

Role Of Chin Tucking On Pain And Disability Of Text Neck Syndrome

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ABSTRACT

Background: Text Neck Syndrome occurs due to excessive use of any smartphone/ laptop / gadget in improper posture of upper cervical and scapular area that results into flexion of neck in forward direction, flattening of curvature of spine and stretching of neck muscles. This word was given by Dr. Lean Fishman. If text neck syndrome is not treated on time, it can lead to severe damages such as loss of normal curve of spine, early degenerative / arthritic changes, mal-alignment of spine, degenerative changes of spine, compression of intervertebral disc, peripheral nerve damage, muscle damage and loss of lung capacity. Chin tucking exercise involves drawing the head straight back to line up the ear with shoulders, it resembles like making double chin. The head is retracted without flexion or extension of the neck. It restores the natural curvature of cervical spine. The aim of this study is to gain insight into the effect of chin tucking exercises on neck pain and disability of text neck syndrome.

Method: The students of various allied health science courses were assessed for their neck pain and text neck syndrome. Smartphone addicted adults with neck pain for more than three months were selected after their consent. All the participants were assessed for their pain and disability using VAS and NDI, their demographic data were collected and randomly divided in two groups. Participants of group A were given chin tucking exercises along with conventional treatment for neck pain and participants of group B were given conventional treatment for neck pain. All participants were assessed for VAS and NDI after four weeks of intervention. Collected data was entered in to Microsoft excel sheet and analysed using JAMOVI software to describe the participants' demographic features and type of their mobile use

Results: The selected 350 participants having neck pain more than three months were randomly divided into two groups having 175 participants in each group. There were 28 male and 147 female participants in group A and 47 male and 128 female participants in group B. In total 275 participants were female and 75 participants were male. The mean age for the participants of group A was 21.98 ± 2.17 and for group B was 22.68 ± 3.09 . Participants of group A who received chin tucking exercises along with conventional treatment showed statistically more significant improvement in their neck pain and disability.

Conclusions: The findings from this study provide valuable insight into the effect of chin tucking exercises on the neck pain and disability in text neck syndrome.

Key words: Text neck syndrome, chin tucking exercise, visual analogue scale, neck disability index.

INTRODUCTION

The word "Text Neck Syndrome" was given by Dr. Lean Fishman. It is the due to excessive use of any smartphone/ laptop / gadget in improper posture of upper cervical and scapular area. It results into flexion of neck in forward direction, flattening of curvature of spine and stretching of neck muscles.¹ The total number of smartphone users have increased by more than 83 crores.² The smartphones are advancing in the technology with internet facility added to it, social media platform, gaming apps, digital cameras with high configurations and touchscreens with high resolution are the factors to attract users; and excessive use leads to addiction to smartphone.³ Researches have concluded that the prevalence/occurrence of text neck syndrome is 68.1%. The text neck syndrome sufferers do not have only pain; they have physical discomfort and affects quality of life. Neck functional disability often resulting from text neck syndrome decreases quality of life which may include sleep disturbances and psychological distress.⁴ There is positive linear link for smartphone addiction and neck disabilities which is positively related. Similarly research among physiotherapy students in Bangladesh and India found that 43.3% smartphone addicted students have neck pain and disability.⁵

When a person uses a smartphone or any gadget for longer time, one position is sustained for longer time and specific movements occur repeatedly, a person looks downwards to watch the screen, hold arm out in front of them to hold smartphone and moves head forward that can cause an excessive anterior curve in lower cervical

spine and an excessive posterior curve in upper thoracic spine.⁶⁻⁸ If text neck syndrome is not treated on time, it can lead to severe damages such as:

- Loss of normal curve of spine
- Early degenerative / arthritic changes
- Mal-alignment of spine
- Degenerative changes of spine
- Compression of intervertebral disc
- Peripheral nerve damage
- Muscle damage
- Loss of lung capacity⁹

A study performed to find prevalence showed that seventy-nine percentage of the adult population, between eighteen to fourteen years of age group carry their smartphones with them almost all the time; they keep smartphone aside only for two hours of the working day.¹⁰ Smartphone can be used to browse internet, social media activities, chatting with others, to play online games, gambling, to listen music and perform many more activities.¹¹⁻¹² If any person concentrates on the small screen of smartphone, tries to flex the neck at screen and this can lead to severe problems.¹³ Continuously looking down at smartphone may results in neck pain, muscle spasm, shoulder pain, muscle tightness and shoulder muscle spasm.¹⁴ Smartphone and gadgets are considered as a double-edged sword that makes the life convenient. During COVID 19 pandemic smartphone was used by students for online class, educational activities, learning, seeking information, communication and entertainment.¹⁵ The over use of smartphone causes musculoskeletal disorders and sub health problems like indigestion and fatigue; psychopathological problems like anxiety and depression; ocular alteration like burning in eyes and dry eyes; sleep disorders like sleepiness during daytime, reduced quality and duration sleep at night and delayed bed time.¹⁶⁻²¹ Smartphone emits blue light may affect melatonin level, affect sleep duration and quality; it also affects wakefulness status.²²⁻²³

Chin tucking exercise involves drawing the head straight back to line up the ear with shoulders, it resembles like making double chin. The head is retracted without flexion or extension of the neck. It restores the natural curvature of cervical spine. It occurs by activation of deep cervical flexor muscles. These exercises encourage a neutral alignment of the head and neck, reduce anterior shearing forces on the spine and can reduce pressure on intervertebral discs and surrounding soft tissues so combination of these two exercises may reduce severity of neck shoulder pain, improve functional ability of neck and standards of life in text neck syndrome of smartphone addicted adults.²⁴ This exercise is done in sitting/standing position with neutral cervical spine, keeping shoulder relaxed and arms by side. A participant is asked to draw the chin straight back without flexing or extending the neck to vertically line up ear with shoulder like making double chin, holds the position for ten to fifteen seconds, relaxes and repeat the same contractions.²⁴⁻²⁵

The use of smartphone, gadgets and technologies cannot be denied in today's era as it is essential device for each group people and improper use of smartphone or gadgets for longer time with poor posture due to lack of awareness leads to anatomical and physiological changes that results into pain and disabilities of neck and shoulder and further consequences affects the life quality. It is very essential to find proper protocol to combat the adverse effects of excessive smartphone usage, so this research may contribute to clinical practice and public health policies by identifying non pharmacological intervention for the modern life style due to technology.²⁶

OBJECTIVE

The objective of this research is to get insight into the effect of chin tucking exercises on neck pain and disability of text neck syndrome.

MATERIALS AND METHODS

Study Design

This is an interventional study.

Study area and population

This study has been conducted at the MAHSI, MGM Medical College, Indore. The population included are the students of various allied health sciences courses.

Sample size

Sample size for the study was decided using formula $\text{Sample Size} = \frac{Z^2 * p * q}{d^2}$

Z = Confidence interval at 95%, standard value is 1.96

$$p = \text{prevalence} = 61.4\%$$

$$q = 1-p$$

$$d = \text{margin of error} = 5\%$$

The prevalence for text neck syndrome is 68.1%, calculated sample size is 333 so 350 participants were selected.

Sampling

Participants were selected by purposive sampling method and they were divided into two groups by using odd and even method of randomization.

Variables

Independent variables – Chin tucking exercise, conventional treatment for neck pain

Dependent variables – pain, disability

Outcome measures

VAS – Visual analogue scale (VAS)

NDI – Neck disability index (NDI)

Data Collection

The students of various allied health science courses were assessed for their neck pain and text neck syndrome. Smartphone addicted adults with neck pain for more than three months were selected after their consent. All the participants were assessed for their pain and disability using VAS and NDI. The VAS is a 10-point linear scale marked with 0 for no pain and 10 for worst pain and patient is instructed to mark himself or herself for pain intensity; it is valid and reliable outcome measure.²⁷⁻²⁹ The NDI is a 10 itemed scaled questionnaire used for the assessment of disabilities of daily living which are most affected by neck pain and the reliability of NDI was studied by H Vernon et al.³⁰⁻³¹ All participants were randomly divided into two groups. 175 participants of group A were given chin tucking exercises along with conventional treatment and participants of group B were given conventional treatment for the neck pain. The treatment was given for five days per week for four weeks. After four weeks all participants were assessed for VAS and NDI.

Data Analysis

Data was entered into Microsoft excel sheet and analyzed using JAMOVI software. Continuous data was expressed in terms of mean and SD. Categorical data was expressed in form of proportions and percentage. The result was obtained using various descriptive and analytical statistics. The descriptive analysis aimed to describe the participants' demographic features and type of their mobile use.

Ethical Approval

The study was approved by the Committee for advance studies and research, Nims University, Jaipur and Ethics and scientific committee, MGM Medical College & M Y Hospital, Indore.

RESULTS

The selected 350 smartphone addicted participants having neck pain for more than three months were randomly divided into two groups having 175 participants in each group. There were 28 male and 147 female participants in group A and 47 male and 128 female participants in group B. In total 275 participants were female and 75 participants were male.

Table 1: Gender distribution of participants in both groups

Gender	Group A	Group B	Total
Male	28(16%)	47(26.9%)	75(21.4%)
Female	147(84%)	128(73.1%)	275(78.6%)
Total	175(100%)	175(100%)	350(100%)

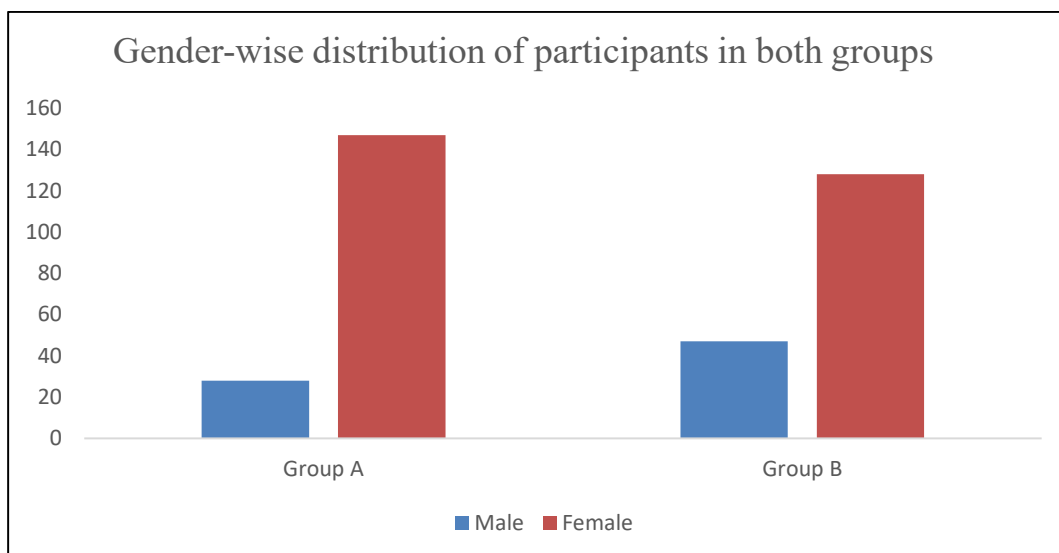


Figure 1: Gender distribution of participants in both groups

Table 1 and Figure 1 shows gender wise distribution of participant in both the groups which indicate dominance of female participants.

The mean age for the participants of group A was 21.98 ± 2.17 and for group B was 22.68 ± 3.09

Table 2: Mean age of participants in both the groups

Parameter	Group A	Group B
Age	21.98 ± 2.17	22.68 ± 3.09

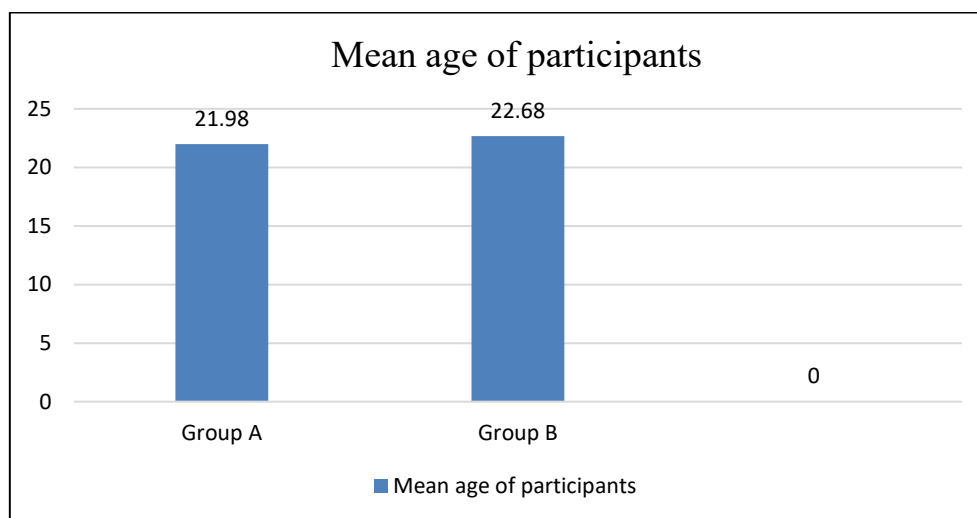


Figure 2: Mean age of participants in both the groups

Table 2 and figure 2 shows mean age of participants in both the groups Participants of group A were given chin tucking exercises along with conventional treatment for the neck pain, participants of group B were given conventional treatment for the neck pain. The intervention was given for five sessions per week for four weeks. All the participants were screened for VAS & NDI before and after intervention to assess their pain and disability.

Table 3: Comparison of pre-intervention and post-intervention VAS & NDI score for group A

Group A	VAS	NDI
Pre-intervention	6.19 ± 1.61	14.03 ± 8.70
Post-intervention	0.77 ± 0.97	1.85 ± 2.04
p value	0.001	0.001

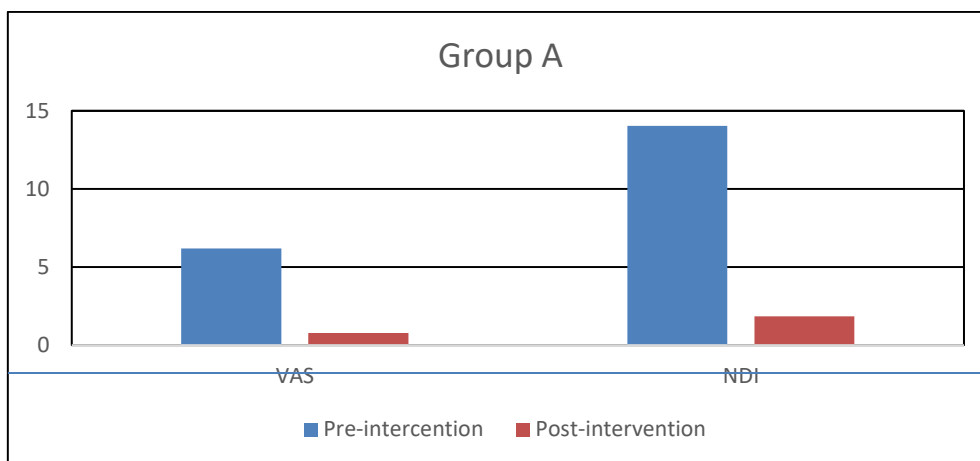


Figure 3: Comparison of pre-intervention and post-intervention VAS & NDI score for Group A
 Table 3 and figure 3 compares pre and post-intervention outcomes of VAS & NDI for group A which was calculated using Wilcoxon test. The p value is less than 0.05 indicates statistically significant difference between pre and post intervention scores of VAS and NDI, hence intervention of group A is significant.

Table 4: Comparison of pre-intervention and post-intervention VAS & NDI score for group B

Group B	VAS	NDI
Pre-intervention	6.23±1.46	17.86±7.46
Post-intervention	3.17±1.71	9.39±5.90
p value	0.001	0.001

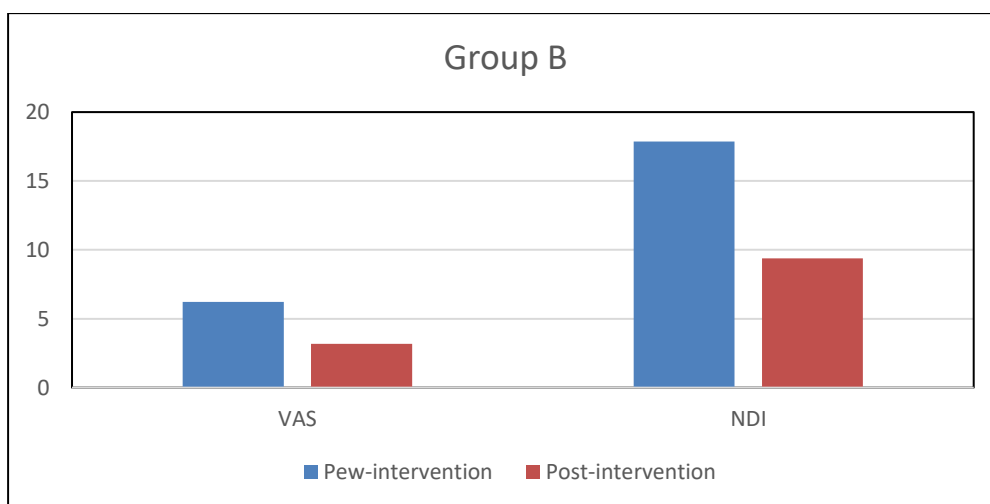


Figure 4: Comparison of pre-intervention and post-intervention VAS & NDI score for Group B

Table 4 and figure 4 compares pre and post-intervention outcomes of VAS & NDI for group B which was calculated using Wilcoxon test. The p value is less than 0.05 indicates statistically significant difference between pre and post intervention scores of VAS and NDI, hence intervention of group B is also significant.

Table 5: Comparison of pre-intervention and post-intervention VAS & NDI score for both the groups

Parameters	Group A	Group B	P-Value
Pre VAS for neck	6.19±1.61	6.23±1.46	0.825
Post VAS for neck	0.77±0.97	3.17±1.71	0.001
Pre NDI	14.03±8.70	17.86±7.46	0.001
Post NDI	1.85±2.04	9.39±5.90	0.001

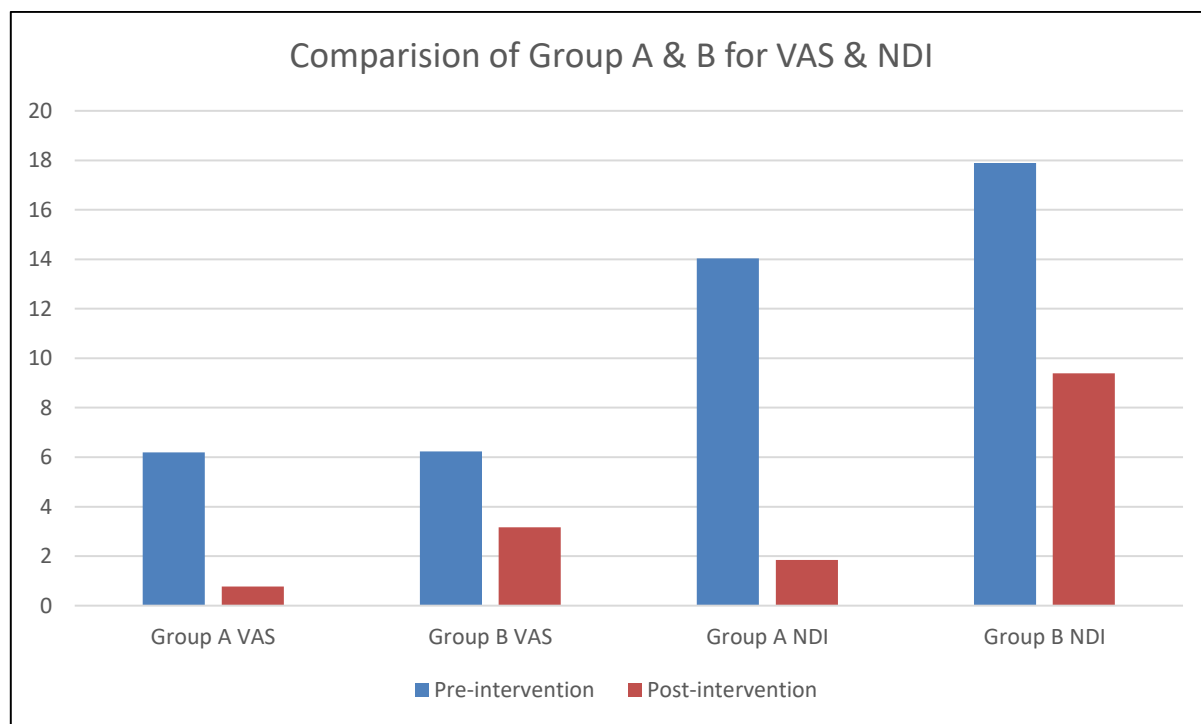


Figure 5: Comparison of pre-intervention and post-intervention VAS & NDI score for both the groups

Table 5 and figure 5 compares pre and post-intervention outcomes of VAS & NDI for both the groups which were calculated using Mann-Whitney U test. The p value for the post intervention VAS & NDI is less than 0.05 indicates statistically significant difference between the outcome of both the groups hence both the groups showed improvement but group A showed more significant improvement than group B.

DISCUSSION

It has been found that the prevalence/occurrence of text neck syndrome is very common among the smartphone, laptop, computer and gadget users. The text neck syndrome sufferers have neck pain and physical discomfort. Seventy-nine percentage of the adult population, between eighteen to fourteen years of age group carry their smartphones or gadget with them almost all the time; they keep their gadget aside only for two hours of the working day. These devices can be used to browse internet, social media activities, chatting with others, to play online games, gambling, to listen music and perform many more activities. When a person uses a smartphone or gadget for longer time, one position is sustained for longer time and specific movements occur repeatedly, a person looks downwards to watch the screen, hold arm out in front of them to hold smartphone and moves head forward that can cause an excessive anterior curve in lower cervical spine and an excessive posterior curve in upper thoracic spine which is known as text neck syndrome. It was stated that chin tucking exercises effectively reduce neck pain and disability and improve anterior translation of head among the persons who works on computer and look at the screen for longer time and have developed forward head posture. Chin tucking exercises improve proprioception and joint position sense of neck. Yin Chen et al. in systemic review concluded that neck pain is mostly associated with posture of head and neck, mostly anteriorly translated head over neck and scapular therapy is effective for pain management.

Chin tucking exercises strengthen deep cervical flexors longus capitis and longus colli, improves neck stability, maintain cervical alignment, decreases compressive load on cervical disc, decreases overactivity of superficial neck muscles, sternocleidomastoid and upper trapezius, it also enhances cervical proprioception and the this outcome is consistent with the outcome of Nishanth H and Aishwarya concluded that chin tuck in exercise corrects anterior head translation - FHP by increasing the craniovertebral angle.²⁴⁻²⁵ Research studies have concluded that chin tucking exercises increases craniovertebral angle, improves forward head posture, enhance muscle balance and improves posture. Chin tucking exercises are simple but effective intervention and incorporating this intervention in smartphone addicted may assist for pain and disability management.²⁵

CONCLUSION

The findings from this study provide valuable insight into the role of chin tucking exercises on neck pain and disability in adults suffering from text neck syndrome. The sufferers of text neck syndrome have maximum use of their smartphone or gadget for educational activities which plays important role in their learning, it helps students to develop knowledge and skills, make high contributions and develop careers but longer use of it affects normal biomechanics and quality of life. Intervention using chin tucking exercises help to improve pain and discomfort among students.

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