



The Prevalence of Internet Gaming Disorder and its Associated Factors Among College Students in Saurashtra Region, Gujarat, India

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Abstract

Background: Internet gaming has become popular in the last few decades; however, very few studies have been conducted on internet gaming in India. This study aimed to investigate internet gaming disorder (IGD), its prevalence, gaming behavior, and effects as well as multiple factors associated with its emergence among college students.

Methods: This cross-sectional study involved a group of 150 college students. Data were collected using a semi-structured questionnaire containing the Internet Gaming Disorder Scale-Short Form (IGDS9-SF). Statistical analysis was done using Jamovi software.

Findings: A total of 150 college student gamers were involved with a mean age of 18.69 ± 0.10 years. The mean IGD score was 18.74 with a standard deviation of 0.53, while the median score was 18. The prevalence of IGD was 5.3% among the participants. The IGD prevalence was higher in male students and those whose mothers had a high school diploma or higher. Gamers who spent more than 2 hours a day on games had significantly higher IGD scores ($P < 0.05$). A significant association was also found between tingling/numbness in the hand while playing and physical pain with IGD ($P < 0.05$).

Conclusion: Spending more time playing online games was significantly associated with a higher risk of IGD. One negative consequence of IGD is the development of physical health issues. It is important to raise awareness about the physical health consequences of excessive gaming among students, parents, institutions, and concerned authorities.

Keywords: IGD, Prevalence, Gamer, Online game

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Introduction

Internet gaming has become one of the prevailing and favored recreational pursuits in modern times. At present, internet gaming is a booming market in developing countries like India.¹ In the 11th revision of the International Classification of Diseases (ICD-11), gaming disorder was outlined as a behavioral pattern marked by a lack of control over gaming, an elevated emphasis on gaming that overrides other interests and daily commitments, and persistent or increased gaming despite encountering adverse consequences. To diagnose gaming disorder, this behavioral pattern must demonstrate a level of severity that substantially impairs functioning in personal, familial, social, emotional, occupational, educational, or other crucial aspects of life.²

The global prevalence of internet gaming disorder (IGD) varies between 0.7% and 15.6%, averaging at

4.7%.^{3,4} There is a scarcity of research on the frequency or occurrence of IGD specifically within India.⁵ In India, few published studies found a correlation between internet gaming and certain variables among college students.⁶ Effective prevention relies on understanding the causes and identifying the risk factors and high-risk groups. Gaming disorders could have a deleterious effect on the health status of college students.⁷⁻⁹ Accordingly, this study aimed to investigate IGD, its prevalence, gaming behavior, and effects as well as multiple factors associated with its emergence among college students in Amreli, Gujarat, India. Additionally, this study will add valuable information to the limited existing literature on this topic.

Methods

Study design and population

This observational cross-sectional study was conducted



on college students in Amreli, India from September to December 2022. Convenience sampling was used to select the participants and obtain data.

Inclusion and exclusion criteria

Those who gave informed consent, were willing to participate, and were playing online games on a smartphone, laptop, or computer were included in the study. The participants with incomplete information and those who reported psychological problems were excluded from the study.

Data collection

Data were collected using a semi-structured questionnaire through Google Forms. The link was shared via WhatsApp after obtaining permission from college authorities. The questionnaire included items on sociodemographic characteristics and gaming behaviors and contained the Internet Gaming Disorder Scale-Short Form (IGDS9-SF). Sociodemographic characteristics included gender, age, education, family details, sleep patterns, and physical pain (in hand, neck, and back). To assess participants' gaming behavior, data regarding the average daily time dedicated to gaming and the game most frequently played or preferred were collected. The type of family was defined as follows¹⁰:

1. Nuclear family: A married couple with or without unmarried children
2. Joint family: Two or more married couples living together as one generation (horizontal level) or three or more married couples living together as multiple generations (vertical level).

The IGDS9-SF with nine items detailed in the DSM-5, was utilized to assess gaming behavior within the past 12 months. Participants were asked to self-assess their responses to these items on a 5-point Likert scale: 1 = "Never", 2 = "Rarely", 3 = "Sometimes", 4 = "Often", and 5 = "Very Often". The total score, derived from all nine items, fell between 9 and 45, with a higher score signifying increased severity of IGD.^{11,12}

A total of 311 participants responded to the questionnaire. Participants who responded 'No' to the question regarding whether they had engaged in online games within the past 12 months were categorized as non-gamers and consequently excluded from the analysis. The remaining sample comprised 150 individuals identified as gamers for the final analysis. The gamers were categorized into three groups based on their scores: IGD gamers, probable IGD gamers, and regular gamers. Gamers scoring 36 or higher were categorized as IGD gamers, those scoring 18-35 were categorized as probable IGD gamers, and those with scores lower than 18 were categorized as regular gamers.

Data analysis

The data were collected using Google Forms and analyzed via descriptive statistics in Jamovi software.¹³ Descriptive statistics were reported using mean, standard deviation, and frequency, while sample characteristics and gaming behavior were presented using percentages. The Kruskal-Wallis test was used to identify significant differences among IGD gamers. The multinomial logistic regression analysis was used to examine if the study variables had a significant independent effect on IGD status. A *P* value of less than 0.05 was considered statistically significant.

Results

Table 1 shows the associations between participants' characteristics and their gaming behavior regarding IGD. The mean age of the participants was 18.69 ± 0.10 years. The majority of participants (78.7%) were male, 70.7% were educated in sciences, 58% were from rural areas, and 86.7% were residing at home. Three-fourths of participants (73.3%) had a total monthly income of less than 10 000 rupees. Around 60% of parents were educated, one-fourth of participants had tingling/numbness while playing games, and around one-fifth had physical pain due to playing games.

The present study included 150 gamers, and the prevalence of IGD among college students was 5.3%. Moreover, 46.67% were identified as probable IGD, while 48% were classified as regular gamers without IGD. The mean IGD score was 18.74 with a standard deviation of 0.53, while the median score was 18. The IGD prevalence was significantly higher among male students, the students whose mothers had a high school diploma or higher, and gamers who spent 2 or more hours per day on games ($P < 0.05$). The association of IGD with tingling/numbness in the hand while playing and physical pain was also significant ($P < 0.05$).

Table 2 shows different types of online games and their number of players. Most of the students were playing Battle Ground Mobile India (BGMI) (52.77%) followed by Free Fire (34.25%), Clash of Clans (COC) (18.51%), and Call of Duty (COD) (9.2%) games. The results of multinomial logistic regression indicated that IGD risk factors were physical pain and spending more than 2 hours a day playing games. Significant risk factors for probable IGD included being male, experiencing physical pain, and spending more than 2 hours a day gaming as outlined in Table 3 ($P < 0.05$).

Discussion

In this study, the prevalence of IGD was 5.3% among college students. Similar studies were conducted in India, and the prevalence of IGD was 3.5% among adolescent school children in Andhra Pradesh,⁴ 3.6% in New Delhi,⁹ and 4.25% in Kanchipuram district of Tamil Nadu.¹⁴ In other nations, a prevalence rate of 21.8% was reported

Table 1. IGD scores and the characteristics of the study participants (n=150)

Characteristics	IGD categories				P value
	Total No. (%)	IGD No. (%)	Probable IGD No. (%)	RG No. (%)	
Gender					0.044*
Male	118 (78.7)	6 (75)	61 (87.1)	51 (70.8)	
Female	32 (21.3)	2 (25)	9 (12.9)	21 (29.2)	
Age (y)					0.674
17-18	80 (53.3)	1 (12.5)	41 (58.6)	38 (52.7)	
≥19	70 (46.7)	7 (87.5)	29 (41.4)	34 (47.2)	
Field of study					0.184
Sciences	106 (70.7)	5 (62.5)	45 (64.3)	56 (77.7)	
Commerce/Arts	44 (29.3)	3 (37.5)	25 (35.7)	16 (22.3)	
Residence					0.201
Urban	63 (42)	4 (50)	24 (34.3)	35 (48.6)	
Rural	87 (58)	4 (50)	46 (65.7)	37 (51.4)	
Currently living at					0.185
Home	130 (86.7)	6 (75)	58 (82.8)	66 (91.6)	
Paying guest/Hostel	20 (13.3)	2 (25)	12 (17.2)	6 (8.4)	
Paternal education					0.318
Below high school	55 (36.7)	3 (37.5)	22 (31.4)	30 (41.6)	
High school	60 (40)	5 (62.5)	30 (42.8)	25 (34.7)	
Graduate and above	35 (23.3)	0 (0)	18 (25.8)	17 (23.7)	
Maternal education					0.031*
Below high school	54 (36)	3 (37.5)	17 (24.3)	34 (47.2)	
High school	76 (50.7)	4 (50)	45 (64.3)	27 (37.5)	
Graduate and above	20 (13.3)	1 (12.5)	08 (11.4)	11 (15.3)	
Type of family					0.459
Nuclear	98 (65.3)	4 (50)	44 (62.8)	50 (69.4)	
Joint	52 (34.7)	4 (50)	26 (37.2)	22 (30.6)	
Monthly income (Rs.)					
≤10000	110 (73.3)	4 (50)	48 (68.6)	58 (80.5)	0.034*
>10000	40 (26.7)	4 (50)	22 (31.4)	14 (19.4)	
Gaming partner					0.870
Alone	50 (33.3)	2 (25)	24 (34.3)	24 (33.3)	
Group	100 (66.7)	6 (75)	46 (65.7)	48 (66.7)	
Time spent on game per day (h)					0.001*
<2	101 (67.3)	3 (37.5)	39 (55.7)	59 (81.9)	
≥2	49 (32.7)	5 (62.5)	31 (44.3)	13 (18.1)	
Sleep pattern					0.860
Disturbed	12 (8)	1 (12.5)	5 (7.2)	06 (8.4)	
Normal	138 (92)	7 (87.5)	65 (92.8)	66 (91.6)	
Tingling/Numbness in the hand while playing					0.040*
Yes	39 (26)	3 (37.5)	24 (34.3)	12 (16.6)	
No	111 (74)	5 (62.5)	46 (65.7)	60 (83.4)	
Physical pain (in hand, neck, and back)					0.000*
Yes	32 (21.3)	4 (50)	22 (31.4)	06 (8.4)	
No	118 (78.7)	4 (50)	48 (68.6)	66 (91.6)	

Abbreviations: IGD, internet gaming disorder; RG, regular gamer.

*Statistically significant.

among male high school students in the Eastern region of Dammam, Saudi Arabia,¹⁵ 10.3% among Chinese students,¹⁶ 9.2% among Lebanese students,¹⁷ 5.9% among Korean students,¹⁸ 2.03% among Indonesian medical students,¹⁹ 5.4% among secondary school students in Thailand,²⁰ and 5.06% among advanced students in Sri Lanka.²¹ The variations may be due to the different scales used to assess the prevalence of IGD, sociocultural distinctions, differences in targeted demographics, and differences in sample sizes in different studies.

The current study showed the mean age of college students was 18.69 ± 0.10 years while in other studies, the mean age of college students was from 20 to 22 years.⁸ The differences in results might be due to the fact that our study participants were from a non-medical background compared to other studies that focused on medical students. Additionally, the majority of participants in the present study were male, which may be attributed to the higher involvement of males in gaming activities as reported in a study by Dong et al.²² The findings also revealed a higher percentage of disordered gamers (56.8% with IGD and probable IGD) among male students. Similar to the present study, other studies showed male students were more involved in games than female students.^{4,9,14,18,21}

Table 2. Distribution of study participants according to the type of game

Type of game	Number of players (%)
BGMI (Battle Ground Mobile India)	57 (52.77)
COC (Clash of Clans)	20 (18.51)
COD (Call of Duty)	10 (9.2)
Free fire	37 (34.25)
Teen Patti	4 (3.7)
Rummy	5 (4.6)
Mini Militia	3 (2.7)
Chess	5 (4.6)
GTA 5 (Grand Theft Auto 5)	2 (1.85)
LUDO	6 (5.55)
Mine Crafts	2 (1.85)

The higher level of education of parents has a significant role in developing IGD among children.²² Similarly, the results of the present study showed a statistically significant association between maternal education and IGD. Indeed, the use of modern technology and gadgets may increase with higher literacy. Comparable results were observed in the study conducted by Undavalli et al in Andhra Pradesh, India.⁴ Living away from home was significantly associated with IGD as shown by Taechoyotin et al in Thailand²⁰ and Singh et al in New Delhi.⁹ Nevertheless, the present study showed IGD was higher (10%) among students who were living at paying guest/hostels, but the difference was not significant.

Some studies showed playing multiplayer online games was associated with an increased risk of IGD.^{9,15,21} Similarly, the current study revealed that engaging in group gaming (6%) exhibited a higher likelihood of developing IGD compared to playing alone (4%). This association is possibly attributed to the diverse subgenres within multiplayer online games, such as simulation, real-time strategy, and action games, leading to increased frequency and duration of gaming sessions for gamers.^{23,24} Spending more than 2 hours a day gaming was retained as a significant association in multinomial analysis, highlighting the role of excessive game play in disordered gamers. Moreover, the average daily time spent on gaming emerged as an independent factor significantly linked to IGD. This finding is consistent with that of a study by Singh et al in Delhi⁹ indicating a positive correlation between gaming duration and the severity of IGD.^{1,21}

The findings from the current study demonstrated no association between sleep disturbance and IGD. Similar results were reported in a study by Manchanayake et al in Sri Lanka.²¹ Contrary to the present study, a number of studies found that sleep disturbance was associated with IGD.^{14,17,25,26} This contradiction concerning the association between sleep behavior and IGD could be possibly due to different measurement tools used in other studies or may be because the study participants were really able to manage their regular sleep regardless of IGD. Physical pain was significantly associated with IGD in this study.

Table 3. Variables estimates of the multinomial regression analysis

Variables	IGD (n=8)		Probable IGD (n=70)	
	B (95% CI)	P value	B (95% CI)	P value
Male	1.831 (0.282-11.882)	0.526	3.615 (1.281-10.200)	0.015*
Maternal education				
<High school	1.161 (0.071-18.872)	0.916	0.508 (0.136-1.892)	0.312
High school	2.219 (0.161-30.557)	0.551	2.445 (0.727-8.230)	0.149
Monthly income < 10000	0.263 (0.045-1.550)	0.140	0.798 (0.315-2.022)	0.634
Physical pain (in hand, neck, and back)	14.310 (1.817-112.698)	0.01*	5.184 (1.549-17.351)	0.008*
Tingling/Numbness in the hand while playing	1.112 (0.146-8.486)	0.918	1.726 (0.626-4.759)	0.291
Time spent on game ≥ 2 h/day	8.279 (1.493-45.921)	0.016*	4.744 (1.886-11.934)	0.001*

The reference category: Regular gamers. * $P < 0.05$, significant.

There is evidence supporting the idea that physical health issues can result from IGD, as demonstrated in a case report by Mamun et al. in India²⁷ and a systemic review conducted by Mihara et al in Japan.¹

Few data are available on IGD among college students. To the best of the researchers' knowledge, this study is the first of its kind in this particular setting, making it a valuable contribution to the existing literature on this topic in India. Additionally, the results of this study will be useful for detecting hidden cases of IGD. However, the study was conducted with some limitations. For instance, it only assessed the temporal association not the causal one as this was a cross-sectional study. Besides, the participants were selected using convenience sampling which would restrict the generalizability of the findings. Furthermore, this study did not assess the previous and subsequent status of participants. In addition, other variables such as depression, anxiety, academic performance, and social competence were not assessed in this study. Therefore, further studies are recommended with a more representative sample to provide a deeper understanding of IGD.

Conclusion

The present study showed the prevalence of IGD among college students was 5.3% according to DSM-5 criteria. The results also indicated spending more time playing online games was significantly associated with a higher risk of IGD. Moreover, physical pain was found as a negative consequence of IGD. Accordingly, students, parents, institutions, and concerned authorities should be aware of the negative effects of excessive gaming.

Authors' Contribution

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Competing Interests

The authors declared no conflict of interest in this study.

Ethical Approval

This study was approved by the Institutional Ethical Committee (Ethics No. IEC.36/22/22).

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References

- Mihara S, Higuchi S. Cross-sectional and longitudinal epidemiological studies of Internet gaming disorder: a systematic review of the literature. *Psychiatry Clin Neurosci*. 2017;71(7):425-44. doi: 10.1111/pcn.12532.
- World Health Organization. WHO Releases New International Classification of Diseases (ICD 11). 2018. Available from: [https://www.who.int/news/item/18-06-2018-who-releases-new-international-classification-of-diseases-\(icd-11\)](https://www.who.int/news/item/18-06-2018-who-releases-new-international-classification-of-diseases-(icd-11)). Accessed November 9, 2022.
- Feng W, Ramo DE, Chan SR, Bourgeois JA. Internet gaming disorder: trends in prevalence 1998-2016. *Addict Behav*. 2017;75:17-24. doi: 10.1016/j.addbeh.2017.06.010.
- Undavalli VK, Rani GS, Kumar JR. Prevalence of internet gaming disorder in India: a technological hazard among adolescents. *Int J Community Med Public Health*. 2020;7(2):688-93. doi: 10.18203/2394-6040.ijcmph20200450.
- Darvesh N, Radhakrishnan A, Lachance CC, Nincic V, Sharpe JP, Ghassemi M, et al. Exploring the prevalence of gaming disorder and Internet gaming disorder: a rapid scoping review. *Syst Rev*. 2020;9(1):68. doi: 10.1186/s13643-020-01329-2.
- Saini VK, Baniya GC, Verma KK, Soni A, Kesharwani SK. A study on relationship of Facebook and game addictive behaviour with personality traits among medical students. *Int J Res Med Sci*. 2016;4(8):3492-7. doi: 10.18203/2320-6012.ijrms20162318.
- King D, Delfabbro P. *Internet Gaming Disorder: Theory, Assessment, Treatment, and Prevention*. Academic Press; 2018. p. 15.
- Ayenigbara IO. Gaming disorder and effects of gaming on health: an overview. *J Addict Med Ther Sci*. 2018;4(1):1-3. doi: 10.17352/2455-3484.000025.
- Singh S, Dahiya N, Singh AB, Kumar R, Balhara YPS. Gaming disorder among medical college students from India: Exploring the pattern and correlates. *Ind Psychiatry J*. 2019;28(1):107-14. doi: 10.4103/ipj.ipj_96_18.
- Sharma R. The family and family structure classification redefined for the current times. *J Family Med Prim Care*. 2013;2(4):306-10. doi: 10.4103/2249-4863.123774.
- Pontes HM, Griffiths MD. Measuring DSM-5 internet gaming disorder: development and validation of a short psychometric scale. *Comput Human Behav*. 2015;45:137-43. doi: 10.1016/j.chb.2014.12.006.
- Lemmens JS, Valkenburg PM, Gentile DA. The internet gaming disorder scale. *Psychol Assess*. 2015;27(2):567-82. doi: 10.1037/pas0000062.
- The Jamovi Project. Jamovi (Version 2.3) [Computer Software]. 2022. Available from: <https://www.jamovi.org>.
- Karthikeyan E, Norman P, Thirunaukarasu D, Geetha M, Kumar H. Relationship between internet gaming disorder and insomnia among medical college students of Kanchipuram district, Tamil Nadu. *Int J Community Med Public Health*. 2021;8(10):4786-91. doi: 10.18203/2394-6040.ijcmph20213689.
- Alhamoud MA, Alkhalifah AA, Althunyan AK, Mustafa T, Alqahtani HA, Awad FA. Internet gaming disorder: Its prevalence and associated gaming behavior, anxiety, and depression among high school male students, Dammam, Saudi Arabia. *J Family Community Med*. 2022;29(2):93-101. doi: 10.4103/jfcm.jfcm_48_22.
- Xiang H, Tian X, Zhou Y, Chen J, Potenza MN, Zhang Q. The relationship between behavioral inhibition and behavioral activation systems, impulsiveness, and internet gaming

- disorder among students of different ages. *Front Psychiatry*. 2020;11:560142. doi: [10.3389/fpsy.2020.560142](https://doi.org/10.3389/fpsy.2020.560142).
17. Hawi NS, Samaha M, Griffiths MD. Internet gaming disorder in Lebanon: relationships with age, sleep habits, and academic achievement. *J Behav Addict*. 2018;7(1):70-8. doi: [10.1556/2006.7.2018.16](https://doi.org/10.1556/2006.7.2018.16).
 18. Yu H, Cho J. Prevalence of internet gaming disorder among Korean adolescents and associations with non-psychotic psychological symptoms, and physical aggression. *Am J Health Behav*. 2016;40(6):705-16. doi: [10.5993/ajhb.40.6.3](https://doi.org/10.5993/ajhb.40.6.3).
 19. Siste K, Hanafi E, Sen LT, Wahjoepramono POP, Kurniawan A, Yudistiro R. Potential correlates of internet gaming disorder among Indonesian medical students: cross-sectional study. *J Med Internet Res*. 2021;23(4):e25468. doi: [10.2196/25468](https://doi.org/10.2196/25468).
 20. Taechoyotin P, Tongrod P, Thaweerungruangkul T, Towattananon N, Teekapakvisit P, Aksornpusitpong C, et al. Prevalence and associated factors of internet gaming disorder among secondary school students in rural community, Thailand: a cross-sectional study. *BMC Res Notes*. 2020;13(1):11. doi: [10.1186/s13104-019-4862-3](https://doi.org/10.1186/s13104-019-4862-3).
 21. Manchanayake MM, Malsirini TG, Vithanage AM, Jayawardene D. Prevalence and correlates of internet gaming disorder among an advanced level student population from Colombo, Sri Lanka. *Int J Med Stud*. 2022;10(2):165-74. doi: [10.5195/ijms.2022.1193](https://doi.org/10.5195/ijms.2022.1193).
 22. Dong G, Zheng H, Liu X, Wang Y, Du X, Potenza MN. Gender-related differences in cue-elicited cravings in Internet gaming disorder: the effects of deprivation. *J Behav Addict*. 2018;7(4):953-64. doi: [10.1556/2006.7.2018.118](https://doi.org/10.1556/2006.7.2018.118).
 23. Király O, Griffiths MD, Urbán R, Farkas J, Kökönyei G, Elekes Z, et al. Problematic internet use and problematic online gaming are not the same: findings from a large nationally representative adolescent sample. *Cyberpsychol Behav Soc Netw*. 2014;17(12):749-54. doi: [10.1089/cyber.2014.0475](https://doi.org/10.1089/cyber.2014.0475).
 24. Kuss DJ, Griffiths MD. Online gaming addiction in children and adolescents: a review of empirical research. *J Behav Addict*. 2012;1(1):3-22. doi: [10.1556/jba.1.2012.1.1](https://doi.org/10.1556/jba.1.2012.1.1).
 25. Satghare P, Abdin E, Vaingankar JA, Chua BY, Pang S, Chong SA, et al. Prevalence of sleep problems among those with internet gaming disorder in Singapore. *ASEAN J Psychiatr*. 2016;17(2):188-98.
 26. Kristensen JH, Pallesen S, King DL, Hysing M, Erevik EK. Problematic gaming and sleep: a systematic review and meta-analysis. *Front Psychiatry*. 2021;12:675237. doi: [10.3389/fpsy.2021.675237](https://doi.org/10.3389/fpsy.2021.675237).
 27. Mamun MA, Griffiths MD. The psychosocial impact of extreme gaming on Indian PUBG gamers: the case of PUBG (PlayerUnknown's Battlegrounds). *Int J Ment Health Addict*. 2021;19(6):2170-4. doi: [10.1007/s11469-019-00102-4](https://doi.org/10.1007/s11469-019-00102-4).