RESEARCH ARTICLE

CORRELATION OF SMARTPHONE ADDICTION WITH TEXT NECK SYNDROME DURING COVID-19 PANDEMIC

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Received on: *27-03-2022*
Revision on: 06*-12-2022*
Published on: *31-12-2022*

Citation
Shamsi RF, Sadeeqa A, Khan AA, Khan FM, Saeed A, Sheeraz SN. Correlation of smartphone addiction with text neck syndrome during covid-19 pandemic. T Rehabili. J. 2022:06(04);442-445
soi: 22-2017/re-trjvol06iss04p442
doi: https://doi.org/10.52567/trj.v6i04.148

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ABSTRACT

Background: Smartphones pervasiveness has captured people with the ability to search for information, communicate more easily, and make our day-to-day jobs easier. On the other hand, excessive smartphone use can also lead to serious musculoskeletal consequences including neck pain and disability. **Objective:** To determine the correlation of Text-Neck-Syndrome with smartphone addiction during the COVID-19 pandemic. **Methods**: The cross-sectional study was conducted on n=500 participants of both genders between 20 to 30 years olds. The study population were assessed for text next syndrome with Neck disability index, and neck pain on Visual analogue scale (VAS) and Smartphone addiction scale short version (SAS-SV) to find problematic smartphone usage. The spearmen test was used to determine the correlation between the Text neck syndrome and smartphone addiction during Covid-19 pandemic. **Results:** The mean age of the participants was 22.8±2.47 years. A total of n=418(83.6%) were female and remaining n=82(16.4%) was male participated in the study. The results showed that there is significant mild to moderate positive significant correlation ($p<0.05$) between individual item and total score of SAS-SV with pain and neck disability. **Conclusion:** It was concluded that the excessive use of smart phone during COVID 19 caused neck pain and related functional impairment.

Keywords: Addiction, neck disability, neck pain, text neck syndrome, VAS

INTRODUCTION

Smartphone addiction has become more prevalent than ever since its up gradation from mere "mobile phones" to smart phones. In the recent years these portable devices cater to every technological need an individual could require like camera, e-mail, navigating systems and the internet which has made the world a global village[1]. The smartphone has become a pivotal part of everyday life, and studies show that on an average, majority of people spend 10 to 14 hours on smartphones every day. This has led to increasing addiction to their smartphones. Smartphone addiction not only brings behavioural and mental changes but leads to number of problems like stress, restlessness, social anxiety and affects the musculoskeletal health also which is tightly tied with neck pain and back pain which has become more prevalent in the COVID 19 pandemic[2].

A forward head posture is responsible for increasing load on muscles and the joints of the neck area and in the long can link to chronic pain, fatigue and musculoskeletal disorders[3]. The usage of smartphones and its association with neck pain is prevalent among different age groups in the society. A study conducted on office workers in 2020 concluded that the 30.1% of neck pain is associated with the use of smartphone. Women reported neck pain more frequently (43%) as compared to (30%) in men[4]. When surveyed, approximately 70% of people reported to have experienced neck pain in their life[5].

Text neck syndrome is a common neck disorder which is prevalent among smartphone users. Typical features of text neck syndrome refer to neck soreness, stiffness and when the neck leans forward for a long period. This kind of position is typically adapted when looking at a smartphone screen for the purpose of instant messaging or viewing social updates[6]. A constant flexion neck angle of 45 - 60-degree, places a weight of 50 to 60 pounds on the cervical spine, which is far from normal i.e. 10 to 20 pounds in a neutral position.

This causes muscles to contract and become tight over time, hence, interfering with the body's normal musculoskeletal system. Once the condition becomes chronic, most people become use to of the neck pain that they have a feeling of constant nagging pain in the neck region and shoulders and so only feel the difference once the neck is retracted to its normal neutral position. As compared to previous studies, this study was conducted during the COVID-19 pandemic when the primary mode of entertainment or education was via smart devices like smartphones and thus the number of hours spent using smartphones was significantly more in comparison to the latter

studies. The current study was conducted to identify the correlation between text neck syndrome and smartphone addiction and to raise awareness regarding text neck syndrome.

METHODOLOGY

The cross-sectional survey was conducted from February 2021-2022. A total of n=500 participants were included in the study. The participants of both genders, with the age group of 20-30 years, using smartphones for more than 6 months, willing to participate in the study, had neck pain from the past 7 days and had normal activity levels were included. The participants who had fractures in the neck and shoulders, had any kind of deformity, blind, handicap, unable to complete questionnaire, occupation related overuse or those who didn't want to answer the questionnaire were excluded. A non-probability convenience sampling technique was used to collect data via online Google questionnaire and in-person at the Riphah International University. The study was approved by the ethical committee at Riphah international university RIPHAH/RAHS/DPT (G)/LETTER-0968. After taking the written informed from the participants, the data was collected through the neck disability index (NDI), a condition-specific functional status questionnaire consisting of 10 items which include personal care, lifting, headaches, work, sleeping, recreation, driving, reading, concentration and pain. The test is interpreted by a raw score of 50 with 0 contributed to no activity limitation and 50 interpreted as complete activity limitation. This tool was used for neck pain and disability (Cronbach'α= 0.95)[7]. The smartphone addiction scale short version (SAS-SV) is a validated scale, contains ten items rated on a dimensional scale (1 "strongly disagree" to 6 "strongly agree"). The total score ranges from 10 to 60, with the highest score being the maximum presence of "Smartphone addiction" in the past year. (Cronbach'α= 0.94) questionnaire measures the degree of addiction to smartphones includes questions regarding daily-life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse, and tolerance[8]. The visual analogue scale (VAS) was used to measure the intensity of pain. The amount of pain felt by a patient range from across a continuum from no pain at 0 to worst possible pain at the mark of 10 on the scoring scale. The scale measures the intensity of frequency of various pain symptoms. The reliability was found to be 0.94 whereas the validity was 0.99[9].

The demographics of participants such as name, age, gender, hours of mobile phone use, mobile weight, neck angle while using the phone and pain after COVID 19 due to smartphone use were also included in the questionnaire and presented in the form of frequency, percentages, mean±sd etc. To determine the correlation between the smartphone addiction during Covid-19 pandemic and Text neck syndrome (pain and disability), spearmen rank test (r_s) was applied as the individual items of SAS-SV were on ordinal scale and the total score was also not normally distributed. The SPSS version 21 was use for data analysis.

RESULTS

The mean age of the participants was 22.8±2.4[7] years. A total of n=418(83.6%) were female and remaining n=82(16.4%) was male participated in the study. Other detail of demographic can be seen in table 1

Table 1: Demographics of the study

Variables	Sub-Variables	n(%)
Experienced Neck Pain After COVID-19	Yes	276(55.2%)
	No	224(44.8%)
Mobile Weights	194 grams	110(22.0%)
	170-190 grams	276(55.2%)
	200 grams	114(22.8%)
Duration Of Smart Phone Usage	1-3 hours	57(11.4%)
	3-5 hours	218(43.6%)
	5-10 hours	225(45.0%)
Neck Angle While Using Mobile	15 degrees	194(38.8%)
	30 degrees	180(36.0%)
	45 degrees	103(20.6%)
	60 degrees	23(4.6%)

The results showed that there is significant mild to moderate positive significant correlation ($p<0.05$) between individual item and total score of SAS-SV with pain and neck disability. While one item of SAS-SV "never give up smart phone" has not significant correlation ($p=0.087$) with pain. (Table 2)

Table 2: Correlation of SAS-SV with NDI and VAS

		NDI		VAS	
	Mean±SD	25.18±7.02		3.58±2.0	
		r-value	p-value	r-value	p-value
Missed planned work	3.31±1.60	0.313	0.00***	0.106	0.018*
Hard Concentrating in class	3.30±1.64	0.289	0.00***	0.185	0.00***
Pain in wrist or back	3.38± 1.65	0.298	0.00***	0.128	0.004**
Wont able to stand	3.16±1.73	0.138	0.00***	0.227	0.00***
Feeling impatient and fretful	3.17±1.63	0.285	0.00***	0.170	0.00***
Having smartphone in my mind	2.88± 1.61	0.335	0.00***	0.141	0.002**
Never give up using smart phone	2.94± 1.65	0.291	0.00***	0.077	0.087
Constant checking	3.20± 1.70	0.237	0.00***	0.108	0.016*
Using smartphone longer	2.58±1.62	0.192	0.00***	0.202	0.00***
I use smart phone too Much	3.25±2.14	0.326	0.00***	0.198	0.00***
Total Score (SAS-S)	32.15±10.68	0.410**	0.00***	0.429	0.00***

level of significance: p<0.05, p<0.01**, p<0.001****

DISCUSSION

The present study provides an insight into smartphone addiction and it's correlation with text neck syndrome being investigated during the COVID19 pandemic. The results showed statistically significant correlation of text neck syndrome with smartphone during the COVID-19 pandemic.

In a study, Van Dyck[10] found a consistency in smartphone and computer users who spent 43.57, (46.57%) time on an average using the internet. This study was conducted in a time when there was no COVID-19 pandemic. A significant increase in the usage of smartphones during the COVID 19 pandemic can be found in our study which shows the usage of internet on the phones between 5 to 10 hours (46.4%) in a day. The 20.8% of our study population reported to have used their smartphones longer than intended which is in line with a study previously done in Denmark where the usage of smart devices plunged to 185% during the lockdown. This signifies the trend towards smartphone addiction which can be seen prevailing during the COVID 19[11].

The possible reasons for neck pain are likely linked to prolonged sitting hours. When sitting in a work position, it can lead to sciatic load onto the muscles of the neck. This in turn induces biomechanical strain thus leading to an increased muscle tone. There are also plausible interrelations of neck position, rotation and sitting position which in the long run leads to neck pain[12].

Neck pain may also lead to ADL inconveniences such as intense neck pain can prevent individuals working for long number of hours or when driving. According to a study by Ehrlichand George the forward leaning posture, pimps, racer's or multi tasker postures are common postures which drivers acquire while driving 18% frequency of neck pain among drivers in another study[13].

In our research, neck angle was assessed in smartphone addicts, and 36% participants reported using their phones in a 30 degree neck angle and literature reported such flexed neck postures are a well-known cause of neck pain[14]. When the neck is in flexion angle of more than 45 degrees for more than 5% of the usual time spent on a smart device, the risk of neck pain markedly increases. Even if the neck is flexed more than 20 degrees than its usual neutral position, for more than 40% of the time while using a smartphone to work, the neck pain can exaggerate rapidly[15]. These stats are in line with our study where 141 participants have reported at least slight neck pain and 36% having used their phones at an angle of 30 degree.

A research conducted in India to investigate the correlation of smartphone addiction with text neck syndrome and SMS thumb, the results showed a significant positive and moderate correlation of NDI and smartphone addiction ($p<0.001$, $r=0.671$)[16]. In accordance with the previous study, the correlation of text neck syndrome with smartphone addiction in a recent study also presented positive mild to moderate correlation of smartphone addiction with NDI ($p<0.001$, $r=0.326$) with values ranging from 0.37- 0.192, these values are statistically significant in proving the correlation of these two variables. Individuals who used their smartphones for longer hours reported mild to moderate neck pain which was experienced during the lockdown.

A recent study reported that longer duration of cell phone usage leads to pain in neck region which is in accordance with the previous study of Parasuraman et al. a study reported that the use of

phone for 5 hours or more is a reason of pain and compromised function[17]. Also, in this study participants spending time on their smartphone for 5 to 10 hours a day, reported neck pain of mild moderate to severe. Neck flexion in a sustained constant position for a significant amount of time could prove to be a risk factor in developing pain of the neck region[18].

The limitation of the study was a cross-sectional convenience sampling study, which only focused on university students, and data was limited due to the COVID-19 pandemic and thus it does not imply to the years outside the pandemic continuum. Also proper posture assessment tool wasn't used and many questionnaires were filled via Google questionnaire.

CONCLUSION

This study demonstrates that excessive use of smartphone may cause the neck pain and disability which saw a rise during the COVID 19 pandemic. This study highlighted the importance of awareness studies which should be conducted with emphasis on physical therapy, stretching exercises; proper neck pain assessment and diagnosis of text neck syndrome before individual becomes a victim to it.

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Disclaimer: None to declare.
Conflict of Interest: None to declare.
Funding Sources: None to declare.