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PREVALENCE AND AWARENESS OF TEXT NECK SYNDROME AND TEXT THUMB SYNDROME IN YOUNG ADULT POPULATION

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ABSTRACT

Background: The term "text neck" can be defined as repetitive strain injury and pain due to excessive viewing and texting on a smartphone for a prolonged duration. Long-term untreated text neck results in inflammation of ligaments and muscles, which can lead to permanent arthritic changes. Many smartphone users experience thumb/wrist pain, but some people who develop pain are smartphone addicts. The present study checks the prevalence and awareness of text neck and thumb text syndrome in young adults. **Methods:** A cross-sectional study was conducted with 200 volunteers between 18-25 years age who have been using mobile phone in the last five years. A structured questionnaire was created, validated, and used for the study. Descriptive statistics was used to assess responses received from participants. The prevalence of text neck syndrome and thumb text syndrome has been analyzed. **Results:** About 50.3% of the participants were unaware of text neck syndrome and 57.1% of text thumb syndrome. Maximum mobile phone usage included texting and calls. About 45.2% of the participants use their right thumb and index finger to text. 33% of people have a head forward posture when using mobile phones. An analysis of pain, discomfort, and duration during mobile phone use was done. **Conclusion:** The prevalence of text neck and thumb text syndrome in the young adult population indicates the need to plan future pain management strategies and increase user awareness

INTRODUCTION

Today's mobile phones are used for multipurpose benefits such as WhatsApp, email, Facebook, SMS, cameras, games, etc. The cervical spine comprises muscles, nerves and joints connecting brain to spinal cord. Irritation along this pathway causes pain [1]. According to recent studies, the prevalence of musculoskeletal problems due to high mobile phone usage along with neck disorders ranges from 17.3% to 67.8% [2]. The term "text neck"

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or turtle neck posture is described as strain injuries and pain caused by prolonged texting and continuous usage of handheld devices [1]. Text neck results in adverse symptoms such as upper back pain, chronic headaches, shoulder pain, neck pain, and increased curvature of the spine [1]. Users tend to keep their heads forward longer when using a mobile phone for an extended period [3-6]. According to a recent study, text neck syndrome affects people of all ages who use mobile phones continuously. Text neck syndrome has now become an alarming health problem that can affect many people around the world [3]. Failure to handle or correct text necks promptly can cause severe permanent damage and lead to overuse syndrome or repetitive stress injury. If text neck is left untreated for a long duration, it can lead to inflammation of the neck's ligaments, muscles, and nerves, resulting in permanent arthritic changes [1,3,7,8]. It can also result in flattening of spinal curvature, disc compression, arthritis, disc herniation, spinal misalignment, spinal degeneration, etc [1,9]. Dependence on mobile phones is increasing rapidly, and prolonged use has led to various musculoskeletal issues [5,6,10]. This study will help create awareness of text neck syndrome because neck pain is a significant and widespread health problem. The literature on text neck syndrome is lacking. Therefore, this study will help gain insight into this disease and its perception among people. Smartphone devices have evolved rapidly in functionality and distribution over the past two decades [11]. Smartphones combine the standard mobile phone features with other personal digital assistance functions, large displays, desktop synchronization, motion sensor, voice recognition, touch screen, capturing high-quality photos, third-party applications known as "apps," including internet browsing, accessing email, and global positioning system (GPS) navigation [12]. Behavioral addiction is widespread today, including impulse buying, internet addiction, eating disorders, and gambling [13]. Previous studies proved that using electronic devices that involve frequent use and movement of the thumb results in a higher prevalence of musculoskeletal disorders [14-16]. Smartphones have significant applications in medical education, enabling doctors and students to access resources that support better decision-making in patient care [17-20]. Besides its benefits, overuse can result in various physical effects, including neck and wrist pain, sleep disturbance, and anxiety [21,22]. The present study was done to check the prevalence and awareness of text neck and thumb text syndrome in the young adult population and also to study the effects of overuse of the thumb when sending text messages, and to compare the effects of text-neck and thumb-text syndrome among frequent and less frequent mobile phone users.

MATERIALS AND METHODS

An observational cross-sectional study with a sample size of 200 Volunteers aged 18-25 years, who used mobile phone in the last 5 years. The IEC has approved this study (Ref no.: VMKVMC&H/IEC/21/132). The sampling method used was convenient sampling. The survey was conducted on the population living in and around Salem, Tamil Nadu. Each participant's consent was taken. A structured questionnaire was created, validated, copyrighted, and used in the study. The prevalence rate of text neck syndrome and thumb text syndrome was noted.

Sample Size

The sample size required for cross-sectional observational studies is estimated using the P = 92% response rate. The minimum number of participants for the study is 200 volunteers using mobile phones. Participants were divided according to their time on their mobile phones into high mobile users (Group A) and low mobile users (Group B). The low mobile phone users (Group B) use their mobile phones for less than 1 hour per day and less than 7 hours per week. Group A, who use mobile phones frequently, uses the mobile phone for more than 1 hour a day and more than 7 hours a week, including Internet surfing and texting.

Inclusion criteria: This group includes volunteers who have been using mobile phones for the past five years and are between 18 and 25 years old.

Exclusion criteria includes volunteers with congenital cervical problems and also participants with traumatic and pathological cervical problems, neurological problems, and hand/thumb malformations. A structured questionnaire was set. The questionnaire included questions on a) mobile phone use and awareness (Annexure 1) and b) the Text Neck Syndrome and Thumb Text Syndrome questionnaire (Annexure 2). The questionnaire was validated by a panel of experts and revised based on the feedback received. The final version of the questionnaire was used for the study. Descriptive statistics was performed to assess responses received from participants. The prevalence of text neck and thumb text syndrome was expressed as a percentage.

RESULT

Around 50.3% and 57.1% of participants were unaware of text neck syndrome and text thumb syndrome. Maximum mobile phone usage includes texting and talking. About 45.2% of the participants use their right thumb and index finger to text. 33% of people have a head-forward posture when using their mobile phones. An analysis of pain, discomfort, and duration of pain during mobile phone use was analyzed.

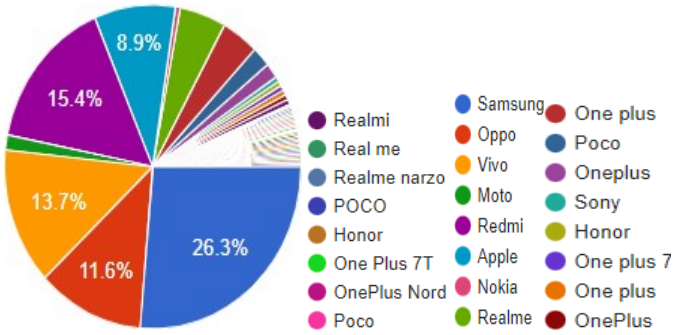

Figure 1: Mobile phones commonly used by participants.

The above figure shows that 26.3%of participants use Samsung mobile phones.

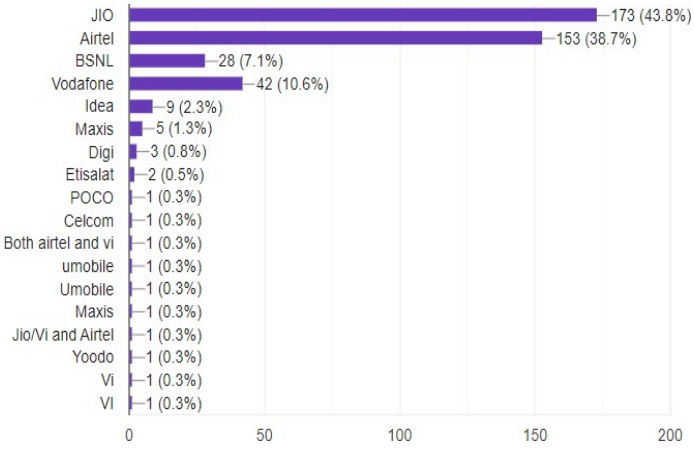

Figure 2: Service providers of participants

The above figure shows that 43.8% of participants use Jio, and 38% use Airtel network.

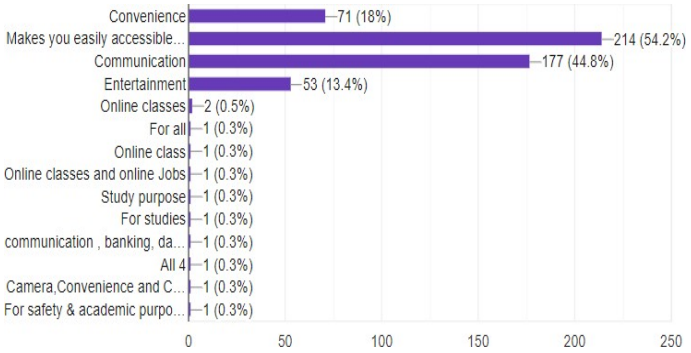

Figure 3: Participants reason for purchasing mobile phone

The above figure shows that 54.2% use mobile phones to make them easily accessible

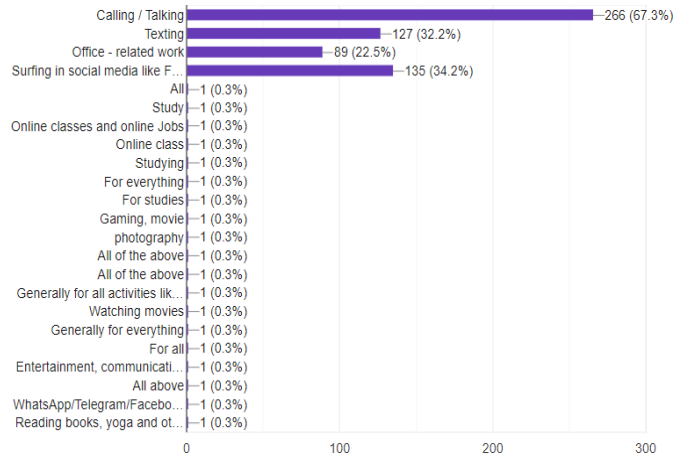

Figure 4: General usage of mobile phones

67.3% of participants use mobiles for making calls and talking, 34.2% for surfing social media & 32.2% for texting.

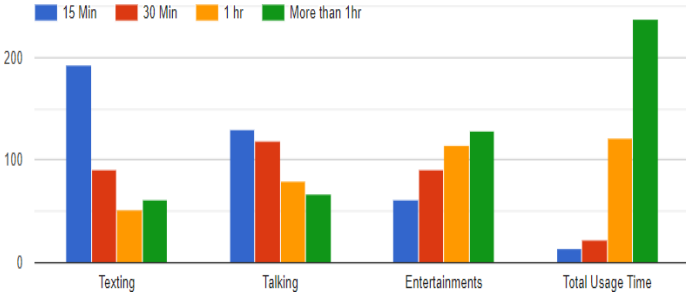

Figure 5: Duration of mobile phone usage in hours per week by participants

The above figure shows the usage of phones for texting talking and entertainments.

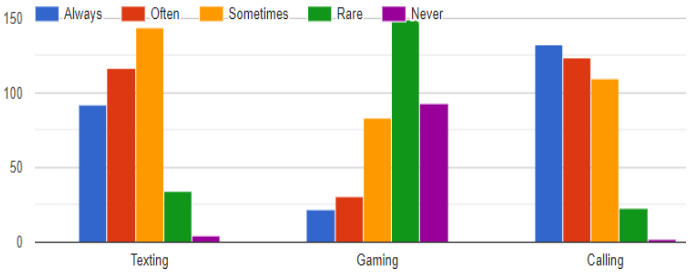

Figure 6: Usage of the phone for various purposes

The above figure shows that the maximum usage of mobile phones was for calling.

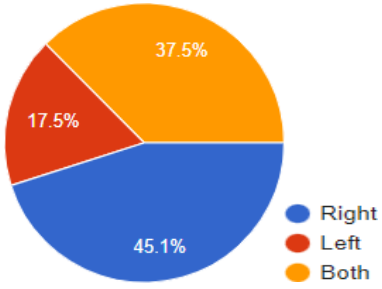

Figure 7: Hand used for holding the phone while texting

The right hand is more frequently used for texting than the left hand, as 37.5% of people use both hands for texting.

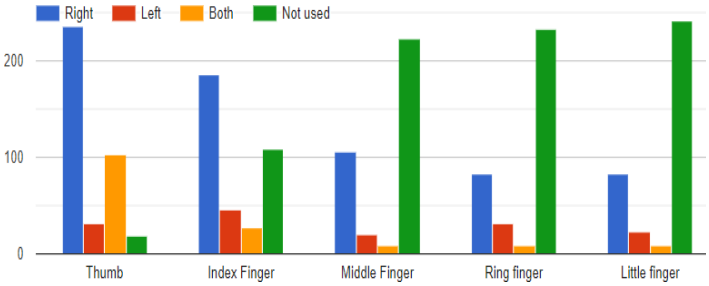

Figure 8: Fingers used for texting and gaming

The above figure shows the frequently used fingers for texting & gaming.

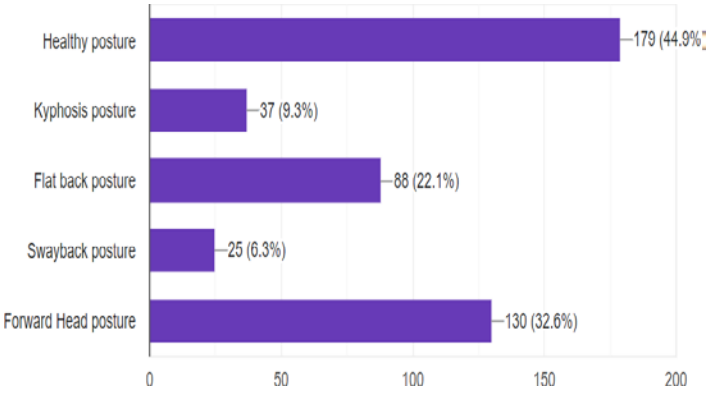

Figure 9: Posture adopted while using mobile phone

Around 44.8% of people use healthy posture, whereas 32.6% of people use forward head posture (unhealthy posture)

DISCUSSION:

The present cross-sectional study was done on participants who use mobile phones frequently. The study includes the low mobile phone users (Group B) who use their mobile phones for less than 1 hour per day and less than 7 hours per week. Group A, who use mobile phones frequently, use the mobile phone for more than 1 hour a day and more than 7 hours a week. Figure 1 shows that the most commonly used mobile phone was Samsung company among the users. The service providers include 43.8% of participants using Jio, and 38% using the Airtel network (Figure 2). Around 54.2% use mobile phones to make them easily accessible (Figure 3). 67.3% of participants use mobiles for making calls and talking, 34.2% for surfing social media, and 32.2% for texting (Figure 4). Figures 5 and 6 show the common usage of phones for texting, talking, and entertainment. The right hand was more frequently used for texting than the left hand, as 37.5% of people use both hands. The frequently used fingers for texting & gaming were thumb (Figure 7 & 8). Around 44.8% of people use healthy posture, whereas 32.6% use forward head posture (unhealthy posture) (Figure 9). A cross-sectional survey was conducted in 2016 [23], with all study participants who own a smartphone and use it for more than 2 hours a day. Individuals with a history of hand surgery or inflammatory arthritis were excluded.

Table 1: Right-Hand Thumb Discomfort

		Right Hand Area A (shaded area) 	Right Hand Area B (shaded area) 	Right Hand Area C (shaded area) 
Experience of aches, pain, and discomfort in the shaded area **(Frequency)**	Never	75.7%	77.4%	81.2%
	1–2 time last week	17.8%	17%	11.8%
	3–4 time last week	2%	1.8%	3.3%
	Once every day	3.3%	2.3%	2.5%
	Several times every day	1.3%	1.5%	1.3%
Uncomfortable (**Discomfort**)	Slightly uncomfortable	56.1%	52.3%	47.9%
	Moderately uncomfortable	5.2%	7.3%	7%
	Very uncomfortable	34.3%	3.6%	2.7%
	Not at all	4.4%	36.8%	42.4%
Interference in work **(Interference)**	Not at all	81.6%	80.8%	84.1%
	Slightly Interfered	17.5%	17.5%	14.4%
	Substantially Interfered	0.9%	1.8%	1.5%

Table 2: Left Hand Thumb Discomfort

		Left Hand Area A (Shaded area) 	Left Hand Area B (Shaded area) 	Left Hand Area C (Shaded area) 
Experience of aches, pain, and discomfort in the shaded area **(Frequency)**	Never	85%	84.2%	87.5%
	1-2 time last week	9%	10%	8.5%
	3-4 time last week	2.5%	2.8%	0.8%
	Once every day	2.8%	2.3%	2.8%
	Several times every day	0.8%	0.8%	0.5%
Uncomfortable (**Discomfort)**	Slightly uncomfortable	50.8%	48.8%	50.5%
	Moderately uncomfortable	7.3%	8.6%	4.7%
	Very Uncomfortable	2.1%	2.8%	2.5%
	Not at all	39.1%	39.8%	42.1%
Interference in work **(Interference)**	Not at all	83%	83.6%	86.3%
	Slightly Interfered	16.7%	15.5%	13.4%
	Substantially Interfered	0.3%	0.9%	0.3%

Table 3: Neck Discomfort

		Neck Discomfort
While texting in a Mobile Phone, how often did you experience aches, pain, and discomfort in the neck: - **Frequency**	Never	48.9%
	1-2 time last week	30.8%
	3-4 time last week	7.5%
	Once every day	8.5%
	Several times every day	4.3%
If you experienced ache, pain, discomfort in neck, how uncomfortable was this? **Discomfort**	Slightly Uncomfortable	57.8%
	Moderately Uncomfortable	18.5%
	Very Uncomfortable	5.1%
	Not at all	18.5%
If you experienced ache, pain, discomfort in neck, did this interfere with your ability to work? **Interference**	Not at all	58.5%
	Slightly Interfered	37.5%
	Substantially Interfered	4%

Table 1 shows the percentage of frequency, discomfort, and interference of right-hand thumb discomfort in the shaded areas. Table 2 illustrates the percentage of frequency, discomfort, and interference of left-hand thumb discomfort in the shaded areas. Table 3 shows the percentage of frequency, discomfort, and interference of neck discomfort.

A shortened version of the Smartphone Addiction Scale (SAS-SV) Questionnaire was tested using Cronbach and confirmatory factor analysis. SAS-SV was used to group the participants into smartphone-dependent or non-dependent groups based on their scores [24]. Wrist pain was assessed using the patient-grade wrist and hand score (PRWHE-A) [25]. The scoring system is calculated by adding the functional scores and dividing by 2, then adding the pain scores to get 100 points [26]. Lower scores indicate better function and less pain. The Finkelstein test was performed for those with pain in their dominant thumb or wrist [26-29]. Similar to the above present study was done by scoring system for thumb (Table 1 & 2). The percentage of frequency, discomfort, and interference of left- and right-hand thumb discomfort was significant.

Text neck is repetitive strain injury and pain resulting from excessive viewing and texting on handheld devices for long periods. Dependence on mobile phones is increasing rapidly, and prolonged use is leading to musculoskeletal problems. Various studies show perceptions of text neck syndrome and the dangers of excessive phone use [30]. In recent years, advanced touchscreen cells have replaced most keyboard cell phones due to their flexibility and versatility. The same number of people keep their necks bent using hands-on devices: constant neck and shoulder pain [31]. Most mobile phone users must intentionally look down or stretch their arms forward to read the screen. This pushes the head forward, excessively flexing the lower cervical spine and unnecessarily flexing the upper thoracic spine backward. It maintains balance and supports the weight of the cervical spine and neck muscles [32]. The percentage of frequency, discomfort and interference of neck discomfort was shown in the table 3 in the present study. Neck posture was assessed using members' self-awareness and physiotherapist judgment during cell phone messaging [33]. This problem is more of a problem for children, who have larger heads relative to body size than adults and are more at risk because they tend to use mobile phones. An untreated neck can result in virtually permanent damage, similar to verbal abuse disorders and recurrent pressure ulcer/strain pain.

Approximately 50.3% and 57.1% of participants were unaware of text neck and thumb syndrome. Maximum mobile phone usage includes SMS and calls. Approximately 45.2% of participants use their right thumb and index finger to type text. 33% of people use the head-to-front position when using their mobile phone. The present study's overall discomfort score was as follows: NDI – 34.26 (37.40) and CTDQ – 24.18 (26.39).

CONCLUSION

The prevalence shows that necessary strategies for pain management have to be planned in future and awareness has to be created among the users. Yoga therapy with various asnas like Vajra asnas, Urdhva Baddha Anguliasana, Namaskarasana can be used to overcome the effects. Stretch Exercises - Make a fist, finger stretch, claw stretch, grip strengtheners, pinch strengthens etc., can be much beneficial if practised regularly to relieve the syndrome. The present study was done as a survey analyzing the discomfort and pain. The study was planned to be extended further to rule out the musculoskeletal deformities using EMG, and relevant yoga therapy and exercise will be scheduled as an intervention to get relief from the text thumb and text neck syndrome.

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CONFLICT OF INTEREST

The authors declare no conflict of interest

AUTHOR CONTRIBUTION

Senthil Kumar B had drafted the work and prepared the required questionnaire, and collected the data. Kouser Banu Khaleeluddin, Saikarthik Jayakumar, K. Ezhil Vendhan corrected the content, performed the literature survey, and contributed to the manuscript's design. All the authors designed the final manuscript.

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