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Original Research Article

Text neck: a modern concern

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ABSTRACT

Background: Nowadays, the mobile phone is the most popular and widely used device for various daily activities. Text neck used to describe neck discomfort and injury of upper back muscle which is caused by the frequent forward bending of neck at various angles, while staring down at a mobile phone. This should consider as "pain of the modern era" since it is caused by modern-era gadgets. The text neck syndrome is a growing health concern and has the potential to affect millions of people all over the world. The objectives of the study were to assess the burden of text neck syndrome and to find out the effect of neck disability on daily activities.
Methods: A cross sectional study was conducted among adults aged between 18-50 years from the general population using neck disability index questionnaire to gather information on how neck pain affected one's ability to function in everyday life.
Results: Out of 691 responses, 95.8% were the mobile phone uses and 36.2% were on mobile phone for 5-7 hours per day. 27.4% were experiencing the mild neck pain. 45.6% of respondents reported mild text neck disability, 14.5% reported moderate, 3% reported severe and 0.4% reported complete text neck disability, and 36.5% did not suffer text neck disability.
Conclusions: A person's life is incomplete without mobile phones, so that timely interpretation and interventions along with good knowledge about postural correction will be the key entities to deal with text neck syndrome.

Keywords: Neck Disability, Neck pain, Pain of modern era, Smart phones, Text neck

INTRODUCTION

Nowadays, the mobile (smart) phone is the most popular gadget and widely used device for various daily activities such as exchanging information, accessing the internet, watching movies, using social media sites, gaming, and a variety of other activities.[1] A study revealed that about 79% of the population in the age group 18-44 years have a smartphone with them most of the time.[2] Those who were constantly engaged to their phones may suffer from worry, stress, panic disorders, and various other psychological illnesses. Apart from these psychological disorders, individuals may suffer from many physical disorder and text neck syndrome is one of the major problems among them.[1]

The term "text neck'' was first coined by an US chiropractor Dr. Dean L. Fishman. This term is used to describe neck discomfort and injury of upper back muscle which is caused by the frequent flexion of neck at various angles, while staring down at a mobile phone which alters the normal curve of the cervical spine. Because it is brought on by modern-day gadgets like cell phones, computers, and other smart devices, text neck syndrome ought to be referred to as the "pain of the modern era" and it causes acute to chronic pain in the neck and upper back area.[3] The weight made over the spine increases on flexing the neck at various degrees. A report shows that when the head is flexed 15 degrees, the forces acting on the neck are 27 pounds, 40 pounds when the neck is flexed 30 degrees, 49 pounds when the neck is flexed at

45 degrees, and 60 pounds when the neck is flexed at 60 degrees; the model prediction at 90 degrees is not accurate.[4]

In order to read the screen on a smartphone, most tasks require users to look down sharply or hold their arms out in front of them. This forces the head to move forward, creating an excessive forward curve in the lower cervical vertebrae, and an exaggerated posterior curve in the upper thoracic vertebrae in order to maintain balance, putting strain on the neck muscles and cervical spine.[4] The cervical spine is a continuous and coordinated network of muscles, nerves and joints, the pathway ranging from the brain to the spinal cord. Irritation along this pathway leads to pain. A recent systematic review done in Hong Kong suggests that prevalence of musculoskeletal problems with mobile phone usage are high ranging from 17.3% to 67.8% for neck complaints.[6]

A recent Thailand study reveals that text neck syndrome is now a global epidemic that affects a large number of mobile phone users of all ages. Text neck syndrome is a growing health concern and can affect large number of populations all over the world.[6] If text neck is not treated or corrected in right time it can lead to serious permanent damage and can result into overuse syndrome or repeated stress injury. Text neck can cause permanent arthritic changes to the muscles, ligaments, and nerves of the neck if left untreated for a long time. It may also lead to some serious damage, such as flattening of the spinal curve, early onset of arthritis, spinal misalignment, spinal degeneration, disc compression, disc herniation, etc. As the dependence of mobile phone is increasing rapidly and people spend long hours on mobile phone which lead to various musculoskeletal problems.[6]

Thus, this study will help us gain knowledge regarding this condition and its burden of text neck syndrome amongst the population effects of neck pain on daily routine activities. The main objectives for the study include assessing the burden of text neck syndrome and to find out the effect of neck disability on daily routine activities.

METHODS

A cross-sectional study was conducted amongst the adults aged from 18 to 50 years in Bhopal, Madhya Pradesh for 3 months duration in the year 2021-2022. The sample size was 691 participants selected using convenient sampling technique ($N = 4pq/l^2$).

Inclusion criteria

Participants who were adults aged between 18-50 years, those who are using android mobile (smart) phones were included in the study.

Exclusion criteria

Those who did not give the consent, those who were not using android mobiles, mobile phone other than androids, those who had previous history of an accident or severe injury of neck region, and participants with musculoskeletal disorders were excluded from the study.

A semi structured questionnaire tool containing the basic socio demographic details, detailed history of electronic gadgets usage, and with neck disability index (NDI) questionnaire was used for the data collection. Neck disability index contains 10 questions includes pain intensity, personal care, lifting, reading, head ache, concentration, work, driving, sleeping, recreation. Each section in NDI is scored on a 0 to 5 rating scale, in which zero means 'no pain' and 5 means 'worst imaginable pain'. Points summed to a total score. The NDI can be scored as a raw score or doubled and expressed as a percent. (score: /50 transform to percentage score x 100 = %points); 0 points or 0% means: no activity limitations, 50 points or 100% means complete activity limitation. A higher score indicates more patient-rated disability. 0-4 points (0-8%) no disability, 5-14 points (10-28%) mild disability, 15-24 points (30-48%) moderate disability, 25-34 points (50-64%) severe disability, 35-50 points (70-100%) complete disability.

After the approval from institutional ethics committee, the study was carried out. Consent was obtained from all the study participants. Confidentiality was maintained, and no financial costs were borne by the participants.

Statistical analysis

Data was entered in to Microsoft Excel which was analyzed using Epi Info software. Descriptive analysis was done in the form of mean and standard deviations or proportions wherever appropriate.

RESULTS

Table 1 shows the sociodemographic details of the study participants. The maximum (50%) of study participants was of 21-25 years of age, followed by 30% from age group 16-20 years and 9.4% from age group 26.30 years and mean age of the study participants was 23.63±6.14 years. 53.3% were males and 46.7% were females participated in the study. Most of the participants were graduates (86.1%) and were students (70.2%).

Figure 1 shows that most of the study participants used mobile phones (95%).

Figure 2 shows the hours spent on gadgets amongst study participants where most of them were on for 5-7 hours (36%), and followed by 3-4 hours (29%).

Table 1: Socio-demographic distribution of the participants (n=691).

Variable	Sub-variable	Frequency	Percentage
Age groups (in years)	16-20	208	30.1
	21-25	346	50.1
	26-30	65	9.4
	31-35	33	4.8
	>35	39	5.6
Gender	Male	368	53.3
	Female	323	46.7
Education	Higher secondary school	59	8.5
	Graduates	595	86.1
	Post-graduates	37	5.4
Occupation	Unemployed/housewife	41	5.9
	Students	485	70.2
	Medical professionals	54	7.8
	Engineers	30	4.3
	Teachers	22	3.2
	Laborers	26	3.8
	Others[$]	33	4.8

[$]Others- Chefs, business professionals, bank managers, police personnels, architecture, data analysts

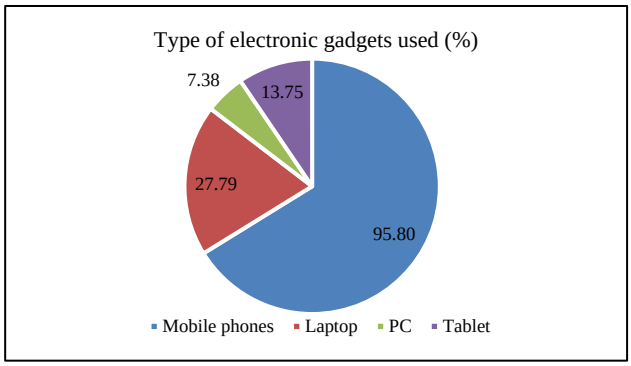


Figure 1: Types of gadgets used amongst study participants (n=691).

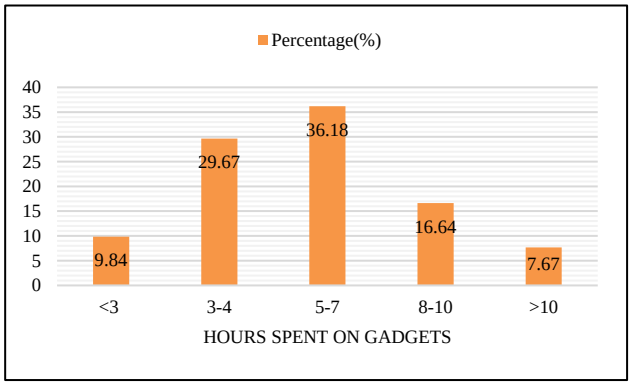


Figure 2: Hours spent on gadgets by study participants (n=691).

Table 2 describes the various factors for the using the gadgets amongst the study participants. The common posture adopted while using the gadgets were sitting (76.8%), and followed by lying on bed (56.15%). The usual purpose on using the gadgets were of educational use (83%), followed by social media platforms (75%) and of entertainment purpose (67%). Various symptoms were complained by study participants experienced other than neck pain which were eye strain/pain (48%), headache (45%), and lack of concentration (40%). Other complaints were sleep disturbances, back pain, weakness, anxiety, hand/arm pain and ear pain.

Table 2: Details regarding the gadgets used by study participants (n=691).

Variable	Sub-variable	Frequency	Percentage
Posture preferred during use of gadgets#	Sitting	531	76.85
	Lying on bed	388	56.15
	Standing	86	12.45
Common purpose on using the gadgets#	Educational	574	83.07
	Social media	520	75.25
	Entertainment	468	67.73
	Browsing	334	48.34
	Occupational	194	28.08
	Gaming	166	24.02
Other symptoms experienced among gadgets users#	Eye strain/pain	333	48.19
	Headache	317	45.88
	Lack of concentration	279	40.38
	Sleep disturbance	259	37.48
	Back pain	256	37.05
	Fatigue/weakness	191	27.64
	Anxiety	152	22.00
	Hand/arm pain	125	18.09
	Ear pain	79	11.43

Multiple responses

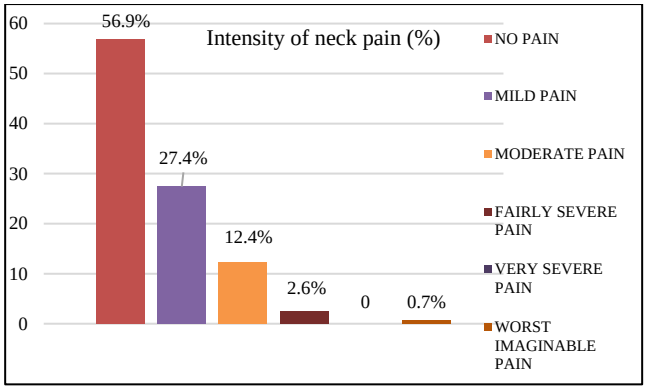


Figure 3: Intensity of neck pain experienced by study participants (n=691).

Figure 3 depicts the neck pain intensity experienced by study participants as maximum experienced no pain (56.9%), and followed by mild pain (27.4%).

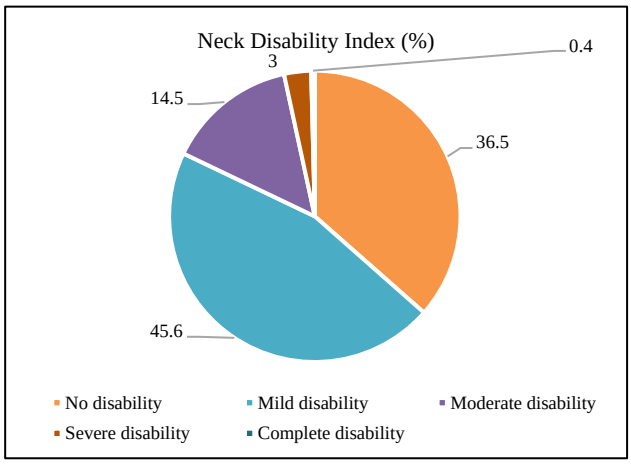


Figure 4: Neck disability index scoring of the study participants (n=691).

Figure 4 depicts the neck disability index scoring of the study participants, around 45.6% had mild disability, 14.5% had moderate disability, followed by 3% had severe disability and little 0.4% had complete disability. About 36.5% of participants had no disability in the study. Median score was 7 for the NDI score.

DISCUSSION

Maximum (50%) of study participants was of 21-25 years of age. Almost half were males and females respectively. Majority were graduates (86.1%) and followed by students (70.2%). According to study by Kumari et al around 73.4% students were from age group 18-24, 16% were from age group 25-34, 8.5% were below 18, and 2.1% were from age group 35-40.[1] Around 61.7% were females and 38.3% were males. In our study the results showed around 95% used mobile (android) phone which is similar to the study observed by Lee et al described almost 99.07% were smartphone users.[7]

The hours spent on mobile phones amongst participants were on for 5-7 hours (36%), and followed by 3-4 hours (29%) which is almost similar to study by Kumari et al showed that about 39.4% spent 5-7 hours a day on mobile phones followed by 27.7% spent on around 3-4 hours a day.[1] Almost similar to study reported by Ahmed et al around 35.4% used smartphone followed by 27.5% used it for more than 5 hours.[2] According to Samani et al also showed similar findings that 42% population uses phone for 2-4 hours in a day, 27% population uses phone for 4-6 hours and 20% population uses phone for more than 6 hours in a day.[6] According to study by Kim et al, around 42% used smartphone more than 4 hours, followed by 25% for 2-3 hours.[8]

Sitting (76.8%) was the usual posture adopted on using mobile phones, where the common purpose on using were of educational use (83%), followed by social media platforms (75%) and of entertainment purpose (67%). The common complaints were eye strain/pain (48%), headache (45%), and lack of concentration (40%). Similar findings were observed by Kim et al as 40% adopted sitting posture while using smartphones, followed by 34.9% lying on the back, and 10% were standing.[8] Those who use smartphones whilst sitting and lying on their back had a relatively high complaint rate. A similar study by Kim et al, around 42.5% used smart phone for chatting purpose, followed by 38.2% for searching purpose, 12.5% for playing games, was also found that those who use smartphones for searching the internet and chatting had the highest complaint rate.[8] Kim et al also observed about 42.1%, felt pain in their eyes, 54.8% felt in shoulders, 19.2% felt in arms, 19.2% felt in hands, 27.1% felt in wrists, 19.9% felt pain in fingers, 29.8% felt pain in waist, and 9.6% felt pain in their legs and feet.[8]

In our study the intensity of neck pain experienced by participants as maximum experienced no pain (56.9%), and followed by mild neck pain (27.4%). According to study by Kumari et al showed almost similar findings that 36.2% reported moderate neck pain, 27.7% reported mild pain, 9.6% reported severe pain, 2.1% reported extremely severe pain, and 1.1% reported the worst pain ever experienced.[1] Almost similar to study reported by Ahmed et al that around forty-six percent of the population reported having pain during prolonged smartphone use.[2]

Around 45.6% had mild disability, 14.5% had moderate disability, followed by 3% had severe disability and little 0.4% had complete disability as per neck disability index among the participants. About 36.5% of participants had no disability in the study. According to study by Kumari et al showed almost similar findings that 36.4% of respondents reported a mild disability, 36.0% having no disability, 23.4% reported moderate disability, and 2.1% reported severe, and 2.1% reported complete disability.[1] Almost similar to study reported by Ahmed et al where around 31.9% had mild disability, 8.8% had moderate disability and 1.8 and had severe disability.[2]

CONCLUSION

As in the era of technology, when most people used mobile (smart) phones as their primary device for 5-7 hours daily, mostly for educational purposes. Almost half of them had mild neck disability. Positive association was observed between gender and neck disability and also between hours spent on smart phones and neck disability. Awareness of proper posture, regular breaks from device use, and exercise to strengthen the neck and upper back muscles are crucial in preventing and managing text neck syndrome which is a modern-day ailment. It is essential to address this issue promptly to avoid further health complications and maintain a healthy lifestyle in the digital age.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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