Original Article

Prevalence of Smartphone Addiction and its Relation with Depression among School-going Adolescents

Deepak Sharma[1*], Naveen Krishan Goel[1], Ajeet Sidana[2], Shefali Kaura[1], Michelin Sehgal[1]

[1]Department of Community Medicine, Government Medical College and Hospital, Chandigarh, India.
[2]Department of Psychiatry, Government Medical College and Hospital, Chandigarh, India.

Abstract

Background: Smartphone addiction among adolescents is an increasingly recognized problem worldwide. It affects the psychological well-being of an individual.

Aim and objective: The current study aimed to assess smartphone addiction's prevalence and its relation to depression among adolescents.

Methods: This cross-sectional study was conducted among 400 school-going adolescents. Smartphone addiction scale - Short version (SAS-SV) and patient health questionnaire (PHQ-9) were used to assess the prevalence of smartphone addiction and depression. Data were analyzed using Epi info software for windows (CDC, Atlanta). Statistical significance was set at $p<0.05$.

Results: The mean age of study participants was 14.4 years (SD=1.5 years). The prevalence of smartphone addiction was 23%, while depression was present among 45% of the study participants. Comparatively higher duration of smartphone use was significantly associated with smartphone addiction. Depression was significantly higher among smartphone addicts (77.2%) as compared to their counterparts (35.4%).

Conclusion and Recommendation: The smartphone usage of adolescents, if not monitored, could lead to its addiction and thus increase the risk of depression among them. To prevent smartphone addiction, limiting children's screen time is recommended. In this regard, parents can play a pivotal role by becoming responsible digital role models for their children.

Keywords: Adolescent, Child, Aged, 80 and over Smartphone, Internet Addiction Disorder, Patient Health Questionnaire, Prevalence, Screen Time, Cross-Sectional Studies, Depression, Schools Parents, Software, Centers for Disease Control and Prevention, U.S.

Introduction

India has many mobile phone subscribers, most of whom are now smartphone users. Fast-increasing internet connectivity coverage, social media communication and digital initiatives have further fuelled the smartphone demand in our country.[1] Nowadays, a smartphone is a necessity rather than a luxury item. During the COVID-19 lockdown period, most of the classes were held online on smartphones, which further increased its access among school children. However, its obsessive and excessive usage is a cause of concern, especially among adolescents.[2]

Depression, characterized by persistent sadness and a loss of interest in activities, is a significant contributor to global disability. The burden of this mental health problem is comparatively higher in low-income and middle-income countries, including India. There are multiple etiological risk factors for depression like biological, cultural and substance abuse.[3] Smartphone addiction may lead to sleep disturbances, stress, and impaired cognitive abilities, thus impacting school grades.[4,5] Existing research has shown a significant

Access this article online

Quick Response Code

Website: www.iapsmupuk.org

DOI: 10.47203/IJCH.2023.v35i01.006

Address for correspondence: Deepak Sharma
Department of Community Medicine,
Government Medical College and Hospital, Chandigarh, India
E-mail: drdeepakgmch@gmail.com

How to cite this article: Sharma D, Goel NK, Sidana A, Kaura S, Sehgal M. Prevalence of Smartphone Addiction and its Relation with Depression among School-going Adolescents. Indian J. of Com. Health. 2023;35(1):27-31.
Received: 10-09-2022, **Accepted:** 15-02-2023, **Published:** 31-03-2023

relationship between smartphone addiction and depression.[6,7,8] A possible reason for this association is that increased screen time may lead to stress, anxiety and mood fluctuations. Individuals may start experiencing fear of missing out (FOMO), due to which they repeatedly check social media websites.[9,10] To assess the prevalence of smartphone addiction among school-going adolescents. To study the relationship between smartphone addiction and depression.

Methodology

Study Type

This cross-sectional school-based study was conducted for 2 months (May and June 2022). The inclusion criteria was school-going adolescents who had access to a smartphone for at least the past 6 months.

Sample Size and Sampling Methodology

A sample size of 394 was calculated (rounded off to 400), assuming a prevalence of smartphone addiction of 37%,[11] absolute precision of 5, 95% confidence interval and 10% non-response rate. There is one government senior secondary school in the Department of Community Medicine field practice area, Govt Medical College and Hospital, Chandigarh. This was selected purposively based on the available resources and workforce. School-going children of this school (classes 8th, 9th, 10th and 12th) were enrolled in the study. The probability proportion to the size statistical sampling technique was used to decide the number of children included in each class and section. In the selected class and section, students were chosen by random roll number selection. Intern doctors and medical social workers administered the questionnaire to the study participants. Written informed consent was obtained from the guardians of the study participants, and assent was informed from them before the survey.

Study Tool

The data collection comprised of three sections socio-demographic information b) the smartphone addiction scale short version (SAS-SV) questionnaire and c) patient health questionnaire (PHQ-9). Trained intern doctors self-administered the study tool to the study participants. The SAS-SV was used to assess smartphone addiction. This validated scale contains 10 items ranging from 1 (strongly disagree) to 6 (strongly agree). A higher score represents a higher possibility of smartphone addiction. The cut-off value used in the present study for categorizing smartphone addiction was ≥31 in boys, and ≥33 in girls.[12] This tool was translated from english to hindi and then back-translated by language experts to ensure that the hindi translation maintained the same meaning as the original questionnaire. Depression was screened using the PHQ-9.[13] The score assigned to each item of the questionnaire ranges from zero (not at all) to three (nearly every day). A higher score indicates more severity of depression. A cut-off score of five has high sensitivity and specificity for screening depression among adolescents.[14] Hindi version of PHQ-9 was used in the present study.[15]

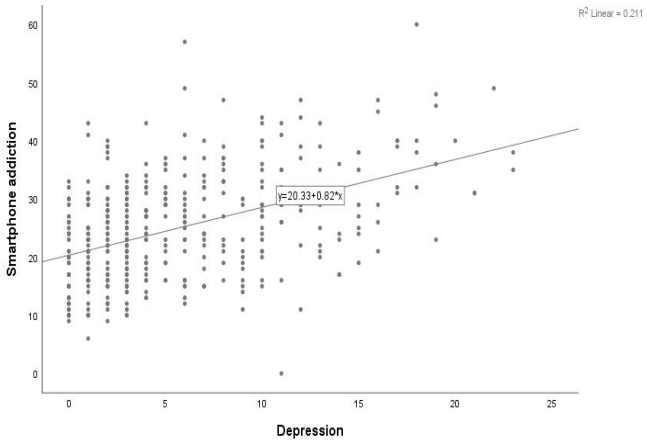

Figure 1: Relationship between smartphone addiction and depression scores

Statistical Analysis

Data were analyzed using Epi Info software version 7.1.5.2 for windows (CDC Atlanta). The prevalence of smartphone addiction and mental depression were presented as percentages. In the present study, it was decided to categorize the average duration of smartphone user per day as up to 1-hour and more than 1-hour. A *p-value* of <0.05 was considered to be statistically significant. Spearman correlation (r) was used to assess the nature and significance of the relationship between smartphone addiction and depression. When r = 0.1–0.3, 0.3–0.5 and 0.5–0.9, the correlation strength is classified as weak, moderate, and strong, respectively. Ethical approval for this study was obtained from the research and ethical committee of the Government Medical College and Hospital, Chandigarh. (Ref: GMCH/IEC/2021/629R/374 dated: 07-10-2021)

Results

A total of 400 students participated in the study. The mean age of the study participants was 14.4 (SD ± 1.5) years, ranging from 12 to 19 years. The study sample comprised 51% girls (n = 204) and 49% boys (n = 196). There were 105(26.3%) in early adolescence age (12–13 years) and 295(73.7%) in middle and late adolescence age (14–19 years). The prevalence of smartphone addiction was 23% (92/400). Smartphone addiction was statistically higher among boys (29.6%) than girls (16.7%). The prevalence of smartphone addiction was higher among early adolescents (24.8%) than middle and late adolescents (22.4%); however, the difference was insignificant. There is a statistically significant relationship between daily hours of smartphone usage and smartphone addiction (p<0.01) and daily hours of smartphone usage and depression (p=0.03) Table 1. Among 400 students, the prevalence of depression was 45.0%(180/400). Mild depression was present in 92 (23%), moderate in 57 (14.2%), and severe in 31(7.8%). The overall

prevalence of depression was not significantly associated with age group (p=0.6) and gender (p=0.8). It was significantly higher among smartphone addicts (77.2%) as compared to their counterparts (35.4%). Further, those using a smartphone for more than an hour daily (51.9%) were comparatively more depressed as compared to their counterparts (40.5%). Table 1. The total mean SAS-SV score was 24.9(SD=9.2), while for PHQ-9 was 5.5(SD=5.1). The mean score of SAS-SV was higher for early adolescence (mean=25.5, SD=8.7) than for middle and late adolescence (mean= 24.7, SD=9.4); however, this was not statistically significant (p=0.47). The SAS-SV score among boys was 25.8 (SD=8.8) and among girls was 24.0 (SD=9.5) (*p-value*=0.05). There was a significant statistical association between the total score on the SAS-SV and daily usage hours (up to 1-hour daily mean= 23.1(SD=8.9) and more than 1-hour daily mean = 27.6(SD=9.1); *p-value* <0.001). The mean depression score was not related to age group or gender, but there was an association with daily hours of usage (up to 1-hour mean=5.0, SD=4.9; more than 1-hour mean=6.3, SD=5.4; p=0.02). Finally, there was a significant moderate correlation between smartphone addiction and depression (correlation coefficient of 0.46 (p = 0.01)) Figure 1.

Table 1: Factors associated with smartphone addiction and depression among the study participants

	Yes N=92	*No N=308*	*Chi-square, p-value*
Smartphone addiction			
Age group			
Early adolescence (12–13 years)	26(24.8)	79(75.2)	0.25;0.62
Middle and late adolescence (14–19 years)	66(22.4)	229(77.6)	
Gender			
Boys	58(29.6)	138(70.4)	9.5;0.02
Girls	34(16.7)	170(83.3)	
Average duration of use per day			
Up to 1-hour daily	43(17.8)	199(82.2)	9.5; <0.01
More than 1-hour daily	49(31.0)	109(69.0)	
Depression			
	Yes N=180	No N=220	Chi-square, p-value
Age group			
Early adolescence (12–13 years)	45(42.9)	60(57.1)	0.26; 0.61
Middle and late adolescence (14–19 years)	135(45.8)	160(54.2)	
Gender			
Boys	87(44.4)	109(55.6)	0.06; 0.81
Girls	93(45.6)	111(54.4)	
Average duration of use per day			
Up to 1-hour daily	98(40.5)	144(59.5)	5.0; 0.03
More than 1-hour daily	82(51.9)	76(48.1)	
Smartphone addiction			
Present	71(77.2)	21(22.8)	49.9; < 0.01
Absent	109(35.4)	199(64.6)	

Discussion

In the present study, the prevalence of smartphone addiction was 23%. Similar to our finding, Zou in China reported that 22.8% of students had smartphone addiction.[16] However, a higher prevalence of smartphone addiction has been reported in studies conducted by Bhandari (37%)[11] and Kundapur (57%).[17] A meta-analysis reported that smartphone addiction in India ranged from 39 to 44%.[18] The varied prevalence of smartphone addiction across studies can be attributed to the different study populations and areas. Further, in our study, the prevalence of smartphone addiction was higher among boys than girls. Contrary to this finding, a study by Kundapur reported that females had higher addiction scores than males.[19] In the current study, the prevalence of depression was 45%. Similar to our finding, a previous research work from the study area by Singh reported that 40% of adolescents had depressive disorders.[20] A study by Bharti reported that 51.2% of adolescents had depression.[21] However, a community-based study by Mohta in Haryana reported a comparatively lower prevalence of depression (20.6%).[22]

Adolescents are already vulnerable to mental health issues, including depression, due to physical, emotional and social changes.[23] Smartphone addiction can compound this by substituting real-life interaction with social media interactions. A real-person interaction can promote greater empathy and cooperative relationships vis a social media interaction wherein there might be more friends, but the quality of interaction is poor. Further, more time on a smartphone means less participation in physical activities like playing sports or exercising, which is known to increase mental health.[24] Smartphone excessive use has been documented to disrupt sleep by delaying the time to fall asleep and reducing sleep quality.[4,5] Preoccupation with social media lowers self-esteem by comparing oneself with online acquaintances and thus may lead to irritability, anxiety and depression.[25] Our study found a positive linear correlation between smartphone addiction and depression. Previous studies have documented such a correlation.[6-8] A survey among university students reported that depression positively predicted smartphone addiction.[26]

A study by Wang reported a correlation between depression and their social behavior on smartphones.[27] In our study, we found no relationship of depression with gender. A contrary finding has been reported in studies wherein gender was significantly associated with depressive disorder among adolescents.[28,29]

Conclusion

A positive linear correlation between smartphone addiction & depression among school going adolescents.

Recommendation

It is recommended that the smartphone usage of adolescents should be monitored and regulated by parents. School teachers should sensitize children to control their smartphone usage. Healthcare professionals should regularly screen school-going adolescents, and those identified as addicted or having depression should be managed appropriately. Parents can play a pivotal role by becoming responsible and good digital role models for their children. Finally, policymakers should design appropriate interventions to curtail this public health problem.

Limitation

There are a few limitations of the current study. Firstly as it was a self-reported survey, there are chances of underestimation or overestimation. Secondly, owing to the cross-sectional study design, the temporality of the association between dependent and independent variables could not be established. Lastly, this study was conducted among students of one particular school in the study area, thereby limiting the generalization of the results. However, future studies on this topic can adopt a greater sample size and a better geographic representation of schools. The strength of the present study is using validated scales to assess smartphone addiction and depression.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Number of smartphone users in India. Available from URL: https://www.statista.com/. [cited 1-9-2022].
2. Serra G, Lo Scalzo, L, Giuffre M. *et al.* Smartphone use and addiction during the coronavirus disease 2019 (COVID-19) pandemic: cohort study on 184 Italian children and adolescents. Ital J Pediatr 2021;47, 150 .
3. Depression. Available from URL: https://www.who.int/. [cited 1-9-2022]
4. Parasuraman S, Sam AT, Yee SWK, Chuon BLC, Ren LY. Smartphone usage and increased risk of mobile phone addiction: A concurrent study. Int J Pharm Investig. 2017;7(3):125-131.
5. Thomee S. Mobile Phone Use and Mental Health. A Review of the Research That Takes a Psychological Perspective on Exposure. Int J Environ Res Public Health. 2018 Nov 29;15(12):2692.
6. Elhai J.D., Levine J.C., Dvorak R.D., Hall B.J. Non-social features of smartphone use are most related to depression, anxiety and problematic smartphone use. Comput. Hum. Behav. 2016;69:75–82.
7. Yen CF, Tang TC, Yen JY, Lin HC, Huang CF, Liu SC et al. Symptoms of problematic cellular phone use, functional impairment and its association with depression among adolescents in Southern Taiwan. J. Adolesc. 2009;32:863–73.
8. Ghasempour A., Mahmoodi-Aghdam M. The Role of Depression and Attachment Styles in Predicting Students' Addiction to Cell Phones. Addict. Health. 2015;7:192–197.
9. Boers E, Afzali MH, Newton N, Conrod P. Association of Screen Time and Depression in Adolescence. JAMA Pediatr. 2019;173:853-9.
10. Li L, Griffiths MD, Mei S, Niu Z. Fear of Missing Out and Smartphone Addiction Mediates the Relationship Between Positive and Negative Affect and Sleep Quality Among Chinese University Students. Front. Psychiatry 2020;11:877.
11. Bhanderi DJ, Pandya YP, Sharma DB. Smartphone Use and Its Addiction among Adolescents in the Age Group of 16-19 Years. Indian J Community Med. 2021;46(1):88-92.
12. Kwon M, Kim DJ, Cho H, Yang S. The smartphone addiction scale: development and validation of a short version for adolescents. PLoS One. 2013;8(12):e83558.
13. Kroenke K, Spitzer RL. The PHQ-9: A new depression and diagnostic severity measure. Psychiatric Annals 2002;32, 509-521.
14. Ganguly S, Samanta M, Roy P, Chatterjee S, Kaplan DW, Basu B: Patient health questionnaire-9 as an effective tool for screening of depression among Indian adolescents. J Adolesc Health. 2013, 52:546-51.
15. Avasthi A, Varma SC, Kulhara P, et al. Diagnosis of common mental disorders by using PRIME-MD Patient Health Questionnaire. Indian J Med Res, 2008; 127(2): 159–164.
16. Zou Y, Xia N, Zou Y, Chen Z, Wen Y. Smartphone addiction may be associated with adolescent hypertension: a cross-sectional study among junior school students in China. BMC Pediatr 2019; 19: 310.
17. Kundapur R, Hanglur Narasimha H, Baisil S, Badiger S. Assessment of Smartphone Addiction among adolescents in a University. Indian J Community Health 2020;32:161-3.
18. Davey S, Davey A. Assessment of Smartphone Addiction in Indian Adolescents: A Mixed Method Study by Systematic-review and Meta-analysis Approach. Int J Prev Med. 2014;5:1500-11.
19. Kundapur R, Harshitha H N, Baisil S, Badiger S. Assessment of Smartphone Addiction among adolescents in a University. Indian J Comm Health. 2020;32:161-3.
20. Singh MM, Gupta M, Grover S. Prevalence & factors associated with depression among school going adolescents in Chandigarh, north India. Indian J Med Res. 2017;146:205-15.

21. Bharati DR, Kumari S, Prasad N, Choudhary SK, Kumar S, Pal R. Correlates of depression among school going adolescents in the urban area of Patna in eastern India. J Family Med Prim Care. 2022;11:1702-9.
22. Mohta A, Malhotra S, Gupta SK, Mani K, Patra BN, Nongkynrih B. Depression Among Adolescents in a Rural Area of Haryana, India: A Community-Based Study Using Patient Health Questionnaire-9. Cureus. 2021;29;13:e18388.
23. Adolescent mental health issues. Available from URL: www.who.int [cited 1-9-2022]
24. Kim SE, Kim JW, Jee YS. Relationship between smartphone addiction and physical activity in Chinese international students in Korea. J Behav Addict. 2015;4(3):200-5.
25. Abi-Jaoude E, Naylor KT, Pignatiello A. Smartphones, social media use and youth mental health. CMAJ. 2020;192:E136-E141.
26. Matar Boumosleh J, Jaalouk D. Depression, anxiety, and smartphone addiction in university students- A cross-sectional study. PLoS One. 2017;12:e0182239.
27. Wang Y, Ren X, Liu X, Zhu T. Examining the Correlation Between Depression and Social Behavior on Smartphones Through Usage Metadata: Empirical study. JMIR Mhealth Uhealth. 2021; 6;9:e19046.
28. Salk RH, Hyde JS, Abramson LY. Gender differences in depression in representative national samples: Meta-analyses of diagnoses and symptoms. Psychol Bull. 2017;143(8):783-822.
29. Wang L, Zhang Y, Yin H, Zhang Z, Tao Y, Xu Ye et al. The effects of parental relationships, and gender and grade differences on depressive disorder in Chinese adolescents: the evidence from multiple cross-sectional surveys (1999–2016). China popul. dev. stud. 2019; 3, 37–52.