

Original research Article

Cross-sectional study to analyse the pattern of smartphone usage among adolescents in urban slum of a metropolitan city

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ABSTRACT

Background: Adolescents are defined as young people between the ages of 10 to 19 years. Smartphone is a term used to distinguish mobile phone with advanced features from basic feature phones. Modern smartphones currently include all the features of a laptop, including web browsing, Wi-Fi and 3rd-party apps etc. Indian teens are currently driving the smartphone market in India.

Methods: A cross-sectional study was done in an urban slum of a metropolitan city. 100 adolescents aged between 10 to 19 years were assessed using pre-structured questionnaire and prior informed parental consent and assent were taken. The questionnaire included questions about socio-demographic profile and questions pertaining to the use of smartphones in relation to time and frequency and regarding use of internet and games on the phone by the adolescents.

Results: Among the 100 participants, mean age was 14.29 years. 93% of the participants were using smartphones, 48.4% were using smartphones since 1 to 3 years and 46.2% used phones between 1 to 3 hours daily. 96.7% used internet on the phone, 72.04% participants have social media accounts and 64.5% played games on phones. The most relevant smartphone function was social networking.

Conclusions: Results show increasing dependency of adolescents on smartphones. Although smartphones offer several conveniences in our life, we need to be aware of the negative effects of smartphone use, the most concerning aspect being smartphone addiction.

Keywords: Smartphones, Adolescents, Internet, Social networking

INTRODUCTION

According to WHO, Adolescents are defined as young people between the ages of 10 and 19 years.¹ Today 20% of the world population is of adolescents, constituting 1.2 billion people worldwide. Nearly 243 million adolescents live in India as per UNICEF Report 2011.² Smartphone is a term used to distinguish mobile phone with advanced features from basic feature phones. The term "smartphone" was first used in 1997 when Ericsson described its GS 88 "Penelope" concept as a smartphone.³⁻⁶ These phones provided integrated services from communication, computing and mobile sectors such

as voice communication, messaging, personal information management applications and wireless communication capability.⁷ The internet is useful for a variety of purposes, such as convenient electronic commerce, rapid sharing of information, contact with other cultures, emotional support and entertainment.⁸ A smartphone combines the services of the internet and mobile phones. The portability and accessibility of a smartphone makes it possible to use it anywhere, for any duration. Modern Smartphones currently include all the features of a laptop, including web browsing, Wi-Fi, and 3rd-party apps etc. Worldwide, smartphones were used by 1.85 billion people in 2014. This number is expected to be 2.32 billion in 2017 and 2.87 billion in 2020.⁹ In 2015,

a median of 54 percent across 21 emerging and developing countries such as Malaysia, Brazil, and China reported using the Internet at least occasionally or owning a smartphone. In comparison, a median of 87 percent reported the same across 11 advanced economies, including the United States and Canada, major Western European nations, developed Pacific nations (Australia, Japan, and South Korea), and Israel.¹⁰ The age group of 25-34 is found to have the highest smartphone usage rate of 62%. 50% of Android smartphone's and 43% of Apple iPhone users are younger than 34 years. Indian teens are currently driving Smartphone's market in India The age group of 16-18 years using Smartphone's have shown a rapid rise from 5% in 2012 to 25% in early 2014. Recently in 2013, there were around "51 million" Smartphone users in Urban India and rate of rise from year 2012 was 90%.^{11,12} Smartphones offer several conveniences in our life, but we also need to be aware of the negative effects of smartphone use, the most concerning aspect being smartphone addiction. Smartphone addiction is a phenomenon that pertains to uncontrollability of smartphone use. People with this problem encounter social, psychological, and health problems.¹³ Adolescents are a high risk group for smartphone addiction. New found freedom, peer pressure, physical and hormonal changes all play a pivotal role in the usage of smartphones among adolescents.

METHODS

A cross-sectional study was done in an urban slum located in Mumbai. According to study by MACROS organisation in Mumbai, the prevalence of smartphone use in Mumbai teens was 58%.¹⁴ Total of 100 adolescents aged between 10 to 19 years were assessed using pre-structured questionnaire. Before the questionnaire, the adolescents and their guardians were explained the purpose of the study and prior informed parental consent and assent were taken. The questionnaire included questions about socio-demographic profile and questions pertaining to the use of smartphones in relation to time and frequency and regarding use of internet and games on the phone by the adolescents. Data was entered in Microsoft Excel and analysed using SPSS. The qualitative data is represented in the form of frequency and percentage and quantitative data is represented in the form of mean, standard deviation. The comparison between the two groups for various factors was done using Chi square test.

RESULTS

Among the 100 adolescents interviewed, 50 were male and 50 female. The mean age of the participants was 14.29 years. Out of the 100 participants, majority (91%) were students and belonged to Muslim community (78%). Among the participants, 93% were using smartphones with 32 (34.5%) using their own smartphone, and 54 (58%) using their parents phones.

Table 1: Sociodemographic profile of study participants.

Variables	N	%
Age (years)		
10-14	53	53
15-19	47	47
Sex		
Male	50	50
Female	50	50
Religion		
Muslim	78	78
Hindu	21	21
Christian	1	1
Occupation		
Student	91	91
Employed	6	6
Unemployed	2	2
Housewife	1	1

Table 2: Pattern of smartphone usage among study participants.

Variables	N	%
Smartphone usage		
Yes	93	93
No	7	7
Smartphone belonging to		
Self	32	34.4
Parents	54	58.1
Siblings	7	07.5
Duration of smartphone use (years)		
<1	13	14.0
1 to 3	45	48.4
3 to 5	22	23.6
>5	13	14.0
Duration of smartphone use (hours) in a typical day		
<1	25	26.9
1 to 3	43	46.2
3 to 5	19	20.4
>5	6	06.5
Frequency of smartphone use on a typical day (times/day)		
<5	20	21.6
6 to 10	18	19.3
11 to 20	18	19.3
21 to 50	22	23.6
51 to 100	14	15.1
>100	1	01.1
Time until first smartphone use in morning (min.)		
<5	17	18.3
5 to 60	14	15.1
>60	62	66.6

Majority 45 (48.4%) were using smartphones since 1 to 3 years whereas 13 (14%) used phones since more than 5

years. Most (46.2%) of the participants used smartphones for 1 to 3 hours on a daily basis, however 26.9% use phones for less than an hour. The frequency of smartphone usage was between 6 to 50 times in maximum (62.3%) participants. Majority (66.6%) of respondents use phone after an hour of waking up while 18.3% use it within 5 min of waking up.

Table 3: Pattern of smartphone usage among study participants.

Variables	N	%
Internet use on phone		
Yes	90	96.8
No	03	03.2
Using social media account		
Yes	67	72.0
No	26	28.0
Games on phone		
Yes	60	64.5
No	33	35.5
If yes, type of game (N=60)		
Violent	23	38.3
Sports	21	35.0
Puzzle	16	26.7
Smartphone use while eating		
Yes	09	09.7
No	84	90.3
Smartphone use while charging		
Yes	21	22.6
No	72	77.4
Feeling without phone		
Restless	60	64.5
No change	33	35.5
Most relevant smartphone function		
Social networking	57	61.3
Gaming	22	23.7
Listening to music	07	07.5
Calling	04	04.3
Studying	03	03.2

Majority (96.7%) of the participants use internet on the phone and 72% participants have social media accounts. Majority (77.4%) participants don't use phone while charging and most (90.3%) don't use phone while having meals. In the participants, majority (64.5%) feel restless without their phones. Among the adolescents, most (64.5%) participants stated that they play games on their phones, of which 38.3% played violent games like PUBG, shadow fighter etc. The most relevant smartphone function was social networking for majority (61.2%) of the participants followed by gaming (21.5%) and music (7.5%), however only 4.3% participants considered making phone calls the most relevant smartphone function.

Statistically significant association was noted between feeling of restlessness and duration of phone use in years (p value 0.009), duration of phone use in hours per day (p value 0.004), frequency of phone use in times per day (p value 0.004) and time until 1st phone use in morning (p value 0.02). The association of feeling of restlessness was also statistically significant with use of social media accounts (p value 0.000) and the most relevant smartphone function (p value 0.005).

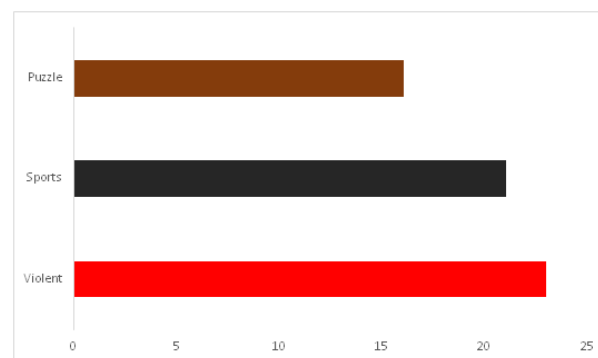


Figure 1: Type of games played on smartphones by adolescents (n=60).

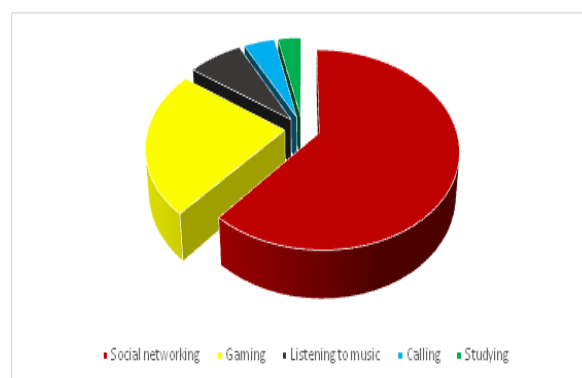


Figure 2: Most relevant smartphone function for study participants.

Association between the most relevant smartphone function was found statistically significant with number of years of usage (p value 0.000), frequency of daily use (p value 0.004), time until 1st use in morning (p value 0.000), internet use (p value 0.04), social media use (p value 0.000) and playing games (p value 0.02) (non-tabulated data).

DISCUSSION

The present study was done to analyse the pattern of smartphone usage among adolescents in an urban slum of metropolitan city. In this study it was observed that 93% of the participants were using smartphones. Similarly it was noted that 95% of teens use smartphones according to a study done by Monica Anderson et al at the Pew research centre.¹⁵ Among the smartphone users, 48.4%

were using phones since 1 to 3 years, with 46% using phones for 1 to 3 hours on a daily basis.

Table 4: Association between patterns of smartphone usage and feeling of restlessness without phone.

Variables	Feeling of restlessness		Chi square, df, p value, significance
	Yes N (%)	No N (%)	
Phone belonging to			
Parents	33 (61.1)	21 (38.9)	3.244, 2, 0.194 not significant
Self	24 (75.0)	08 (25.0)	
Siblings	03 (42.9)	04 (57.1)	
Duration of use (years)			
<1	03 (23.1)	10 (76.9)	11.53, 3, 0.009, significant
1 to 3	33 (73.3)	12 (26.7)	
3 to 5	15 (68.2)	07 (31.8)	
>5	09 (69.2)	04 (30.8)	
Duration of use (hours/day)			
<1	11 (44.0)	14 (56.0)	13.374, 3, 0.004, significant
1 to 3	26 (60.5)	17 (39.5)	
3 to 5	17 (89.5)	02 (10.5)	
>5	06 (100)	00	
Frequency of use(times/day)			
<5	08 (40.0)	12 (60.0)	15.317, 4, 0.004 significant
6 to 10	11 (61.1)	07 (38.9)	
11 to 20	09 (50.0)	09 (50.0)	
21 to 50	18 (81.8)	04 (18.2)	
>51	14 (93.3)	01 (06.7)	
Time until 1 st smartphone use in morning (minutes)			
<5	15 (88.2)	02 (11.8)	5.112, 1, 0.02
>5	45 (59.2)	31 (40.8)	Significant

Results were similar to a study done in medical students of a rural college in Maharashtra.¹⁶ In the current study, majority of students i.e. 66.6% used smartphones 1 hour after getting up in the morning whereas in the Wardha study 77.1% used phone within an hour of getting up in the morning.¹⁶ The difference in this could be attributed to the fact that many participants in the present study were not able to access smartphones early morning as they were using parents and siblings phones.

Majority of the participants in the current study i.e. 96% used internet on their phones. Similar trends were observed in a study done in Tamilnadu by Mathew et al.¹⁷ Majority of the adolescents in the current study i.e. 72% were using social media accounts which was slightly higher than the 57% according to the McAfee report of 2014.¹⁸ In the present study, 64.5% participants played games on their phones. Similar results were obtained with a study done by Singh et al in North-East India.¹⁹ In this study, it was observed that 90.3% participants don't use phone while eating. This is in contrast with most literature available and maybe due to non-availability of phone for adolescents at that times as most use phones of their parents. In the current study, only 22.6% use phones

while charging whereas it was 71% in a study done by Shamshad Ahmad et al in medical college students in Kolkata.²⁰

Table 5: Association between patterns of smartphone usage and feeling of restlessness without phone.

Variables	Feeling of restlessness		Chi square, df, p value, significance
	Yes N (%)	No N (%)	
Internet use on phone			
Yes	59 (66.7)	31 (33.3)	1.429, 1, 0.231 not significant
No	01 (33.3)	02 (66.7)	
Social media account			
Yes	09 (34.6)	17 (65.4)	14.094, 1, 0 significant
No	51 (76.1)	16 (23.9)	
Games on phone			
Yes	42 (70)	18 (30)	2.221, 1, 0.136 not significant
No	18 (54.5)	15 (45.5)	
Use phone while eating			
Yes	08 (88.9)	01 (11.1)	2.585, 1, 0.107 not significant
No	52 (61.9)	32 (38.1)	
Use phone while charging			
Yes	16 (76.1)	05 (23.9)	1.614, 1, 0.203 not significant
No	44 (61.1)	28 (38.9)	
Relevant smartphone function			
Social networking	43 (75.4)	14 (24.6)	7.676, 1, 0.005 significant
Others	17 (47.2)	19 (52.8)	

The contrast in these results may be due to the age difference between the study groups. The most relevant smartphone function for participants in the current study was social networking and was similar to findings of the Wardha study.¹⁶ In this study group, 64.5% reported feeling of restlessness without their phones. This was in contrast to a study done in Malaysia where it was reported to be 36% by Parasuraman et al. The difference may be due to the fact that the previous study was done in 2016 and there has been a significant rise in smartphone use over the years.²¹ The feeling of restlessness without phone was statistically significant in association with the duration of use in years, duration of use in hours per day, frequency of use (times/day) and time until 1st smartphone use in morning. Results were similar to the studies done by Jain et al, Mathew et al and Singh et al.^{16,17,19} The most relevant smartphone function and use of social media applications was also statistically significant in association with feeling of restlessness without phones. Results were in accordance with the study done by Jain et al and Kelly et al.^{16,22} The feeling of restlessness without phone was not associated with internet use and playing games on phones. This is in contrast with most literature available and maybe explained by the small sample size in the current study and limited availability of phones to the participants in the study group.^{16,17,19} Association between the most

relevant smartphone function (social media use) was found statistically significant with number of years of usage, frequency of daily use, time until 1st use in morning, internet use, social media use & playing games. Results were in similarity to available research and literature.^{16,17,19,20,22,23}

Limitations

The limitations of the study lies in the fact that smartphone addiction scale was not used and only the pattern of smartphone usage were obtained. However further research could be done in the current study group to identify smartphone addiction among the participants.

CONCLUSION

The results observed in the current study depict the growing dependence on smartphones in the adolescents of the country. Internet use, social media, violent online games etc. are important indicators for smartphone use among adolescents. Parents should be counselled to inculcate rational use of phones by children and to promote use of phones for purposes of learning and education besides entertainment. Also counselling of students at schools and colleges by teachers and dedicated counsellors regarding judicious use of phones should be done on a regular basis.

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