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Prevalence of Rate of Internet Gaming Disorder and its Association with Substance Abuse and Psychosocial Behavior among Undergraduate Students

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Abstract: The rise of digital gaming has transformed entertainment, and social interaction. However, excessive gaming behaviors have raised concerns about Internet Gaming Disorder (IGD), a condition characterized by loss of control over gaming, prioritization of gaming over daily activities, and resulted negative consequences. The current study is aimed to estimate the prevalence of IGD among under graduate students and to determine the association of IGD with substance abuse and common psychosocial behavior. In this cross-sectional study with a sample size of 68 undergraduate students currently studying in a college were chosen through a random sampling and the participants are from various streams of under graduate courses. The IGD was determine through IGDS9-SF and psychological problems like depression, anxiety, and stress were measured using the DASS-12 scale. The prevalence of IGD was found to be 28% among the total population. 49% of the male respondents exhibit the prevalence of IGD. In this study a significant association between substance abuse and IGD score was reported. The substance abuse includes alcohol consumption (p= 0.00098) and smoking (p= 0.00003) shows positive relation with IGD scores. A statistically significant association between IGD score and DASS score found at 0.05 level (p-value is <0.00001). Males are more addicted IGD than female students. Males are more addicted to internet gaming disorders. Excessive use of gaming application leads to mental disorders, variation in psychosocial behaviors of students. This study will help to identify the effects of internet gaming disorder on the health status of the students.

Keywords: *IGD, Substance Abuse, Undergraduate Students, Psychosocial Behavior.*

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I. INTRODUCTION

Playing games is an ancestral behavior of human beings. The games could be outdoor or indoor that is the secondary part but playing games is a pleasurable and entertaining attribute. To avoid certain type of stress or having a relaxation time one shows the interest of playing games. Once upon a time the games were mostly manual and usage of various tools, comprises of playground with so many players but now this has been reduced with the increment of online gaming applications. Video games were first marketed in 1972 with the release of the first household gaming console, the Magnavox Odyssey. A study by the Entertainment Software Association reported that in the United States, 58 % of the population played video games, video games yielded US$20 billion in annual sales, and over 50% of the population owned a gaming console. As the internet has developed, these games have allowed individuals to engage both socially and

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competitively with players across the globe (Latham et al., 2013). Video games are now one of the most popular media for connecting people throughout the world. Among internet-based games, massively multiplayer online role-playing games (MMORPGs) are the most complex and require the most intensive social interaction (Granic et al., 2014). Currently, MMORPGs are a very popular and enjoyable during leisure activity. A MMORPG provides an immersive virtual environment in which users can interact with one another or with nonplayer characters (Yee 2006). Fuster et al., 2013 suggested that MMORPG players are interested mostly in social interaction and exploration. Lesser motivations include achievement, followed by identification with an avatar and escape from reality (dissociation). These reports suggest that people who play online games such as MMORPGs are attracted to online environments because they provide various psychological pleasures. The games can be very entertaining, and it may be easy to get absorbed in the competition, but can they be addictive? That is a question still being debated among researchers and health professionals, but early evidence suggests that videogames are one of the most addicting technologies around.

New internet technologies that enable real-time interaction and a smooth visual field have resulted in gaming experiences comparable to those in the real world and have led to the development of effective delivery systems that provide high user satisfaction. Further, because most popular MMORPGs have extensive and well-designed virtual worlds, players can express themselves in ways that would cause them discomfort in real life because of their appearance, gender, sexuality, and/or age. An MMORPG environment also enables users to experience teamwork in a fun and encouraging environment (Cole & Griffiths 2007). Although users may be attracted to the pleasure, sense of achievement, social interaction, and immersive experience provided by playing MMORPGs, excessive online gaming may have negative consequences by limiting real-life experiences.

In India, the accessibility to internet now becomes easy and a greater number of young adults are engaged in the social media platform like WhatsApp, Facebook, YouTube etc. Through this platform they got information about online gaming application and their features. They engaged themselves to have entertainment, socialization and pleasure too. In one way they met the unknown individuals but, in another way, they spent a huge time in online gaming, lost money and attacked by cyber arrest too (Rho et al., 2018). Smartphones with smart features support these games which they downloaded and installed from play store app; play the games with just minimal registration amount or else some are free to access. Action games like PUBG, Free Fire and so many are the most popularly played by MMORPGs in India which played by million school and college students. According to a statistical analysis the number of populations in online gaming has been increasing gradually shown in Figure 1. It is estimated that about 455 million online gamers are there in the year 2023 compared to the previous year and nearly 90 million gamers play various types of online games by paying money (Basuray, 2024). These games increase their aggressiveness behavior, poor academic performance, effecting sleep quality and social life, also exhibit social phobia (Wei et al., 2012; Ko & Yen 2023), substance abuse (Van Rooij et al., 2014) and so on. To the best of our knowledge, there are no published studies regarding gaming disorder diagnosed by the IGD questionnaire among youth, especially undergraduate students in Southern Odisha. Hence in this study we tried to find out the prevalence of IGD and its association with psychosocial behavior of the undergraduate students. Meanwhile we also studied their substance abuse relationship with the internet gaming disorder characteristics.

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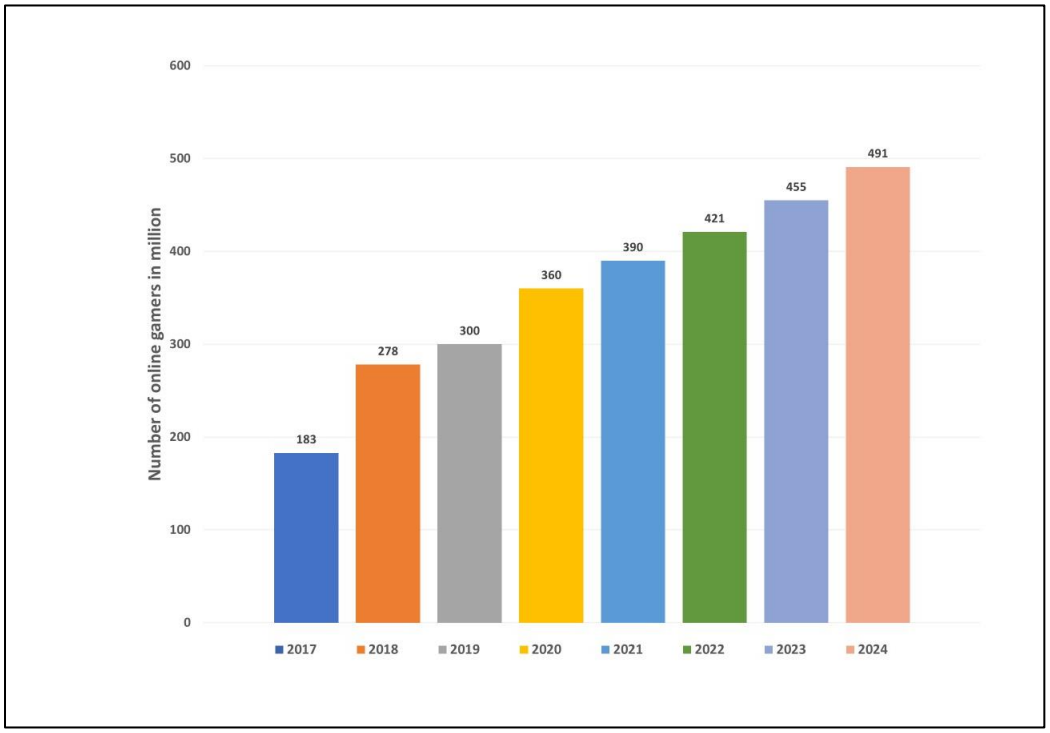

Fig 1: Number of Online Gamers in India from 2017 to 2023 with an Estimate for 2024 in Million

II. MATERIALS & METHODS

In this study researchers randomly selected undergraduate students of an autonomous college which is located at the center of Rayagada district. Here both male and female participants were surveyed having age ≥18 years old. They are randomly selected from various departments. The total number of sample size is 68 where 35 males (19.4±1.03 in year), and 33 females (18.63± 0.75 in year). The present study received approvals from the ethics committees of the college. Data regarding age, gender, DOB, Weight (in kg) and other parameters were collected through biographical data sheet. Then for the estimation of internet gaming addiction we have used IGDS9-SF (Internet Gaming Disorder Scale-Short Form) questionnaire. The questionnaire has 9 items which measure the prevalence of addiction of internet gaming disorders. Each item is comprising of 5 Likert scale (For example 1: Never, 2: Rarely…. and 5: Very Often). The following table indicates the rate of addiction score (Table 1). To measure the effect of Psychosocial behavior like Depression, Anxiety and Stress among the participants with respect to IGD we used DASS-12 questionnaire available in Likert scale forms and the scores of the scale given in Table 2. Data initially collected and then recorded in the excel sheet. Then the statistical analysis is carried out by suitable parametric and non-parametric tests in excel as well in online software. All the calculation has been accepted with P value <0.05.

III. RESULTS

For this study 68 participant of undergraduate students were randomly selected out of which 35 are male and 33 females. The prevalence rate of IGD was found to be 28% among the total population. In further analysis it was found that 49 have less addiction, 16 have mild and 3 severely addicted. In case of male subjects, 18 are found to be less addicted, 14 mild addicted and 3 severely addicted. In case of female subjects, 32 are less addicted, 14 mild addicted and only one is mild addicted but not a single severely addicted case has been reported. 49% of the male respondents exhibit the prevalence of IGD as compared to female which account about only 3%. In this study a significant co-relationship between substance abuse and IGD score was reported. The substance abuse includes alcohol consumption (p= 0.00098) and smoking (p= 0.00003) shows positive relation with IGD scores (Table 3a and 3b) while the BMI and consumption of tea/coffee shows negative correlation with IGD scores p= 0.084 & p= 0.290683 respectively (Table 3c and 3d).

We analyzed the rate of prevalence of psychosocial behavior of the students like Depression, Anxiety and Stress (DAS) by using the DASS-12 scale where it is found that 47 have no symptoms DAS while 19 in mild and 2 in severely categories of Depression, Anxiety and Stress range. In case of male the rate of prevalence of DAS resulted that 22 have no symptoms of DAS while 11 in mild and 2 in severe categories of DAS. But in case of female participants, it is found that 25 have no symptoms and 8 have mild symptoms

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of DAS. Additionally, in female there is no severe categories of DAS is found. In the analysis it is found that the correlation coefficient between IGD score and DASS score found to be significant (Table 4 and Figure 2) at 0.05 level (*p*-value is < 0.00001).

Table 1: Score Ranges of IGDS9-SF	
9-21:	Less Addiction
21-33:	Mild Addicted
33-45:	Severe Addicted

Table 2: Score Ranges of DASS-12	
0-12:	No Addiction
12-24:	Mild Addicted
24-36:	Severe Addicted

Table 3a: A statistically Significant Association Found between Alcohol and IGD Score

	Do you take alcohol	*IGDSF9*	
Do you take alcohol	1		
IGDSF9	0.391054	1	
P-value: **0.00098**			

Table 3b: Statistically a Significant Association between Smoking Attribute and IGD Score

	Are you a smoker	*IGDSF9*
Are you a smoker	1	
IGDSF9	0.492694	1
P-value: **0.00003**		

Table 3c: Statistically not a Significant Association between Tea/Coffee and IGD Score

	Do you drink coffee/tea	*IGDSF9*	
Do you drink coffee/tea	1		
IGDSF9	-0.13174	1	
P-value: 0.290683			

Table 3d: Statistically not a Significant Association between BMI and IGD Score

	BMI	*IGDSF9*	
BMI	1		
IGDSF9	0.142219	1	
P- value: <0.24737			

Table 4: Statistically a Significant Association between DASS and IGD Score

	IGD	*DASS*
IGD	1	
DASS	0.629028	1

P-value: <0.00001

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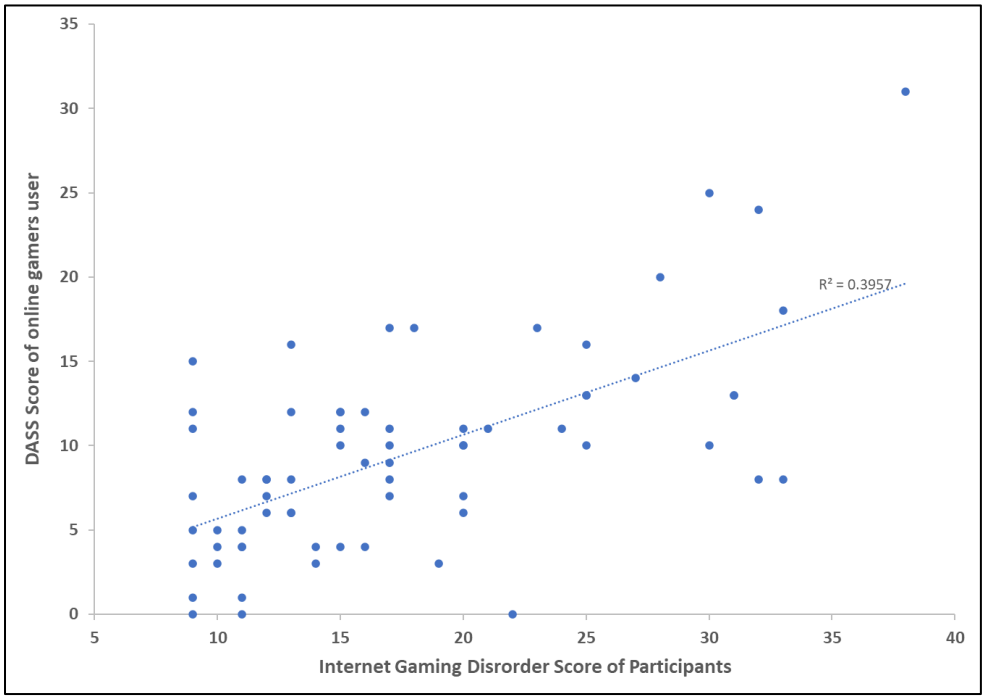

Fig 2: Scatter Plot Represents the Pearson Correlation between IGD Score and DAS Score

IV. DISCUSSION

The prevalence rate of IGD using the IGD9-item short scale is 28%, which is higher than the result of other prior studies. The frequency of IGD was 21.85% among Saudi university students (Latif & Alsunni 2022), and 10.1% among Saudi Arabian University students and 8.8% among KSU medical students, Saudi Arabia (Al Asqah et al., 2020). In India a study revealed that 6.98% among undergraduate medical students, Kerala (Bhaskar et al., 2021) and 10.6% among school going students of western Maharasta (Singh et al., 2021) exhibit IGD prevalence. Nearly 5.3% among college going students in Saurashtra region, Gujarat (Gurjar et al., 2024), 2.1% among Tertiary Care Health Institute, Rajasthan (Kumar et al., 2024), 23.25% amongst medical students of Kodagu Institute of Medical Sciences, Madikeri, Karnataka (Madeshan et al., 2024) also shows the rate of IGD. In another study also IGD prevalence among Chinese adolescent was found to be 13.0% (Yang et al., 2020).

In this study male students are found to be more addicted towards IGD as compared to female participants. Probably the independent nature, and personal access to gaming without parental restriction could be the reason behind the, cheap data charges could be the reason behind the high usage of internet gaming apps among the male students. In few other studies also, the similar type results have also been reported (Rasheed et al., 2021; Alhamoud et al., 2022; Liu et al., 2022). This study also provided evidence supporting the link between spending more time in gaming and a higher risk of developing IGD. Specifically, participants who reported gaming 20 or more hours per week were 13.5 times more likely to exhibit IGD compared to those who played 1 hour or less per week.

Not a significant correlation was found between BMI and IGD in our study but there was a study conducted by Epari et al., 2023 which states that students with IGD had a significantly higher body mass index (Epari et al., 2023). However, a statistically significant association was found between alcohol consumption, smoking and IGD. Individuals with IGD are more likely to engage in heavy alcohol consumption (Kuss et al., 2018). Alcohol may be used to enhance gaming experiences or to cope with the negative emotions associated with IGD compared to those without IGD. The current study revealed that depression, anxiety and stress score have a positively significant relationship with the IGD score of the users. The DAS score was found to be more prominent in males compared to females. In overall 2.3% shows severe depression, anxiety and stress. Psychopathological problems, especially depression, were more pronounced among addicted gamers than normal individuals (Lehenbauer-Baum et al., 2015). Examining the severity of substance use and its connection to anxiety and depression symptoms is a crucial step for developing gender-specific interventions to address IGD in the future.

The relationship between IGD symptoms and anxiety/depression varies between males and females, emphasizing the multifaceted nature of this disorder. Kuss et al., in 2018 found that individuals with IGD exhibit reduced social connectivity and often engage in solitary activities, reinforcing their reliance on gaming. This social isolation can contribute to increased anxiety, depression, and other mental

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health issues, as the lack of social support exacerbates emotional distress.

IGD is characterized by significant emotional dysregulation. The constant stimulation from gaming can hijack the brain's reward system, leading to heightened stress, frustration, and irritability when gaming is unavailable (Kuss 2013). This “gaming withdrawal syndrome" shares similarities with substance use disorders, including tolerance, withdrawal, and cravings (King et al., 2016). These emotional disturbances can significantly contribute to the development and exacerbation of mental health issues, such as depression and anxiety.

IGD significantly impacts academic and occupational functioning. Excessive gaming often displaces time allocated for education or work, leading to decreased academic performance (Lemmens et al., 2015). The constant preoccupation with gaming can hinder the development of essential skills like time management and focus, further exacerbating difficulties in academic and professional domains. IGD is associated with a pattern of compulsive gaming behaviors that closely mirror addiction. Individuals with IGD often demonstrate an intense preoccupation with gaming, leading to neglect of other important life areas (Kuss & Griffiths 2012). The continued engagement in these behaviors despite experiencing negative consequences underscores the addictive nature of IGD and its profound impact on various aspects of an individual's life.

V. CONCLUSION

In brief male students are found to be more addicted towards IGD symptoms. Substance abuse and IGD have a significant association which indicate the negative effects of extreme use of internet gaming applications upon the young mass. Excessive usage also led to depression, anxiety and stress among the student participants. Hence less use of mobile screen and proper council followed by social connectivity through peer and family is highly recommended. The development of self-help groups or positive peer supportive groups for the prevention of internet gaming addiction is required.

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