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*Original Article*

# Internet Gaming Disorder among Undergraduate Health Sciences Students in the Pokhara Valley: a Cross-Sectional Study

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## ABSTRACT

**Introduction:** Internet Gaming Disorder (IGD) is an emerging public health impact of technological advancement and globalization. This study was conducted to assess the prevalence and factors associated with IGD among undergraduate health sciences students.

**Methods:** A web-based cross-sectional study was conducted during a period of November 2019 to July 2020. A total of 412 college students from Undergraduate Health Sciences colleges of Pokhara Metropolitan city in Gandaki province, Nepal were enrolled. Online google forms were sent to all the eligible students through email and other social media sites like face book with the help of coordinator and class representative. Collected data were analyzed using SPSS IBM v.22

**Results:** The finding of the study shows that the prevalence of Internet Gaming Disorder among Undergraduate Health Sciences students was 7.1%. Sex (p=0.027), loneliness level at home (p=0.019), number of close friends (p<0.001), types of game (p<0.001), time spent on play game (p<0.001) and, type of gamer (p<0.001) were the factors associated with Internet Gaming Disorder among the participants.

**Conclusion:** Sex of the participants, loneliness level at home, number of close friends, types of game, time spent on the game play, and type of gamer are the contributing factors for developing Internet Gaming Disorder. It is important to focus on these factors to address Internet Gaming Disorder and its psychological health effects.

**Keywords:** Developing countries, Internet addiction, Internet Gaming Disorder, Problematic gaming, Video games

## Introduction

Internet Gaming Disorder (IGD) refers to the problematic use of online or offline video games. It is defined as persistent and recurrent use of the internet to engage in games, often with other players, leading to clinically significant impairment or distress as indicated by five (or more) of the nine criteria in a 12-month period.[1] World Health Organization (WHO) defined gaming disorder as "a pattern of gaming behavior (digital-gaming or video-gaming) characterized by impaired control over gaming, increasing priority given to gaming over other activities to the extent that gaming takes precedence over other interests and daily activities, and continuation or escalation of gaming despite the occurrence of negative consequences. Gaming disorder was incorporated as a mental health problem in the 11th revision of the International Classification of Disease (ICD-11) in 2018 and was recommended to the governments to formulate public health strategies and monitor IGD trends.[2]

The American Psychiatric Association (APA) included IGD in section III of the Diagnostic and

Statistical Manual of Mental Disorers-5th edition (DSM-5) on the condition that it guaranteed more clinical research and experience.[3] The essential feature of IGD is engaging in gaming for typically 8 to 10 hours or more per day, typically in internet-based group games.[4] Gaming is considered as safe activity but in certain population adverse consequences of involving in this behavior is noticed.[23] Engaging in gaming activities may promote negative behaviors such as smoking and aggression and could be harmful to physical and mental well-being.[24,25] Increase in internet use and video-gaming contributes to public concern on pathological or obsessive play of video games among children and adolescents worldwide.[22] Global Games Market (GGM) has shown that there were more than 2.5 billion gamers in the world in 2016, which is almost one-third of the total population globally.[5] A systematic review on IGD has shown the prevalence of IGD ranged from 0.7 percent to 27.5 percent.[6] In the context of Nepal, there has been very limited studies conducted on IGD to date. A cross-sectional study conducted during COVID-19 Pandemic Lockdown in 2020 showed that the prevalence of gaming disorder was 8.5% among 260 internet gaming users.[20] A study conducted among university students of Ilam on internet addiction showed that 42.84% of students played online games, as a major purpose of internet using.[7] Internet gaming disorder is a relatively new phenomenon, and all the studies on internet addiction that have been published in Nepal have pointed out that further research needs to be done in this area. A scoping review showed that 10-20% of children and adolescents have mental disorders and half of them started at age by 14 years [8]. However, internet gaming as a cause of these conditions has not been ruled out. Hence, this study aimed to assess the status of IGD and factors associated with it. Data obtained from this study generates evidence and would guide to the development of appropriate interventions and policies to prevention of problematic gaming and its psychological health effects.

## Methods

A web-based cross-sectional study was conducted among students of Undergraduate Health Sciences Colleges of the Pokhara Metropolitan City, Gandaki province of Nepal. The study was conducted during November-July 2020. The study participants were undergraduate health sciences students. Sample size was calculated using the formula {$n= z^2p (1-p)/d^2$} where z= level of confidence according to the standard normal distribution (for a level of confidence of 95%, z= 1.96), p= prevalence of IGD= 50%= 0.5, q= 0.5, d= margin of error=0.05 and the sample size (n) was 424 after adding 10% non-response rate. The main instrument to collect data was online self-administered questionnaires using Google forms. The survey instrument was distributed to faculty members to assess its validity and reliability before pretesting among 42 (10% of sample) undergraduate students for relevance, clarity, and acceptability. Changes such as shuffling the question patterns were made before the final questionnaire survey was distributed to the research participants.

The study questionnaire consisted of the following two parts - Part A: General informative questionnaire to assess the socio-demographic profile, and Part B: The English version of the DSM-5 short (9-item) Dichotomous scale which compromises nine items, each reflecting one DSM-5 criteria for IGD. The psychometric properties of this instrument have been well-established.[1,26] For those who did not respond, the forms were sent at a gap of two days. The study included Undergraduate health sciences students of all semester and year studying in different medical colleges in Pokhara Metropolitan city. Interns and Post-graduate students were excluded from the study.

Ethical clearance was obtained from Institutional Review Committee (IRC) of Manmohan Memorial Institute of Health Sciences (MMIHS) Kathmandu, Nepal (Ref no: 77/27) prior to the start of study. The study was conducted during a period of November 2019 to July 2020. Questionnaire did not contain any identification detail such as email, name of the students and confidentiality was strictly maintained throughout the study. The participants had complete freedom to answer or decline the questionnaire.

The data were transferred from Google form into a spreadsheet and again transferred it to micro- soft excel 2016, analysis was done using the Statistical Package for Social Sciences software (SPSS IBM v. 22). Data were presented in the form of frequency and percentage. Chi-square test (at 5% level of significance and 95% CI) was done to show the association between dependent and independent variables. A p value of <0.05 was considered statistically significant for all the tests.

## Results

There were total of 424 students out of which 412 students participated in the study. Table 1 denotes the demographic characteristics of the respondents. The mean age of the participants was 21.45 ± 2.11 years with the majority (80.6%) of females. Most (94.2%) of them were unmarried and were (99.5%) above the poverty line. Average income less than 1.90$ (dollars) per day is defined as below poverty line and equal or more than 1.90$ (dollars) per day is defined as above poverty line.[21]

**Table 1.** Some of the demographic Criteria for Participation

| Variables | Frequency | Percentage |
|---|---|---|
| **Age (in years)** | | |
| Mean ± SD | 21.45 ± 2.11 | |
| **Sex** | | |
| Female | 332 | 80.6 |
| Male | 80 | 19.4 |
| **Ethnicity** | | |
| Janajati | 101 | 24.5 |
| Brahmin | 198 | 48.1 |
| Chettri | 88 | 21.4 |
| Others | 25 | 6.1 |
| **Marital status** | | |
| Unmarried | 388 | 94.2 |
| Married | 24 | 5.8 |
| **Socio-economic status** | | |
| Below poverty | 2 | 0.5 |
| Above poverty | 410 | 99.5 |

**Table 2.** IGD among the respondents was found to be (7.1%)

| Variables | Frequency | Percentage |
|---|---|---|
| **Prevalence of IGD** | | |
| No | 273 | 92.9 |
| Yes | 21 | 7.1 |

Table 3 shows the analysis of factors significantly associated with IGD. Sex was significantly associated with IGD. The prevalence of IGD was higher in males than females. The study shows that males were 3 times more likely to have IGD than the female respondents (OR=2.906, 95% CI= 1.167-7.240). Loneliness level at home was seen to be significantly associated with the IGD of the respondents. The respondents who felt much lonely at home were 7 times more likely to have IGD than the respondents who did not feel lonely at home (OR= 6.583, 95% CI= 1.143-37.917). Likewise, the respondents who felt a little lonely at home were 3 times more likely to have IGD than the respondents who did not feel lonely at home (OR= 3.199, 95% CI= 1.179-8.679).

Number of close friends was also associated significantly with IGD. Respondents who had 1 to 2 close friends were 3 times more likely to have IGD than the respondents who had 7 or more close friends (OR= 3.205, 95% CI= 1.085-9.472). Likewise, respondents who had 3 to 6 close friends were less likely to have IGD than the respondents who had 7 or more close friends (OR= 0.393, 95% CI= 0.116-1.329).

Respondents who played action games were 13 times more likely to have IGD than the respondents who played strategic games (OR= 12.972, 95% CI= 3.600-46.746). Likewise, respondents who played adventure games were 5 times more likely to have IGD than the respondents who played strategic games (OR= 4.556, 95% CI= 0.883-23.495). Similarly, the respondents who played role-playing games were 4 times more likely to have IGD than the respondents who played strategic games (OR= 3.905, 95% CI= 0.381-40.054). Time spent on games was also found to be significantly associated with IGD. Respondents who played game for 8 and more than 8 hours were 7 times more likely to have IGD than the respondents who played games for 0 to 7 hours (OR= 6.951, 95% CI= 2.686-17.989). Respondents who were regular players were 8 times more likely to have IGD than the respondents who were irregular players (OR= 8.227, 95% CI= 3.037-22.284).

**Table 3.** Bivariate analysis of factors significantly associated with IGD

| Factors | Prevalence of IGD | | p-value | OR | 95% CI (lower-upper limit) |
|---|---|---|---|---|---|
| | No | Yes | | | |
| **Sex** | | | | | |
| Female | 217 (94.8%) | 12 (5.2%) | | **Ref** | |
| Male | 56 (86.2%) | 9 (13.8%) | 0.022 | **2.906** | 1.167-7.240 |
| **Loneliness level at home** | | | | | |
| None | 158 (96.3%) | 6 (3.7%) | | **Ref** | |
| Little | 107 (89.2%) | 13 (10.8%) | 0.022 | **3.199** | 1.179-8.679 |
| Much | 8 (80.0%) | 2 (20.0%) | 0.035 | **6.583** | 1.143-37.917 |
| **No. of close friends** | | | | | |
| 1 to 2 | 39 (79.6%) | 10 (20.4%) | 0.035 | **3.205** | 1.085-9.472 |
| 3 to 6 | 159 (97.0%) | 5 (3.0%) | 0.133 | **0.393** | 0.116-1.329 |
| 7 or more | 75 (92.6%) | 6 (7.4%) | | **Ref** | |
| **Types of game** | | | | | |
| Role-playing | 14 (93.3%) | 1 (6.7%) | 0.251 | **3.905** | 0.381-40.054 |
| Action | 59 (80.8%) | 14 (19.2%) | 0.000 | **12.972** | 3.600-46.746 |
| Adventure | 36 (92.3%) | 3 (7.7%) | 0.070 | **4.556** | 0.883-23.495 |
| Strategy | 164 (98.2%) | 3 (1.8%) | | **Ref** | |
| **Time spend on game** | | | | | |
| 0 to 7 hrs. | 212 (98.8%) | 7 (3.2%) | | **Ref** | |
| 8 and more hrs. | 61 (81.3%) | 14 (18.7%) | 0.000 | **6.951** | 2.686-17.989 |
| **Type of gamer** | | | | | |
| Irregular | 254 (95.1%) | 13 (4.9%) | | **Ref** | |
| Regular | 19 (70.4%) | 8 (29.6%) | 0.000 | **8.227** | 3.037-22.284 |

## Discussion

This study found that the prevalence of IGD among Undergraduate Health Sciences students was 7.1% whereas among 92.9% of the respondents there was no IGD. In the context of Nepal, a comprehensive literature review showed a study on gaming disorder in Nepal. A recent study done in 2020 showed that the prevalence of gaming disorder was 8.5%.[20] A study conducted in Kathmandu, Nepal among Health Sciences students in 2015 showed that 32.6% played online games on the internet.[9] Few studies on internet addiction among adolescent students in Nepal showed gaming as a major purpose of internet use.[7,9,10] Likewise, a study conducted in India showed that the prevalence of IGD was 3.50% which was similar to the study conducted in Thailand 5.4%.[11,12]

This study found sex as a strong predictor of IGD and prevalence was high among males than females among Undergraduate Health Science students. A study conducted in India showed that the prevalence of IGD was higher among male students than female students.[11] Majority of the

studies reported similar findings of high male prevalence like Lemmens et al (6.8%), Miller et al (3.1%).[13,14] From this study, it is evident that sex acts as an important risk factor for IGD. This may be because video games are marketed more towards males than females, there are not many games that attract girls, interactive online games and contents mainly rely on power, dominance, control and/or violence, which, may explain males' attraction on the internet use and games. Socio-demographic factors such as ethnicity, marital status, and family size were not associated with IGD in this study.

Loneliness level at home was also significantly associated with IGD. A study conducted in Nepal showed that the respondents who felt much lonely at home were more addicted to the internet.[10] Previous studies have consistently confirmed the connection between loneliness and game addiction.[15,16] This may be because playing online games may temporarily provide an escape from the negative feelings associated with social deficiencies such as dysfunctional family, lack of friends, and may make them free from loneliness. Number of close friends was also significantly associated with IGD. This study did not find any association between tobacco, alcohol consumption, and IGD, this result was supported by a study done in Thailand.[12] The study shows no association between socioeconomic status, internet access, and IGD. Pawan Taechoyotin et al support the findings.[12]

Time spent on games was significantly associated with IGD. A study done in Thailand supports the findings. If the games are played in controlled duration, it has a positive effect on learning process, motivation, memory formation and gives rise to happiness in those who play game. However, excessive internet gaming activity may develop into IGD.[17] Types of gamers were also significantly associated with IGD. A similar study conducted in 2016 by Gaetan et al showed that compared to irregular gamers, regular gamers have IGD and express their emotions less, and have difficulty being emotionally reactive.[18] Types of games were also significantly associated with IGD. This study shows that respondent who play action games were more likely to have a prevalence of IGD, this might be because action games content rely on power, fights, control that will attract the gamers towards the action genre. A study conducted by Bonaire et al in 2019 supports this finding.[19] Video games act as a medium for projecting and experiencing one's emotional life by staging the emotional self and thus giving priority to gaming than other activities.[18]

## Conclusion

The present study revealed 7.1% prevalence of IGD among Undergraduate Health sciences students of Pokhara Metropolitan city. We found respondent's sex, loneliness level at home, number of close friends, types of game played, time spent on a game per day, and type of gamer to be the contributing factors for developing IGD. Therefore, it is very important to focus on these factors to address IGD and its psychological health effects on undergraduate heath sciences students.

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