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SMARTPHONE USE AND ADDICTION AMONG ADOLESCENTS- A CROSS SECTIONAL STUDY

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ABSTRACT **Background:** A rising trend in increase of smartphone use has been observed among younger population, especially adolescent children. This has led to development of behavioural issues which impact physical, psychological and social health in a gradual manner. **Aim:** The aim of present study was to assess use of smartphones and its addiction levels among adolescent children. **Materials And Methods:** This was a prospective and cross-sectional study conducted after obtaining institutional ethical approval from concerned authorities. Total 200 adolescents were recruited based on following inclusion and exclusion criteria. Inclusion criteria were- a) Adolescents between 14 to 18 years and b) assent along with written consent from school administration and parents while exclusion criteria were- a) incomplete questionnaire and b) adolescents having history of medical or psychiatric disorders. Smartphone Addiction Scale was used for assessment of level of addiction. **Results:** Statistically significant differences in numbers of smartphone use hours, type of family unit, number of family members and employment of parents was found to be associated with use of smartphones. Also, no statistically significant difference in genders pertaining to addictive behaviour to use of smartphone was found. **Conclusion:** Present study reported a high prevalence of smartphone use and addiction among adolescent children studied along with their use beginning in earlier than 10 years age.

KEYWORDS : smartphone, addiction, adolescents, prevalence, children

INTRODUCTION:

Smartphones have become an important constituent of day to day life as it caters to different activities like- providing information, as a tool in commerce, in entertainment field, as a means of communication, as a tool in business and as an educational tool. [1] Smartphones are a convenient means to access information regardless of place and time. As a result of this, these have modern communication devices have become indispensable in lives of adolescent children. [2] Smartphones allow students in capturing photographs of study material which help in preparing notes that help in improving academics and also, in sharing of study materials with their peers and teachers and students. [3]

Addiction for Smartphones can be defined as "a psychological dependence on use of smartphone which has been associated with addiction which can be distinctly observed as clinical characteristics along with inability of its users in limiting uses." [4] Addictive behaviour towards use of smartphones can result in stress, anxiety and depression. [5]

Main advantage of smartphone uses are- its portability as well as real-time application due to Internet availability and various social media platforms. Hence, these factors contribute to higher acceptance as well as use of smartphones by adults, adolescents and children. Across the world, prevalence of addiction to smartphone use varies between 2.4% to 60.3% amongst adolescents and children. [6] India is slowly emerging as a fast growing market for smartphone users. It had roughly 41% subscribers of internet in 2018 seconded by China. An average Indian spends seventeen hours on social media platforms per week which is much higher than combined users living in China and US.

50% smartphone users in India are aged between 15-24 years of which majority are students. [7] Most importantly, main uses of these devices are for Chats, streaming of videos, internet browsing, access of social network sites and use of image analysis apps. These activities consume greater than 50% time spent over smartphones. India boasts of highest adolescent population constituting 1/5th Indian population of which 22% belong to urban zones. [8]

In 2021, smartphones had gained access to 75% population around the world. India, as well experienced sharp increase in its usage up to 54% irrespective of urban or rural differences. [9] Smartphones provide with unlimited accessibility for gaining information as well as act as providing social networking. Although there are growing concerns regarding excess dependent behaviour on these devices specially in the adolescent age group.

Addiction of smartphones has been characterized by a compulsive usage, lack of tolerance and symptoms associated with withdrawal. This addictive behaviour is now emerging as a major public health issue. Additionally, an excessive use of smartphones has been consistently related with mental health associated problems which include an increase in depression and/or anxiety. [8, 9] Its addiction is correlated with a decrease in academic performance and more than occasionally, disturbances in sleep patterns. These influences multiple areas of adolescent life- style. [10]Hence, this study was designed with an aim towards assessing the addictive behaviour among adolescents related to smartphone use in India.

MATERIALS AND METHODS:

Study Design And Settings: This was a prospective descriptive analysis conducted in adolescents studying in rural as well as urban areas' private as well as governmental schools. Prior ethical committee permission was obtained before initiating the study and informed consent was obtained from participants before beginning. Participant information was kept confidential as per Declaration of Helsinki statement. The study was conducted for a period of four months i.e., September, 2024 to December, 2024.

Study Population And Sample Size Calculation: Present study had enrolled 200 adolescent students for participating in the study.

Sample size was calculated by following formula:
n=z2 X p^(1- p)/ E2
where, z score (95% confidence level) = 1.96

E= margin of the error= 5% = 0.05

N = Expected size of studied population

p^= population proportion = 50%

Thus, calculated size of sample = 200

Inclusion Criteria of this study were-
a) Adolescents belonging in between 14-18 years age and
b) those who provided assent along with written consent from school administration as well as their parents.

On the other hand, exclusion criteria were-
a) incompletely filled up questionnaire and
b) those adolescent children with history of medical or psychiatric disorders.

Tool used: The Smartphone Addiction Scale consisting of twenty three items and six dimensions- a) compulsion (seven items), b) forgetfulness (two items), c) reduced attention span (two items), d)

depression (four items), e) disturbances in hunger and sleep patterns (four items) and f) withdrawal from society (four items) was used. Each of the items were awarded '5' Points on Likert Scale ranging from 1) Strongly Agree, 2) Agree, 3) Not decided, 4) Disagree and 5) Strong Disagreement. Score ranged from 23 (minimum score) to 115 (maximum score). A high score is indicative of high addiction to smartphone use and vice versa.

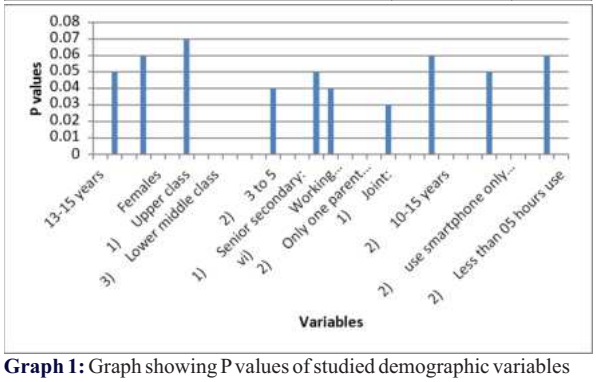
Collection Of Data:
Students were selected on the basis of their availability. The questionnaire was administered on students fulfilling the inclusion/exclusion criteria of the study. Respondents were informed that they were not obliged to participate, that all the answers were anonymous and that they were free to deny to answer any questions. The respondents were given 30 minutes to answer the questionnaire. Two attempts were made through their class schedule to reach out the proposed sample size.

Data Analysis:
Observed data entry was done in Microsoft Excel 2010 and analysis was done by statistical software SPSS version 20.0 (IBM, US). Independent't-test' was employed for comparing intra-group mean ± S.D. values and determining statistical significance which was fixed as value lesser than 0.05.

RESULTS AND OBSERVATIONS:
a) Socio-demographic characteristics: Total 200 adolescent age-group students, mean age of 14.5 ± 0.123 years were studied out of which there were 95 males and 105 females. On studying age distribution, 46% children belonged in between 13 to 15 years while 64% were in 16 to 18 years age group. This was found to be statistically significant (P=0.05). On analyzing distribution of genders, 47.5 % were males while 52.5% were females which was statistically nonsignificant (P=0.06). On analyzing socioeconomic status, 16%, 25%, 25% and 05% of adolescent children belonged to upper, upper middle, lower middle and lower class. 89% of children had more than five while 11% had 3 to 5 members in their family which was statistically significance (P =0.04). 67% students were studying in senior secondary while 33% were studying in high school (statistical significance, P =0.05). 17% of children had both working parents whereas 83% had one parent working only which was again, significant difference (P= 0.04) Majority of adolescents (90%) belonged to nuclear while 10% had joint families which was having significant difference (P=0.04). 34% children started using smartphones at age lesser than 10 years, 56% children started between 10 to 15 years while 10% started their use below 10 years age. This was found to have no statistical significance (P=0.06). 60% adolescent children were using internet via smartphones multiple times a day, 24% adolescent students were using internet facility and 16% were using their smartphones for internet access less often. This was observed to have statistically significant difference (P=0.05). 56 % adolescent children were spending more than five hours each day for using their smartphones however, no statistically significant difference (P=0.06) was obtained. (table and graph 1).

Table 1: Table Demonstrating Socio-demographic Features Of Studied Population

Socio-demogrpahic characteristic studied	Percentages distribution	P values
I) Age distribution:		
13-15 years	46%	0.05
16 to 18 years	64%	
ii) Gender distribution:		
Males	47.5%	0.06
Females	52.5%	
iii) Socioeconomic status:		
1) Upper class	16%	
2) Upper middle class	24%	0.07
3) Lower middle class	25%	
4) Lower class	05%	
iv) Total number of family members:		
1) > 5	89%	0.04
2) 3 to 5	11%	
v) Class inwhich currently being studied:		
1) Senior secondary:	67%	0.05
2) High school:	33%	
vi) Working status of parents:		
1) Both parents working:	17%	0.04
2) Only one parent working:	83%	
vii) Type of family:		
1) Joint:	10%	0.03
2) Nuclear:	90%	
viii) Age of starting of smartphone use:		
1) <10 years 2) 10-15 years 3) > 15 years	34% 56% 10%	0.06
ix) Frequency of accessing internet through smartphone: 1) Less often 2) Only once or twice a day 3) More than twice daily:	 16% 24% 60%	0.05
x) Time spent per day on smartphone use: 1) More than 05 hours 2) Less than 05 hours	 56% 44%	0.06

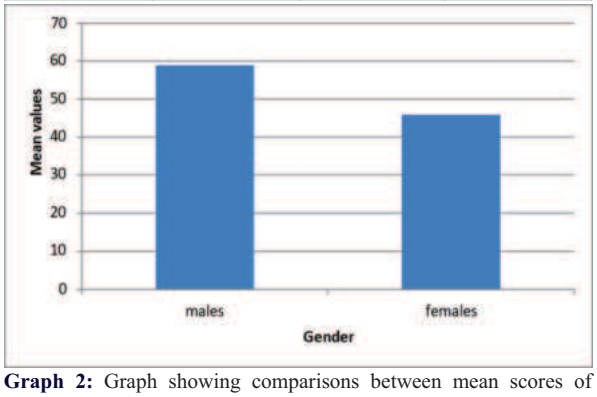


Graph 1: Graph showing P values of studied demographic variables

b) Addiction levels: On comparing levels of smartphone addiction levels in both genders, higher mean ± S.D. value of 59.1 ± 1.23 were obtained among male adolescents in comparison with females i.e., 46.13 ± 0.03. However, this was found to have no statistical significance (P=0.06) (table 2 and graph 2).

Table 2: Table Demonstrating Comparison Between Addiction Level Scores In Both The Studied Genders

Gender	Sample size (n)	Mean ± S.D.	P values
Males	95	59.1 ± 1.23	0.06
Females	105	46.13 ± 0.03	



Graph 2: Graph showing comparisons between mean scores of addiction levels between both genders

DISCUSSION:
Rapid increase in use of smartphones has led to addiction in day to day lives. [11] Smartphones are multi-functional devices and have an advantage of allowing a person to remain connected constantly even while moving.[12] However, this unrestrained and continuous use in adolescents might lead to development of addictive behaviour.

Adolescent growth is crucial period characterized by physical, social and psychological growth marked with impulsive and risk-taking behaviour. [13] Smartphones have easily available advantages for adolescents in terms of education, social networking as well as source of entertainment. Addiction of smartphones can lead to sleep pattern

disturbances, problems in academics, less physical activities and development of family issues due to behavioural problems. [14]

Globally, the rate of prevalence of smartphone addiction amongst adolescents has been estimated to range between 10%-40%. [15] However, it has been estimated to range from 39% to 44% amongst Indian adolescents. [16]

Present study analyzed addiction levels for smartphone usage in Indian adolescent children. Slightly higher addiction was observed among male counterparts with comparison to females. Though, one comparing the mean and standard deviation values, there was no statistically significant difference obtained between use of smartphone between both the genders. Hence, it can be implied that the addictive behaviour is almost similar regardless of gender in adolescent age group. It was further noted that majority of children studied started using smartphones at a very young age i.e., < 10 (34%) and 10-15 years (56%) age groups. Majority of children (56%) were using their smartphones for more than five hours each day and the frequency at which they were accessing internet services through their smartphones was found to be high (60%).

Ladani et al (2025) in their study observations reported 89.8% rate of prevalence and 64% prevalence of addiction among adolescent smartphone users. [17] Yogesh et al (2024) observed prevalence of addictive use of smartphones in 64.6% adolescents. A higher addiction rate was associated with residence in urban area (AOR= 2.4; 95% CI= 1.8–3.3), high education of parents (AOR= 3.3; 95% CI= 1.7–4.3), long duration of smartphone usage (AOR= 2.08; 95% CI= 1.7–3.6) and higher socio-economic status (AOR= 1.9; 95% CI= 1.5–3.51). [18]

These findings are similar to other studies which have reported a prevalence rate ranging between 67 to 97%. [19, 20]

Shastri et al (2024) reported higher smartphone addiction in adolscents between 17 to 19 years of age group. [21]

Parlack et al (2023) found that parental educational level as well as an increase in income of family was associate with a rise in addiction. Also, an increase in age was found to be closely associated with addiction towards smartphones. [22]

Hence, in most of the studies a high prevalence as well as addiction rates of smartphone use among adolescent children was found which was in support with our study findings.

CONCLUSION:

Hence, it can be concluded from this study that due to greater reach of smartphone devices, its usage begins from a young age which leads an increase in dependence during adolescent. This is also attributed to most educational content which is available online which gradually expands to other uses as well. Major limitation of present study was its restriction to a limited sample size in only one part of the country. A diverse group of populations would have provided with greater reflection of the prevalence and addiction rate among Indian adolescents.

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Conflict Of Interest: Nil

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