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Original Research Article

Problematic usage, safety knowledge, and dependency challenges of mobile phones among late adolescents in southern India: a mixed-methods study

Parambilankandi Akshay[1], Jeby Jose Olickal[2]*, Durgesh Roy[3], Venkatachalam Jayaseelan[4], Mahalakshmy Thulasingam[4], Renu V. P.[1]

[1]Achutha Menon Centre for Health Science Studies (AMCHSS), Sree Chitra Tirunal Institute for Medical Sciences & Technology, Thiruvananthapuram, Kerala, India
[2]Amrita Institute of Medical Sciences (AIMS), Kochi, India
[3]Department of Medical, Health and Family Welfare Services, Government of Rajasthan, India
[4]Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India

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***Correspondence:**
Dr. Jeby Jose Olickal,
E-mail: drjebyjose@gmail.com

ABSTRACT

Background: Globally, the number of people using mobile phones is estimated to be around 8.1 billion, with the majority being youths. Therefore, our aim was to assess problematic mobile phone use among late adolescents.
Methods: We conducted an exploratory mixed-method study among selected schools in Puducherry, South India, from September to October 2019. Two focus group discussions (FGDs) were held among students exhibiting high problematic mobile phone use.
Results: A total of 498 students were enrolled, with a mean (SD) age of 14.3 (1.4) years, and more than half were male. Approximately 77% reported using mobile phones, with around 30% spending more than one hour per day on mobile use. Of the total, 23% (95% CI 19.3-26.8) exhibited problematic mobile phone use. Factors significantly associated with problematic use included the student's level of education (APR= 5.6, 95% CI 1.3 – 24.7), parents' occupations (APR= 3.8, 95% CI 1.2 – 12.2), and hours spent on mobile phones (APR= 2.1, 95% CI 1.3 – 3.4). Only 50% were aware that increased mobile phone use is harmful. Qualitative interviews provided significant insights into smartphone dependency and challenges faced by students.
Conclusions: There is a pressing need for comprehensive initiatives to promote responsible smartphone use.

Keywords: Problematic mobile phone use, Adolescent, School students

INTRODUCTION

Globally there has been a steady increase in the sales and usage of smartphones. The number of people using cell phones is estimated to be around 8.1billion, of which the majority are youths.[1] India was ranked as the world's second-largest mobile phone using country in January 2024.[2] Over the years, there was a steady increase in mobile phone subscribers' and in 2021 the number of mobile users are 1.16 billion in India.[3]

Although smartphones have numerous benefits, there are equal numbers of negative effects that can occur with prolonged or excessive usage.[4] Only a very small proportion of people are aware of the safe usage of smartphones.[5] Apart from electromagnetic radiation production, behavioral changes and problematic use are of

main concern in the adolescent population.[4] Problematic use can be referred to as the usage of smartphones beyond optimum levels such that it influences the daily lives of the users.[6] It has been defined as non-substance-related abuse.[7]

Smartphone addiction is one of the most common problems prevalent nowadays. It has been found that addiction to smartphones is higher than addiction to the internet.[8] Youngsters are more interested in smartphones and are getting addicted to it. A study conducted in Spain in 2015 reported that adolescents in the age group of 14-19 years prefer smartphones over computers to access the internet.[9] With an increasing number of smartphone users in India, this area needs to be further explored. Although there have been several studies on smartphone usage, few studies have been conducted relating to problematic usage. Hence, this study aimed to explore the level of knowledge and awareness regarding the problematic use, safe use of mobile phones among late adolescents studying in selected government and private schools.

METHODS

Study design, setting, and population

This is an exploratory mixed-method study, which contains a cross-sectional analytical as quantitative and focused group discussions (FGDs) as qualitative components. This study was conducted among late adolescents of selected government and private schools in urban and rural Puducherry, South India, from September to November 2019. In both urban and rural areas, one government school and one private school were selected. Students from classes seven to twelve were included.

Sample size calculation

Assuming the proportion of adolescents having problematic mobile phone usage as 31.3%, with 5% absolute precision, and a design effect of 1.5, the calculated sample size was 496.[10] This sample size was calculated using Open Epi version 3.1. However, we included 498 students as we collected data from classrooms and included all the students from the selected class rooms.

Sampling technique and study procedure

There are 81 higher secondary schools in urban and 51 in rural areas of the Puducherry district. Four schools were randomly selected from the list of schools, two each from government and private. Permission was obtained from the Directorate of School Education to undertake the study. Any two sections from each class were randomly selected.

FGDs were conducted among the students to explore the safety measures' perception and the challenges in practicing them. Two FGDs; one each among girls and boys who had high problematic usage scores. Each FGD was conducted with 8-10 students after getting written informed consent. The FGDs were audio recorded, and field notes were written down simultaneously.

Ethical approval

We obtained approval from the Institute Ethics Committee. Written informed consent was taken from the parents, and the assent was taken before enrolling them to study.

Study tools

A pretested self-administered structured questionnaire was used to obtain information on student's age, gender, type of school, religion, education, residence, family type, family monthly income, parental occupation, and smartphone usage characteristics. The Problematic Use of Mobile Phone (PUMP) questionnaire was used to assess the problematic use of smartphones. This questionnaire consists of20 self-reported 5-point Likert scale questions. The student has to select the most appropriate option which was felt true for him/her, and each answer was evaluated on a 5-point Likert scale from 1= strongly agree to 5= strongly disagree. A total score of more than 60 was considered as problematic use of smartphones.

A 19-item questionnaire was used to capture details on student's knowledge and safe use of smartphones.

Data analysis

Quantitative part

Data were entered using Epi Data version 4.1, and analysis was done using Stata version 14. All categorical variables were summarized as proportions. The prevalence of problematic use of mobile phones was expressed as proportion with 95% confidence intervals (CIs). The factors associated with problematic use of mobile phones were tested using a chi-square test. A log-binomial regression analysis was performed using the variables that had a p value less than 0.2 in the univariate analysis, and adjusted prevalence ratios (APRs) with 95% CI was calculated. A p value <0.05 was considered as statistically significant.

Qualitative part

In each FGD 8 adolescents are participated and transcribed in a separate dialogue sheet. The codes were taken from the FGDs, following that theme were generated.

RESULTS

The socio-demographic details of the students are shown in Table 1. Around 60% aged <15 years. The mean (SD) age was 14.3 (1.4) years, 56% were males, and 73% belonged to a nuclear family. Around 80% of student's parents were employed in the private sector.

Table 1: Socio-demographic characteristics of late adolescents studying in government/private schools in Puducherry, 2019 (n=498).

Characteristics	N	%
Age groups (years)		
<15	300	60.2
≥15	198	39.7
Gender		
Male	278	55.8
Female	220	44.2
Type of school		
Government	252	50.6
Private	246	49.4
Religion		
Hindu	424	85.2
Christian	29	5.8
Muslim	41	8.2
Others	4	0.8
Education		
Class 7	20	4
Class 8	43	8.6
Class 9	88	17.7
Class 10	125	25.1
Class 11	106	21.3
Class 12	116	23.3
Residence		
Rural	239	48
Urban	259	52
Family type		
Joint	135	27.1
Nuclear	363	72.9
Parental occupation		
Unemployed	5	1.0
Government	89	17.9
Private	399	80.1
Retired	5	1.0

Table 2: Description of smart-phones usage of late adolescents studying in government/private schools in Puducherry, 2019 (n=498).

Characteristics	N	%
Phone type		
Smartphone	382	76.7
Non-smart phone	116	23.3
Smart phone ownership		
Yes	126	25.3
No	372	74.7
Using parent's smart phone		
Yes	421	84.5
No	77	15.5
Time spent with smart phone (in hours)		
<1	347	69.7
1-2	80	16.0
>2	71	14.3
PUMP score		
Normal use of smartphones (<60)	384	77.1
Problematic use of smartphones (>60)	114	22.9

PUMP: Problematic Use of Mobile Phone.

Table 3: Association of socio-demographic characteristics and smart phone use patterns with problematic use of smartphones among late adolescents studying in government/private schools in Puducherry, 2019 (n=498).

Characteristics	Total	Problematic use	Crude PR (95% CI)	Adjusted PR (95% CI)	P value
Total	498	114 (22.9)			
Age group					
<15 years	300	73 (24.3)	1.1 (0.8-1.6)	-	-
15 – 19 years	198	41 (20.7)	1	-	-
Gender					
Male	278	69 (24.8)	1.2 (0.8-1.6)	-	-
Female	220	45 (20.5)	1	-	-
Type of school					
Government	252	71 (28.2)	1.6 (1.1-2.2)	1.2 (0.7-1.9)	0.373
Private	246	40 (17.5)	1	1	-
Religion					
Hindu	424	93 (21.9)	1	1	-
Christian	41	10 (24.4)	1.1 (0.6-1.9)	0.9 (0.4-1.8)	0.816
Muslim	29	11 (38.0)	1.7 (1.0-2.8)	1.4 (0.7-2.8)	0.332
Others*	4	0	-	-	-
Education					
Class 7	20	4 (20.0)	4.3 (0.8-21.5)	3.6 (0.6-20.2)	0.137
Class 8	43	2 (4.7)	1	-	-
Class 9	88	35 (39.8)	8.5 (2.1-33.9)	5.6 (1.3-24.7)	0.021
Class 10	125	27 (21.6)	4.6 (1.1-18.7)	4.0 (0.9-17.1)	0.059
Class 11	106	25 (23.6)	5.0 (1.2-20.4)	3.6 (0.8-16.2)	0.087
Class 12	116	21 (18.1)	3.8 (0.9-15.9)	2.9 (0.6-12.6)	0.156
Residence					
Rural	239	57 (23.9)	1.0 (0.7-1.5)	-	-
Urban	259	57 (22.0)	1	-	-
Family type					
Joint	135	39 (28.9)	1.4 (1.0-1.9)	1.3 (0.8-2.0)	0.158
Nuclear	363	75 (20.6)	1	-	-
Parental occupation					
Unemployed	5	2 (40.0)	1.9 (0.6-6.2)	1.2 (0.2-6.0)	0.765
Government	89	18 (20.2)	1		
Private	399	90 (22.6)	1.1 (0.7-1.7)	1.0 (0.6-1.8)	0.822
Retired	5	4 (80.0)	3.9 (2.1-7.2)	3.8 (1.2-12.2)	0.021
Smart phone ownership					
Yes	126	37 (29.37)	1.4 (1.0-1.9)	1.2 (0.8-2.0)	0.259
No	372	77 (20.70)	1	-	-
Time spent with smart phone (in hours)					
<1	347	64 (18.44)	1	-	-
1-2	80	30 (37.5)	2.0 (1.4-2.9)	2.1 (1.3-3.4)	0.002
>2	71	20 (28.17)	1.5 (0.9-2.3)	1.7 (1.0-3.0)	0.047

*PR=Prevalence Ratio.

Description of smart-phones usage of late adolescents is depicted in Table 2. Nearly one-fourth (23.3%) were using non-smartphones, and 85% were using parents' smartphones and 30% were using phones for more than one-hour duration. Out of 498 students, nearly one-fourth had problematic usage of mobile phones (114, 22.9%, 95% CI 19.3-26.8).

The factors associated with problematic use of mobile phone usage is shown in Table 3. Education (APR=5.6, (95% confidents interval 1.3–24.7, parents' occupation (APR=3.8, (95% confident interval 1.2–12.2), and time spent on mobile phone (APR=2.1, (95% confident interval 1.3–3.4) were significantly associated with the problematic use of mobile phones. The knowledge about the safe use of smartphones is described in Table 4. About 64% call back to most of the missed calls, 57% using mobile phones to help them overcome the bad moods, and only 51% aware that mobile phones' increased use is harmful.

A total of 2 FGDs were conducted among the selected school-going late adolescents. Table 5 shows the themes

and codes of focused group discussion. The results were summarized under the following four themes: usage, challenges, awareness and safety precautions and usage pattern.

Table 4: Knowledge about safe use of smartphones among late adolescents studying in government/private schools in Puducherry, 2019 (n=498).

Characteristics	n*	N	%	95% CI
Call back to most of the missed calls	491	313	63.7	59.32-68.00
Using mobile phone help, you to overcome the bad moods	491	278	56.6	52.10-61.05
Lose track of time after starting to use mobile phone for SMS, games, music	489	271	55.4	50.88-59.88
Aware that increased use of mobile phone is harmful	492	252	51.2	46.71-55.71
Do you feel guilty about the expenditure on mobile phone	490	250	51.0	46.49-55.53
Upset while attempting to cut down phone use	490	244	49.8	45.27-54.31
Mobile phone use led to decrease in meeting the friends	492	229	46.5	42.06-55.10
You lie to others to conceal the extent of your phone use	492	229	46.5	42.06-51.06
Mobile phone use has made you spend less time with friends	494	206	41.7	37.31-46.19
Getting irritated in the morning if you are not able to find your mobile phone	492	181	36.7	32.57-41.22
Aware that Mobile phone use can led to decrease in socialization	490	168	34.3	30.08-38.68
Become anxious of missing something if you have to switch off your mobile phone	490	177	34.2	31.86-40.55
Frequently participate in SMSs or phone entry competitions	498	160	32.1	28.04-36.42

*Number of students answered the question, CI-Confidence interval.

Table 5: Thematic analysis of the focus group discussion. Themes: perception of late adolescent on mobile phone uses.

Final codes applied	Finalised themes based on codes
Not using phone for studies/ Less time for studies	Usage pattern
Compulsion to reply	
Keeping phone close by	
Less socially active	
Responding	
Afraid of scolding	
Strangers/ anonymous in social media/ mobile	Challenges
Gaming addiction	
Privacy issue in internet	
Not responding to unknown contacts/ scams/ messages etc	Awareness and safety precautions
Parental guidance	
Parental supervision	
Aware of physical harm	
Aware of social harm	
Aware of health impact	
Aware of financial harm	

The study finds a variety of smartphone using behaviours, such as high degrees of addiction, dependency, and anxiety-inducing activities. Users appear to be very dependent on their mobile devices for social networking, games, entertainment, and everyday communication.

"I'll wake up in the morning after hearing my phone sound only. If I am talking with them for so long in mobile phone. I feel like …. I forgot their faces. We won't use mobile phone for study purpose… not even for one minute. I'll respond immediately to all the messages I receive."

-A girl from government school aged 17 years/ studying twelfth standard

"If any messages come, I have to see that message immediately if not I'll feel anxious and tensed. If any bad messages come, I have to delete no…. that's why …. if any girls text me I should delete that before my parents see because they will ask me what you want? girlfriends at this age itself ah like that, they will ask …why to get unwanted scolding…"

-A boy from private school aged 17 years/ studying twelfth standard

The data shows how important smart phones are in consumers' daily lives and how dependent they are on them for a variety of tasks. Online forums are preferred over in-person meetings, indicating a change in sociability patterns and highlighting the impact of smart phones on social interactions, especially among students. The psychological components of smartphone use are highlighted by the identification of harmful usage patterns, such as the anxiety associated with quick replies and the impulse to check the device as soon as one wakes up. Moreover, the research highlights that a range of constraints impact smartphone usage habits, with worries about safety, parental oversight, and anxiety being the most significant constraints. Users limit their smartphone usage because they are afraid about unsolicited calls and possible scams. Anxiety and reprimand from parents serve as obstacles that influence how people use their smartphones. The unwillingness to use smart phones for scholarly research, preferring to use them for general information searches, is a reminder of the influence that security concerns and parental supervision have had on the development of smartphone usage habits. Overall, the results highlight the complexity of smartphone dependence and the influence of outside variables on usage patterns.

Challenges

Participants from the study had varying experience with strangers communicating. Girls were facing more troubles while boys reported that they were greatly influenced by smartphone. The major challenges that the study reported where self-restriction through refraining from certain apps installation and primary concerns that were highlighted in the conversation was about spam calls speaking for money and private information.

"Calling and asking for the bank details like I am bank manager giver your details like that. Games like life threat games like blue whale, momo and it made urge. To overcome that was bit challenging like not to install that apps. No privacy in internet, Google …. If I am searching something in Google that comes again in Facebook, Instagram. If any messages come, I have to see that message immediately if not I'll feel anxious and tensed"

-A boy from private school aged 17years/ studying twelfth standard

"We won't use mobile phone for study purpose… not even for one minute. Missed calls, Facebook, Unknown messages from unknown persons. I'll respond immediately to all the messages I receive. I'll wake up in the morning after hearing my phone sound only. If I am talking with them for so long in mobile phone. I feel like …. I forgot their faces"

-A girl from government school aged 17 years/ studying twelfth standard

The data emphasizes how crucial it is to understand the gendered dynamics at play in conversations with strangers as guys negotiate influences and girls deal with obstacles. It is suggested that potential dangers be addressed proactively by abstaining from program installations. The increased awareness of unsolicited emails asking for private and financial information highlights the importance of exercising caution and vigilance when interacting with people online. The participant's description of receiving calls or messages demanding money and pretending to be fraudsters emphasizes even more the variety of strategies employed by possible threats. The results essentially emphasize how important it is to foster caution and knowledge in order to protect personal and financial security against constantly changing online threats.

Awareness and safety precautions

The study covers physical warnings, cautious platform usage, and communication practices, among other levels and facets of safety precautions and awareness surrounding smartphone use. These steps are intended to reduce any possible dangers related to using a smartphone.

"Should not use mobile phone while driving…… Don't click on the unknown link…. don't install unknown apps, games. Should not keep mobile phones near us while sleeping. I won't use mobile phone when it's charging and won't share important details in phone. I don't share the OTP or bank details when someone ask through phone"

-A girl from government school aged 17 years/ studying twelfth standard

"Trusting apps blindly. Once I tried Google maps in unknown place but it showed way to some restaurant when we went there instead of mobile showroom. I won't attend unknown calls and respond to messages, won't attend calls when on charger. I won't use mobile phone for prolonged time with brightness in dark as it affects the eye sight. I won't keep mobile phone in the pockets as the radiation emitted leads to health issues"

-A boy from private school aged 17years/ studying eleventh standard

The presented evidence showcases a thorough strategy in addressing potential hazards linked to smartphone usage. Providing physical warnings about the hazards of using phones while driving or charging reflects a dedication to ensuring user safety. Advising caution in platform usage, including avoiding unfamiliar programs and apps, demonstrates a proactive approach to preventing potential security breaches. The focus on refraining from disclosing private information and keeping phones away from bedside during sleep underscores a commitment to safeguarding personal data and encouraging healthy sleep

habits. The observed cautious communication behaviours, such as disregarding calls from strangers and refraining from responding to unknown texts, indicate an increased awareness of potential digital communication threats. The substantial role of parental guidance in enforcing safety measures, including limitations on smartphone usage for children, underscores the significance of education and supervision in instilling responsible smartphone habits.

Thus, this study discloses a comprehensive set of awareness and safety measures addressing diverse aspects of smartphone usage. These measures collectively contribute to mitigating potential risks and fostering a safer and more responsible approach to using smartphones.

DISCUSSION

This study attempted to assess the knowledge and practice of the safe use of mobile phones among adolescents. The prevalence of problematic usage in the present study was found to be 22.9%. The study conducted by de-Sola et al. in Spain found that around 5% of the participants had problematic use.[11] A study showed a mean PUMP score of 56.33 was obtained.[12] Around half of the participants agreed that they were addicted to the internet in a study conducted by Carbonell et al. in 2017.[13] A study conducted in India by Das et al. found a PUMP score of 53% among 100 participants aged 17-50.[14] The prevalence obtained in the present study could be comparatively low due to the lack of smartphone ownership by many participants. Around 75% of the participants in this study did not have their own smartphones. The difference in scores from the study conducted in India and Spain could be due to incorporating a wider age group in the former, while the current study only assessed PUMP scores from late adolescents. In the present study, problematic use was around 24% in the age group below 15 years. Also, students of class 9 were found to have 5.7 times more problematic usage than other classes, which was statistically significant. In the study conducted by Firat et al., half of the adolescent participants had problematic mobile phone use. The proportion of addictive usage was around 3% in a study conducted in Korea.[15]

In the current study, children of retired parents had more problematic use compared to employed parents. This could be attributed to lesser parental supervision from older parents compared to younger parents. In the study by Hwang et al. in Korea, parents' risk perception was a significant factor in mediating their child's smartphone usage.[16] In the current study, parents who perceived that their child's current smartphone usage was not at risk of turning problematic would have spent less time monitoring their smartphone usage. Kwak et al.'s study in Korea also supports this, with parental neglect and guidance making children prone to problematic usage.[17]

In this study, smartphone usage for more than an hour was significantly associated with problematic usage. Similar results were obtained in a study conducted by Pundir et al. in India, where a high frequency of use was significantly associated with problematic usage.[18] Having a smartphone could lead to more freedom of usage, which leads to increased frequency of usage and then eventually to the problematic use of smartphones, hence explaining the results obtained in the present study.

In our study, the administered questionnaire revealed that around 40-50% of students did not follow safe practices while using smartphones. According to the study by Terras et al, developing proper knowledge on the motive of use and parental supervision are crucial for developing safe usage practices.[19] The findings of the current study show that the study participants might have unclear/multiple motives for usage (usage for increased time to achieve satisfaction and lose track of time after usage). This could be attributed to lack of or decreased parental supervision, leading to the increased time spent on smartphones for texting or playing games.[19]

In this current study, two focussed group discussion was conducted four major themes, such as the problem of the use of mobile phones among late adolescents, the challenges faced while using smartphones, safety measures taken, awareness and knowledge on safe use of smartphones, and respective codes. In the study conducted by Aoki et. al. in the USA, participants used smartphones mostly for personal safety and accessing the information.[20] Smartphone usage also made them depend on smartphones even for small work; these findings were found similar in the current studies. Similarly, in the study conducted by Fullwood et al, the participants stated smartphone usage became their habit and that getting rid of boredom used the phones for recreational activities like listening to music, playing games, and making videos.[21] The participants also used for functional purposes like communications, clock etc, and to get information like maps, web searches for general knowledge were also found similar compared to this study. Similarities in these studies were due to the similar pattern of uses of smartphones among the participants. In this study, the participants also stated about mobile phone's questioned privacy, addiction to smartphones, video making applications, and stranger approaches.

This study has a few limitations. Since it was conducted in selected schools in Puducherry, the generalizability of the findings is limited. Due to the cross-sectional nature of the study, causality cannot be proven. Additionally, due to logistical reasons, only two FGDs were performed, and thus, the findings may not be complete.

CONCLUSION

About one-fourth of the participants had problematic usage, and nearly half of the participants had poor knowledge regarding the safe use of mobile phones. Participant narratives demonstrate the complex nature of smartphone dependence, which emphasizes the need for all-encompassing initiatives to encourage responsible

smartphone use. This study adds important information about smartphone usage trends, user difficulties, and practical safety measures.

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REFERENCES

1. Digital-2023-Global-Overview-Report.pdf [Internet]. Available at: https://wearesocial.com/wp-content/uploads/ 2023/03/Digital-2023-Global-Overview-Report.pdf. Accessed on 04 January 2024.
2. World Population Review. Cell Phones by Country 2024 [Internet]. Available at: https://worldpopulationreview.com/country-rankings/cell-phones-by-country. Accessed on 04 January 2024.
3. Marg JLN. Promoting Networking And Telecom Equipment Manufacturing in India; 2021.
4. Pundir P, Andrews T, Binu VS, Kamath R. Association of problematic mobile phone use with psychological distress and self-esteem among college students in South India : a cross-sectional study. International Journal of Community Medicine and Public Health. 2016;3:2841–9.
5. Suki NM, Suki NM. Mobile phone usage for m-learning: Comparing heavy and light mobile phone users. Campus-Wide Information Systems. 2007;24:355–65.
6. Busch PA, Hausvik GI, Ropstad OK, Pettersen D. Smartphone usage among older adults. Computers in Human Behavior. 2021;121:106783.
7. Zou Z, Wang H, d'Oleire Uquillas F, Wang X, Ding J, Chen H. Definition of Substance and Non-substance Addiction. Advances in Experimental Medicine and Biology. 2017;12:21–41.
8. Demirci K, Orhan H, Demirdas A, Akpinar A, Sert H. Validity and Reliability of the Turkish Version of the Smartphone Addiction Scale in a Younger Population. Klinik Psikofarmakoloji Bulteni. 2014;24:226–34.
9. Butler H. Teens pick "Smombie" as the hippest German word [Internet]. The Local: Stockholm, Sweden. 2015. Available at: https://www.thelocal.de/20151114/are-you-a-smombie-german-youth-word-2016. Accessed on 04 January 2024.
10. Nikhita C. Prevalence of Mobile Phone Dependence in Secondary School Adolescents. Journal of Clinical and Diagnostic Research. 2015;9.
11. Fonseca D, Rubio G. Prevalence of problematic cell phone use in an adult population in Spain as assessed by the Mobile Phone Problem Use Scale (MPPUS). Plos One. 2017;12:1–17.
12. Desouky DE-S, Abu-Zaid H. Mobile phone use pattern and addiction in relation to depression and anxiety. East Mediterr Health J. 2020;26:692–9.
13. Carbonell X, Chamarro A, Oberst U, Rodrigo B, Prades M, Blanquerna F, et al. Problematic Use of the Internet and Smartphones in University Students : 2006 – 2017. International Journal of Environmental Research and Public Health. 2018;15:2006–17.
14. Das R, Sharma PA. A cross-sectional study to assess the problematic use of mobile phones among a selected population in an urban area. Indian Journal of Psychiatric Nursing. 2019;16:7.
15. Fırat S, Gül H, Sertçelik M, Gül A, Gürel Y, Kılıç BG. The relationship between problematic smartphone use and psychiatric symptoms among adolescents who applied to psychiatry clinics. Psychiatry Research. 2018;270:97–103.
16. Hwang Y, Jeong S-H. Predictors of Parental Mediation Regarding Children's Smartphone Use. Cyberpsychology, behavior and social networking. 2015;18.
17. Kwak JY, Kim JY, Yoon Y. Effect of parental neglect on smartphone addiction in adolescents in South Korea. Child abuse & neglect. 2018;77:75–84.
18. Prachi P. Association of problematic mobile phone use with psychological distress and self-esteem among college students in Udupi taluk. Indian Journal of Community Medicine public health. 2016;3:2841–9.
19. Terras MM, Ramsay J, King D, Chan C, Mayor E. Family Digital Literacy Practices and Children's Mobile Phone Use. Frontiets in Psychology. 2016;7:1–11.
20. Aoki K, Downes E. An analysis of Young People's Use of and Attitudes Toward Cell Phones. Telematics and Informatics. 2003;20:349–64.
21. Fullwood C, Quinn S, Kaye KL, Redding C. My Virtual friend: A qualitative analysis of the attitudes and experiences of Smartphone users: Implications for Smartphone attachment. Computers in Human Behavior. 2017;75:347–55.

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