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Factors Associated with Prevalence of Internet Gaming Disorder among School Going Adolescence of Butwal, Nepal

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ABSTRACT

Introduction: Internet gaming disorder (IGD) refers to uncontrolled gaming behavior despite the occurrence of negative consequences. The use of Internet games is popular among school children. Many studies have been conducted on IGD around the globe. This study aimed to measure the prevalence of IGD among adolescents and the factors associated with it.

Methods: A cross-sectional study was conducted among 446 students of grades 8, 9, and 10 in Butwal Sub-metropolitan city. A simple random method was used to select schools. Sections of each class of 8, 9, and 10 were selected using a lottery method (for two or more sections in a grade). All the eligible students of the selected section/grade were included in the study. Self-administered questionnaire and Dichotomous IGD scale-9 were used for data collection. Bivariate analysis was done and 95% confidence interval was used to determine significance.

Results: The prevalence of IGD was found to be 18.9% among school-going adolescents. The associated factors found were male sex (p=0.006), daily playing behavior (p=0.001), availability of personal devices (p=0.005), habit of spending money on games (p<0.001), and presence of regular gaming partners (p=0.005).

Conclusions: IGD is an emerging issue among the young population. Appropriate measures should be taken to control the gaming behavior of students.

Keywords: *Adolescence, Internet Gaming Disorder*

INTRODUCTION

The use of Internet games has become common among children and adolescents. Gaming devices such as mobile, tablets, or consoles are available at affordable prices which aid in the increase in access and engagement in gaming. Gaming may be harmless for most of the user, and even can have benefits to the user however, in some gamers negative effects can be detected.[1] The 11th revision of ICD included and defined Gaming disorder.[2] DSM-5 included Internet Game Disorder (IGM) in the chapter named "Conditions for Further Study". It has outlined nine diagnostic criteria in assessing IGD, out of which at least 5 must be fulfilled in the past 12 months.[3]

In recent years, many studies have been done on IGD around the globe. This study aimed to estimate the prevalence and identified the associated factors in the context of Nepal.

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METHODS

A cross-sectional study was conducted among school-going adolescents of grades 8, 9, and 10 from January to June 2022. The data were collected from the secondary school of Butwal sub-metropolitan city. Four schools were selected using a lottery method. Sections of each class of 8, 9, and 10 were also selected using a lottery method (for grades having 2 or more sections). All the eligible students of the selected section/ grade were included in the study.

The sample size was calculated using formula $n = (Z^2pq) / d^2$

Where,

Z = level of significance at 95% confidence interval (Z = 1.96)

p= 0.106 prevalence of IGD was 10.6% in a study conducted among 13 – 19 years students of Maharashtra, India.[4]

q = 1 – *p*= 0.894

d = allowable error (0.03)

So, $n = (1.96^2 * 0.106 * 0.894) / 0.03^2$

$= 404.49 \approx 405$

Taking non-response rate of 10%, the final sample size was, n = 405 + 41 =446

Semi-structure self-administered questionnaire was used for data collection. The questionnaire was pretested among 45 students of the same grade in Bhairahawa City to assess validity and reliability. The questionnaire consisted of three parts; socio-demographic information (Age, Sex, Grade, Family type, Family structure), gaming behavior (How often do you play, Time spent, Device used, Genera, Age at first play, Availability of personal device, Game partner, Preference on spending money on games) and dichotomous internet gaming disorder scale-9

Dichotomous Internet Gaming Disorder Scale- 9

Dichotomous IGD Scale-9 is a one-dimensional tool consisting of nine items, with a reliability of a Cronbach's alpha of 0.83.[5] English version of this questionnaire was used in data collection. Questions were asked about the participant's gaming activity during the past 12 months that have been played either from a computer/laptop or gaming console or any other devices (Smartphone/ tablet) both online and/or offline. Scoring was done on two bases; 1 for "yes" and 0 for "no". By summing the answers, the score was calculated where the highest score could be "9" and the lowest could be "0" and a score of five or more represents the prevalence of gaming disorder. Participants who had endorsed at least five criteria out of nine by answering yes fell under the criteria of disorder.

Ethical clearance for the study was obtained from the institutional review committee of the Universal College of Medical Science (Ref. no 184/21). Approval was taken from respective school authorities. Informed consent was taken from the parents of study participants before data collection. Orientation to the participants was provided to fill up the questionnaire. Self-administered questionnaires were checked for completeness before submission by the participant. Coding and editing were done on the same day and data entry was done on the corresponding following days.

Data entry and analysis were done by using Statistical Package for the Social Sciences (SPSS) version 25. Categorical variables were presented in percentage and frequency. The independent variables were analyzed by bivariate analysis, Odds Ratio was calculated to determine association and 95% confidence interval was used to determine statistical significance.

RESULTS

In this study 448 participants were included after excluding missing data. The mean age of participants was 14.95 years and 51.8% were male. Most adolescents (77%) were from nuclear families. Only 12.5% were single-child while others had siblings. Table I showed the sociodemographic characteristics of participants.

Table 1. Sociodemographic characteristics of respondents

Variables		n (%)
Age Group (n=448)	10-14	33 (7.4)
	14-17	397 (88.6)
	17-20	18 (4)
Age (Mean and SD)	14.95 ± 1.029 years	
Sex	Male	232 (51.8)
	Female	216 (48.2)
Grade	8	141 (31.7)
	9	176 (39.3)
	10	130 (29)
Type of family	Nuclear	345 (77)
	Joint/ Extended	103 (23)
Family structure	Being single child	56 (12.5)
	Having sibling	392 (87.5)

Among 448 adolescents, only 403 (89.95%) were found to have played internet games in the past 12 months. Only one-third of them played games daily. The majority of them had personal devices to play (70.5%), and preferred spending money on games (82.9%).

Table 2. Characteristics related to gaming behavior

Variables		n (%)
Played games in past 12 months (n=448)	Yes	403 (89.9)
	No	45 (10.1)
How often do you play? (n=403)	Daily	134 (33.3)
	On the weekend/ Occasionally	269 (66.7)
Time spent on Games	Less than 1 hrs	197 (48.9)
	1 to 2 hrs	124 (30.8)
	2 to 4 hrs	64 (15.9)
	More than 4 hrs	18 (4.4)
Device used for playing	Mobile	349 (86.6)
	Other than mobile	54 (13.4)
Genera	Simulation	29 (7.2)
	Strategy	63 (15.6)
	Action	142 (35.2)
	Role-playing	21 (5.2)
	Casual	47 (11.7)
	Sports	74 (18.4)
	Others	27 (6.7)
Age at first game play	Less than or equals to 6 yrs	83 (20.6)
	More than 6 yrs	320 (79.4)
Has personal device	Yes	284 (70.5)
	No	119 (29.5)
Prefer spending money games	Yes	69 (17.1)
	No	334 (82.9)
Regular game partner	Yes	200 (49.6)
	No	203 (50.4)

Table 3 showed the factor associated with IGD. Male sex, daily playing behavior, availability of personal devices, and presence of regular gaming partners were found to be associated with IGD. Similarly, IGD was highly associated with a preference on spending money on games. Prevalence of IGD was almost double in males (23.8%). The prevalence of IGD was found to be 28.4% among those who played daily, 22.5% who had personal devices to play, 36.2% among those who preferred spending money on games, and 24.5% among those who had regular gaming partners.

Table 3. Factor associated with IGD

Variables	Internet Gaming Disorder				OR	95% CI for OR	p-value
	Yes (n=76)		No(n=327)				
	n	(%)	n	(%)			
Sex							
Male	53	(23.8)	170	(76.2)	2.128	1.246 - 3.635	0.006*
Female	23	(12.8)	157	(87.2)	1		
Family structure							
Being single child	7	(13.2)	46	(86.8)	0.620	0.268 - 1.432	0.263
Having sibling	69	(19.7)	281	(80.3)	1		
How often do you play?							

Variables	Internet Gaming Disorder				OR	95% CI for OR	p-value
	Yes (n=76)		No(n=327)				
	n	(%)	n	(%)			
Daily	38	(28.4)	96	(71.6)	2.406	1.447-4.002	0.001*
On the weekend /Occasionally	38	(14.1)	231	(85.9)	1		
Device used for playing							
Mobile	62	(17.8)	287	(82.2)	0.617	0.317-1.203	0.157
Other than mobile	14	(25.9)	40	(74.1)	1		
Availability of personal device							
Yes	64	(22.5)	220	(77.5)	2.594	1.343 – 5.011	0.005*
No	12	(10.1)	107	(89.9)	1		
Prefer spending money on games							
Yes	25	(36.2)	44	(63.8)	3.153	1.775 – 5.599	<0.001**
No	51	(15.3)	283	(84.7)	1		
Presence of regular game partner							
Yes	49	(24.5)	151	(75.5)	2.115	1.261 – 3.550	0.005*
No	27	(13.3)	176	(86.7)	1		

*significant, **highly significant

DISCUSSION

This study found that 12-month prevalence of internet gaming disorder among school going adolescents was 18.9% which was similar to a study conducted in China showing 17% prevalence among 6,379 adolescent game players.[6] However, the prevalence was quite higher in comparison to studies in Nepal (8.5%),[7] India (10.6%, 3.5%),[4,8] China (13%),[9] Korea (13.5%),[10] Thailand (5.4%)[11] and Norway (1.4%).[12] The prevalence of IGD varied widely across studies in different countries, ranging from an estimated 0.6% in a Norwegian survey up to a high of 50% in Korea.[13] The difference in prevalence might be due to differences in sample characteristics, assessment tools, cultural differences, and survey methods employed.

In this study, the sex of respondents and gaming behavior factors were associated with Internet gaming disorder. This study showed the odds of having IGD in male was 2.12 times greater than that of females which was consistent with findings from the studies in Nepal,[7] India,[4,8] China,[6,9] Thailand[11] and Norway.[12] Gender is an important and non-modifiable risk factor as illustrated by these studies. Males tend to be attracted to and play video games more than females as video games are invented and marketed for male.[8] Females mostly use online networking for social media, whereas males prefer the internet to play games.[14] The study also showed women may show better executive control than men when presented with game clues that provide resilience to the development of IGD.[15]

This study found that adolescents who play on a daily basis are 2.40 times more likely to be addicted than those who played occasionally or on the weekend. The finding of this study also showed that with the increase in time spent on gaming, the risk of IGD also increased. Similar findings were found in the studies conducted in Nepal and Korea.[7,10,16] Findings from Zaheer Hussain also showed that the more time a player spends playing games on the internet, the higher the risk of addiction.[17]

The availability of personal devices was found to be a risk factor for IGD among adolescents. These findings align with several studies concluding smartphones as one of the most common predictors of the prevalence.[4,8] Daily time spent on games increases with owning a personal and portable device such as a smartphone. This might be because providing smartphones to school-going adolescents and lack of parental control results in continuous and uncontrolled gaming behavior.

Findings from this study showed a strong association between gaming characteristics of spending money on games and IGD. The risk of being addicted increases by 3.15 times when adolescents prefer spending on games. This finding was similar to the findings from studies in China, Korea, and Thailand.[6,10,11] Commonly players spend money on in-game purchases to obtain premium content of games. The gaming company uses players' game-related preferences, playing and spending habits to maximize the likelihood of elevating players' spending. The direct financial return of these transactions is not possible.[18] Thus, once a player starts spending it becomes urges to continue playing which

might be the reason behind the association between spending on games and IGD.

The presence of regular gaming partners significantly increases the risk for IGD by 2.11 times. Similar findings were found in the studies conducted in China and Korea.[6,10] Multiplayer online games encourage players to team up with other players, thus creating opportunities to have social relationships.

One of the major limitations of this study was the utilization of a cross-sectional design, which implies that the relationship may not be causal. To gain a better understanding of the associations of internet gaming disorders, further research should be conducted.

CONCLUSIONS

This study showed almost one in five school-going adolescents were positive for Internet Gaming Disorder fulfilling five out of nine criteria of DSM-5 within the last year. Risk factors for internet gaming disorder include gender, daily behavior, time spent, game genre, device availability, habit of spending money, and regular gaming partners. Preventive measures and interventions are needed to address this emerging issue among school-going adolescents.

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CONFLICT OF INTEREST

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