The International Journal of
INDIAN PSYCHOLOGY

Research Paper

Assessing the Impact of Smartphone Addiction on Internet Gaming Disorder in Adolescents

Singampalli Harsha Sadgun[1]*

ABSTRACT

The study was conducted to examine the interplay between smartphone addiction and Internet Gaming Disorder (IGD) among Indian adolescents, based on a questionnaire survey of 845 individuals. Results indicate that late adolescents were more vulnerable to smartphone addiction and IGD because they had higher disposable incomes and access to gaming technology. Males tend to be more affected by IGD due to social norms relating gaming to masculinity. In addition, rural adolescents have higher IGD levels compared with their urban peers, probably caused by competitive gaming and lack of awareness. In this study, there is a moderate positive relationship between smartphone addiction and IGD. It is found out that the significant predictors of IGD include smartphone addiction, gender, area of residency, and education level.

T hese days, almost all teenagers across the globe are into using smartphones and access to the internet, and the same is the case with India. New technologies have given rise to a number of possibilities including; interconnectivity, information acquisition, and education. However, they also pose risks with obvious counterparts in the form of behavioral addictions. The most common of them is the smartphone addiction, which defines the excessive and compulsive use of smartphones which interferes with several areas of the person's life. This includes effects on normal functioning, academic performance, physical health, as well as interaction with other people. Another related issue that has raised concerns in today's society is Smartphone addiction, or as it is often called problematic use of smartphones, especially in young people who are more attached to the gadgets. This is more so with the adolescents as they are more vulnerable to this addiction due to the developmental state, social surround and due to combined features of the smartphones where one can access social media, games and other digital contents endlessly. Smartphone addiction means the dependence on the mobile increases, and the individual has chronic symptoms, which makes them unhealthier.

Similar to the phenomenon of smartphone addiction, there exists the Internet Gaming Disorder (IGD), which is a mental health disorder identified by both the World Health

[1]Ph.D. candidate, Department of Psychology, Andhra University, Visakhapatnam, Andhra Pradesh, India.
*Corresponding Author

Organization (WHO) and the American Psychological Association (APA). IGD is defined by compulsively spending time on the internet playing games, which results in or causes severe adverse effects on an individual's life. This can present in various forms ranging from low academic achievement, lack of social interactions, and at times emotional problems such as anxiety, depression and even acts of violence. This is due to the fact that; online games are interactive and can be highly competitive in nature, thus making them more appealing as they cater for the needs of individuals such as the need to achieve, escape reality, and find social affiliation by young people especially teenagers. More so, in the Indian context, the challenge is extremely momentous given the country's youthful population. India Census (2011), pointed out that more than 253 million people fall within the age group of 10-19 years, challenging that adolescents are certainly a huge demography. This demographic is the most involved with smartphones and online gaming platforms making the rates of smartphone addiction and IGD among the youths in India to be of high concern.

Adolescent Development and the Impact of Technology Use
Adolescence is considered a developmental stage that involves major changes in physical, emotional, and cognitive aspects of an individual as one grows from a child to an adult. This stage comprises searching for identity, for more independence and for more serious and close relationships outside the family circle. Middle adolescence is defined as ages 14 through 17; it is characterized by the formation of identity, further independence and substantial growth in both the emotional and cognitive domains (Steinberg, 2014; Arnett, 2000). Late adolescence is considered for ages 18 through 21 and is more focused on the transition to adulthood and an individual's career, education, and stable intimate relationships.

Several papers note high levels of smartphone use by adolescents in India because of social networking and gaming leading to smartphone addiction (Ching et al., 2018) and growing IGD and substantial consequences for health and academic productivity (Goel et al., 2013). Based on the reflection of late adolescence, identity development which includes exploration and formation of deeper interpersonal relational with other people especially through social networks can lead to addictive behaviors (Pang, 2018).

Smartphone Usage Surge and Its Consequences for Indian Youth
In the last decade, the usage of smart phones in India has increased rapidly and according to the Telecom Regulatory Authority of India (TRAI) the smart phone users in India are likely to cross the 760 million figure by the end of 2021. Such growth is enabled by cheap smartphones, the spread of the internet, as well as digitalization campaigns from the government. Teenagers are among the primary groups of users, who primarily communicate, play games, and study with the help of smartphones. The core application of social media includes Instagram, Face book, and WhatsApp, while smartphones are useful in online classes throughout the Covid-19 outbreak (Banerjee et al., 2018; Jena, 2020). Also, applications that involve games and applications like Swiggy and Zomato for delivering food meet the entertainment and immediate wants. However, the availability of content for adult entails a problem of exposing young people to wrong content (Nikken & Opree, 2018).

These different uses draw attention to the need for moderation in the use smartphone as well as building awareness on healthy use of social media among Indian youth. This issue is very alarming to the Indian adolescents because with the availability of cheap smartphones and widespread internet connection the cases are on the rise. In this regard, Davey and Davey (2014) point that students are among the most affected population due to the use of the

gadgets in social networking, gaming, and more importantly, the communications needs. According to Tripathi et al. (2018), detachment from smartphone is linked with psychological problems including anxiety, depression, as well as sleeping disorders; therefore, an awareness of such difficulties as well as possible intervention strategies is recommended.

Rising Tide of Gaming Addiction Among Indian Youth
In India, IGD is getting common in adolescents because most games are easily accessible through smartphones and computers. Converging with global studies, psychological and social consequences of IGD among Indian adolescents with high IGD were reported as moderate level of anxiety, depression and high social isolation by Sharma et al. (2020). This rising incidence thus calls for intervention as well as awareness on the matter. The bootstrap movement online gaming and gambling, especially to the adolescent youths and young adults has been alarming in view of possible addiction.

Mobile games like PUBG Mobile, Free Fire, and Call of Duty etc. and online betting games like Rummy Circle, Teen Patti, bingo etc. which promotes gambling have consumed more time and are now addictive for the youth. Gupta et al., (2021) and Prabhakaran et al., (2020) reveal that excessive gaming has negative consequences that include; sleep disruption, poor performance, and increased anxiety and depression. Social loneliness and academic dysfunctionality reported for Indian adolescents with IGD by Anand et al. (2018) are also seen on global scale. These are some of the reasons why there is a need to consider regulation and sensitization of Indian youth on effects of gaming and gambling addictions.

Imperative to Investigate the Link Between Smartphone Use and IGD
In India, the comorbidity between smartphone dependence and IGD is massive because smartphones serve as devices connecting the players to games over the internet. The accessibility of games is a reason adolescents who are addicted to their smartphones are most likely to develop IGD. This the process provides positive feedback to both as they escalate the intensity of each other. Davey and Davey (2014) stated significant co-relation between smartphone addiction and problematic gaming among the adolescent students of India, further, Kumar et al. (2019) established the relationship between excessive smartphone gaming, anxiety and depression. These findings underscore the cross-sectional design to devise multifaceted preventive intervention for smartphone addiction and IGD in the India context. Nevertheless, various concepts of the adverse effects of smartphone usage have been covered in literature with attention to the IGD among teenagers, especially in the Indian context. Therefore, comprehending this connection should serve as an essential step towards designing appropriate therapies for lessening the collateral consequences of these behavioral addictions.

Objectives
- To identify demographic factors associated with smartphone addiction and Internet Gaming Disorder.
- To analyze the relationship between smartphone addiction (SAS) and Internet Gaming Disorder (IGD).
- To examine the impact of the Smartphone Addiction Scale (SAS) on Internet Gaming Disorder (IGD).

Hypotheses
- Demographic factors are significantly associated with the level of smartphone addiction and Internet Gaming Disorder.
- There is a positive correlation between the level of smartphone addiction (SAS) and the Internet Gaming Disorder (IGD).
- The impact of Smartphone Addiction Scale (SAS) on Internet Gaming Disorder (IGD) is significant.

METHODOLOGY

Sample

The sample consisted of 845 participants, obtained through random sampling. Of these, 387 individuals (45.8%) were aged 14-17, representing middle adolescence, and 458 individuals (54.2%) were aged 18-21, representing late adolescence. The gender distribution included 334 males (39.5%) and 511 females (60.5%). Participants' educational backgrounds varied, with 140 (16.6%) in secondary education, 247 (29.2%) in intermediate education, 313 (37.0%) in undergraduate programs, and 145 (17.2%) in postgraduate studies.

Measures
- ***Smartphone Addiction Scale-Short Version (SAS-SV)*** was developed by Kwon, Kim, Cho, and Yang in 2013 to assess smartphone addiction. This scale is a concise, validated tool used globally to measure the extent of problematic smartphone use among individuals.
- ***Internet Gaming Disorder Scale–Short-Form (IGDS9-SF)***, developed by Pontes and Griffiths in 2015, is a concise and validated tool designed to assess the severity of Internet Gaming Disorder. It includes nine items that reflect the diagnostic criteria of IGD as outlined in the DSM-5.
- ***Demographic sheet*** consists of Age, Gender, Area of Residency and Education.

Procedure

The study employed a cross-sectional survey design to investigate the relationships between smartphone addiction and Internet Gaming Disorder among adolescents. Confidentiality was strictly maintained, and necessary permissions were obtained from the relevant authorities.

Statistics

Data analysis was performed using IBM SPSS Statistics Version 27, employing statistical methods such as independent samples t-tests, one-way ANOVA, Pearson correlation and Regression to examine the relationships and differences among the variables.

RESULTS AND DISCUSSION

Table 1: t-Test Results for IGD and SAS Scores by Age Groups

	AGE	N	Mean	SD	t	p
INTERNET GAMING DISORDER	14-17	387	16.50	7.330	-3.411**	.001
	18-21	458	**18.23**	7.399		
SMARTPHONE ADDICTION	14-17	387	28.16	10.186	-5.488***	.000
	18-21	458	**32.12**	10.672		

Significant value: ***P<0.001, **P<0.01, *P<0.05

Table 1, presents the results of independent samples t-tests for Internet Gaming Disorder (IGD) and Smartphone Addiction Scale (SAS) scores, comparing two age groups: 14-17

years (middle adolescence) and 18-21 years (late adolescence). For IGD, a significant difference was found, t(843) = -3.411, p = 0.001, with the 18-21 age group having higher scores (M = 18.23, SD = 7.399) than the 14-17 age group (M = 16.50, SD = 7.330). Similarly, for SAS, a significant difference was observed, t(843) = -5.488, p < 0.001, with the older group showing higher levels of smartphone addiction (M = 32.12, SD = 10.672) compared to the younger group (M = 28.16, SD = 10.186).

Late adolescents, aged 18 to 21, exhibit higher levels of Smartphone Addiction Scale (SAS) scores and Internet Gaming Disorder (IGD) prevalence compared to younger adolescents due to increased discretionary income, along with the acquisition and utilization of the latest gaming consoles and smartphones. The increased academic and social pressures during this period, such as the demands of higher education and the transition to college life, can lead to greater reliance on smartphones and gaming as coping mechanisms (Alheneidi et al., 2021). Additionally, this age group tends to have more autonomy and financial resources, providing them with greater access to smartphones and gaming platforms without as much parental supervision (Sohn et al., 2019).

Table 2: t-Test Results for IGD and SAS Scores by Gender

	GENDER	N	Mean	SD	t	p
INTERNET GAMING DISORDER	MALE	334	**20.46**	7.641	10.139***	.000
	FEMALE	511	15.46	6.554		
SMARTPHONE ADDICTION	MALE	334	30.12	10.103	-.401	.689
	FEMALE	511	30.42	10.970		

*Significant value: ***P<0.001, **P<0.01, *P<0.05*

Table 2, shows independent samples t-test results for Internet Gaming Disorder (IGD) and Smartphone Addiction Scale (SAS) scores, highlighting differences between male and female adolescents. For IGD, a significant difference was found, t(843) = 10.139, p < 0.001, with males having higher IGD scores (M = 20.46, SD = 7.641) than females (M = 15.46, SD = 6.554), indicating more severe gaming issues among males. For SAS, no significant difference was observed with males and females showing similar levels of smartphone addiction.

Males exhibit higher levels of Internet Gaming Disorder (IGD) than females, largely due to socialization processes that normalize gaming as a masculine activity, reinforcing stereotypes of competition and gaming proficiency. Males are generally more attracted to the competitive and achievement-oriented aspects of games, which can enhance their engagement and potential for addiction (Ko et al., 2005). Additionally, the gaming industry predominantly markets to a male audience, creating more gaming content that appeals to male interests and preferences, thus increasing their likelihood of developing IGD (Kuss & Griffiths, 2012).

Table 3: t-Test Results for IGD and SAS Scores by Area of Residency

	AREA	N	Mean	SD	t	p
INTERNET GAMING DISORDER	RURAL	228	**19.15**	7.972	3.906***	.000
	URBAN	617	16.80	7.099		
SMARTPHONE ADDICTION	RURAL	228	30.77	10.200	.790	.430
	URBAN	617	30.13	10.788		

*Significant value: ***P<0.001, **P<0.01, *P<0.05*

Table 3, displays Welch's t-test results for Internet Gaming Disorder (IGD) and Smartphone Addiction Scale (SAS) scores based on area of residency (rural vs. urban). For IGD, a significant difference was found, t(367.88) = 3.906, p < 0.001, with rural adolescents scoring higher (M = 19.15, SD = 7.972) than urban adolescents (M = 16.80, SD = 7.099), suggesting more severe gaming issues in rural areas. For SAS, no significant difference was observed.

Rural adolescents in India show higher levels of Internet Gaming Disorder (IGD) than their urban peers, likely due to the competitive nature of online games and the appeal of achievement in environments with limited academic or career opportunities and Lack of awareness about Internet Gaming Disorder. Additionally, the lack of educational programs about the risks of excessive gaming means rural parents and educators often fail to recognize or address IGD. Limited recreational activities and social opportunities in rural areas lead to increased online gaming as a form of entertainment and socialization (Hawi et al., 2019). The rapid spread of smartphones and internet access in these regions makes gaming more accessible, offering an escape from daily stress (Singh et al., 2020).

Table 4: One-Way ANOVA Results for IGD and SAS Scores by Educational Levels

EDUCATION		N	Mean	SD	F	p
INTERNET GAMING DISORDER	SECONDARY	140	14.89	5.821	10.670***	.000
	INTER	247	17.41	7.927		
	UG	313	17.96	7.241		
	PG	145	**18.82**	7.721		
	Total	845	17.44	7.414		
SMARTPHONE ADDICTION	SECONDARY	140	25.72	9.610	15.420***	.000
	INTER	247	29.54	10.262		
	UG	313	**32.24**	10.527		
	PG	145	31.85	11.010		
	Total	845	30.30	10.631		

*Significant value: ***P<0.001, **P<0.01, *P<0.05*

Table 4, Welch's ANOVA was conducted to examine the differences in Internet Gaming Disorder (IGD) and Smartphone Addiction (SAS) scores across different educational levels. For Internet Gaming Disorder (IGD), there was a statistically significant difference in scores across the four educational levels, Welch's F(3, 392.50) = 10.67, p < .001 with Secondary (M = 14.89, SD = 5.82), Intermediate (M = 17.41, SD = 7.93), Undergraduate (M = 17.96, SD = 7.24), and Postgraduate (M = 18.82, SD = 7.72). For Smartphone Addiction (SAS), the results also showed a statistically significant difference in scores across the educational levels, Welch's F(3, 384.17) = 15.42, p < .001 with Secondary (M = 25.72, SD = 9.61), Intermediate (M = 29.54, SD = 10.26), Undergraduate (M = 32.24, SD = 10.53), and Postgraduate (M = 31.85, SD = 11.01).

Smartphone addiction, driven by excessive use of social media apps and subsequent engagement in online gaming, results in higher SAS scores among undergraduate students. This often progresses over time, leading to increased smartphone addiction and, consequently, higher Internet Gaming Disorder (IGD) scores among postgraduate students. Postgraduate (PG) students often show higher rates of IGD due to academic pressure, flexible schedules, and extensive digital device access (Griffiths et al., 2016; Hussain et al., 2017). Conversely, UG students tend to exhibit higher levels of smartphone addiction influenced by younger age, peer influence, and extensive smartphone use for social

interactions (Lin et al., 2015; Tang et al., 2016). These trends reflect how academic level and social dynamics shape digital addiction tendencies.

Table 5: Correlation analysis results for IGD and SAS

	INTERNET GAMING DISORDER	SMARTPHONE ADDICTION
SMARTPHONE ADDICTION	.323**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6, Correlation analysis reveals a significant positive relationship between the two variables. The Pearson correlation coefficient between IGD and SAS scores is r=0.323 which is statistically significant at the $p<0.001$ level. This indicates a moderate positive correlation, suggesting that higher levels of Internet Gaming Disorder are associated with higher levels of smartphone addiction among the participants. Liu and Xu (2021) found a significant positive relationship between smartphone addiction and Internet Gaming Disorder, with their meta-analysis revealing that higher levels of smartphone addiction are associated with increased severity of IGD, aligning with the findings of a moderate positive correlation in the current study.

Table 6: Multiple Regression Analysis results for predicting IGD

MODEL	B	Std. Error	Beta	t	p
(Constant)	19.702	1.408		13.990	.000
SMARTPHONE ADDICTION	.213	.021	.306	9.921***	.000
AGE	-.929	.921	-.063	-1.010	.313
GENDER	-5.015	.461	-.331	-10.873***	.000
AREA OF RESIDENCY	-1.354	.515	-.081	-2.631**	.009
EDUCATION	1.217	.482	.158	2.527*	.012

Significant value: ***P<0.001, **P<0.01, *P<0.05
R = .486, R² = .236, Adjusted R² = .231, F(5, 839) = 51.813
Dependent Variable: INTERNET GAMING DISORDER
Predictors: (Constant), SMARTPHONE ADDICTION, AGE, GENDER, AREA OF RESIDENCY, EDUCATION.

Table 7, multiple regression analysis revealed several significant predictors of Internet Gaming Disorder (IGD) among adolescents in India. The model, which explains 23.6% of the variance in IGD scores, demonstrated that smartphone addiction significantly contributes to higher IGD scores (B = 0.213, β = 0.306, p < 0.001), indicating that increased smartphone use correlates with more severe issues with online gaming. Gender also played a crucial role, with males showing higher IGD scores compared to females (B = -5.015, β = -0.331, p < 0.001), suggesting a gender disparity in gaming habits. Additionally, adolescents living in rural areas exhibited higher IGD scores than their urban counterparts (B = -1.354, β = -0.081, p = 0.009), reflecting potential differences in access and lifestyle. Surprisingly, education level was positively associated with IGD scores (B = 1.217, β = 0.158, p = 0.012), implying that higher educational attainment may not mitigate gaming-related behaviors but could possibly reflect different patterns of technology use among students. Age, however, did not significantly predict IGD in this model. These findings underscore the complex interplay of demographic factors, such as gender, area of residency, and education level, along with smartphone addiction, in influencing internet gaming behaviors among adolescents in India.

CONCLUSION

In summary, the study highlights the multifaceted relationship between smartphone addiction and Internet Gaming Disorder (IGD) among adolescents in India, revealing that Late adolescents (18-21 years) show higher Smartphone Addiction scores and Internet Gaming Disorder (IGD) prevalence compared to younger adolescents, influenced by increased income and access to advanced gaming technology. Males are more prone to IGD due to gender norms that link gaming with masculinity. Rural adolescents in India also exhibit higher IGD levels, driven by competitive gaming in environments with limited opportunities and a lack of awareness about IGD. Smartphone addiction, starting with excessive social media use, escalates among undergraduates and contributes to higher IGD scores, particularly among postgraduate students. There is a moderate positive correlation between smartphone addiction and IGD. The multiple regression analysis identified smartphone addiction, gender, area of residency, and education level as significant predictors of Internet Gaming Disorder (IGD) among Indian adolescents. These findings highlight the need for targeted interventions addressing both smartphone addiction and IGD across different adolescent groups.

REFERENCES

Alheneidi, H., AlSumait, L., AlSumait, D., & Smith, A. P. (2021). Loneliness and problem-solving style as predictors of smartphone addiction among university students in Kuwait. Psychological Reports, 124(6), 2781-2797. doi:10.1177/0033294120974960

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: American Psychiatric Publishing.

Anand, N., Jain, P. A., Prabhu, S., Thomas, C., Bhat, A., Prathyusha, P. V., & Young, K. (2018). Internet use patterns, internet addiction, and psychological distress among engineering university students: A study from India. Indian Journal of Psychological Medicine, 40(5), 458-467. doi:10.4103/IJPSYM.IJPSYM_124_18

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. American Psychologist, 55(5), 469-480. doi:10.1037/0003-066X.55.5.469

Banerjee, S., Dutta, S., & Dasgupta, A. (2018). Social networking sites usage pattern among undergraduate medical students of a medical college of Kolkata, West Bengal, India. International Journal of Community Medicine and Public Health, 5(6), 2457-2461. doi:10.18203/2394-6040.ijcmph20182174

Ching, S. M., Hamidin, A., Vasudevan, R., Sazlyna, M. S., Wan Aliaa, W. A., & Foo, Y. L. (2018). Prevalence and factors associated with Internet Gaming Disorder (IGD) among medical students in Malaysia: A cross-sectional study. International Journal of Mental Health and Addiction, 16(4), 874-885. doi:10.1007/s11469-018-9890-7

Census of India. (2011). Census 2011. Retrieved from https://censusindia.gov.in/

Davey, S., & Davey, A. (2014). Assessment of Smartphone Addiction in Indian Adolescents: A Mixed Method Study by Systematic-Review and Meta-Analysis Approach. International Journal of Preventive Medicine, 5(12), 1500-1511.

Goel, D., Subramanyam, A., & Kamath, R. (2013). A study on the prevalence of internet addiction and its association with psychopathology in Indian adolescents. Indian Journal of Psychiatry, 55(2), 140-143. doi:10.4103/0019-5545.111451

Gupta, R., Sharma, A. M., & Vats, R. (2021). Problematic gaming behavior among adolescents and young adults in India: A growing concern. Asian Journal of Psychiatry, 56, 102540. doi:10.1016/j.ajp.2021.102540

Griffiths, M. D., van Rooij, A. J., Kardefelt-Winther, D., Starcevic, V., Király, O., Pallesen, S., ... & Demetrovics, Z. (2016). Working towards an international consensus on

criteria for assessing internet gaming disorder: A critical commentary on Petry et al. (2014). Addiction, 111(1), 167-175.

Hawi, N. S., Samaha, M., & Griffiths, M. D. (2019). Internet gaming disorder in Lebanon: Relationships with age, sleep habits, and academic achievement. Journal of Behavioral Addictions, 8(2), 328-335. doi:10.1556/2006.8.2019.32

Hussain, Z., Griffiths, M. D., & Sheffield, D. (2017). An investigation into problematic smartphone use: The role of narcissism, anxiety, and personality factors. Journal of Behavioral Addictions, 6(3), 378-386.

Jena, P. K. (2020). Impact of pandemic COVID-19 on education in India. International Journal of Current Research (IJCR), 12(7), 12582-12586.

Ko, C. H., Yen, J. Y., Chen, C. C., Chen, S. H., & Yen, C. F. (2005). Gender differences and related factors affecting online gaming addiction among Taiwanese adolescents. Journal of Nervous and Mental Disease, 193(4), 273-277. doi:10.1097/01.nmd.0000158373.85150.57

Kumar, S., Dixit, A., Prasad, S., & Shukla, R. (2019). Smartphone addiction and its correlates: A cross-sectional study among the students of a rural medical college in central India. Journal of Family Medicine and Primary Care, 8(8), 2635-2640. doi: 10.4103/jfmpc.jfmpc_287_19

Kwon, M., Kim, D. J., Cho, H., & Yang, S. (2013). The Smartphone Addiction Scale: Development and validation of a short version for adolescents. PLoS ONE, 8(12), e83558. doi:10.1371/journal.pone.0083558

Lin, Y. H., Chiang, C. L., Lin, P. H., Chang, L. R., & Ko, C. H. (2015). Proposed diagnostic criteria for smartphone addiction. PloS One, 10(11), e0134572.

Liu, M., & Xu, J. (2021). The relationship between smartphone addiction and Internet gaming disorder: A meta-analysis. Journal of Behavioral Addictions, 10(4), 1224-1235. https://doi.org/10.1556/2006.2021.00082

Nikken, P., & Opree, S. J. (2018). Guiding young children's digital media use: SES-differences in mediation concerns and practices in the Netherlands. Journal of Children and Media, 12(1), 64-82. doi:10.1080/17482798.2017.1398670

Pang, H. (2018). Exploring the influence of social media usage on job performance: A study on employees of the Chinese public sector. Telematics and Informatics, 35(1), 271-282. doi:10.1016/j.tele.2017.11.010

Pontes, H. M., & Griffiths, M. D. (2014). Assessment of internet gaming disorder in clinical research: Past and present perspectives. Clinical Research and Regulatory Affairs, 31(2-4), 35-48. doi:10.3109/10601333.2014.962748

Pontes, H. M., & Griffiths, M. D. (2015). Measuring DSM-5 internet gaming disorder: Development and validation of a short psychometric scale. Computers in Human Behavior, 45, 137-143. doi:10.1016/j.chb.2014.12.006

Prabhakaran, V., Patel, V., & Rai, S. (2020). Internet gaming disorder in India: A national survey. Journal of Behavioral Addictions, 9(3), 765-777. doi:10.1556/2006.2020.00045

Prasad, S., & Bhat, P. S. (2021). Problematic smartphone use among medical students in Mangalore. International Journal of Community Medicine and Public Health, 8(11), 4965-4970. doi:10.18203/2394-6040.ijcmph20214360

Singh, S., Suri, J. C., & Suri, J. C. (2020). The internet gaming disorder and sleep problems: A cross-sectional study among adolescents in India. Journal of Family Medicine and Primary Care, 9(12), 5990-5996. doi:10.4103/jfmpc.jfmpc_1272_20

Sohn, S. Y., Rees, P., Wildridge, B., Kalk, N. J., & Carter, B. (2019). Prevalence of problematic smartphone usage and associated mental health outcomes amongst

children and young people: A systematic review, meta-analysis and GRADE of the evidence. BMC Psychiatry, 19(1), 356. doi:10.1186/s12888-019-2350-x

Steinberg, L. (2014). Age of Opportunity: Lessons from the New Science of Adolescence. Houghton Mifflin Harcourt.

Sharma, M. K., Sahu, M., Kasar, P. K., & Sharma, A. (2020). Internet gaming addiction in children and adolescents: A systematic review. Journal of Addiction Medicine, 14(1), e9-e16. doi:10.1097/ADM.0000000000000579

Tang, H., Lu, X., Zhang, S., & Han, X. (2016). State recognition and the influential factors of smartphone addiction in undergraduates. Chinese Journal of School Health, 37(9), 1382-1385.

Telecom Regulatory Authority of India. (2021). Annual report 2020-21. Retrieved from https://www.trai.gov.in/

Tripathi, S., Yadav, V., & Khanna, A. (2018). Impact of excessive use of mobile phone on adolescent's mental health in India. Indian Journal of Psychological Medicine, 40(1), 33-37.

World Health Organization. (2018). International classification of diseases for mortality and morbidity statistics (11th Revision). Retrieved from https://icd.who.int/

Conflict of Interest
The author(s) declared no conflict of interest.