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A cross-sectional study on assessment of smartphone addiction among secondary & higher secondary school students in Jamnagar, Gujarat.

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ABSTRACT

INTRODUCTION

Adolescents are defined as young people between the ages of 10 and 19 years as per WHO (2014) criteria. Mobile phone addiction/abuse/misuse is one of the forms of compulsive use of "a mobile phone" by adolescents across the world. Indian adolescents are also affected by high smartphone engagement. The proportion of school going children possessing a smartphone in India has expanded from 36 % to 61% over the last two years.

METHODOLOGY

There are 108 schools with secondary & higher secondary students in the study area. Out of that 41 are Government and 67 are private schools. Of them 4 Government and 6 Private schools were considered by Simple Random Sampling. Data was collected by *Smartphone Addiction Scale-Short Version* Questionnaire. Students of standard 8^{th} to 12^{th} were considered for the study and selected by random sampling using roll number. Data analysis was done by Chi-square test, Co-relation Co-efficient and ANOVA test.

RESULT

Out of total 421 students, 227 were males and 194 were females. Smartphone addiction was found in 109 males (48.01%) and 68 females (35.05%), χ^2=7.21, p=0.007. There were 267 students of Private Schools and 154 students of Government Schools. Smartphone addiction was found in 125 (46.81%) Private School students and 52 (33.76 %) Government school students, χ^2 = 6.82, p=0.008. Maximum use of smartphone was for texting (WhatsApp), Social Media apps (Facebook, Instagram, Snapchat) and watching media.

CONCLUSION

Smartphone addiction is high among school students in Jamnagar city of, Gujarat. Significantly higher addiction was present in males and students of private schools Almost 42% of students are addicted to smartphone. 2) Maximum number of students reported to use smartphones for texting (WhatsApp), Social media apps (Facebook, Instagram, Snapchat) and watching media.

Keywords: Adolescents, High-School Students, Smartphone Addiction

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INTRODUCTION

Adolescence is the phase of life between childhood and adulthood and range from age 10 to 19. It is a unique stage of human development and an important time for laying the foundations of good health [1]. Smartphones are technological advancements that significantly alter people's everyday routines and behaviours. These gadgets' capabilities and utilities are growing, and it is anticipated that this trend will continue over the coming years. [2]. Although smartphones provide many benefits, we also need to be mindful of their drawbacks, the most worrying of which is smartphone addiction. The uncontrollable use of smartphones is referred to as smartphone addiction. These individuals experience social, psychological, and health issues. [3]. Addiction is considered by WHO (WHO Expert Committee - 1964) as dependence, as the continuous use of something for the sake of relief, comfort, or stimulation, which often causes cravings when it is absent [4]. Significant social issues have arisen as a result of the associated addiction phenomena and negative consequences. The direct signs of a smartphone addiction include psychological discomfort, communication avoidance, weakened social skills, and withdrawal symptoms. [5]

Smartphone reliance is also known as nomophobia, which is defined as a fear of being without your smartphone. According to the Financial Review 2020-21, the percentage of school-age children in regional India who own smartphones has increased from more than 36% to 61% over the past two years. [6]. Recent studies have revealed a high prevalence of smartphone addiction in university students and not only urban but also rural school students [7]. Teenagers' excessive smartphone use can lead to friction with their parents, poor academic performance, and a lack of life pleasure, which can prevent them from completing developmental tasks and make adaptation difficult. [8]. With above statement kept in mind the present study was carried out in a view to detect the smartphone addiction among secondary and higher secondary school students along with socio-demographic factors affecting it in the study area. PRIMARY OBJECTIVE: of the study was to detect the prevalence of secondary and higher secondary school students addicted to smartphone. SECONDARY OBJECTIVE: to assess various socio-demographic and smartphone usage characteristics associated with smartphone addiction.

METHODOLOGY

The present study is a Cross-Sectional Study. Study was carried out between October 2021 to March 2022. Study Population considered for the study is school going students from Standard 8th to 12th and it was carried out in Schools of a Jamnagar city of Gujarat where secondary and higher-secondary students were studying. A list of total 108 schools was obtained from Municipal Corporation and permission was taken from the same. Out of 108 schools, 41 were government schools and 67 were private schools. A total of 4 government schools and 6 private schools was considered for the study from different localities/areas of the city by random selection. Rationale for selecting 4 government and 6 private schools was on the basis of proportionate sampling (10% of schools from both government and private were considered for the study).

From a previous study it was found that the prevalence of mobile addiction is around 49% [6]. By using the formula for sample size calculation for a cross-sectional study $Z^2\ p\ q\ /\ L^2$ (where, Z = 1.96 at 95% Confidence Interval, 5% alpha error, 80% power, p = 49, q = 100-49 = 51, L = absolute error taken as 5) sample size was 383. Adding a 10% non-response rate the final sample size was taken as 421. Same number of students were selected from each class/standard. 84 students were selected from each standard except 8th standard in which 85 students were selected to achieve final sample size. Verbal informed consent was obtained in prior and only those students who gave consent were considered for study. Students were selected randomly by roll numbers assigned to them. If a particular roll number student was absent or fell in exclusion criteria the number immediately following it was considered for the study.

INCLUSION CRITERIA:

1) Students of Standard 8th to 12th of the selected schools.
2) Students present on the day of data collection.

3) For sake of generalizability to local area, students from local area were only considered for the study.
4) Students who gave verbal informed consent.

EXCLUSION CRITERIA:

1) Students who did not have smartphone of self or at home.
2) Students who were not of local area were not included in the study.

DATA COLLECTION TOOL: Data was collected by a Questionnaire Smartphone Addiction Scale- Small Version [9]. The data collection tool consisted of 2 sections. In first section the Socio-demographic details of the students was collected. In second section the questions of Smartphone Addiction Scale-Short Version were asked. There are 10 questions used in short version on a Likert scale of 6 from (strongly agree to strongly disagree). The rationale for using shorter version was the complexity in original version and confusing questions which may impact the response of adolescents. A cut off value of 30 was taken to consider as a positive response for smartphone addict. Data were collected by classroom visits by principal investigator and questionnaire was filled.

DATA ANALYSIS: Data was entered in MS Excel and analysis was done through IBM SPSS for Statistics, version 25. Descriptive statistics were used to describe the data, Chi-square test, Z and Anova test were used to analyze association between smartphone addiction and socio-demographic variables. Pearson Co-relation co-efficient was used for an association between standard/class and smartphone addiction. Ethical Clearance was obtained from Institutional Ethical Committee (125/05/2/2021) before starting the study.

RESULTS

Out of total 421 study participants 177 were addicted to smartphone, thus overall prevalence was 177/421 (42.04%). 109 males out of 227 males were addicted (48.01%) and 68 females out of 194 females were addicted (35.05%). For 8th standard 29 students were addicted out of 85 (34.11%), for 9th standard 31 students out of 84 (36.09%), similarly in 10th standard 35 students out of 84 (41.66%), for 11th standard 42 out of 84 students (50%) and for 12th standard (47.61%) were addicted.

Maximum percentage of addicts were seen in Muslims (12 out of 23, 52.17%), followed by Hindus (155 out of 373, 41.55%), Jains (7 out of 17, 41.17%) and Christians (3 out of 8, 37.5%).

Maximum number and percent of students in addicts were seen in nuclear family. 136 out of total 293 nuclear family were addicts (46.41%). Similarly, in joint family (26 out of 75, 34.66%) and 3rd generation family (15 out of 53, 28.3%) were addicted.

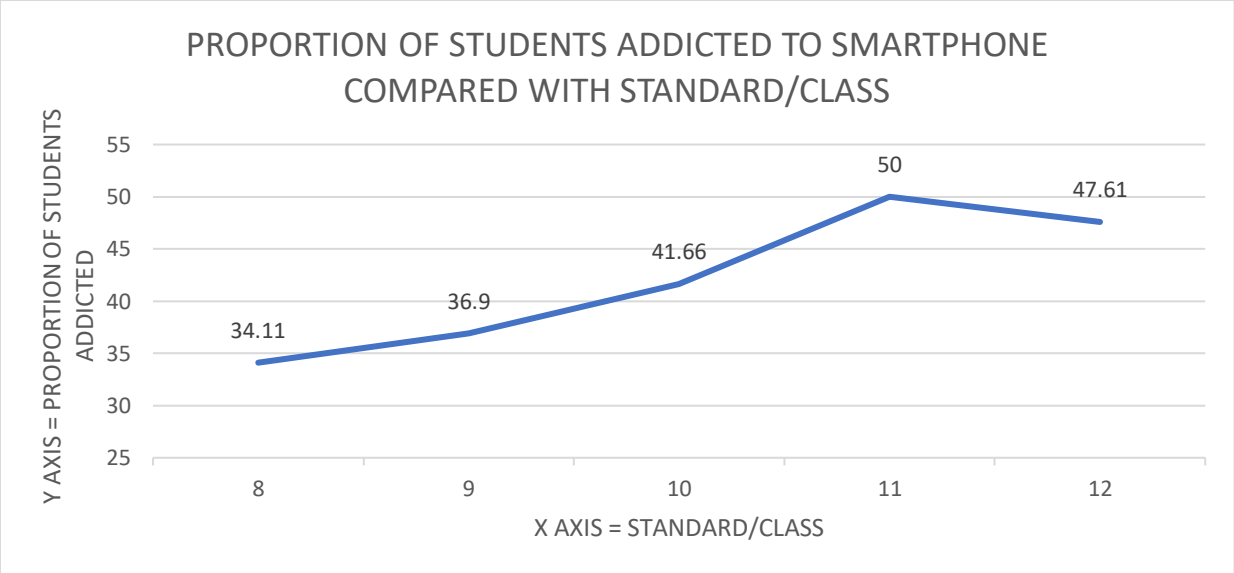
Thirty-five students out of 91staying in home were addicted (38.46%), 115 students out of 283 staying in hostel were addicted (40.63%) and 27 students out of 47 staying as rental/paying guest were addicted (57.44%).

TABLE 1: Prevalence of smartphone addiction in various socio-demographic variables. (N=177)

A] GENDER	n (%)
Male	109 (61.58%)
Female	68 (38.41%)
B] STANDARD/CLASS	
8th	29 (16.38%)
9th	31 (17.51%)
10th	35 (19.77%)
11th	42 (23.72%)
12th	40 (22.59%)
C] RELIGION	
Hindu	155 (87.22%)

Muslim	12 (6.77%)
Jain	7 (3.95%)
Christian	3 (1.69%)
Others	0
D] TYPE OF SCHOOL	
Government	52 (33.76%)
Private	125 (46.81%)
E] TYPE OF FAMILY	
Nuclear	136 (76.83%)
Joint Family	26 (14.68%)
3rd Generation	15 (8.47%)
F] RESIDENCE	
Home	35 (29.91%)
Hostel	115 (64.97%)
Paying Guest/Rental	27 (15.25%)

FIGURE 1: Correlation of proportion of addicted students with class/standard



On calculating Pearson Co-relation Co-efficient for no. of students addicted to class/standard the value of $r = 0.93$ ($p < 0.05$) signified a strong co-relation Increasing standard had strong positive and significant correlation with smartphone addiction.

TABLE 2: Smartphone addiction assessment among school students (N=421)

A] What do you Smartphone maximum for? (Multiple Responses allowed)	
Messaging (text, WhatsApp, etc)	243 (57.71%)
Watching Media	212 (50.35%)
Social Media Apps	185 (43.94%)
Gaming	106 (25.71%)
Phone Calls	67 (15.91%)
Internet Browsing	51 (12.11%)
Songs	39 (9.26%)
Reading	32 (7.6%)
B] What is the total duration of Smartphone use per day	
<2 hours	128 (30.40%)
2-4 hours	165 (39.19%)
4-6 hours	86 (20.42%)
6-8 hours	31 (7.36%)
>8 hours	11 (2.61%)
C] Do you use your smartphone before sleeping at night?	
Yes	278 (66.03%)
No	143 (33.97%)
D] Do you have cravings for using smartphone use during routine work?	
Yes	98 (23.27%)
No	323 (76.77%)

Maximum usage of smartphone among users was for messaging (57.71%) followed by watching media in the form movies, serials, web series or sports matches. The least use for reading for academics or literature (7.6%) and listening/watching songs (9.26%). Maximum duration of smartphone use per day is 2-4 hours followed by <2 hours. Overall mean score of Addicted students is 34.65±4.15 SD whereas of non-Addicted students is 29.15±3.84 which is significant higher in addicted students as on applying Z test p value comes out to be <0.05.

TABLE 3: Smartphone addiction score and its association with socio-demographic variables (N=421)

VARIABLE	n	MEAN ± SD	Z / Anova
A] GENDER			
1. Male	227	35.31 ± 3.89	Z = 15.39 p = <0.0001*
2. Female	194	29.89 ± 3.23	
B] STANDARD/CLASS			
1. 8th	85	32.16 ± 3.11	F ratio = 10.59

2. 9th	84	31.81 ± 2.97	p = < 0.0001* d.f = 4
3. 10th	84	34.77 ± 3.35	
4. 11th	84	33.75 ± 3.97	
5. 12th	84	33.63 ± 3.71	
C] RELIGION			
1. Hindu	373	34.17 ± 2.78	F ratio = 0.004 p = 0.004 d.f = 3
2. Muslim	23	35.39 ± 2.35	
3. Jain	17	33.79 ± 3.08	
4. Christian	8	31.25 ± 3.57	
D] TYPE OF SCHOOL			
1. Government	154	32.22 ± 3.53	Z = 3.30 p = 0.001*
2. Private	267	33.45 ± 3.76	
E] TYPE OF FAMILY			
1. Nuclear	293	32.27 ± 3.53	F ratio = 1.45 p = 0.23 d.f = 2
2. Joint	75	32.79 ± 3.15	
3. 3rd Generation	53	31.93 ± 2.83	
F] RESIDENCE			
1. Home	91	31.01 ± 3.13	F ratio = 93.002 p = < 0.0001* d.f = 2
2. Hostel	283	36.19 ± 4.05	
3. Paying guest/Rental	47	30.34 ± 3.15	

Where, Z = Z test applied, p = p-value, d.f = degree of freedom, F ratio = Anova test applied= significant*

As shown in Table 3, a significant difference in the mean was observed between gender, standard, religion, type of school and current residence. Type of family was not associated with smartphone addiction. In table 3, where more than 2 variables are compared Anova test is applied while where 2 variables are compared Z test is applied.

TABLE 4: Association between socio-demographic characteristics and smartphone use with smartphone addiction (N=421)

Socio-demographic characteristics / smartphone use		Addicted n (%)	Total (n)	p value	ODDS RATIO (95% CI)	χ^2
Gender	Male	109 (48.01)	227	0.007*	1.71 (1.15 - 2.54)	7.21
	Female	68 (35.05)	194			
Age	12-15	80 (39.02)	205	0.221	1.27 (0.86-1.88)	1.49

	16-18	97 (44.90)	216			
School Type	Government	52 (33.76)	154	0.008*	1.73(1.14 – 2.61)	6.82
	Private	125 (46.81)	267			
Duration of Smartphone use	<2 hours	49 (38.28)	128	0.301	1.25 (0.82 – 1.91)	1.06
	>2 hours	128 (43.68)	293			
Smartphone use at night before sleeping	Yes	136(48.92)	278	0.00006*	2.38 (1.55 – 3.67)	15.89
	No	41(28.67)	143			
Smartphone cravings during routine work	Yes	48 (48.97)	98	0.11	1.44 (0.92 – 2.27)	2.52
	No	129 (39.93)	323			

Chi-square test is applied on variables gender, age group (12-15 & 16-18), school type, duration of smartphone uses with smartphone addiction and smartphone cravings during routine work. In gender male have higher chance of being smartphone addicted as compared to females (p value = 0.007). Similarly, in schools, private school students have higher chance of being smartphone addicted as compared to government school students (p value = 0.008).

DISCUSSION

This study aimed to reveal the Smartphone addiction among Secondary & Higher Secondary school students and to identify the predictors of smartphone addiction. Therefore, we examined the prevalence of smartphone addiction, demographic characteristics, daily duration of a smartphone usage, type of usage, use at night before sleeping & craving of use during routine work.

The overall prevalence of smartphone addiction in this study is 42.04% which is higher as compared to study conducted in other countries. A study conducted by Seong Soo Chaa [3] in South Korea shows 31% prevalence and 10 percent in England, 21 percent in the Philippines, and 18 percent in Hong Kong. [10][11]

According to this study males are more addicted to smartphones as compared to females which is in line with study conducted by Limalema Jamir et al [12] but contradictory to the result of study conducted by Jogendrakumar Nayak [13] which showed of females more smartphone addiction as compared to males. The present study result is also contradictory with Youl Pyo Hong et al [8] in which they found that female students are more likely to be addicted to smartphones.

As standard/class increases thee is increase in smartphone addiction with peak of addiction seen in 11th standard which is different from study by Limalema Jamir at al [12] in which they concluded as maximum proportion of smartphone addicted students in 9th and 12th standard which are at both ends of spectrum of secondary school. A study conducted by Hye-Geong Son et al [14] also states that with increasing age from standard 5th to 8th there is increasing proportion of smartphone addicted students.

Maximum number of participants belonged to Hindu religion. But proportion wise maximum was seen in Muslims and least in Christians. There was no significant difference in association by religion or race wise and the findings are conclusive with the findings of Siew Pien Lee et al [17] in which also there is non-significant association between different race. However, in present study the sample size for is small for some religions like Christians and Jains.

Private school students are more addicted to smartphone as compared to government school students according to this study. Similar study findings have been observed in study by Limalema Jamir et al in rural area of North India [12] in which private school students are more

addicted as compared to government school students.

Maximum usage of smartphone was seen for Messaging in the form texts, WhatsApp followed by social media usage which is similar to study conducted by Jogendra kumar Nayak in Roorkee, India [13] whereas the least use of smartphone was seen for reading or for academic purposes. Study by Masaru Tateno et al in Japan [15] states that there was a trend that males preferred gaming in their internet use while females used there smartphones mainly for social networking applications. Another study by Park SB et al. [16] states that students use smartphone applications intended for user convenience, such as educational programs/dictionaries or other academic purposes.

In present study maximum participants responded of using smartphone for 2-4 hours on a daily basis. Study conducted in Malaysia by Siew Pien Lee [17] shows that maximum students use smartphone for > 3 hours a day. According to a report published by App-Anime it showed average duration use of 4.6 hours use per day by average Indian which is more as compared to our study [18]. The study is a single city study and the data was self-reported. There could be a bias in the data.

CONCLUSION

The present study found that 42% of students were addicted to smartphones. Maximum usage was for texting (WhatsApp), Social media apps (Facebook, Instagram, Snapchat) and watching media. Daily 2-4 hours of usage was found. Significantly higher smartphone addiction was found among males, private school students, hostelers, and those using mobile phones before going to bed at night. We recommend developing a screening programme and counselling for smartphone addiction in students. Training school teachers on counselling skills will be helpful. Discussions in the parent-teacher meeting is suggested. The involvement of the Community Medicine and Psychiatry departments along with the Education department will add value. We recommend larger-scale studies to assess addictions at the state or national level.

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