



## AWARENESS AND EFFECTS OF TEXT NECK SYNDROME IN PHYSIOTHERAPY STUDENTS IN DEHRADUN

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### ABSTRACT

**Background:** Text neck is a repeated stress injury and pain sustained from excessive watching or texting on handheld devices for long periods of time. This study was designed to guide us through occurrence, awareness and consequences of text neck syndrome in physiotherapy students.

**Method:** The study design was an observational study with a sample size of 258 healthy physiotherapy students of the age group 18-24 years. Students were asked to fill the questionnaires of Awareness of Text neck syndrome (ATNS), NDI, SPADI and Headache. The questionnaire collected the awareness of Text Neck Syndrome and its affects in the selected sample. CVA was obtained and recorded photographically and was measured using Coral Draw X7 software.

**Conclusion:** The study demonstrated a low level of awareness of text neck syndrome amongst young physiotherapy students in Dehradun. The study also depicted that daily mobile phone use for more than 2 hours resulted in mild pain and disability in the neck and shoulder along with forward head posture. In addition the result depicted that subjects using phone more than 6 hours were at higher risk of Text neck Syndrome.

**KEYWORDS :** Text neck syndrome, Forward Head Posture, Neck Disability Index, shoulder pain and disability Index

### INTRODUCTION

The neck or cervical spine is a coordinated network of nerves, bones, joint, and muscles directed by the brain and the spinal cord. Additionally, irritation along the nerve pathways can cause pain into the shoulder, arm and hand. "Text neck" is the term used to describe the neck pain and damage sustained from looking down at the cell phone, tablets or other wireless device too frequently and for too long.<sup>1</sup>

A recent systematic review done in Honk Kong suggests that prevalence of musculoskeletal problems with mobile phone usage are high ranging from 17.3% to 67.8% for neck complaints.<sup>2</sup> The term "Text neck" was coined by Dr. Dean L. Fishman, a US chiropractor. The term of "Text neck or another phrase turtle neck posture can be described as a repeated stress injury and pain sustained from excessive watching or texting on handheld devices for long periods of time".<sup>3</sup> A recent study done in Thailand shows that text neck syndrome has become a global epidemic affecting a large number of population of almost all ages who use mobile phones.<sup>2</sup> Text neck syndrome is a growing health concern and can affect large number of population all over the world.<sup>1</sup>

Warikoo and Mittal depicted that the mobile phone has rapidly become an established part of daily life.<sup>4</sup> While this new information and communication technology is convenient and popular, during its adoption, various social issues have arisen, including excessive use or even dependence. The Smartphone has become a necessity for most people. Smart phones are used for both communication and entertainment purposes.

In the last 20 years world wide mobile phone subscriptions have grown. In spite of some knowledge on unfavorable health effects, the usage of cell phone has increased dramatically, especially since the time they have become more affordable and available all over the world.<sup>5</sup> The use of cellular phones has skyrocketed in recent years, with more than 929.37 million subscribers in India as of May, 2012.<sup>4</sup>

There has been controversy about the hazards related to cell phone use, which have been reported to include headache, sleep disturbance, lack of concentration, impairment of short term memory, dizziness, heating of the ear, burning skin, brain

tumors and hypertension.<sup>5</sup> It is expected to develop Forward Head Posture which is a common cervical abnormality that predisposes population to pathological ailments such as headaches, neck pain, vertebral bodies' disorders, length of soft-tissue and altered strength.<sup>6</sup>

Physiotherapy students are the future health care professionals. Any musculoskeletal disorder will decrease their professional efficiency. Therefore it was a need to find whether this group of population has awareness about this syndrome. In addition the study elicited the effect of high mobile usage on neck and shoulder disability.

### MATERIALS AND METHODS

This is an "observational study" with a sample size of 258 subjects. Method of sampling used was "Purposive Sampling". This study was performed on the students of Physiotherapy Program from various colleges of Dehradun, India. The data was collected after Ethics Committee approval and informed consent was taken from all the subjects before collecting the data.

Study Design - Survey study

### INCLUSION CRITERIA

- Physiotherapy Students
- Age group - 18-24
- Gender - Both male and female
- Individuals using mobile phones from 1 year or more
- Individuals spending 2 hour or more than 2 hours per day using mobile phones

### EXCLUSION CRITERIA

- Abnormal neurological findings
- Radiculopathy
- Vertebrobasilar insufficiency
- Congenital cervical abnormalities
- Recent surgery around neck and arm
- Any open wound around neck

Ethical approval was obtained from the institutional ethical committee and each subject signed an informed consent approved by the committee.

**OUTCOME MEASURES**<sup>7,8,9,10</sup>

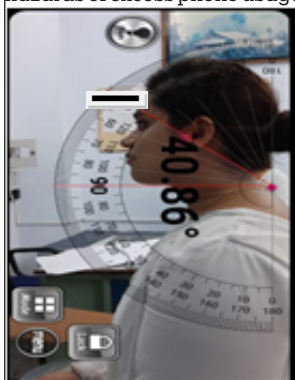
- ATNS( Awareness of Text Neck Syndrome)
- NDI [ Neck Disability Index]
- SPADI [Shoulder Pain and Disability Index]
- Craniovertebral angle
- Headache

**INSTRUMENTS**

1. Tripod Canon IXUS Digital Camera
2. Corel draw X7 software version 3. Plump line

Subjects were selected on the basis of inclusion and exclusion criteria and were recruited for the study. Method and the purpose of the study were explained to the subjects. Written consent form was signed by the patients for the participation on this study.

**Questionnaire** A self - administered questionnaire was prepared. The questionnaire included pertaining to 1) personal and information related to phone usage 2) awareness and knowledge related to text neck syndrome 3) hazards of excess phone usage.



**Fig 1: Measuring CVA**



**Fig 2: Tripod Camera**

Along the questionnaire, all the students were verbally explained about the consequences of high mobile usage and text neck syndrome to develop awareness in them.

**DATA ANALYSIS**

Data analysis was done using SPSS 19.0 version. Descriptive analysis was done to calculate the mean for age, BMI, NDI, SPADI, HEADACHE, and CVA

Independent t- test was done to compare the NDI, SEVERITY, SPADI, HEADACHE, CVA between the group.

Repeated measure using ANOVA technique to applied to compare the NDI, SEVERITY, SPADI, HEADACHE, and CVA.

The statistical significance was set as 95% confidence interval with p value ≤0.05 considered to be significant.

**RESULT**

The data was firstly analyzed on self designed ATNS questionnaire. Among all subjects 37% of subjects had awareness of Text Neck syndrome.

The data was divided into 3 groups on the basis of Phone usage. Group 1 (2-4hours) Group (4 – 6) and Group 3 (≥6)

Descriptive was used to analyses Neck disability (NDI), shoulder pain and disability (SPADI), Headache, CVA in all three group.

All three groups showed mild disability on NDI and SPADI. The result showed that subjects of all 3 groups had no significant headache but showed presence of forward head posture. [Table 1]

**Table 1: Descriptive Analyses Table**

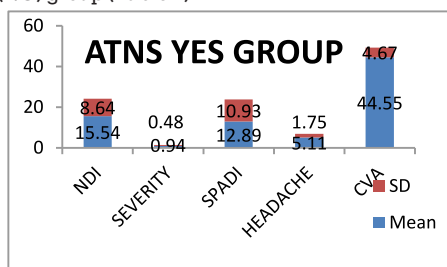
	Group 1 (2-4 hours)	Group 2 (4-6 hours)	Group 3 (>6 hours)
AGE	20.72 ± 1.78	20.59 ± 1.75	21.65 ± 1.79
BMI	21.22 ± 3.69	20.89 ± 2.36	21 ± 2.67
NDI%	15.3 ± 8.87	17.43 ± 10.9	19.75 ± 9.01
SPADI%	14.9 ± 12.77	17.63 ± 11.21	20.09 ± 11.25
HA	5.05 ± 1.9	5.32 ± 1.73	5.56 ± 1.93
CVA	45.08 ± 4.15	45.13 ± 3.91	44.93 ± 4.45

Independent T test was done to compare data. The result between ATNS Yes and ATNS No depicted that subjects who were aware of TNS had significantly less disability in neck and shoulder as compared to subjects who were unaware. [Table 2]

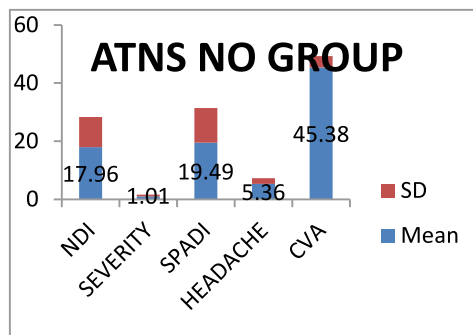
**Table 2: Analysis between ATNS Yes and ATNS No**

	Group 1 (ATNS YES)	Group 2 (ATNS NO)	t Value	Significance
NDI	15.54 ± 8.64	17.96 ± 10.4	-2.016	0.045*
SEVERITY	0.94 ± 0.48	1.01 ± 0.57	-1.138	0.256
SPADI	12.89 ± 10.93	19.49 ± 11.96	-4.507	0.000*
HEADACHE	5.11 ± 1.75	5.36 ± 1.9	-1.029	0.305
CVA	44.55 ± 4.67	45.38 ± 3.88	-1.505	0.134

The result showed no significant difference on severity HA & CVA between ATNS (Yes) and CVA between ATNS (YES) and ATNS (NO) group (Table 2)



**Fig 3: NDI SEVERITY SPADI HEADACHE CVA scores in ATNS YES group.**



**Fig 4: NDI SEVERITY SPADI HEADACHE CVA scores in ATNS NO group**

**ANOVA was done to compare the mean of NDI, SPADI, Headache and CVA.**

The result depicted that there was significant difference between the data of neck disability (NDI) and shoulder pain and disability (SPADI) between three groups.

The result depicted that subject using phone more than 6 hours (Group3) had high neck pain and disability of (19.75± 9.01) and high reading on SPADI (20.09± 11.25).

No significant difference was found on the scale of Headache between three groups. In addition the reading of CVA depicted no significant difference between 3 groups. But all three groups presented forward head posture (CVA < 50).

**Table 3: ANOVA Results**

	F Value <sup>1</sup>	Significance
NDI	3.85	0.023*
SEVERITY	4.109	0.018*
SPADI	3.622	0.028*
HEADACHE	1.428	0.242
CVA	0.041	0.960

## DISCUSSION

Young adults today have grown up with mobile phones as an evident part of their lives.<sup>11</sup> The mechanical stress caused by poor posture due to mobile phone usage is a threat to cervical spine integrity.<sup>12</sup> Ruivo et al. found an association between head protraction posture and neck pain.<sup>13</sup> "Text neck" syndrome is a group of symptoms and cases are treated accordingly to the sign and symptoms. Shah and Sheth in their study showed that the degree of Smartphone influences was significantly high with musculoskeletal discomfort in the participants.<sup>14</sup>

The result of present study showed that 37% of physiotherapy students were aware of text neck syndrome. The awareness was checked on ATNS YES and ATNS NO questionnaire. The result was depicted that the students who were aware had significantly less neck & shoulder disability ( $p \leq 0.045$ , 0.00 respectively) as compared to unaware students. The result also depicted no significant difference on CVA and headache. According to Ewa Gustafsson et al one obvious ergonomics problem when using a mobile phone or a smartphone for texting is that keys and screen are in the same plane.<sup>15</sup> To reach a comfortable posture for the arms when texting, most hold the phone quiet low in front of the belly which means they have flex the neck to read the screen. To reach a comfortable posture for the neck, i.e. an upright neck, one need to hold the phone quite high in the front of the chest.<sup>7</sup> According to Abdullah farooq et al the lack of knowledge about warm up exercise, posture change and break-away while using smartphone was lacking in most of the students.<sup>16</sup> The result of the present study also depicted that students using mobile phones more than 2 hours had significant changes in NDI, SPADI, Headache, CVA. However students using for more than 6 hours were found to have more affected by mobile phones. ( $p \leq 0.05$ ).

Supporting our study Abdullah farooq et al added that undergraduate medical students who use smartphones, tablets and laptops for their educational and personal use for many hours and pattern of using different gadgets in daily life had high effect on their musculoskeletal system.<sup>16</sup>

Texting on mobile phones is an activity which involves looking into mobile screens in a flexed position of the neck with a forward head posture and with rounding of shoulders and movement of the thumb and arms in a continues pattern. If this posture is maintained over long time, the centre of weight for the head is pushed forward. This imbalance, causes constant contraction of musculature to compensate giving rise to text neck syndrome with symptoms such as neck pain, shoulder pain, upper back pain, forward head posture, muscle spasm. Most of the subjects use their mobile phone for 2-4 hours in a day (42%) and 27% population use their phone for 46 hours in a day.<sup>1</sup> A study done in Korea mentions a positive relationship between hours of mobile phone use and subjective musculoskeletal problems.<sup>17</sup> When smart phones are constantly used without any rest, and a poor posture is maintained over a long period of time, musculoskeletal pain can occur.

According to P. Shah et al the neck disability among smartphone users might be related to frequent neck flexion posture, which changes the natural curve of the cervical spine and increases the amount of stress on the cervical spine,

leading to irritation and spasm in the surrounding skeletal structures and ligaments.<sup>14</sup>

The text neck epidemic is a global phenomena and problem. A U.S.A. survey of university students revealed that forty percent of participants faced text neck or spinal pain using mobile devices. Supporting our study Warikoo et al depicted that teenagers dependence on mobile phone is a problem that is not only new, but also on the rise. It is necessary to continue to study the conditions that foster this dependence, to develop prevention and treatment programs, and to make available assessment and diagnostic instruments that enable effective intervention.<sup>4</sup> To reduce the risk of developing severe neck pain, clinician should instruct Smartphone users to maintain a correct neck posture. As a text neck is a repetitive stress injury, it can be easily relieved or prevented by taking frequent breaks from the mobile device, like every 20 min or so. You should constantly look up bring the neck back into its original neutral position. Other alternatives are to hold the mobiles/electronic devices higher, so that it is alignment with the eyes and the stress on the neck muscles is reduced. Doing posture focused exercises, such as Pilates and yoga, which aims in gaining the right posture, will reduce the stress on the neck and shoulder. These exercises will increase the awareness of the way the mobile devices are used and should be used.<sup>1</sup>

## CONCLUSION

This study has demonstrated a low level of awareness of text neck syndrome amongst young physiotherapy students. Only 37% physiotherapy students between 18-24 yrs of age from different colleges in Dehradun have heard of this term. The study also depicted that daily mobile phone use for more than 2 hours result in mild pain and disability in the neck and shoulder. In addition it also results in forward head posture.

Further research could be done to identify associated changes on other joints along with neck in Text Neck Syndrome.

## CLINICAL SIGNIFICANCE

- An aware physiotherapist can better and efficiently advice the patient and general population about the text neck syndrome.
- A proper program on awareness of text neck syndrome is needed to decrease its impact on musculoskeletal system

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