ORIGINAL ARTICLE

ASSOCIATION BETWEEN SMARTPHONE ADDICTION AND NECK PAIN & DISABILITY AMONG UNIVERSITY STUDENTS; A CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction: The smartphone has become an important necessity in our daily life. It has many positive impacts; communication has made easy, daily utilities and health care services may be accessible through online services and mobile apps. On the other hand, it has negatively affected individuals as addiction to smartphones causes physical and mental health problems. Smartphone addiction leads to prolonged forward head posture, straining neck muscles and compressing spinal discs, which can cause chronic pain and musculoskeletal issues.

Material & Methods: This was a cross-sectional study and data was collected from 907 students from the universities of Rawalpindi/ Islamabad and Lahore. The study was conducted from February 2022 to June 2022. Visual Analogue Scale (VAS pain), Neck Disability Index Urdu version (NDI-U), and short version of the Smartphone Addiction scale (SAS-S) were used to analyze neck pain intensity, neck pain & disability and smartphone addiction respectively. Data were analyzed using SSPS version IBM- 21. Descriptive statistics were used in terms of mean, frequency, and percentages and the Pearson correlation coefficient was used to assess the relationship between smartphone addiction and neck pain & disability.

Results: Out of 907 participants, 38.7% were male and 61.3% were female, 21.25% were medical students, and 78.7% were non-medical students. The result of this study shows that a significant moderate association was found between SAS-SV and NDI-U ($r= 0.59$, $p<0.01$), SAS-SV and VAS pain ($r= 0.63$, $p<0.01$).

Conclusion: There is a moderate association between smartphone addiction and neck pain in university students. These results highlight the importance of awareness and preventative strategies among young smartphone users.

Keywords: Addiction, Disability, Neck pain, Smartphone.

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INTRODUCTION

The use of smartphones has become a necessity in daily life.[1-3] Smartphones are used for a variety of activities, including communication, internet access, social media, music, games, and work-related activities.[4] Due to its multidivisional applications, smartphone users are increasing day by day. Many smartphone users spent much of their time using smartphones, become addicted and neglect their tasks.[5,6] Smartphone addiction has potential negative influences on individual economic, mental and health status.[7] Individuals' financial, mental, and physical well-being may be negatively impacted by smartphone addiction.[8] The neck, shoulders, elbows, wrists, fingers, and back can all experience musculoskeletal discomfort as a result of extended and repetitive smartphone use. Neck pain from smartphone use often arises from prolonged

forward head posture, which strains cervical muscles and compresses spinal discs. [9-11]

Approximately 79% of people between the ages of 18 and 44 own cell phones.[12] In the USA, 87% of teens aged 14 to 18 have smartphones, while in the UK, 79% of teenagers aged 12 to 15 have smartphones.[13] Cell phones are now being used by 91% of adults.[13] In Pakistan, the prevalence of smartphone addiction among university students was reported to be 48% - 60% while in India mobile phone dependence among university students was reported to be 42.6% - 71.39%.[14] The previous research showed that 39.5% of people occasionally have pain during daily tasks, and 35.0% of smartphone users often experience neck pain while results also showed that the majority of people with neck pain spend more than three hours per day using their phones while seated at an angle of 30-45 degrees of neck flexion.[15] The result of previous studies showed that 38%-69% of university students in Pakistan reported neck pain.[16-19] Khattak et al reported that computer and cellphone use are two primary causes of neck pain.[17]

Neck pain and disability has emerged as substantial health problem. To raise awareness among the community, particularly students, it is crucial to establish a link between smartphone addiction and neck pain & disability. This study has been conducted on large scale to find out the frequency of neck pain and disability in smartphone users and the association between smartphone addiction and neck pain & disability among university students. This study might help enlighten the younger generations about the increasingly negative effects of addiction to smartphones.

MATERIAL AND METHODS

This was a cross-sectional survey and a total of 1000 university students from Rawalpindi, Islamabad and Lahore were recruited in this study through a convenient sampling technique from February 2022 to June 2022. Under- Graduate and Post-Graduate level students using smartphone were included in the study and Students with any other medical cause or a known condition that could lead to neck pain e.g. vertebral fracture, myelopathy, neck/brain surgery, infectious/inflammatory diseases, neurological deficits, Pregnancy, tumor, or other systemic diseases have been excluded.

The Margalla Institute of Health Sciences ethical committee approved the study, and each participant gave their written informed consent. Demographic data and participant characteristics were collected through a self-structured questionnaire while the Visual Analogue Scale (VAS pain), Neck Disability Index Urdu version (NDI-U) and short version of the Smartphone Addiction scale (SAS-S) were used to analyze neck pain intensity, neck pain & disability and smartphone addiction respectively. The VASpain is a 100 mm horizontal line with the phrases "worst possible pain" and "no pain" at either end. By placing a vertical mark on the portion of the horizontal line that best reflected their level of pain during the last week, students were asked to rate the severity of their neck pain. It has been demonstrated that the VASpain is a valid and reliable technique for assessing pain severity.[20]

NDI has ten items with six possible answers each that relate to pain severity, headache, attention, and various physical activities (lifting, personal care, recreation, work, driving, reading, and sleeping). Each item has a possible score ranging from 0 to 5. The maximum score that may be achieved is 50, which is also expressed as a percentage. A higher score indicates a greater degree of disability. It has been established that the NDI-U is a valid and reliable questionnaire for people who have neck pain.[21]

The SAS-SV is a well-validated tool used to determine the level of smartphone addiction and is derived from the original (long) version of the smartphone addiction scale.[22] There are 10 questions in this tool that includes aspects such as everyday life disturbance, pleasant anticipation, withdrawal, online relationship, overuse, and tolerance. Participants responded to each question on a 6-point scale, with 1 being the strongest disagreement and 6 being the

consensus (strongly agree). Scores of ≥ 31 and ≥ 33 denote smartphone addiction among males and females, respectively.[22]

Data were analyzed using SSPS version IBM- 21. Descriptive statistics were used in terms of mean, frequency, and percentages. The association between variables e.g. gender, qualification, discipline, duration of usage and neck pain was evaluated by using chi-square and the Pearson correlation coefficient was used to assess the relationship between smartphone addiction and neck pain & disability. The p-value < 0.05 was considered statistically significant.

RESULTS

A total number of 1000 participants were asked to fill out all the questionnaires distributed to them. Out of 1000 questionnaires, 93 has been excluded as they were not fulfilling the eligibility criteria of the study so a total 907 questionnaire have been analyzed in the study. The mean age of participants were 21.35±2.55 years. The other characteristics of participants are shown in Table 1.

Table 1 shows participant's characteristics and frequency of neck pain

Variables	n/ %	Neck pain n/ %		p-value
		Yes	No	
Gender				
Male	351/ 38.7	125/ 35.61	226/ 64.39	<0.05
Female	556/61.3	244/ 43.88	312/ 56.12	
Qualification				
Undergraduates	854/ 94.2	348/ 40.74	506/ 59.26	0.70
Postgraduates	53/ 5.8	21/ 40.38	32/ 59.62	
Discipline				
Medical	192/ 21.16	73/ 38.02	119/ 61.98	0.39
Non-Medical	715/ 78.83	296/ 41.39	419/ 58.61	
Duration of usage				
Less than 1 year	39/ 4.3	8/ 20.51	31/ 79.48	
1-3 year	195/ 21.5	60/ 30.76	135/ 69.23	< 0.01
3-6 year	293/ 32.3	122/ 41.63	171 /58.36	
More than 6 year	380/ 41.9	179/ 47.1	201/ 52.89	
Hours of usage				
Less than 1 hour	22/ 2.4	5/ 1.35	17/ 3.15	
1-3 hours	128/ 14.1	39/ 10.56	89/ 16.5	
3-5 hours	274/ 30.2	97/ 26.28	177/ 32.89	<0.01
5-7 hours	249/ 27.5	110/ 29.31	139/ 25.83	
More than 7 hours	234/ 25.8	118/ 31.97	116/ 21.56	
Smartphone users				
Addicted	565/ 62.29	273/ 48.31	292/ 51.69	<0.01
Non-addicted	342/ 37.71	96/ 28.07	246/ 1.93	

The result showed that 62% of participants were addicted to smartphone usage; females (61.5%) and Non-medical students (66.99%) were more addicted to a smartphone as compared to males (51.28%) and medical students (44.79%). Out of 907 respondents, 41% of participants reported neck pain in the last week. Females (43.88%) reported more pain as compared to males (35.61%). The mean values of NDI-U, VAS pain AND SAS-SV between smartphone addictions and non-addictions are shown in Table 2.

Table 2: Table showing the mean values of NDI, VAS pain AND SAS-SV for smartphone-addicted and non-addicted groups

	Addicted group (n=565)	Non- addicted group(n=342)
	Mean ± SD	Mean ± SD
NDI-U Range (0-50)	15.94±7.91	4.84±6.5
SAS-SV Range (10-60)	41.47±6.99	22.62±6.76
VAS (pain) Range (0-10)	2.03±2.3	1.00±1.79

The result of this study highlighted that those students who were using smartphones more than 6 years experienced more neck pain (47.1%). The result also depicted that students who used smartphones for more than 7 hours per day reported more neck pain (31.97%). The gender, duration of usage and hours of usage of the smartphone were found to be statistically significant contributing factors for developing neck pain however the qualification level and discipline (i.e. Medical/ Non-medical) showed non-significant association between smartphone addiction and neck pain& disability.

Among participants, 30 (3%) participants reported severe disability, 125 (14%) with moderate disability, 268 (30%) with mild disability and 484 (53%) with no disability as shown in figure 1. There is a significant positive moderate association found between SAS-SV and NDI-U (r= 0.59, p<0.01), SAS-SV and VAS pain (r= 0.63, p<0.01).

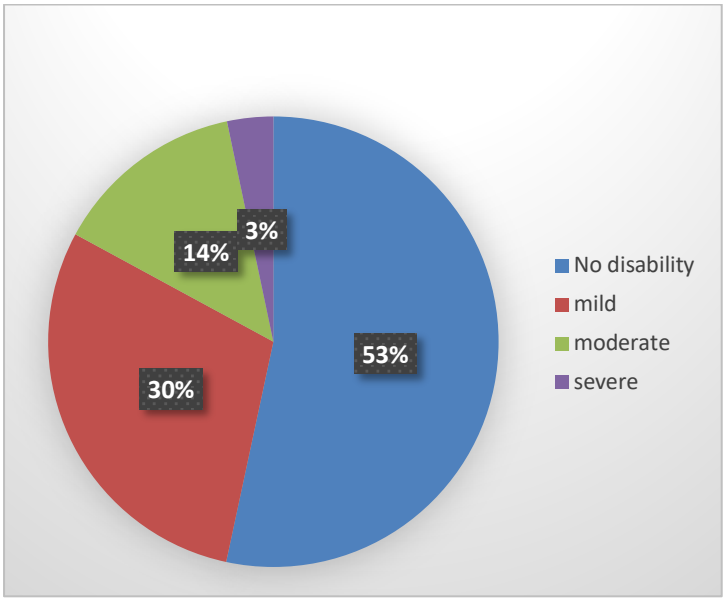

Figure 1: Level of disability among participants

DISCUSSION

The participant's average age in years in this study was 21.35±2.55, although the average age in other investigations ranged from 21.5 to 29.6 years.[15,17,23] In this study, there were 61.3% females and 38.7% males, previous researches likewise had a predominance of the female gender.[15,17,23] Females reported more neck pain than males in this study. The results of prior studies likewise show that women experienced more neck pain than men[17, 23, 24] except one study that is conducted by Alzaid et al reported more neck pain in males due to smartphone use.[25]

According to the study's findings, neck pain was experienced by more participants (31.97%) whose daily smartphone usage exceeded seven hours. While Khan et al reported that people used their phones on average for between 5 and 6 hours every day.[23] Nawaz et al. found that 39.5% of people experience neck pain during daily activities after using a cell phone for longer than three hours.[15]

According to this study, individuals who had used a smartphone for more than 6 years, experienced more neck pain. Participants in the earlier study who had been using their cellphones for longer than 5 to 6 years reported more neck pain.[23, 25, 26]

This study depicted that 62% of participants were addicted to their smartphones and experienced more neck pain (48.3%) than non-addicts (28.07%). The findings are in line with those of earlier research, which showed that between 23.7% and 55.8% of smartphone users complained of neck pain.[23, 26, 27] According to this study, smartphone

addiction was higher in female students (61.15%) and non-medical students (66.99%). According to the Alhadidi et al. study, 32.05% of individuals were addicted to their smartphones.[24] As reported by Khan et al, females are more likely to develop smartphone addiction.[23]

Participants' neck impairment is evaluated using the NDI-U. No disability was reported by 53% of participants, mild disability was reported by 30%, and considerable disability was reported by 14%. In the Khan et al study, 42.5% of patients had moderate neck disability[23], while 35% had a minor disability.[23] According to another study, the participants had a moderate impairment (32.2%).[15]

A significant positive moderate correlation between SAS-SV and NDI-U (r= 0.59, p0.01) and SAS-SV and VAS pain (r= 0.63, p0.01) was found in this study similarly shah et al. study also found a significant moderate correlation between SAS and NDI (r=0.671, p<0.001).[27]

The study's weakness is that convenient sampling technique limits the generalizability of results and secondly, self-reported questionnaires were employed in this study, so under- or over-reporting may be a concern. This study's findings indicated that the majority of smartphone-addicted students had neck pain; it is recommended that greater focus be placed on educating students about the need to limit smartphone usage to reduce the frequency of neck pain.

CONCLUSION

The study concluded that the majority of students who used their smartphones for an extended period experienced neck pain. Neck pain, disability, and smartphone addiction have all been proven to be significantly moderately correlated.

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