THE IMPACT OF POSTURAL RE-EDUCATION AND ISOMETRIC NECK STREGTHENING ON TEXT NECK SYNDROME AMONG UNIVERSITY STUDENTS - A RANDOMISED CONTROL TRIAL

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BACKGROUNG & PURPOSE: Text neck is a pervasive condition characterized by neck pain and poor posture, has become increasingly prevalent among college students due to prolonged smartphone and computer usage. Postural re-education and isometric neck strengthening are the basis yet beneficial exercise. Hence this exercise is used to evaluate the effect of exercise on pain and functional status and providing valuable insights for the development of effective prevention and treatment strategies. **METHOD**: A 60-person study was conducted. Male and female having text neck syndrome aged 18–25 was studied. Subjects were divided between two equal groups. Group A received conventional treatment including. Postural re-education and isometric neck strengthening exercise, whereas group B received conventional treatment including hot packs and home advice. Study individuals received treatment for 3days for 3 weeks. Numerical pain rating scale (NPRS), Neck disability index (NDI) were used as outcome measures. **RESULTS:** Statistically significant difference (<0.005) was seen using unpaired t-test. **CONCLUSION:** Exercise with conventional protocol; is effective on improving pain and functional status in college going students with text neck syndrome. **KEYWORDS:** Text neck syndrome, postural correction exercise, neck isometric exercise, and hot packs.

Abbreviation: NPRS - Numerical Pain Rating Scale, NDI - Neck Disability Index.

INTRODUCTION :

The term "text neck" is used to describe the neck pain and injury brought on by excessively and continuously gazing down at a cell phone, tablet, or other wireless devices. Text neck is an overuse syndrome or a repetitive stress injury caused by having your head slumped forward and downward for an extended amount of time when using a mobile device.

Students who use their phones for extended periods and slouch their shoulders frequently experience this issue. This results in discomfort, impairment, and a weakening of the cervical muscles .Dr. Dean L. Fishman, a chiropractor in the United States, coined the term "Text Neck" to refer to the muscular injury and neck pain caused by stress or overuse syndrome from texting. According to estimates, 79% of people between the ages of 18 and 44 always have their cell phones on them, except for two hours when they go for a walk.[(1)]

It develops as a result of repetitive stress injury or overuse when the neck is bent forward to look at a phone or other electronic device [2].

The final result is discomfort in the hands, neck, upper back, and shoulder, increasing spine curvature, and recurrent headaches. While hunched over these devices, a prolonged neck flexion position causes a forward

head posture. According to a new study from Thailand, text neck syndrome has spread over the world and now affects people of practically all ages who use mobile phones. Concern has been raised about text neck syndrome, which has the potential to impact many smartphone users worldwide of all ages [3].

According to a source, the forces acting on the neck are 27 pounds when the head is flexed 15 degrees , and 40 pounds when the The model forecast at 90 degrees is inaccurate when the neck is flexed 30 degrees, 49 pounds when it is flexed 45 degrees, and 60 pounds when it is flexed 60 degrees. Numerous studies have been carried out to ascertain how smartphone addiction affects the musculoskeletal system and a number other studies found a significant correlation between the amount of time spent on mobile phones and shoulder and neck pain.(4)

The forward head posture (FHP) and the rounded shoulder posture (RSP) are the two most common postural changes in text neck sufferers. Particularly, lower cervical flexion and higher cervical extension define forward head position.

Due to tension in the pectoralis minor and weakening in the rhomboids and middle trapezius, this posture also exhibits changes in scapular protraction and downward rotation, a decrease in cervical lordosis, and altered thoracic kyphosis (5)

If text neck is neglected and untreated, it can lead to major long-term consequences, such as flattening of the spinal curvature, early onset of arthritis, spinal degeneration, disc compression, disc herniation, damage to the nerves or muscles, inflammation of the cervical ligaments, and nerve irritation.(5,6)

METHODOLOGY: This experimental study received approval from the Institutional Ethical Committee of Parul University. This randomized controlled trial included 60 participants who were selected based on inclusion and exclusion criteria. The inclusion criteria for the study were individuals between 18- 30 years of age, using mobile phones for more than 3-4 hours per day for texting, with a pain score of more than 4 on the numerical pain rating scale and clinically diagnosed with text neck syndrome. Individuals with a recent history of neck or back surgery, recent history of trauma or fracture, congenital disorders of the cervical spine, and any psychiatric diseases were excluded from the study.

The individuals were randomly allocated into two groups (Group A and Group B) using the simple random sampling method. Before being randomly allocated to either the experimental and control group each participants were given complete information about the study protocol and given the informed consent. The outcome measures used were the numerical pain rating scale for pain assessment, neck disability index (NDI). The pre- and post-assessment scores were taken and statistical analysis was carried out using SPSS Software version 23.0 to obtain the results.

Group A received the postural correction, neck isometric and scapular stabilization exercises. Group B received the conventional treatment in form of hot packs and home advice three times a week for 3 weeks.

STATISTICAL ANALYSIS:

Statistical analysis was done by using SPSS software version 27. It used a paired t-test to compare the pre and post parameters (NDI and NPRS) for Group A and Group B. On the other hand, the unpaired t-test was used to compare the parameters after the intervention within each group. Microsoft Excel version 2021 has been used to create the table and graphic depiction.

RESULT:

60 individuals were recruited for the study and divided into two equal groups of 30 each. Pre and post-Mean were calculated. Both techniques showed a reduction in pain and were effective for a neck disability,

but when we compared both of the techniques. Postural re-education and isometric neck strengthening showed more effective results, with a significant difference in Mean than control group.

TABLE 1 :

PRE-POST COMPARISON OF NDI VALUE OF GROUP- A				
Group-A	**Mean**	**±SD**	**t-value**	**p-value**
Pre	**19.43**	**3.49**	**15.09**	**0.001**
Post	**10.10**	**3.40**		

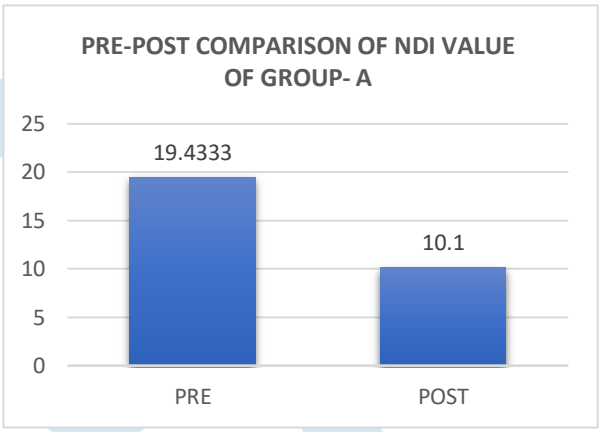
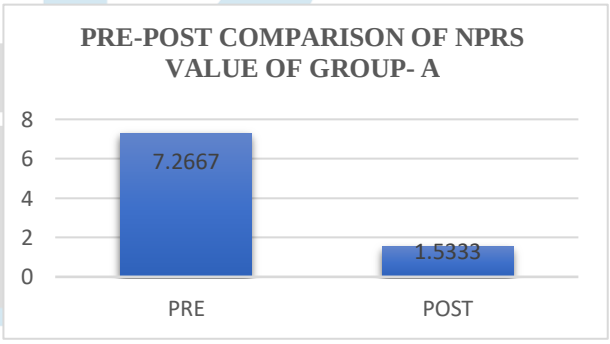


Table 1: shows the comparison of NDI in group A with pre and post-mean ±SD values of value exercise 19.43±3.49, and post 10.10±3.40 respectively. Values are significant at p<0.001 with t- of 15.09.

TABEL 2

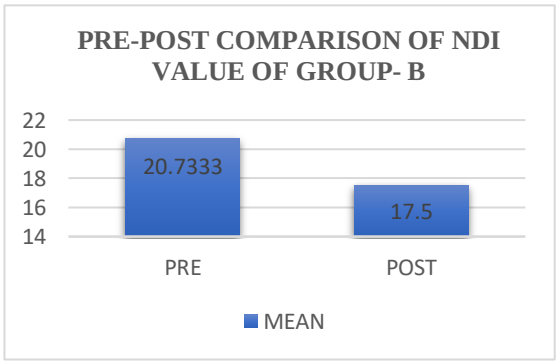
PRE-POST COMPARISON OF NPRS VALUE OF GROUP- A				
Group-A	**Mean**	**±SD**	**t-value**	**p-value**
PRE	**7.27**	**1.04**	**24.97**	**0.000**
POST	**1.53**	**0.51**		



TABEL 2 : Shows the comparison of NPRS in group A with pre and post-mean±SD values of 7.27±1.04, and post 1.53±0.51 respectively. Values are significant at p<0.001 with a t-value of 15.09.

TABEL 3 :

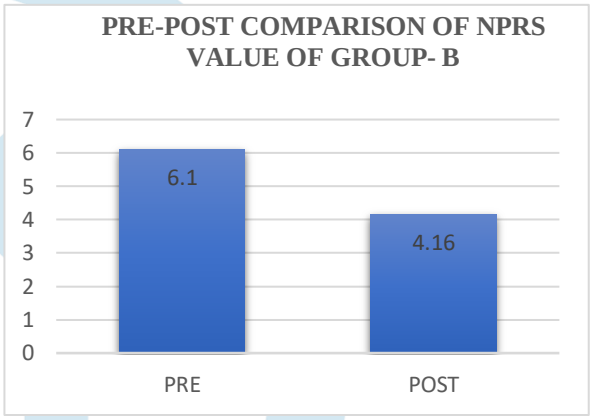
PRE-POST COMPARISON OF NDI VALUE OF GROUP- B				
Group-B	**Mean**	**±SD**	**t-value**	**p-value**
Pre	**20.73**	**3.49**	**10.20**	**0.000**
Post	**17.50**	**3.79**		



TABEL 3: Shows the comparison of NDI in group B with pre and post-mean±SD values of 20.73±3.73, and post 17.50±3.50 respectively. Values are significant at p<0.001 with a t-value of 10.20.

TABEL 4 :

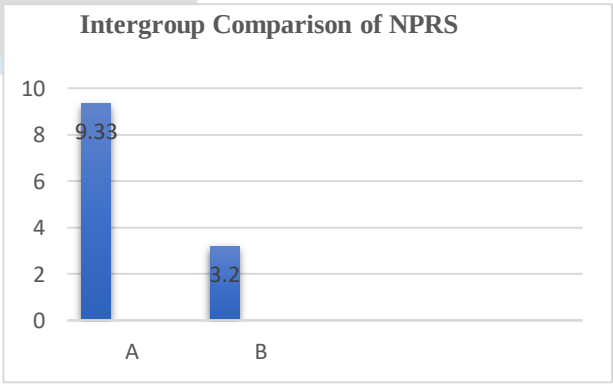
PRE-POST COMPARISON OF NPRS VALUE OF GROUP- B				
Group-B	**Mean**	**±SD**	**t-value**	**p-value**
Pre	**6.10**	**1.24**	**7.41**	**0.000**
Post	**4.16**	**1.41**		



TABEL 4 : Shows the comparison of NPRS in group B with pre and post-mean ±SD values of 6.10±1.24, and post 4.16±1.41 respectively. Values are significant at p<0.001 with a t-value of 7.41.

TABEL 5 :

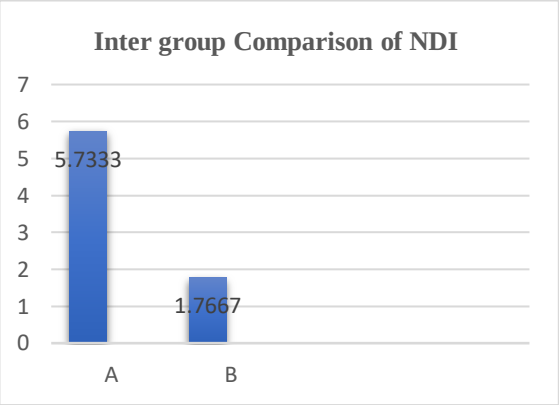
INTERGROUP COMPARISON OF NDI				
Group	**Mean**	**±SD**	**t-value**	**p-value**
A	**9.33**	**3.38**	**8.85**	**0.000**
B	**3.20**	**1.71**		



TABEL 5 : Shows the comparison of NDI for group A and group B the pre-post mean±SD values are 9.33±3.38 and post 3.20±1.71 respectively. Values are significant at p<0.001 with a t-value of 8.85. The result showed more improvement in group A in comparison to Group B.

TABEL 6 :

INTERGROUP COMPARISON OF NPRS				
Group	**Mean**	**±SD**	**t-value**	**p-value**
A	**5.733**	**1.26**	**13.313**	**0.000**
B	**1.766**	**1.04**		



Tabel 6 : Shows the comparison of NPRS for group A and group B the mean ±SD values are 5.7333±1.26 and post 1.7667±1.04 respectively. Values are significant at $p<0.001$ with a t-value of 13.313. The result showed more improvement in group A in comparison to Group B.

DISCUSSION:

The purpose of this study was to determine whether postural reeducation and isometric neck strengthening were effective treatments for text neck syndrome in college-bound students. The purpose of this study was to compare the effectiveness of hot packs to placebo in reducing neck pain and neck impairment. Out of 60 college students, 30 were randomly assigned to an exercise intervention group while the other 30 received hot packs and home advice . During three weeks, the treatment plan was administered three times a week. Before and following the three-week treatment program, measurements were taken. The study's outcome measures included the NDI and NPRS. We concluded from the findings that group A, which had posture reeducation and isometrics neck strengthening , improved more than group B, which underwent hot packs and home advice , in terms of neck functional ability.

In both groups, the level of pain significantly decreased. P Thoren et al. discovered that rhythmic exercise can cause an increase in the discharge of mechanosensitive afferent nerve fibres that are produced by contracting skeletal muscle. This effect was consistent with our findings that improved neuromuscular control and an increase in endorphins following exercise may reduce pain. Muscle ergo receptors are triggered by muscular contractions (stretch receptors). Endogenous hormones and beta-endorphins from the pituitary gland are released as a result of afferents from these muscles. These secretions may inhibit both central and peripheral pain [22]. The musculotendinous proprioceptors may be able to reduce their stretch reflex responses with neck workouts by applying operant training strategies and repeated practice sessions. The intrafusal fibers may be reset, ending the loop of muscle tension, poor circulation with metabolite accumulation, and pain related to myogenic (myofascial) pain [22].

In our study, there were significant changes in both groups' neck disability indices. This outcome is due to a decrease in pain intensity, which can improve impairment. Herman et al. further suggested that since pain intensity is one of the ten domains covered by the NDI, the association between pain and neck disability index is quite strong. One would anticipate a connection between these variables. Our findings concur with this proof. The minimal detectable score and the minimal clinically significant difference, according to NDI literature, are 5 points each. The NDI should also be used to gauge therapeutic effectiveness at baseline and every two weeks moving forward [23].

The temperature of the tissues being treated with hot packs is increased. Vasodilatation results from this, which increases the tissues' metabolic rate. The main therapeutic effects of hot therapy include reductions in pain and spasm as a result of these physiological effects on improving the clearance of inflammatory factor. In our results, the improvement showed in both the exercise intervention and control group which received hot packs in all outcome measures but the improvement was greater in intervention group than in control group[24]

CONCLUSION:

From the results, there was a significant reduction of pain and neck disability in the college-going students with text neck syndrome after the treatment protocol in form of hot packs and postural re-education and isometric neck strengthening exercise. However, group A students who received exercise interventions showed more improvements by reliving pain and neck disability over group B. Hence it is concluded that exercise interventions such as postural re-education and isometric neck strengthening exercise are very useful in relieving pain and functional ability in young adults with text neck syndrome.

LIMITATION:

1. Small sample size.
2. The duration of the study was short.
3. The samples were taken randomly.
4. The data was collected from one population.

FUTURE RECOMMENDATIONS:

1. The study can be performed in larger groups.
2. The study can be done using different age groups.
3. The immediate effects of this study can be found.

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