Original Research Article

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Relationship between internet gaming disorder and insomnia among medical college students of Kanchipuram district, Tamil Nadu

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ABSTRACT

Background: Excessive online gaming poses a big problem among the growing generation. It leads to poor quality of sleep among students.

Methods: It is a cross-sectional study done among medical college students of a tertiary care hospital, Kanchipuram district, Tamil Nadu for a period of 6 months (May to October 2019). 376 students participated in this study. Data was collected using self-administered questionnaire containing IGDS9-SF and ISI scales. Data was analysed using SPSS version 21.

Results: Of the 376 participants, 220 (58.51%) were males and 156 (41.49%) were females. Prevalence of internet gaming disorder (IGD) was 4.25%. Among the 376 participants, 73(19.4%) had moderate severity insomnia. Correlation was significant between internet gaming and insomnia severity.

Conclusions: The result of the study shows that prevalence of IGD was low among medical college students in the Kanchipuram district and there was medium correlation between IGD and insomnia.

Keywords: IGD, Insomnia, Prevalence, Medical students

INTRODUCTION

Excessive online gaming poses a big problem among the growing generation. It is an ever-increasing activity among children, adolescents and adults. It causes loss of grey matter which could lead to poor memory of past events and experiences. Playing online games excessively leads to decrease in work efficiency, poor academic performance, lack of socialization, loss of interest in hobbies, spending less time with friends, family, lack of sleep, aggressive behaviour, increased stress and even suicidal intentions.

Individuals who play games excessively can manifest as IGD. IGD is defined as excessive use of computers or other devices like smart-phones, tablet, I-pad etc. for

online gaming, so that that even other daily life activities are compromised badly. In general populations, the prevalence of IGD varies from 0.21 to 57.50% throughout the world.⁴ In India it was 3.5% among school children and among medical students it was 3.6% and 9%.⁵⁻⁷

Due to the increasing problem of online gaming, it has been recognized and included in the non-substance addiction appendix of 5th edition of diagnostic and statistical manual of mental disorders (DSM-5). According to the DSM-5, IGD is indicated by the support of at least five core symptoms (from nine) in over one 12-month period. The diagnostic criterion of IGD, according to DSM-5 includes the following nine clinical symptoms: (1) preoccupation with videogames, (2) withdrawal, (3) tolerance, (4) lose control, (5) surrender from other

activities, (6) continuation, (7) fraud, (8) escape and (9) negative consequences.⁸

Sleep is an essential part of life and it consumes about one third of our life. Any change in sleep pattern for long time leads to increased risk of depression, accidents, injuries, high blood pressure, diabetes, obesity, cardiovascular diseases, self-harm, suicidal thoughts and attempts and so on.⁹ Among sleep problems, insomnia is the most common complaint leading to abnormal function and quality of life. 10 According to international classification of sleep disorders (ICSD-3) insomnia is defined as "a persistent difficulty with sleep initiation, duration, consolidation, or quality that occurs despite adequate opportunity and circumstances for sleep, and results in some form of daytime impairment, whereas excessive daytime sleepiness is only a symptom of sleep disorders or other illnesses". 11 Prevalence of insomnia throughout the world varies from 10-30% in general population.¹² Available data from the South East Asian region reveals that poor quality of sleep among university students varies from 35.4 to 70%.13 Prevalence of insomnia was found to be 37%, among medical college students of Tamil Nadu.14

College students are well known for having erratic sleep schedules because of their gaming habits. Among university and other college student's medical students have higher levels of stress. Adequate sleep is essential for them to maintain their physical and mental wellbeing. ¹⁵ Prevalence of insomnia, excessive daytime sleepiness, snoring, sleep apnoea, teeth grinding and nightmare are among individuals with internet addiction. ²

Since, not many studies are available in Tamil Nadu among medical students, this study was carried out to assess the association between IGDs and sleep problems.

METHODS

It is a cross-sectional study done among medical students of a tertiary care hospital, Kanchipuram district for a period of 6 Months (May to October 2019). In a study by Satghare et al in 2016, the prevalence of sleep disturbance was 28.2%, taking this as prevalence, precision of 5% and a non-response rate of 10%, sample size was found to be 357.² Since there were 380 students at that period of time, all students were invited to participate in the study, 376 responded. Only medical students were included in the study. CRRIs were not included in the study. Semistructured self-administrated questionnaire, consisting of socio-demographic details along with two scales i.e., internet gaming disorder (IGDS9-SF) and insomnia severity index (ISI) were administered to the participants. Students were informed that there was nothing like correct and incorrect answers and assured them that complete anonymity and confidentiality will maintained for their responses. An investigator was present during the session of answering the questionnaire, as to assist the students in case of any doubts and to minimise any interaction.

IGDS9-SF suggested by the American psychiatric association in the latest edition of the diagnostic and statistical manual of mental disorders (DSM-5) was used to assess the severity of IGD. This 9-item scale is a self-reported screening measure to assess the symptoms and prevalence of IGD among general population. The gaming activity in the past 12 months is assessed. Each item is scored from 1 to 5, higher scores indicating greater severity. Scores are summed to determine a total score, which ranges from 9 to 45, with higher scores indicating of higher degrees of gaming disorder. If 5 out of 9 criterions are answered as very often (which is considered as endorsement of criterion), the participant is considered as disordered gamer. ¹⁶

The 7-item ISI was used to assess the severity of insomnia over the past two weeks. The ISI consists of seven domains with one item each assessing severity of sleep-onset, sleep maintenance, early morning awakening problems, sleep dissatisfaction, interference of sleep difficulties with daytime functioning, noticeability of sleep problems by others and distress caused by the sleep difficulties. Each item is scored from "0" to "4", with higher scores indicating greater insomnia severity. Scores are summed to determine a total score, which ranges from 0 to 28. Total scores are interpreted as 0-7 for no clinically significant insomnia; 8-14 for sub-threshold insomnia. 15-21 for clinical insomnia (moderate severity) and 22-28 for clinical insomnia (severe).¹⁷ The ISI and IGDS9-SF questionnaire was in English language. Data was entered in excel and analysed using SPSS version 21.0. Quantitative variables were summarized as mean and SD, qualitative variables as proportion/percentage. Association between IGD and ISI was evaluated using Pearson's correlation coefficient.

RESULTS

Out of 376 participants, who were enrolled in the study, 220 (58.51%) were males and 156 (41.49%) were females (Figure 1). Mean age of the participants was 19.81±1.87.

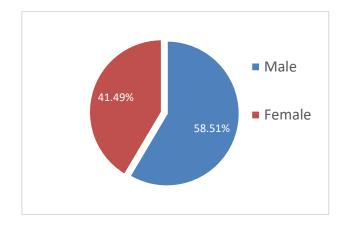


Figure 1: Gender distribution of participants.

The 301 (80.05%) participants used mobile phones for playing games while 45 (11.97%) of the students used laptops and 30 (7.98%) students used tablets for gaming purpose (Figure 2). Out of the 376 participants, 115 (30.58%) did not play games. The 189 (50.26%) participants played online games for less than 4 hours a day (Table 1).

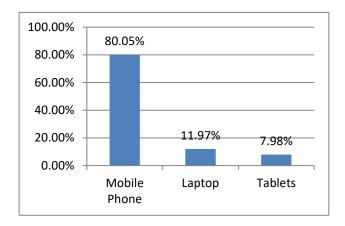


Figure 2: Gadgets used for gaming purpose.

Table 1: Number of hours spent for gaming purpose.

| Duration (Hours) | N=376 | Percentage (%) |
|---------------------|-------|----------------|
| Non gamers | 115 | 30.58 |
| <4 | 189 | 50.27 |
| >4 | 72 | 19.15 |

Prevalence of IGD was 4.25% (16 participants), of these males were 12 (75%) and females were 4 (25%), based on the endorsement of criterion. Mean score of participants was 18.9 ± 6.8 . Mean score IGD of participants was 18.9 ± 6.8 , with males around 19.4 ± 6.8 and females 18.1 ± 6.75 (Table 2).

Table 2: Mean score IGD of participants.

| Gender | N | Mean | Std. Deviation |
|--------|-----|------|----------------|
| Male | 220 | 19.4 | 6.8 |
| Female | 156 | 18.2 | 6.7 |
| Total | 376 | 18.9 | 6.8 |

Among the 376 participants, 73 (19.4%) had moderate severity insomnia while 136 (36.2%) participants had no insomnia (Figure 3). Mean score severity of insomnia was among males and among females were 10.53 ± 4.9 and 9 ± 5.2 (Table 3).

Table 3: Mean score ISI among the participants.

| Gender | N | Mean | Std. Deviation |
|--------|-----|-------|----------------|
| Male | 220 | 10.53 | 4.9 |
| Female | 156 | 9 | 5.2 |
| Total | 376 | 9.9 | 5.1 |

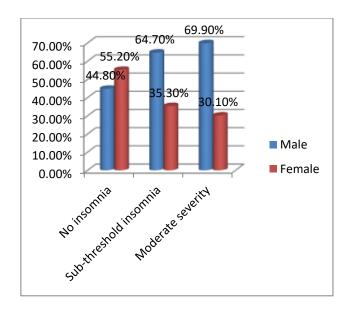


Figure 3: Insomnia severity among the participants.

Bi-variate analysis showed correlation was significant between internet gaming and insomnia severity. (Pearson correlation coefficient was 0.5, and the relationship was significant at p<0.01) (Figure 4).

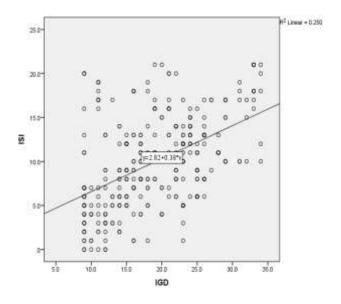


Figure 4: Scatter plot showing correlation between IGD and insomnia severity.

DISCUSSION

Mean age of the participants was 19.81±1.87 years. It was similar (20.2±9 years) to the study done in Punjab among medical and dental students.⁷ This pattern is similar among medical colleges across India.

The 69.32% of participants were current games, whereas 55% students in study by Sing et al and 79.2% students were identified as current gamers in study by Agarwal et al.^{6,7} The reason might be related to the increased smart

phone usage and access to internet, release of new massive multiplayer online games.

Prevalence of IGD was 4.25% in our study. Results from various studies showed a prevalence of 10.9% among Arabic students, 10.3% among Chinese students, 9.2% among Lebanese students, 9.03% among Egyptian students, 5.9% among Korean students, 2.03% among Indonesian medical students and 3.6, 4% and 6% among medical students by Sing et al, in New Delhi by Basu et al and in Guntur using Young's internet addiction scale by Yersani et al respectively, 3.5% among adolescent school children in Andhra Pradesh by Undavalli et al. 5.6,18-25 The variation may be due to the different scales used to assess the prevalence of IGD, socio-cultural differences, different cut-off values and methodology of assessments. Among medical students the prevalence is relatively low compared to other university and college students.

Prevalence of insomnia was 19.4% (moderate severity insomnia). In a study done in Chennai among medical students showed a prevalence of 37%. ¹⁴ Insomnia among university students in South-Asia ranged from 35.4% to 70%. ²⁶ It may be due to difference in socio cultural differences, methodologies and different scales used in calculation of insomnia. The 44.4% of participants had sub-threshold insomnia in our study. In a study done by Moayedi et al in Iran among medical university students, 50.2% students had below threshold insomnia which is similar to our study. Participants with increased gaming behaviour were associated with insomnia and day time sleepiness.

There was medium correlation between internet gaming and insomnia (Pearson correlation coefficient was 0.5, p<0.01). Yarasani et al conducted a cross-sectional study among 575 UG students of Katuri medical college (Guntur) and the result shows 73.9% of students were addicted to online gaming and had sleep disturbances.²⁵

CONCLUSION

Our study highlights a significant correlation between IGD and insomnia. Although internet gaming is not a big problem, prolonged and addicted gaming behaviour leads to improper sleep which in turn leads to anxiety, depression, and poor academic performance and in some cases grave consequences among the growing generation. It is therefore necessary to sensitise the students to the harmful health effects of internet gaming and help them adopt responsible internet usage.

Limitation

This was a cross-sectional study using self-reported questionnaire, though there were measures to maintain anonymity, there might be a possibility of bias and other factors such as anxiety, depression and academic performance could have been evaluated.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

REFERENCES

- 1. West GL, Konishi K, Diarra M, Benady-Chorney J, Drisdelle BL, Dahmani L et al. Impact of video games on plasticity of the hippocampus. Mol Psychiatry. 2018;23(7):1566-74.
- Satghare P, Abdin E, Vaingankar, JA, Chua BY, Pang S, Picco L et al. M. Prevalence of sleep problems among those with Internet gaming disorder in Singapore. Asean J Psychiatry. 2016;17(1):1-11.
- 3. Griffiths MD, Kuss DJ, King DL. Video game addiction: Past, present and future. Current Psychiatry Rev. 2012;8(4):308-18.
- American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5®). Arlington, VA: American Psychiatric Publishing. 2013.
- 5. Undavalli VK, Gobburi SR, Jonnalagadda RK. Prevalence of internet gaming disorder in India: a technological hazard among adolescents. Int J Community Med Public Health. 2020;7:688-93.
- 6. 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.
- 7. Aggarwal A, Pandian JD. Internet gaming disorder in undergraduate medical and dentistry students. Chrismed J Health Res. 2019;6:237-41.
- 8. Jo YS, Bhang SY, Choi JS, Lee HK, Lee SY, Kweon YS. Clinical Characteristics of Diagnosis for Internet Gaming Disorder: Comparison of DSM-5 IGD and ICD-11 GD Diagnosis. J Clin Med. 2019;8(7):945.
- 9. Paruthi S, Brooks LJ, D'Ambrosio C, Hall WA, Kotagal S, Lloyd RM et al. Recommended amount of sleep for pediatric populations: a consensus statement of the American Academy of Sleep Medicine. J Clin Sleep Med. 2016;12(6):785-6.
- 10. Burman D. Sleep Disorders: Insomnia. FP Essentials. 2017;460:22-8.
- 11. Sateia MJ. International Classification of Sleep Disorders-Third Edition Highlights and Modifications. J chestnet org. 2014;146(5):1387-94.
- 12. Bhaskar S, Hemavathy D, Prasad S. Prevalence of chronic insomnia in adult patients and its correlation with medical comorbidities. J Family Med Prim Care. 2016;5(4):780-4.

- Chowdhury AI, Ghosh S, Hasan MF, Khandakar KAS, Azad F. Prevalence of insomnia among university students in South Asian Region: a systematic review of studies. J Prev Med Hyg. 2021;61(4):E525-9.
- 14. Kumar RS, Kumar KS. Prevalence of insomnia and sleep pattern among MBBS students of Stanley Medical College, Chennai. Int J Community Med Public Health. 2019;6(3):1057-60.
- 15. Wong JGWS, Patil NG, Beh SL, Cheung EPT, Wong V, Chan LC et al. Cultivating psychological wellbeing in Hong Kong's future doctors. Med Teacher. 2005;27(8):715-9.
- 16. Pontes HM, Mark D. Griffiths. Measuring DSM-5 internet gaming disorder: Development and validation of a short psychometric scale. Computers in Human Behavior. 2015;45:137-43.
- 17. Morin CM, Belleville G, Belanger L, Ivers H. The Insomnia Severity Index: psychometric indicators to detect insomnia cases and evaluate treatment response. Sleep. 2011;34:601-8.
- 18. Hawi NS, Samaha M. Validation of the Arabic Version of the Internet Gaming Disorder-20 Test. Cyberpsychol Behav Soc Netw. 2017;20(4):268-72.
- Hui X, Xiaolin T, Yu Z, Jieyu C, Marc NP, Qun Z. The Relationship Between Behavioral Inhibition and Behavioral Activation Systems, Impulsiveness, and Internet Gaming Disorder Among Students of Different Ages. Frontiers Psychiatry. 2021;11:1546.
- 20. 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.

- 21. Elnahas G, Elella EA, Hewedi D, Elhabiby M, Elkholy H, Mansour O. Problematic Online Gaming Among a Sample of University Students in Egypt. Addictive Disorders Their Treatment. 2018;17.
- 22. 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.
- 23. 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.
- 24. Basu S, Sharma P, Rustagi R, Sharma R, Sharma N. Measuring addiction to internet gaming among Indian medical students: Development and preliminary psychometric properties of a new scale. Ind Psychiatry J. 2020;29(1):33-7.
- 25. Yarasani P, Shaik RS, Myla ARR. Prevalence of addiction to online video games: gaming disorder among medical students. Int J Community Med Public Health. 2018;5:4237-41.
- 26. Pontes HM, Griffiths MD. Measuring DSM-5 Internet Gaming Disorder: Development and validation of a short psychometric scale. Computers in Human Behavior. 2015;45:137-43.

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ANNEXURE

Internet gaming disorder scale-short-form (IGDS9-SF)²⁶

Instructions

These questions will ask you about your gaming activity during the past year (i.e., last 12 months). By gaming activity, we understand any gaming-related activity that has been played either from a computer/laptop or from a gaming console or any other kind of device (e.g., mobile phone, tablet, etc.) both online and/or offline.

| Questions | Never | Rarely | Sometimes | Often | Very often |
|---|---------|--------|-----------|---------|---------------|
| Do you feel preoccupied with your gaming behavior? (Some examples: Do you think about previous gaming activity or anticipate the next gaming session? Do you think gaming has become the dominant activity in your daily life?) | С | С | С | С | О |
| Do you feel more irritability, anxiety or even sadness when you try to either reduce or stop your gaming activity? | \circ | O | O | \circ | O |
| Do you feel the need to spend increasing amount of time engaged gaming in order to achieve satisfaction or pleasure? | С | 0 | C | o | С |
| Do you systematically fail when trying to control or cease your gaming activity? | O | 0 | 0 | 0 | O |
| Have you lost interests in previous hobbies and other entertainment activities as a result of your engagement with the game? | С | 0 | C | C | С |
| Have you continued your gaming activity despite knowing it was causing problems between you and other people? | \circ | O | C | O | O |
| Have you deceived any of your family members, therapists or others because the amount of your gaming activity? | C | O | 0 | O | C |
| Do you play in order to temporarily escape or relieve a negative mood (e.g., helplessness, guilt, anxiety)? | O | O | О | O | O |
| Have you jeopardized or lost an important relationship, job or an educational or career opportunity because of your gaming activity? | C | 0 | С | o | О |

Scoring information

Total scores can be obtained by summing up all responses given to all nine items of the IGDS9-SF and can range from a minimum of 9 to a maximum of 45 points, with higher scores being indicative of a higher degree of IGD. In order to differentiate disordered gamers from non-disordered gamers, researchers should check if participants have endorsed at least five criteria out of the nine by taking into account answers as '5: Very often', which translates as endorsement of the criterion.