A Study to Correlate Smart Phone Addiction and Adult Hypertension Among Students of KPGU University: A Pilot Study

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Abstract

Background: The prevalence of hypertension is rising globally due to unhealthy lifestyle. Smartphones are vital instrument as a result of the rising use of technology in education. Anxiety, sadness, and sleep difficulties are all linked to smartphone addiction. These mental illnesses also have an impact on blood pressure. The purpose of this study was to investigate the prevalence of hypertension and its association with smartphone addiction among adults.

Methods: An university-based cross-sectional study was conducted on 74 young adults, aged 17-24 years (18.47±0.51for males and 19.27±0.97 for females) by random cluster sampling method after getting consent. Systolic and Diastolic blood pressure were measured according to normative data of ACSM guidelines. BMI was calculated to identify the prevalence of obesity and its association with an increase in blood pressure. The Smartphone Addiction Scale - a short version was used to assess level of smartphone addiction.

Results: The prevalence of risk of developing hypertension in those who are having smartphone addiction was 9.45% ((OR=0.53, 95% CI: 0.155-1.762). And the association between smartphone addiction and obesity was 6.75%.

Conclusion: Among college-going students surveyed at KPGU University Vadodara, there is a risk of developing hypertension due to excessive smartphone addiction as it shows borderline or elevated blood pressure and obesity. This can affect their physical as well as mental health. Therefore it is essential to arrange educational seminars to make students aware of reducing the use of social media by engaging them in various recreational activities.

Keywords: Smartphone addiction, young adults, hypertension, University students

Introduction

Nowadays one of the most popular forms of information and communications technology is the mobile phone, which is also likely the one that has demonstrated the most amazing development in recent years about technological advancements, social effects, and widespread use by the vast majority of people[1]. However, there are drawbacks. Technology addiction is an impulse control disease characterised by obsessive usage of mobile devices, the internet, or video games, regardless of negative effects to the user. The condition is also known as digital addiction or online addiction. Smartphones, which are portable devices with various functionalities, are increasingly becoming a must for students and improving their educational experiences.[2] Some students also

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use their smartphones as leisure devices, such as watching movies, playing games, and talking online[3]. Problematic smartphone use is defined as "an inability to control one's smartphone use, which eventually has detrimental effects on daily life"[4]. Young people depend on their smartphones, and their unintentional use makes them prone to many adverse effects[5]. 1.2 billion adolescents cover up about 20% of the world population, where as in India, it has 600 million adolescents. In 2017, worldwide, mobile phone users were 4.77 billion. There is an increase in mobile phone users in India from 2013 to 2019 that is accounted for 730.7 million users in 2017, which includes 340 million smartphone users.[6]

The age range of 18 to 34 is reported to have the highest rate of smartphone usage, at 62%. 43% of Apple i-Phone users and 50% of Android Smartphone users are people who are under 34 years old. A little over 53% of men and 47% of women use smartphones. [7]. These negative health effects could emerge physically, such as an increased risk of type 2 diabetes mellitus due to sedentary lifestyle, hypertension, cardiac diseases, ophthalmic or auditory difficulties, and musculoskeletal problems. disorders or psychological difficulties including nutritional or sleep issues. Risk, habits, addictive behaviour, and low self-esteem behaviours are all factors to consider.[8-10]

The major cause of CVD death and disease burden worldwide is hypertension, which is also a significant risk factor for ischemic heart disease, dementia, stroke, and chronic renal disease.[11] According to contemporary estimates, 7.7 to 10.4 million deaths per year are directly related to high blood pressure, which affects 1.4 billion people globally.[12] In 2018, it was observed that the amount of time spent on a mobile phone increased the risk of acquiring hypertension. Furthermore, those who had used mobile phones for at least eight years had a six-fold increase in this risk, as did those who used them for more than 60 minutes every day.[13] Smartphone addiction has been categorised as a disorder in the 10th edition of the International Classification of Diseases under the criteria for Dependence in Mental and Behavioural Disorders syndrome.[11] To assess smartphone addiction, Kwon et al. created and validated the SAS (Smartphone Addiction Scale), which has 33 questions and 6 points. The Smartphone addiction Scale-Short version (SAS-SV) is a validated scale.[14] SAS-SV is internally consistent (Cronbach's α= 0.844). There is very few studies have been done yet on the University students to find out the relationship between mobile phone usage and its association with hypertension. Thus there was a need to identify the relationship between them among university students.

The aim of this study was to investigate the prevalence of hypertension and its association with smart phone addiction among adults of KPGU university of Vadodara.

Methodology

Participants and Procedure

Between the months of December 2022 and January 2023, a cross-sectional survey was conducted. By random cluster sampling, 74 university students (19 boys and 55 girls) aged 17-24 years (19.06±0.94 years) were enrolled in this study. The university's ethical council authorised the study's design and procedure, and informed Google form-based consent was obtained from all participants prior to the survey.

Measurements

All of the individuals were in good health, had no kidney or cardiovascular disease, and were not using any mental, sleep, or cardiovascular medications. Body Mass Index (BMI) was used to define weight status (weight in kilogrammes divided by height in metres squared). BMI was assessed to indicate obesity caused by prolonged inactive hours. Demographic information such as age, height, and weight, as well as SAS-SV rating, were collected using a Google form.

After each subject had rested for at least 5 minutes, systolic and diastolic blood pressure measurements were collected in the sitting position with a mercury sphygmomanometer and the appropriate cuff in a quiet surroundings. The reference values in this study were derived from the ACSM 10th edition recommendations.[15]

Data Analysis

Frequency(%) and mean standard deviation (SD) were used to characterise categorical results

and continuous results, respectively. The t test for continuous variables, was used to assess group differences. p values of <0.05 were considered statistically significant. All data were analyzed using the SPSS version 20.0.

Results

Participants Characteristics

Out of 74 participants 25.67% were male with a mean age of 18.47 years (SD=0.51) and 74.33% were female with a mean age of 19.27 years (SD=0.97) **(Table 1).** The mean prevalence of smart phone addiction was 41±9.89 (39.16±6.62 for female and 41.67±5.68 for male). There was no statistically significant difference between gender and smart phone addiction. Compared to the females, the males had a significantly higher height, weight and DBP. Whereas females had higher age and BMI. But there was no difference in SBP.

Analysis of Factors Associated with Smart Phone Addiction in Adults

18 participants(24.32%) who are having overweight were showing great amount of smart phone addiction. Out of 30 participants (40.54%) with elevated blood pressure, 7 (9.46%) participants had positive smart phone addiction **(Table 2).** Among 9.46% obese participants 1.35% showed smartphone addiction positive.

Analysis of Factors Associated with Adult Hypertension

The overall prevalence of hypertension among adults was 40.54%. Out of them 9.45% adults were addicted to smart phone**.(Table 2)**

Discussion

According to this survey, smart phone addiction can cause a variety of issues, including increased blood pressure and weight gain as a result of prolonged inactive hours while using a smartphone. The primary finding of this study was that smart phone addiction may be a substantial and independent predictor of hypertension in persons aged 17 to 24.This study showed that overall prevalence of elevated blood pressure was 30 (9.45%) out of which 7 (9.45%) showed peak of smart phone addiction. Numerous studies have shown in recent years that excessive smart phone use is associated to a variety of health risks, ranging from potentially fatal injuries from car accidents to psychological disorders such as anxiety and sleep issues. [16,17]

Table 1: Participants characteristics

	TOTAL(N=74)	FEMALE (N=55)	MALE (N=19)	P value
Age	19.06±0.94	19.27±0.97	18.47±0.51	0.0010
Height	1.57±0.042	1.54±0.13	1.64±0.059	0.0019
Weight	55.47±4.94	54.09±10.25	59.47±14.41	0.081
BMI	24.98±2.23	23.52±5.46	21.78±4.36	0.21
SBP	124.3±2.80	124.07±2.82	124±4.24	0.93
DBP	80.10±4.24	78.50±4.13	84.2±4.24	0.312
Smartphone Addiction:- Negative Positive	21.46±4.69 41±9.89	22.39±4.68 39.16±6.62	20.43±5.21 41.67±5.68	0.151 0.116

The results of many scales also revealed that smart phone addiction is becoming a public health issue that cannot be ignored.[18,19] Interestingly, 22 individuals (29.72%) with borderline or increased blood pressure also showed smartphone addiction. This suggests that adults with high blood pressure are more likely to be drawn to smart phones, but additional research is needed to determine the precise mechanism.

Table 2: Analysis of factors associated with smart phone addiction

	Total (N=74)	Smartphone Addiction positive(N=22)	Smartphone Addiction Negative(N=52)	P value
Gender:				
Female	55(74.32%)	19(25.6%)	55(74.33%)	0.11
male	19(25.68%)	3(4.05%)	16(21.63%)	
BMI(%)				
Under-weight Normal	14(18.92%)	6(8.10%)	8(10.82%)	
Over-weight	35(47.3%) 18(24.32%)	11(14.8%) 4(5.40%)	23(31.02%) 11(14.87%)	0.022
obesity	7(9.46%)	1(1.35%)	10(13.52%)	
Blood pressure:				
Normal	44(59.45%)	15(20.2%)	30(40.54%)	<0.0001
Elevated	30(40.54%)	7(9.46%)	32(43.24%)	

Out of 55(74.32%) females 19(25.68%) and among 19(25.68%) males total 3(4.05%) reached to peak of smart phone addiction. The results of this study also showed that the risk of hypertension was higher among those with smart phone addiction (OR=0.53, 95% CI:0.155-1.762). According to a study done by Long J and Liu et al;(2016) Phone, camera, multimedia player, internet browser, navigation system, e-mail service, social networking, and gaming are all examples of smart phone functions. Because of these powerful and attractive benefits, many youngsters overuse their mobile devices, resulting in comparable addiction symptoms. Taking of BP measurements in only one visit was limitation of this study. The another limitation was, we did not examine potential confounding variables that could have an impact on our results, such as daily dietary practices (especially salt intake), physical activity, genetics, the use of stimulants to treat attention deficit hyperactivity disorder and depression in adults. As this study was a pilot study, there was very small sample size so in future this study can be done with larger number of participants.

Conclusion

Among college-going students surveyed at KPGU University Vadodara, there is a risk of developing hypertension due to excessive smartphone addiction as it showed borderline or elevated blood pressure and obesity. This can affect their physical as well as mental health. Therefore it is essential to arrange educational seminars to make students aware of reducing the use of social media by engaging them in various recreational activities.

Ethical Clearance: At the time the study was conducted, a formally constituted Institutional Ethics Committee was not established in our institute. However, prior permission to conduct the study was obtained from the Head of the Institute. The study was conducted in accordance with ethical principles for research involving human participants. Written informed consent was obtained from all participants prior to inclusion in the study

Authors Contribution: All three authors contributed to the study's idea and design, data analysis and interpretation, and paper preparation. In addition, the first author helped with data collection and analysis.

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Abbreviations
ACSM : American College of Sports Medicine **BMI :** Body Mass Index
CVD : Cardio Vascular Disease
SBP : Systolic Blood Pressure
DBP : Diastolic Blood Pressure
BP : Blood Pressure

SAS-SV : Smartphone Addiction Scale- Short Version

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