral cavity. Furthermore, dental procedures are usually long and require much more concentration during work .The neck pain symptoms in dentists are caused due to the many reasons for e.g,, prolonged static posture, repetitive movements, sub optimal lighting, and genetic predisposition . According to Ratzon, occurrence of neck pain in dentists is caused by assumption of static postures, which usually requires more than 50% of the body's muscle to contract, to hold the body motionless while resisting gravity. It is believed that repeated prolonged static postures initiate series of events that could lead to pain, injuries or career ending problems seen in MSD.

Repetitive movement: repetitive forces lead to micro trauma which triggers the inflammatory process and result in swelling. In dentistry damage exceeds the rate of repair due to insufficient rest period.

Awkward and prolonged static posture: the posture that persists can lead to muscle necrosis, discomfort, pain or disability which facilitates the development of MSD.

 Muscle imbalance: even in optimal postures muscle tension increase causing muscle ischemia and joint hypo-mobility because the dentist have to stay in these postures for prolonged period of time this alters the biomechanics resulting in tightness of one group of muscle and weakness in the opposite group of muscle .

NECK PAIN DUE TO POOR ERGONOMICS:

Ergonomics-ergo means work and nomics means law. It is the science of fitting the job setting conductive to the worker. The occurrence of neck pain in dentist is caused by frequent assumption of static postures which requires more than 50% of body's muscle to contract the physical ergonomic features of work frequently cited as risk factors for Work related MSD. It also includes rapid work pace and repetitive motion forceful exertions, non-neutral body postures and vibration. Proper ergonomic design is necessary to prevent repetitive   strain injuries, which can develop over time and can lead to long term disability. Poor workplace posture is a major cause of neck and back pain, workplace stress and can lead to repetitive strain injuries. This can result in poor employee health and low morale which will ultimately lead onto reduced productivity, lost time and higher business costs. The effects of poor posture: poor joint alignment, general muscle, increased

shear forces within the spine effecting disc integrity, compression of disc and joint structures, compression/reduced space for nerves to course through the body, reduced blood flow to muscles resulting in increased fatigue, overuse injuries.

NECK DISABILITY INDEX SCALE:

The neck disability index was developed in the late 1980's by Dr. Howard Vernon first published in the journal of manipulative and physiological therapeutics in 1991. The neck disability index (NDI) is the most specific tool in use for measuring neck related disability. It has been shown to be a reliable and valid tool. In a recent study there was no difference in NDI scores patients with or without unilateral arm pain suggesting that the NDI adequately accounts for UE symptoms in conjunction with neck pain(young et al 2009). There are 10 questions each scored with a possible 0-5value with the larger number indicating a higher self-reported disability status. The score on this questionnaire can range from 0-50. in order to calculate a percentage, simply multiple the final value by two. Neck disability index measure the level of neck pain. This questionnaire is designed to enable us to understand neck pain. Also describes, how it affects our ability to manage everyday activities. The neck disability index can be used to evaluate the patients status pretherapy &after the therapy.

AREA OF ASSESSMENT:

Activities of daily living.

Attention and work memory.

Functional mobility.

Life participation.

Occupational performance.

Pain.

Quality of life.

Sleep.
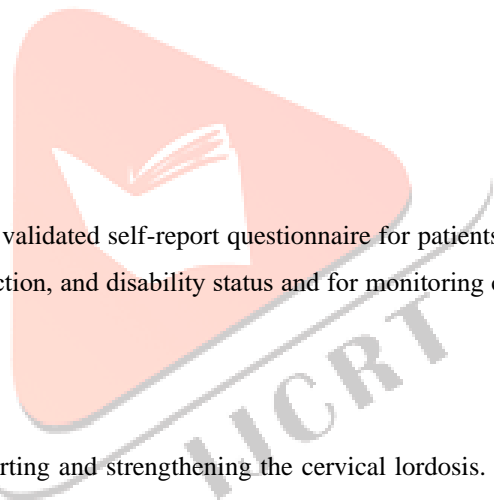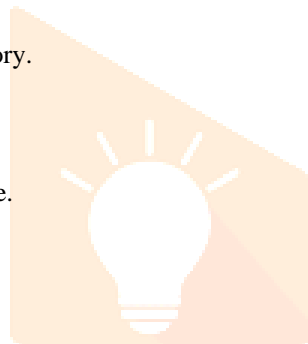
Childs &colleagues (20080 recommend the use of the NDI as a validated self-report questionnaire for patients with neck pain. The NDI is useful in identifying a patient's baseline pain, function, and disability status and for monitoring change in a patient's status through the course of treatment.

DEEP CERVICAL FLEXOR TRAINING:

Deep cervical flexor (DCF) has a major postural function in supporting and strengthening the cervical lordosis. It has been found that certain muscle in the cervical spine tend to weaken in neck pain, the most common of these being DCF.

Indeed, evidence is emerging, that suggests that people with neck pain drift into a more forward head position (FHP) when they are distracted.

The main action of deep cervical flexor muscle which supports deep cervical flexor motion segments is craniocervical flexion (CCF). Hence, DCF training is recommended clinically for the management of neck pain.

The deep cervical flexor training should aim at increasing the overall fitness of a dentist. Fitness is a general term used to describe the ability to perform physical work. Performing a physical work efficiency requires a good cardiopulmonary functioning, musculoskeletal strength, endurance and flexibility.

PRODUCTIVITY:

Neck pain is a common problem in society, in particular among the working population. Neck pain could also lead to reduced work effectiveness. Many works still go to work despite the feeling that, in the light of their health, they should have taken sick leave. This phenomenon is known as sickness presenteeism. Although they are present at work, their productivity could be reduced due to functional limitations. Neck pain characteristics, physical, psychosocial and personal factors might affect productivity

Literature suggests that the prevalence of musculoskeletal pain in dentist, dental hygienists and dental students range between 64% to 93% . the most prevalent regions for pain in dentist have been shown to be the back (36.3-60.1%) and neck(19.8-85%) while the hand and wrist region were the most prevalent region for dental hygienist (60-69.5%).

Lehto et al. surveyed musculoskeletal health examination. Forty two percent of dentist has experienced pain and interference with daily activities by neck- shoulder problems during the preceding year, with a tendency to greater prevalence in salaried dentists than in private practitioner.

OBJECTIVES OF THE STUDY:

-To determine the presence of neck pain in dental professionals.

-To assess the symptoms of neck pain in dental professionals using the neck disability index.

-After grouping them based on the presence of neck pain, random allotment in the experimental group will be performed.

-To evaluate the effect of deep cervical flexor training in the study group

NEED FOR THE STUDY:

Occupational therapy is useful in many areas of life. Any occupation practiced in energy saving method can lead to better productivity. Good ergonomics posture is also the role of occupational therapist. Hence I am trying to find, ergonomically better, pain free neck for dentist by this study.

REVIEW OF LITERATURE

Amir Letafatkar et al. (2020) effects of therapeutic exercise routine on pain, disability, posture and health status in dentists with chronic neck pain: a randomized controlled trail. Experimental group received 8 weeks of treatment aimed to improve muscle coordination and proprioception, muscle endurance and muscle strength. Control group received no specific exercise. The pain were assessed at baseline after an 8 week by visual analogue scale, neck disability index treatment successfully alleviated pain, disability, posture and health status in dentists suffering from chronic neck pain.

Susanna marklund et al. (2020) work ability and productivity among dentists: associations with musculoskeletal pain, stress and sleep. Presence of pain at different sites, work ability assessed and productivity in terms of quality and quantity of work .a high prevalence of pain was shown among dentists. Decreased work ability in terms of productivity loss was associated with poor sleep quality, high amount of stress, and multiple site pain were associated with decreased work ability.

Isha sikka, et al. (2020) effects of deep cervical flexor training on forward head posture, neck pain and functional status in adolescents using computer regularly. The pretest - posttest experiment design was design was used. Functional status was measured through the neck disability index (NDT) score. This study showed that DCF training and postural education of 4 weeks not causes any significant improvement in FHP in adolescent pupils using computers regularly. But neck pain and functional status (perceived disability) improved significantly with DCF training and postural education either given alone or in combination with each other.

Johannes blomgren, et al. (2018) effects of deep cervical flexor training on impaired physiological functions associated with chronic neck pain; a systematic review. Twelve randomized controlled trails were included that compared DCF training as sole intervention to other training or no intervention in person with neck pain.DCF training can successfully address impaired neuromuscular coordination, but not cervical flexor strength and endurance at higher contraction intensities.

Natasa pejcic et al. (2017) Assessment of risk factor and preventive measures and their relations to work-related musculoskeletal pain among dentists. Self-reporting questionnaire .the main risk factors for musculoskeletal pain were advanced age, female dentists, and presence of chronic diseases, long working hours, and high frequency of treated patients. Proper implementation in everyday life of adequate preventive measures is essential for preventing musculoskeletal pain and development of WRMSDs.

Vishakha shinde et al. (2015) neck pain amongst dentists in mumbai: an exploratory study. The aim of the study was to assess the prevalence of neck pain in a dentist population in mumbai and factors affecting the neck pain. They were assessed

using a semi structured and neck pain disability index. It indicates that neck pain in dentists is a common problem and needs goods ergonomic and holistic management to ensure relief.

Bhuvan deep gupta et al. (2013) effect of deep cervical flexor training vs. Conventional isometric training on forward head posture, pain, neck disability index in dentists suffering from chronic neck pain. Neck disability index (NDI)is used. Then, experimental group was given DCF training and control group was given conventional isometrics training (CIT) for 4 weeks under supervision of examiner. All measurements were repeated at end of 4th week; on completion of study.DCF training is more effective than CIT in improving forward head posture, decreasing pain and disability in dentists suffering from chronic neck pain.

Pooja sharma et al. (2011) awareness among indian physical activity in prevention of work related musculoskeletal disorders. The prevalence of work-related musculoskeletal complaints in dentists is high and the past two decades have witness a sharp rise in the incidence of various disorders. Therefore a questionnaire survey was carried out among 102 Indian dentists belonging to different fields having at least one musculoskeletal disorder in last 6 months. The work-related musculoskeletal disorders among dentists not only decrease their efficiency but also are a major concern among them. Self-awareness and benefits of regular exercise is the need of the hour.

Swenne G. et al. (2007) loss of productivity due to neck symptoms and hand symptoms: results from the PROMO- study. A cross- sectional design was used. In most computer workers with neck symptoms and hand symptoms productivity loss derives from a decreased performance at work and not from sickness absence. Favorable psychosocial work characteristics might prevent productivity loss in symptomatic workers.

Keith t palmer, et al. (2001).prevalence and occupational associations of neck pain in the British population. This study determined the prevalence of neck pain and its relation to occupation and occupational activities in the general population .a questionnaire was mailed to subjects aged 16-64 years randomly selected from the patient. The data evidence against a association physical activity. They suggest that psycho-social factors may be more important.

Gunnar bovim et al. (1994) neck pain in the general population. A randomized cross- sectional questionnaire was used to determine the prevalence of neck pain in norwegian adults. A questionnaire that inquired about neck pain with in the last year was sent to random sample of adult norwegians. Chronic neck pain is a frequent symptom in the general population, particularly in women. Although reservations have to be taken as to the interpretation, the reported prevalence of persisting pain after whiplash injuries is of the same magnitude as the prevalence of chronic pain in the general population

Howard vernon, silvano mior(1991). The neck disability index: a study of reliability and validity.methods of assessment for such disability, especially those targeted at activities of daily living which are most affected by neck pain, are few in member. This study demonstrated that the NDI achieved a high degree of reliability and internal consistency. The NDI is offered as a potentially useful instrument in the assessment of neck pain complaints.

Ellen g rader (1986). ergonomics, occupational therapy and computer. The study of interaction between the worker and the work environment is dedicated to the promotion of work health, safety, and productivity. This paper will review basic ergonomic design principle for video display terminal workstations. It is the role of the ergonomist to design work environments which anticipate and adapt to the physical and psychological need of its worker.

H.nadri, f fasih ramandi. Low back and neck pain intensity among relationship with disability index among dentists. Non-specific pain of low back and neck has direct impact on quality of life. The purpose of this study was to determine the pain intensity and disability index for low back and neck disability index were evaluated with the self-administered was done. Result in disability index of low back and neck has been reported equal respectively. Dentists have a high pain prevalence and moderate disability index of low back and neck.

METHODOLOGY

STUDY DESIGN:

Experimental study- Randomized control study.

STUDY SETTING:

RMDC&H,

Annamalai University.

DURATION OF THE STUDY:

The duration of the study was 2 months.

SELECTION CRITERIA

INCLUSION CRITERIA:

➢ Both male and female dentists will be selected.

➢ Age group 21 years & above.

➢ Subjects with work related neck pain

EXCLUSION CRITERIA:

➢ Subjects with history of trauma and surgery

➢ Intervertebral disc prolapse

OUTCOME MEASURE:

Neck disability index scale.

MATERIAL REQUIRED:

Mattress & towel for doing exercise.

RESEARCH HYPOTHESIS:

Hypothesis is framed by assuming that deep cervical flexor training will be effective in dealing with neck pain related to poor ergonomic posture.

RESEARCH DESIGN:

The present study was done with two group pre -test and post- test of experimental design.

➢ Control group --- pre-test---------post-test.

➢ Experiment group-----pre-test -----------training -------post-test.

SAMPLE SIZE:

50 subjects diagnosed with neck pain in division of pedodontics, division of periodontics, division of endodontics, division of orthodontics, division of prosthodontics division of oral medicine, division of oral surgery, were included for the study, based on selection criteria. Informed consent was obtained by brief explanation about the study. Subjects were randomly divided into group.

GROUP A-experimental group

GROUP B-control group

The level of neck pain is diagnosed by neck pain disability index scale (NDI)

TABLE-1

Based on neck disability index assessment (inclusion criteria)		
Experimental group (GROUP-A)	mild	moderate
	10	15
Control group (GROUP-B)	mild	moderate
	10	15

TREATMENT PROCEDURE:

50 Dentist diagnosed with neck pain in Rajah Muthiah dental college and hospital were included for the study.50 subject were divided into moderate and mild according to the neck disability index score. 30 subjects in moderate group and 20 subjects in mild. Subjects were randomly divided into experimental group and control group. Experimental group received the deep cervical flexor training and control group did not receive training.

TRAINING 1:

Lie on your back with knees comfortably bent. Find out neutral spine position, as explained by the therapist. Use a small rolled towel under the head if needed. Lift your head off the towel and feel the muscle on the front of the neck. These are NOT the deep neck flexor muscle. Perform a small nodding movement, as if to look towards your toes. Do not lift your head up your should not feel the muscle on the front of the neck moving. But rather you should be using the muscle deep behind them. Hold for 5 seconds, repeat 5 times.

TRAINING 2:

 Position as above

 Place your hand on the side of your head and provide gentle resistance, as if you are bending your head to one side

 Hold for 5 seconds. Repeat 5 times.

 Use hand to resist small rotation movement

 Hold for 5 seconds. Repeat 5 times

TRAINING 3:

 Lie on your tummy with hands supporting the forehand.

 Perform the small nodding movement and float the head and breastbone off the floor.   Hold for 5 seconds. Repeat 5 times.

TRAINING 4:

 Stand with your back to the wall and your feet slightly in front. Hip width apart. Perform the small nodding movement, while sliding the base of the skull up the wall. You should feel the neck lengthen.

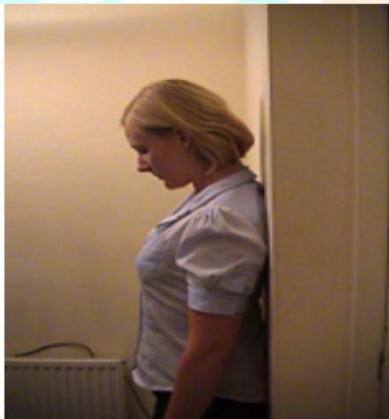 Hold for 5 seconds. Repeat for 5 times

TRAINING 5:

 Same as exercise above

 From the lengthened position, move your head away from the wall so that you're looking at the floor.

 Then return to the starting position.

 Do not allow your chin to poke forward trough either movement.

Correct position   Incorrect position

DATA ANALYSIS:

NECK PAIN IN DENTISTS

EXPERIMENTAL GROUP (MILD)

TABLE-2

| S.NO	NAME OF THE PARTICIPATE	SCORE		
		PRE THERAPY	POST THERAPY(4th week)	POST THERAPY(8th week)
1.	A	14	8	0
2.	B	8	4	0
3.	C	14	8	2
4.	D	16	10	4
5.	E	10	6	2
6.	F	10	6	0
7.	G	10	6	2
8.	H	8	4	0
9.	I	12	8	2
10.	J	8	4	0

TABLE-3

Paired Sample t-test of effectiveness of deep cervical flexor training in neck pain among health professionals in 4th week – Mild Pain (Experimental Group)

Group-A	N	Mean	Standard deviation	Standard Error Mean	t-value	Probability Value
Pre	10	10.40	5.34	2.26	10.99	0.001*
4th week	10	6.40	2.83	1.36		

* Highly significant at 0.01 level

In pre test (10.40) scored higher mean value than 4th week (6.40) after training. The calculated 't' value 10.99 and Probability value is 0.001 at 0.01 level of significance. Hence it is concluded that, there is a significant difference between the pre and 4th week for effectiveness of deep cervical flexor training in neck pain among health professionals – Mild Pain (Experimental group)

Mean value of effectiveness of deep cervical flexor training in neck pain among health professionals in 4th week – Mild Pain (Experimental Group)
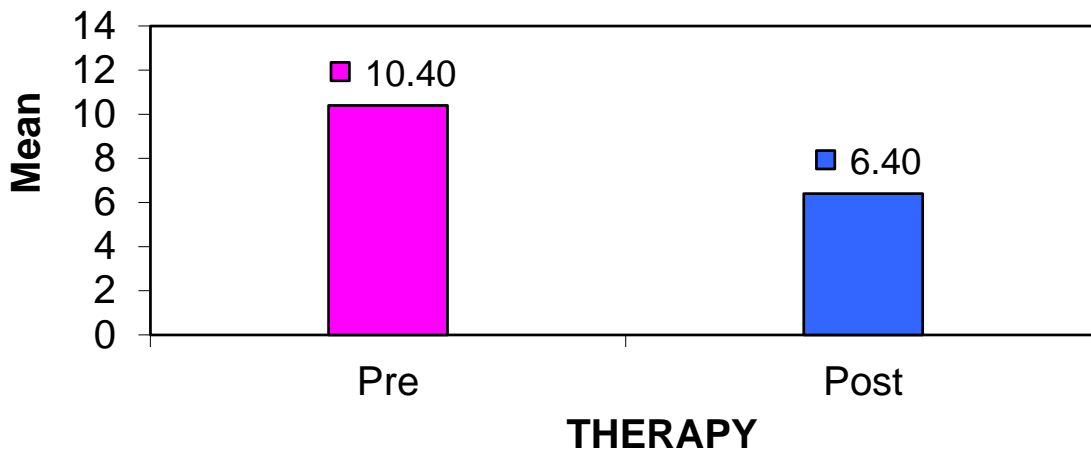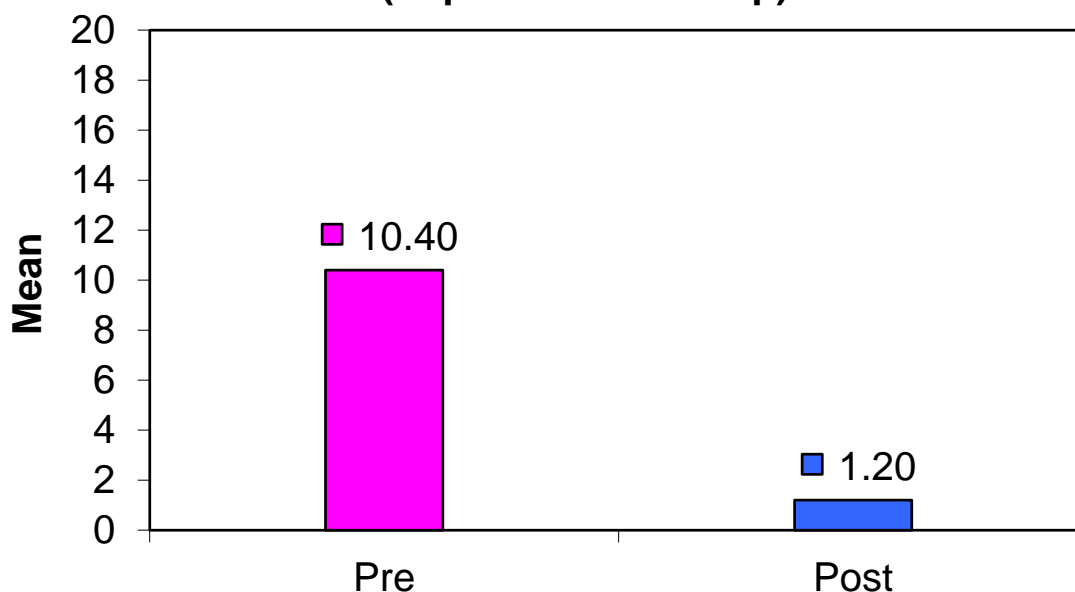

TABLE-4

Paired Sample t-test of effectiveness of deep cervical flexor training in neck pain among health professionals in 8th week – Mild Pain (Experimental Group)

Group-A	N	Mean	Standard Deviation	Standard Error Mean	t-value	Probability Value
Pre	10	10.40	5.34	2.26	19.82	0.001*
8th week	10	1.20	0.12	0.07		

* Highly significant at 0.01 level

In 8th week, pre test (10.40) scored higher mean value than 8th week (1.20). The calculated 't' value 19.82 and Probability value is 0.001 at 0.01 level of significance. Hence it is concluded that, there is a significant difference between the pre and 8th week for effectiveness of deep cervical flexor training in neck pain among health professionals – Mild Pain (Experimental Group).

Mean value of of effectiveness of deep cervical flexor training in neck pain among health professionals in 8th week – Mild Pain (Experimental Group)

Group-A

NECK PAIN IN DENTIST

EXPERIMENTAL GROUP (MODERATE)

TABLE-5

S.NO	NAME OF THE PATICIPATE	SCORE		
		PRE THERAPY	POST THERAPY (4TH week)	POST THERAPY (8TH week)
1.	A	28	22	2
2.	B	26	16	6
3.	C	40	20	2
4.	D	28	18	2
5.	E	28	20	0
6.	F	34	22	2
7.	G	30	20	2
8.	H	36	24	4
9.	I	38	28	6
10.	J	32	24	2
11.	K	40	22	2
12.	L	28	20	4
13.	M	26	14	4
14.	N	28	18	2
15.	O	28	20	2

TABLE-6

Paired Sample t-test of effectiveness of deep cervical flexor training in neck pain among health professionals in 4th week – Moderate Pain (Experimental Group)

Group	N	Mean	Standard Deviation	Standard Error Mean	t-value	Probability Value
Pre	15	31.33	11.66	4.51	8.88	0.001*
4th week	15	20.53	9.52	3.36		

* Highly significant at 0.01 level

Pre therapy mean value score(31.33) was higher,than mean value in 4th week (20.53). The calculated 't' value 8.88 and Probability value is 0.001 at 0.01 level of significance. Hence it is concluded that, there is a significant difference between participants attended training in 4th week itself. – Moderate Pain (experimental group)

Mean value of of effectiveness of deep cervical flexor training in neck pain among health professionals in pre and 4th week – Moderate Pain (Experimental Group)
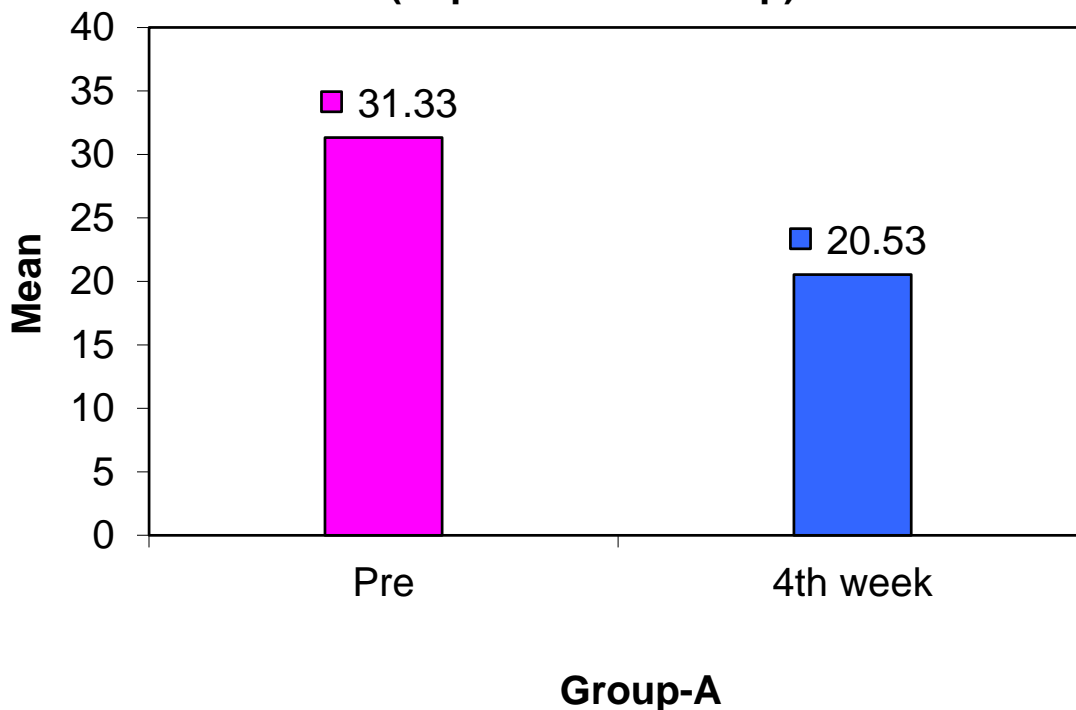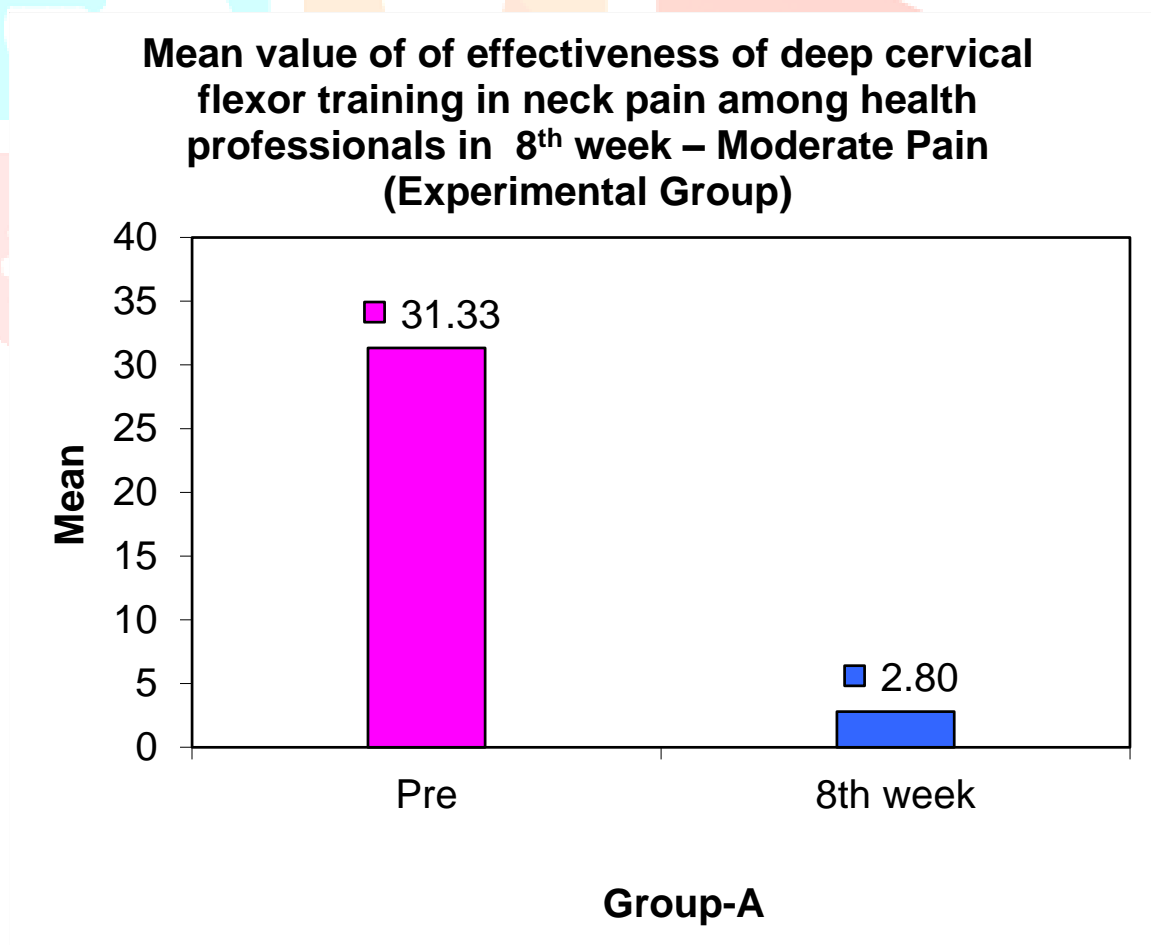
TABLE-7

Paired Sample t-test of effectiveness of deep cervical flexor training in neck pain among health professionals in 8th week – Moderate Pain (Experimental Group)

Group	N	Mean	Standard Deviation	Standard Error Mean	t-value	Probability Value
Pre	15	31.33	11.66	4.51	27.92	0.001*
8th week	15	2.80	1.12	0.42		

* Highly significant at 0.01 level

pre test (31.33) score was higher with mean value than 8th week (2.80). The calculated 't' value 27.92 and Probability value is 0.001 at 0.01 level of significance. Hence it is concluded that, there is a significant difference between the pre therapy and 8th week post therapy session. Moderate Pain (Experimental Group).

Mean value of of effectiveness of deep cervical flexor training in neck pain among health professionals in 8th week – Moderate Pain (Experimental Group)

CONTROL GROUP(MILD)

TABLE-8

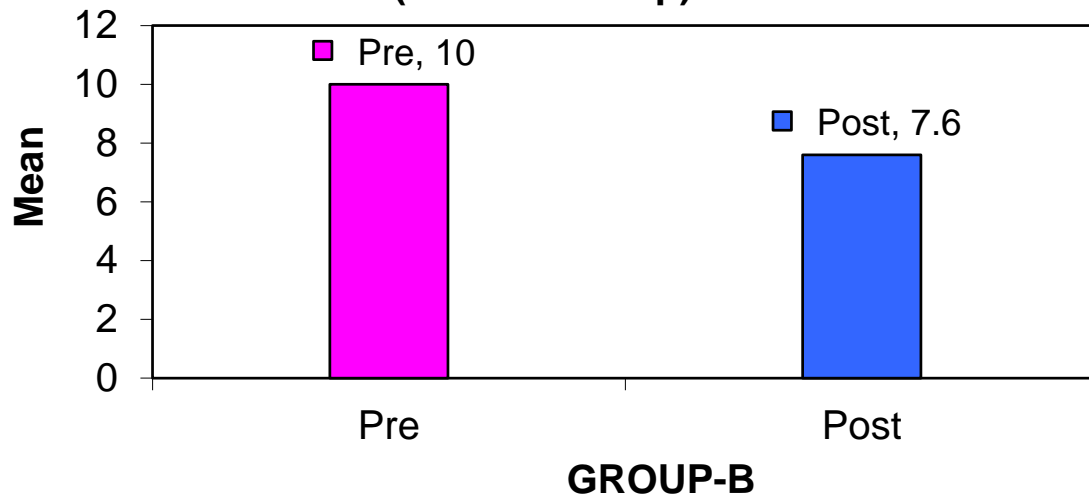| S.NO	NAME	SCORE	
		PRE THERAPY	POST THERAPY
1.	A	8	5
2.	B	10	7
3.	C	8	6
4.	D	12	10
5.	E	12	10
6.	F	6	4
7.	G	16	12
8.	H	10	8
9.	I	10	8
10.	J	8	5

TABLE-9

Paired Sample t-test of among health professionals in pre and post test – Mild Pain (CONTROL GROUP)

Group	N	Mean	Standard Deviation	Standard Error Mean	t-value	Probability Value
Pre	10	10.00	6.88	2.16	5.92	0.001*
Post	10	7.60	4.63	1.96		

* Highly significant at 0.01 level

In pre and post test (control group), pre test (10.00) scored higher mean value than post test (7.60). The calculated 't' value 5.92 and Probability value is 0.001 at 0.01 level of significance. Hence it is concluded that, there is a significant difference between the pre and post test for effectiveness of deep cervical flexor training in neck pain among health professionals - Mild Pain (Control Group).

Mean value of effectiveness of deep cervical flexor training in neck pain among health professionals in pre and post test – Mild Pain (Control Group)

CONTROL GROUP(MODERATE)

TABLE-10

| S.NO	NAME	SCORE	
		PRE THERAPY	POST THERAPY
1.	A	26	22
2.	B	28	21
3.	C	24	22
4.	D	28	24
5.	E	24	22
6.	F	32	30
7.	G	36	32
8.	H	24	20
9.	I	34	30
10.	J	26	24
11.	K	36	32
12.	L	28	26
13.	M	20	18
14.	N	20	18
15.	O	30	28

TABLE-11

Paired Sample t-test in neck pain among health professionals in pre and post test – Moderate Pain (Control Group)

Group	N	Mean	Standard Deviation	Standard Error Mean	t- value	ProbabiliValue
Pre	15	27.73	12.93	4.86	7.55	0.001*
Post	15	24.60	8.34	4.72		

* Highly significant at 0.01 level

In pre and post test (control group), pre test (27.73) scored higher mean value than post test (24.60). The calculated 't' value 7.55 and Probability value is 0.001 at 0.01 level of significance. Hence it is concluded that, there is a significant difference between the pre and post test for neck pain among health professionals – Moderate Pain (Control Group).

Mean value for neck pain among health professionals in pre and post test – Moderate Pain (Control Group)
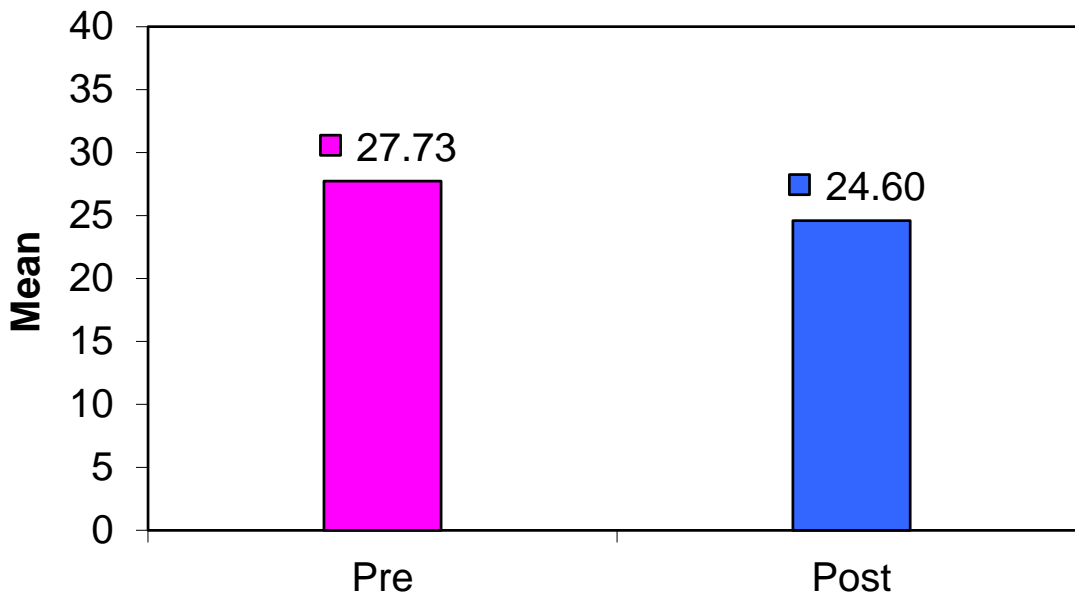
According to DURATION of working time

<p align="center">TABLE-12</p>

S.No.	Hours	Number of dentists	Experimental group participants	Control group participants	Percentage
1.	2 hours	28	16	18	56.0
2.	5 hours	22	9	7	44.0
	Total	**50**	**25**	**25**	**100.0**

Out of 50 dentists, participants who worked for 2 hours and five hours were differentiated. They were given training for four times a week and on all days respectively.

RESULTS:

From the table (4), pre therapy (10.40) score for mild group was having higher mean value than 8th week (1.20). The calculated 't' value 19.82 and Probability value is 0.001 at 0.01 level of significance for this group. In moderate group, (table 7) pre test (31.33) score was higher with mean value than 8th week (2.80). The calculated 't' value 27.92 and Probability value is 0.001 at 0.01 level of significance for moderate group. Hence effectiveness of deep cervical flexor training is proved.

<p align="center">DISCUSSION</p>

The purpose of this study was to see how effective a deep cervical flexor training program was at reducing neck pain in dental professionals aged 20 to 40 at Rajah Muthiah dental college and hospital in Chidambaram. In total, 50 dental professionals were chosen based on inclusion and exclusion criteria. The neck disability index score is used to categorize this sample as mild or moderate. 30 moderate group samples were divided into two groups, experimental group and control group of 15 samples each. There were also 20 samples in the mild group. The experimental group received 2 months of training, with each session consisting of 30 minutes of deep cervical flexor training (DCF), whereas the control group did not receive DCF. The pre test and post test were assessed by the neck disability index scale in both experimental and control group, comparing done with the paired sample t test.

According to the statistical analysis, there is a significant difference between the pre and post test scores. It is visible in the fourth (tables 3 and 6) and eighth weeks (table-4 and table-7). In the experimental group, it is applicable to mild pain and moderate pain. Pre and post therapy comparisons in the control group show (tables 9 and 11) that there is little relief for pain felt after medication and rest, as reported by three participants. These study participants have demonstrated the effectiveness of exercise. This can be extended to reduce pain and increase productivity at work. Occupational therapy can make work more meaningful.

CONCLUSION:

According to the findings of this study, there was a highly significant improvement in the experimental group due to the effectiveness of deep cervical flexor training, but little improvement in the control group, which did not receive deep cervical flexor training. This exercise has been shown to be an effective intervention for reducing neck pain in dental professionals. Less pain may allow for better ergonomically good posture, to work better.

RECOMMENDATIONS:

The study can be done with other health care professionals also.

The study can include various age groups.

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APPENDICES:

NECK PAIN DISABILITY INDEX QUESTIONNAIRE

*PLEASE READ***: This questionnaire is designed to enable us to understand how much your neck pain has affected your ability to manage your everyday activities. Please answer each section by circling the ONE CHOICE that most applies to you. We realize that you may feel that more than one statement may relate to you, but** *PLEASE JUST CIRCLE THE ONE. CHOOSE WHICH MOST CLOSELY DESCRIBES YOUR PROBLEM RIGHT NOW.*

SECTION 1 - Pain Intensity A I have no pain at the moment. B The pain is very mild at the moment. C The pain is moderate at the moment. D The pain is fairly severe at the moment. E The pain is very severe at the moment. F The pain is the worst imaginable at the moment.	*SECTION 6 - Concentration* A I can concentrate fully when I want to with no difficulty. B I can concentrate fully when I want to with slight difficulty. C I have a fair degree of difficulty in concentrating when I want to. D I have a lot of difficulty in concentrating when I want to. E I have a great deal of difficulty in concentrating when I want to. F I cannot concentrate at all.
SECTION 2 -Personal Care (Washing, Dressing, etc.) A I can look after myself normally without causing extra pain. B I can look after myself normally, but it causes extra pain. C It is painful to look after myself and I am slow and careful. D I need some help, but manage most of my personal care. E I need help every day in most aspects of self-care. F I do not get dressed; I wash with difficulty and stay in bed	*SECTION 7 - Work* A I can do as much work as I want to. B I can only do my usual work, but no more. C I can do most of my usual work, but no more. D I cannot do my usual work. E I can hardly do any work at all. F I cannot do any work at all.
SECTION 3 - Lifting A I can lift heavy weights without extra pain. B I can lift heavy weights, but it gives extra pain. C Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, for example, on a	*SECTION 8 - Driving* A I can drive my car without any neck pain. B I can drive my car as long as I want with slight pain in my neck. C I can drive my car as long as I want with moderate pain in my neck.

table.
D Pain prevents me from lifting heavy weights, but I can manage
light to medium weights if they are conveniently positioned.
E I can lift very light weights.
F I cannot lift or carry anything at all.

D I cannot drive my car as long as I want because of moderate pain
in my neck.
E I can hardly drive at all because of severe pain in my neck.
F I cannot drive my car at all.

SECTION 4 - Reading
A I can read as much as I want to with no pain in my neck.
B I can read as much as I want to with slight pain in my neck.
C I can read as much as I want to with moderate pain in my neck.
D I cannot read as much as I want because of moderate pain in my
neck.
E I cannot read as much as I want because of severe pain in my
neck.
F I cannot read at all.

SECTION 9 - Sleeping
A I have no trouble sleeping.
B My sleep is slightly disturbed (less than 1 hour sleepless).
C My sleep is mildly disturbed (1-2 hours sleepless).
D My sleep is moderately disturbed (2-3 hours sleepless).
E My sleep is greatly disturbed (3-5 hours sleepless).
F My sleep is completely disturbed (5-7 hours)

SECTION 5 - Headaches
A I have no headaches at all.
B I have slight headaches which come infrequently.
C I have moderate headaches which come infrequently.
D I have moderate headaches which come frequently.
E I have severe headaches which come frequently.
F I have headaches almost all the time.

SECTION 10 - Recreation
A I am able to engage in all of my recreational activities with no
neck pain at all.
B I am able to engage in all of my recreational activities with some
pain in my neck.
C I am able to engage in most, but not all of my recreational
activities because of pain in my neck.
D I am able to engage in a few of my recreational activities because
of pain in my neck.
E I can hardly do any recreational activities because of pain in my
neck.
F I cannot do any recreational activities at all.

COMMENTS:_____

_____

NAME: _____ **DATE:** _____ **SCORE:** _____