Original Article

An epidemiological study on factors influencing gaming disorder: An online cross-sectional design

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Abstract

Background: Gaming disorders have increased over time due to easy availability of online gaming. The aim of this study is to determine the factors influencing the gaming disorders. **Methods:** An online questionnaire was circulated on gaming platforms for the assessment as per IGD-20 and DSM-5 criteria. **Results:** A significant correlation was found between duration of play and gaming disorders ($r = 0.131$, $P < 0.05$). The scores were concurrent as per IGD-20 and DSM-5 criteria. **Conclusion:** Undiagnosed gaming disorder among gamers needs to be addressed. Duration of playing of games also needs to be checked to reduce the prevalence of gaming disorders.

Keywords: Computer, gaming disorder, internet, mental disorders, screen time

Introduction

Gaming in simplest terms is an act of playing games. In technical language, it refers to running of specialized applications referred as electronic games or video games on game consoles or on personal computers or may be smartphones. The term "gaming" originated as a synonym for "gambling," although most electronic games today do not involve gambling within the traditional sense. Terms like computer games and electronic games are sometimes used synonymously with video games. The history of video games needs to be traced back to early 1950s, when academic computer scientists began designing simple games and simulations as a part of their research or for leisure activity.[1]

As affordable broadband internet connectivity spread, many individuals turned to online gaming as some way of innovation. An internet game could be a computer game that is either partially or primarily played through internet or through any other electronic network available. Online games have become ubiquitous on modern gaming platforms like PCs, consoles, and smartphones, and include many genres including first person shooters, strategy games, and massively multiplayer online role-playing games (MMORPG).[2]

Video gaming has now become a well-liked leisure activity in many parts of the planet. An oversized portion of worldwide top 100 websites in terms of traffic are made from gaming website. The ubiquity of video games in today's society has led to significant interest in their impact on the brain and behavior of the players.[3]

In Section 3 of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders [DSM-5], the American Psychiatric Association [APA] included Internet Gaming Disorder [IGD] as a condition warranting more clinical research. IGD according to DSM-5 deals with the compulsive preoccupation some people develop in playing online games, often to the exclusion of other

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needs and interests.[4] However, the World Health Organization in 2018 included gaming disorder, with its online and offline variants, alongside gambling disorder under "Disorders Due to Addictive Behaviors" in its 11th edition of the International Classification of Diseases as a clinically recognizable and clinically significant syndrome, when the pattern of gaming behavior is of such a nature and intensity that it leads to marked distress or significant impairment in personal, family, social, educational, or occupational functioning.[5]

IGD has received much research attentions since the discharge of the primary commercial game in early 1970s, especially after the incident of several high-profile cases of violence because of gaming issues like the Colorado movie show massacre in 2012. However, the research literature on violent video games is considerably small because such games are a recent phenomenon and there has been little government funding for such research. The primary comprehensive meta-analytic review by Anderson and Bushman in 2001,[6] used modern meta-analytic techniques to mix the results of empirical studies of violent computer game effects on five sorts of outcome variables: aggressive behavior, aggressive cognition, aggressive affect, helping behavior, and physiological arousal. They found significant effects of violent video games on each of these five variables. Exposure to violent video games increases aggressive thoughts, feelings, and behaviors, increases arousal, and reduces helping behavior.

The COVID-19 pandemic has affected all aspects of the society.[7] Studies have suggested that stressors due to the pandemic have contributed to increased addictive behaviors, such as substance use, alcohol, food, and social media.[8] The World Health Organization has warned that during the COVID-19 pandemic, screen time and game-playing time may increase leading to increased risk of internet and gaming addiction. Comparisons before and during the pandemic have revealed that probable IGD prevalence has increased 1.6 times.[9]

Primary care physicians (PCP) provide both the first contact for a person with an undiagnosed health concern as well as continuing care of varied medical conditions including gaming disorders. This cross-sectional epidemiological study on factors influencing gaming disorders will provide a comprehensive knowledge about gaming disorders, so that PCPs can provide necessary help for diagnosis, treatment, and recovery of such patients.

Methods

Participants were invited to participate in the study by clicking the survey link provided in several gaming forums. In order to widely spread the survey, a thread was created and circulated among gaming groups. The survey was created and hosted online. The web data collection methodology was chosen due to its inherent benefits, like easy access to larger sample pools, cost efficiency, and its usefulness and practical advantages for researching behavioral addictions usually,[10] especially within the case of online gamers. This technique may also increase participant's self-disclosure[11] and disinhibition,[12] which helps to decrease social desirability. A total of 372 online questionnaires were collected. However, 19 of those were not completed and were therefore excluded from next phase analyses. Sociodemographic information regarding gender, age, country of residence, age when they first began gaming, relationship status, ownership of mobile device with internet access and/or gaming console, and other gaming devices were collected. This variable examined the player's weekly time spent gaming on computers, consoles, and/or other gaming platforms (e.g. handheld devices). In order to participate in the study, informed consent was sought amongst participants and therefore the minimum age of participation in this study was 16 years old.

Results

Sociodemographic characteristics of respondents

In Table 1, among the 353 participants, 264 (74.8%) were males and 89 (25.2%) were females. About 83% of the respondents were unmarried. Majority of the respondents (72.8%) were students. Regarding educational status of the respondents about 32.3% had completed their higher secondary school education and about 25.5% had completed their graduation.

Gaming preference of the respondents

The major chunk of the respondents (42.8%) played MMORPG followed by strategy games (22.9%), and also the least genre of game played by the respondents was Sports (4.5%). Most of the respondents (about 80%) used smartphones to play the online/offline games. When asked about the foremost important

Table 1: Sociodemographic profile

Variable	Frequency	Percentage
Gender		
Male	264	74.8
Female	89	25.2
Marital status		
Unmarried	293	83.0
Married	54	15.3
Divorced	0	0
Widowed	6	1.7
Family type		
Nuclear	210	59.5
Joint	143	40.5
Occupation		
Student	257	72.8
Professional	48	13.6
Semiprofessional	18	5.1
Clerical	24	6.8
Unemployed	6	1.7
Residence		
Rural	188	53.3
Urban	165	46.7
Education		
Primary completed	0	0
Middle completed	18	5.1
High completed	60	17.0
Higher secondary completed	114	32.3
Graduation completed	90	25.5
Postgraduation completed	71	20.1

reason to play a game consistently, majority of the respondents answered making social connections (24.6%) followed by realistic graphic (18.4%) and team player/Multiplayer (16.1%).

IGD-20 and DSM-5

The IGD-20 Test includes 20 items reflecting the nine criteria of IGD as in the DSM-5 and incorporated the theoretical framework of the components model of addiction (i.e. salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse). Considering 71 as an ideal empirical cut-off to distinguish disordered gamers from non-disordered gamers, 8.4% of the participants were found to be disordered gamers as per IGD. The diagnostic features of the IGD in DSM-5 comprise nine criteria reflecting its key aspects. According to the APA, to be diagnosed with IGD, a person has to endorse at least five (or more) of the nine criteria over a 12-month period. In our study, around 37% of the participants were found to be suffering from IGD as per DSM-5

From Table 2a, it is evident that there is a significant positive correlation between IGD-20 and hours in a day one spends on gaming. It can be said that more the hours spend on the gaming per day leads to the high score IGD-20. Higher hours spent on gaming led to higher IGD-20 scores and in turn having higher chance of gaming disorder. However, a weak correlation was observed.

Table 2b shows that there is a positive correlation between DSM-5 and hours spend on gaming per day however insignificant. Thus, it can be said that more or less the hours spend on the gaming per day may not have any effect on the score of Diagnostic and Statistic Manual of mental disorders-5.

Table 2c shows that there is significant association between the type of game played and IGD-20. It also indicates that there is significant association between the reason to play games consistently and IGD-20. Further, majority of people agreed with the following reasons: making social connections, followed by graphics, and then by team play.

In Table 3, we observed that after Modelling for Multivariate Regression, there does not appear to be any major change between two models.

Table 2a: Relation between IGD-20 and duration of playing games

Item	Pearson's *R*	*P*
How long have you been playing online/offline game/s (in months)	-0.117	0.027
On an average how many hours in a day do you spend on gaming?	0.131	0.014

Table 2b: Relation between DSM-5 and duration of playing games

Item	Pearson's *R*	*P*
How long have you been playing online/offline game/s (in months)?	-0.141	0.008
On an average how many hours in a day do you spend on gaming?	0.030	0.576

Table 2c: Association between type of game played and IGD-20 Scores

Item	Presence of gaming disorder		Fischer's exact test	Point probability
	No	Yes		
Which online/offline game/s do you play?				
MMO	139	12	27.896	0.001
Strategy	63	18		
Puzzle	49	0		
Sports	16	0		
Arcade	56	0		
Total	323	30		
On which device do you play online/offline game/s?				
PC	12	0	7.514	0.004
Smartphone	251	30		
Tablet	6	0		
Play station	6	0		
PC + Smartphone	48	0		
Total	323	30		
To you what is/are the most important reason/ reasons to play the game consistently?				
Story Mode	30	0	89.211	0.016
Making Social Connections	84	3		
Team Play/Multiplayer	48	9		
Graphics (Realistic)	65	0		
No Predefined End of Game	6	18		
Graphics and Attribution	18	0		
Story Mode and Graphics	24	0		
Making Social Connections and Graphics	48	0		

Table 3: Association between sociodemographic factors and model components of IGD-20

Model	Constant	Standardized Coefficient Beta	*t*	Sig.	95% CI for B	
					Lower	Upper
Model 1	Salience	1.365	29.326	0.000	1.274	1.457
	Withdrawl symptoms	1.383	24.995	0.000	1.274	1.492
	Conflict	1.012	27.550	0.000	0.939	1.084
	Moodmod	1.017	23.022	0.000	0.930	1.104
	Relapse	0.974	18.447	0.000	0.870	1.078
Model 2	Salience	1.331	29.922	0.000	1.244	1.419
	Withdrawlsymptons	1.379	27.446	0.000	1.280	1.477
	Conflict	1.015	29.857	0.000	0.948	1.082
	Moodmod	0.979	23.174	0.000	0.896	1.062
	Relapse	1.097	21.687	0.000	0.997	1.196

Model 2 adjusted for Age, Gender, Marital status, Family type, Religion, Occupation, Residence, Monthly family income, Education/Qualification completed

Table 4: Association between sociodemographic factors and model components of DSM-5

Model	Constant	Standardized Coefficient Beta	*t*	Sig.	95% CI for B	
					Lower	Upper
Model 1	Salience	0.344	9.320	0.000	0.175	0.269
	Moodmod	0.243	9.462	0.000	0.156	0.238
	Tolerance	0.153	4.533	0.000	0.065	0.164
	Withdrawl symptoms	0.169	4.391	0.000	0.067	0.177
	Confilict	0.150	4.859	0.000	0.050	0.118
	Relapse	0.130	3.818	0.000	0.046	0.144
Model 2	Salience	0.337	9.503	0.000	0.172	0.262
	Moodmod	0.239	9.621	0.000	0.154	0.233
	Tolerance	0.059	1.705	0.089	-0.007	0.095
	Withdrawl symptoms	0.210	5.861	0.000	0.101	0.202
	Conflict	0.147	5.071	0.000	0.050	0.114
	Relapse	0.184	5.546	0.000	0.087	0.182

Model 2 adjusted for Age, Gender, Marital status, Family type, Religion, Occupation, Residence, Monthly family income, Education/Qualification completed

Table 5: Relation between IGD-20 and DSM-5

Item	Spearman's Correlation	*P*
IGD20 Scoring- DSM Criteria Scoring	0.904	<0.001

In Table 4 as well, we observed that there is not any major difference between two models used.

In Table 5, The IGD-20 and DSM Criteria are in concurrence with each other.

Discussion

The literature on gaming disorders is scarce. Moreover, it has only been recently that the IGD was included within the fifth edition of the DSM-5 by the APA. The results of this study showed that majority of the respondents (42.8%) played MMORPG followed by strategy games (22.9%), and also the least genre of game played by the respondents was Sports (4.5%). Most of the respondents (about 80%) used smartphones to play the online/offline games and the also most significant reason to play a game consistently was making social connections (24.6%) followed by realistic graphics of the games (18.4%).

In this study, 12.2% of the participants were found to be disordered gamers as per IGD-20 scale which is higher than the results (5.4%) of a cross-sectional study in Thailand in 2020[13] but comparable to results of studies by Kim *et al.* (13.8%)[14] and Wu *et al.* (16.7%).[15] Around 37% of the participants were found to be stricken by IGD as per DSM-5 criteria. The results have been almost in line with a study done in Seoul Korea[16] and southern Brazil.[17]

We also found a significant positive correlation between IGD-20 and hours in a day one spends on gaming. A positive correlation was found between DSM-5 and hours spend on gaming per day however insignificant. We also found a significant association between IGD-20 and the type of game played as well as the reason to play games consistently.

Conclusion

On the basis of the observation of the study, it had been found that MMORPG were the foremost common style of games played and majority of the respondents used smartphones to play online/offline games. The most important reason to play a game consistently was making social connections. About 8.4% of the participants were found to be disordered gamers as per

IGD-20. There is a substantial presence of undiagnosed IGD in gamers especially among those playing more which needs to be addressed. Additional research is needed in exploring the pattern of gaming and its health impacts on the players.

Summary

What are the new findings:

- *There is a prevalence of undiagnosed gaming disorders among gamers*
- *The disorders depend on the type of game played by the gamer*
- *Duration of playing games online has an impact on prevalence of gaming disorder*

How might it impact on healthcare in the future:

- Classification of new mental disorders
- Subclinical presentations and overlap with other disorders
- Increase in prevalence of mental syndromes.

Ethical approval and consent to participate

The study was conducted and approved by the Ethics Committee of the GMC, Sgr.

Consent for publication

Informed consent was obtained from all subjects involved in the study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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