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Effect of Theraband Exercises on Neck Pain and Forward Head Posture in Various Occupation

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ABSTRACT

Introduction: Various occupation experience daily neck pain largely due to their awkward postures and high work demand. This puts extra strain on the muscles and predispose to development of faulty posture and muscles imbalance. So to avoid all this problems and exercise plan is needed, which can be easily performed even at the workplace. The purpose of the study was to determine the effects of the band exercises on neck pain and forward head posture in various occupation. Methodology: Thirty patients between the age of 25-50 participated in the study. They were randomly assigned to either and experimental (15) or a control group (15). The experiment group participated in Thera Band exercises Programme while control performed conventional exercises for 6 weeks. Evaluation of neck pain done by numeric pain rating scale and forward head posture was measured by digital photography technique. Results: The paired sample t-test results showed statistically significant difference in the pre and post intervention scores of both NPRS (p=<0.01) and CV angle (p=<0.01) in the participants of both the groups. Conclusion: the result of this study suggests that the use of TheraBand exercises may be helpful for reducing neck pain and carting forward head posture in various occupation.

Methods: An comparative study was conducted on 30 patients having neck pain and forward head posture in various physiotherapy OPD and rehabilitation Centre Dehradun. The patient neck pain was measured by NPRS (Numeric Pain Rating Scale) and forward head posture measured by the digital photography technique.

Results: The majority of patient was showing significant reduction in neck pain and extent of forward head Posture.

Conclusion: The result of this study suggests that the use of Thera Band exercises maybe helpful for reducing neck pain and correction forward head posture in various occupation.

KEYWORDS: Thera Band; Neck Pain; forward Head posture

ARTICLE DETAILS

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INTRODUCTION

Forward head posture (FHP) is most often described as excessive anterior positioning of the head in relation to a vertical reference line, involving increased cervical spine lordosis (head forward, middle cervical spine extended, lower cervical spine Flexed and rounded shoulders with thoracic kyphosis. A recent surge in the prevalence of "forward head posture", a postural condition where the cervical spine adopts a forward-leaning misalignment and can cause mild to severe neck and upper back pain. Also known as "texting neck", forward head posture is commonly found in those with seated desk jobs, poorly designed working conditions, and excessive smartphone use. Maintaining the poor posture causes extra pressure on the muscles and causes muscle fatigue [1]. Naturally under these circumstances we slump forward, develop rounded shoulders. Forward head posture is measured by craniovertebral angle and the normal craniovertebral angle is <50 degrees [2].

When the head is nicely balanced on the neck and shoulders it doesn't take much effort to hold it in place. The light work of a few ligaments and muscles will maintain stability. The

weight of the average human head is around 5kg but in forward head posture it can have an apparent weight of more than 15kg. This sets off a cascade of events that, in the long term, can cause a great deal of pain and discomfort. Some of the causes of Forward Head Posture include: Weakness in the neck muscles can lead to forward head posture, Injuries, such as neck sprains and strains, Poor or bad sleeping position, Incorrect breathing habits, Driver's -neck is also one of the causes of forward head posture, Texting- neck, Computer neck, Reader's- neck, Repetitive use of/or indulging in TV, computer, video games, texting, gardening and carrying heavy backpacks can also cause forward head posture .The typical slumped posture with rounded shoulders and forward head is easily recognizable in modern society and, when maintained persistently, the knock on effects can be very widespread and debilitating. It is the soft tissues that suffer first [3].The muscles of the neck and upper back (including the upper trapezius and neck extensors) are in a sustained isometric contraction and become short and tight. The muscles of the chest (pectorals) also become short and tight. Causing generalized aching and more localized trigger points in the muscle. The muscles in the front of the neck, the deep neck flexors, are stretched and become weak and inhibited. A number of mid-back muscles (lower trapezius and rhomboids) plus the serratus anterior muscles are also stretched and become weak. A number of ligaments (nuchal ligament) will be placed under excessive stress [4].The normal curve of the upper back becomes exaggerated (thoracic kyphosis). The shoulder blades (scapulae) rotate downwards. The vital capacity of the lungs is decreased with a diminished thoracic cavity. The joints of the cervical spine can become partially compressed and the cartilage is exposed to repeated trauma. This compression could potentially lead to nerve root pressure. There is a decreased range of movement of the neck and shoulder.

Neck pain has become a public health problem and its prevalence is accelerating. According to Peter et al, lifetime prevalence of neck pain was 71% and that between 12% and 34% of adult experienced neck pain annually [5].In a study by Jull et al it was shown that 55% of the dentist's population had neck pain. Dental profession is one of the occupational risk factors of neck pain neck and it starts early in dental career even during educational training. Dental practice is characterized by high visual demands, which result in adoption of fixed postures. Repeated unnatural, deviated, or inadequate working postures, forceful hand movements, inadequate equipment or workplace designs, and inappropriate work patterns are likely to be the particular risk factors for musculoskeletal disorders among dental professionals.

For every inch that the head moves forward in posture, it increases the weight of the head on the neck by 10 pounds. Digital photography is a form of photography that uses cameras containing arrays of electronic photodetectors to capture images focused by a lens. Many researchers have used digital photography technique as a method of assessment for forward head posture.

According to Schumacher et al Exercise is known to be an important component of treatment programs for patients with neck pain. Strengthening exercises may decrease pain and increase neck range of motion and muscle performance. According to Carrie M Hall et al isometric exercise is commonly used to increase muscle performance. Although no joint movement occurs, isometric exercise is considered functional because it provides strength base for dynamic exercise and because many postural muscles work primarily in an isometric fashion. Posture correction is recommended to dentists with poor neck postures. Isometric neck exercises has shown an immediate pain reduction response. It is noted that impaired muscle function has been shown to be a feature in painful neck disorders and exercises to retrain performance of the muscles is effective in the long term for alleviation of pain. Nodding exercises are helpful in providing the most significant immediate relief from pain if performed 3 times per week for 4 weeks and showed significant improvement in neck pain as well as posture and it is concluded this is effective in relieving pain, improving function, and correcting forward head posture.

Body weight, resistive bands, pulleys and weight machines are a few modes of dynamic resistive exercises. According to Porte et al strength training is beneficial in decreasing neck pain and also specific strength training with Thera Band has been considered preventive regarding neck pain among military pilots and office workers.

A TheraBand is an elastic band used for strength training. They are commonly used in physical therapy, specifically by convalescents of muscular injuries, including cardiac rehab patients to allow slow rebuilding of strength.

In a study by J,Yilnen,E.Takala,M.Nykanen,et al it is shown that Strength training helps in attaining beneficial long-term effects of resistance training in terms of reduced neck pain[6].

Resistance band training is now used widely as part of general fitness and strength training. Typically, the bands are color coded to show different levels of resistance and users need to select an appropriate level and are Simple to use and their light weight allows people to easily carry them if traveling and continue with routine sessions for strength training [7].

Lars Anderson and his colleagues their study concluded that as little as a single set of 2 minutes Thera Band exercises can significantly reduce neck and shoulder pain[8].

Manual muscle testing is a procedure for the evaluation of the function and strength of individual muscles and muscle groups based on the effective performance of a movement in relation to the forces of gravity and manual resistance [9].

Purpose of current study is to find whether addition of Thera Band based neck exercises to the conventional treatment program helps in reducing pain and improvement in Forward head posture in various occupation.

METHODOLOGY

A Comparative study was conducted to see the effect of TheraBand exercises on neck pain and forward head posture in various occupation

The Scale use to measure the pain was NPRS and Forward Head posture measure by digital Photography Technique, Data was conducted by scale form provided to patient and methodology was explained to the patient.

The subject participates in the study indicate the intensity of their pain by means of NPRS 0-10 in last 24 hrs verbally.

The NPRS has good sensitivity while producing data that can be statistically analyzed (Williamson &Hoggar, 2005)[11,12].

Many researchers have used digital photography technique as a method of ad dement for forward headposture[6].

The three angles and three distances, commonly used to assess FHP, that were calculated by the Biotoxin™ automated biomechanical assessment tool included shoulder-to-pelvis angle (the angle between vertical and the line joining acromion to mid-point between ASIS and PSIS indicating trunk inclination), head angle (the angle between horizontal and the glabella-to-tragus line), neck angle (the angle between horizontal and the tragus-to-C7 line); and head distance (horizontal distance from tragus to vertical plumb aligned with base of fifth metatarsal); shoulder distance (horizontal distance from acromion to plumb line) and Scale (horizontal distance between acromion and tragus). All angles will be measured in degrees and distances were measured in cm

DATA ANALYSIS

Analysis of the data collected for NPRS and Craniovertebral angle for reading of 30 subjects was done by SPSS software version 23.00. The result was considered statistically significant at P<0.01.

The characteristics of the data were presented through tables and graphs.

Paired sample T-test was used to analyses intra – group differences in NPRS scale and Craniovertebral angle before and after performing the intervention.

RESULT

The data were analysis for 30 subjects who were equally divided into two groups with 15 subjects in each group. The average age was (34.13±5.42) for GROUP A and for GROUP B is (34±5.02).

The baseline NPRS average for subjects GROUP A is (6.6±1.64) and for the subject GROUP B is (5.27±1.58) respectively.

Similarly, the pre intervention CV angle was found to be (45.21±2.56) for GROUP A and (45.45±3.13) for GROUP B.

Table 5. 1 Descriptive Statistics

	Group A (Mean ± SD)	Group B (Mean ± SD)
Age	34.13 ± 5.42	34 ± 5.02
NPRS (Pre-Intervention)	6.6 ± 1.64	5.27 ± 1.58
NPRS (Post-Intervention)	5 ±1.65	1.27 ± 1.33
CV Angle (Pre-Intervention)	45.21 ± 2.56	45.45 ± 3.13
CV Angle (Post-Intervention)	46.13 ± 2.42	48.05 ± 2.28

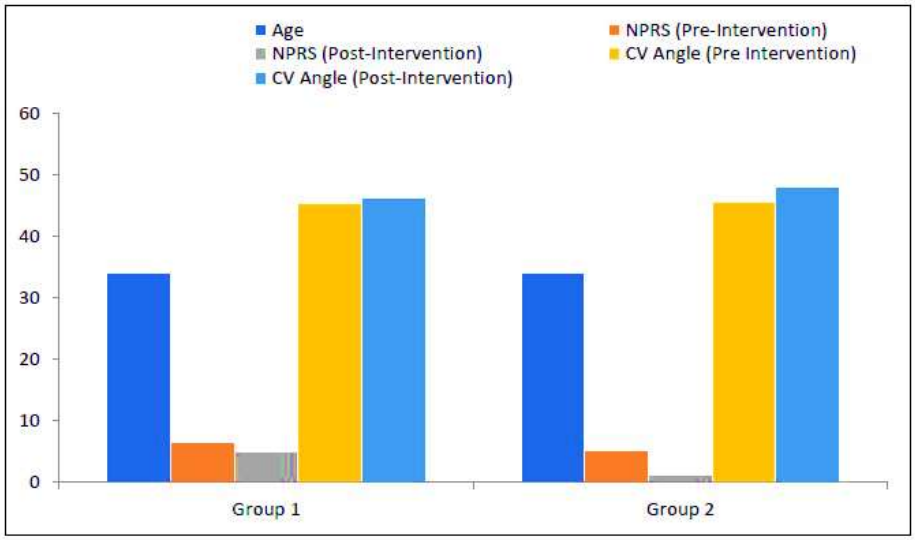

Fig 1.2 Bar chart representing descriptive

The paired sample t-test results showed statistically significant difference in the pre and post intervention scores of both NPRS (p=<0.01) and CV angle (p=<0.01) in the participants of both the groups.

(Paired sample t-test)

Table 5.3 Comparison of pre and post-intervention scores of NPRS and CV angle

Group	Outcome Measure	t-value	Significance
Group 1	NPRS	5.87	<0.01*
	CV Angle	-4.63	<0.01*
Group 2	NPRS	15.49	<0.01*
	CV Angle	-8.3	<0.01*

The scores of NPRS and CV angle measure were compared using independent sample t-test. The result revealed statistically significant difference in the score of NPRS (p=<0.01) and CV angle measure (p=0.033)

(Paired sample t-test)

Table 5.4 Comparison of NPRS and CV angle between the groups

	t-value	Significance
NPRS	6.820	<0.01*
CV Angle	-2.241	0.033*

DISCUSSION

The aim of our present study was to find out the effect of two treatment techniques, that is conventional given exercises and Thera Band exercises in reducing pain and forward head posture in various occupation. Numeric pain rating scale was used to measure pain, digital photography technique for forward head posture. The subjects in this study had similar baselines values of all dependent variables suggesting that all groups had homogenous distribution of patients. The results showed significant improvement in the outcome measure in both the techniques. However, both methods are found to be similarly effective in decreasing pain & forward head posture in various occupation.

The results of our study were also supported by the results of the study done by Tae-WoonKim,Da- In An, Hye- Yun Lee, Yun-HeeSung,Dong-Hyun Kim et al.2016 [10].They investigated the effects of elastic band exercises program on the posture of subjects with rounded shoulder and forward head posture. The results of the study suggested that the strength training with the aid of elastic band was helpful in correcting rounded shoulder and forward head posture and it showed a significant result

In a study done by Mark Lidegaard and Lars L.Andersenet al.2013[11]in office workers, they had found that only a little exercises say for 2 minutes daily for 10 weeks with resistance band can effectively reduce neck and shoulder pain. .In this study subjects were asked to perform resistance band based exercises for 2 minutes daily for a period of 10 weeks, and it has led to a significant decrease in neck and shoulder pain.

To conclude both groups were found to be effective in reducing pain and forward head posture. Results of the study revealed that addition of Thera Band exercises as a mode of resistance training program when added to conventionally given exercises which includes (stretching, isometrics and posture correction exercises) brings better improvements in terms of reducing pain and improving forward head posture.

CONCLUSION

This study compared the effectiveness of conventional provided exercises to Thera Band exercises in reducing pain and forward head posture in various occupation. The result show that the band exercises are more effective

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