

Internet Gaming Disorder and Aggression among Students on School Closure during COVID-19 Pandemic

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ABSTRACT

Background: The Corona Virus Disease (COVID-19) pandemic has significantly disrupted the regular school-going activities of the students, predominantly increasing internet gaming activities to endure significant stress. Excessive involvement in internet gaming brings deviant behaviour, especially aggression among the students. Hence, this study aimed to assess the internet gaming disorder and aggression among the students on school closure during COVID-19 pandemic in Chitwan, Nepal.

Methods: A web-based cross-sectional survey was conducted among 417 students from secondary and higher secondary level who studied in two private schools of Chitwan district. Sample were selected using simple random sampling technique and structured questionnaire, i.e. Internet gaming disorder scale- short form (IGDS9-SF) and Aggression questionnaire (Buss & Perry, 1992) were used to collect the data via web-based through Google Form. Obtained data were analysed using descriptive and inferential statistics.

Results: Out of 417 students, the mean age was 17 (± 1.411) years, 278 (66.7%) were male and 150 (36.0%) were studying in twelve standard. Majority of students 405 (97.1%) were non-disordered gamers whereas only 12 (2.9%) students were disordered gamers. Students' overall aggression score was 57.79% where the verbal aggression score was higher (66.33%) followed by hostility (61.41%) and anger (56.80%). Further significant positive relationship was found between scores on online gaming disorders and aggression ($r=0.239$, $p<0.001$).

Conclusions: Internet gaming disorder and aggression are common among the students during COVID-19 pandemic. Therefore, educational institutions and concern authorities need to organize awareness programs and effective psychosocial intervention approaches for students to enhance the knowledge regarding harmful use of internet game, IGD, to cope with stress and aggression as well as to enhance the adoptive behaviour.

Keywords: Aggression; COVID-19 pandemic; internet gaming disorder.

INTRODUCTION

Ongoing Corona Virus Disease 19 (COVID-19) pandemic, disruption in the regular school going activities and increase exposure to online learning through electronic devices has limited the social interactions as well as increased addictive online gaming behaviours of students following the school closure worldwide.¹⁻³ With the protracted periods of isolation, the tendency to engage

in online gaming play as a putative coping strategies to meet the basic psychological needs however ,bringing a massive impact on human life particularly Internet Gaming Disorders (IGD) and aggression in an extreme case.^{1,4,5} To the best of our knowledge, this is the first study which aimed to determine the IGD and aggression among students after the school closure in Nepal during the COVID-19 pandemic. This study is important to understand how COVID-19 pandemic influenced the

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excessive use of online games during this unique period, increasing the risk of aggression.

METHODS

A web based cross-sectional study was carried out in two private schools of Chitwan district. Population of the study was those students who had enrolled in 9th, 10th, 11th and 12th standard of selected schools and who were involved in online gaming. Calculated sample size was 482 with 0.5 probabilities (p), 5% allowable error (e), 95% confidence level and 25% non-response error. Ethical approval was obtained from Chitwan Medical College Institutional Review Committee (Ref. no-077/078-109) and data collection permission was taken from the school authorities. First of all students name lists with email /cell phone address was obtained from the school authorities and simple random sampling technique with random table method was used to select the desired sample. Internet gaming disorder scale- short form (IGDS9-SF)⁶ was used to measure the internet gaming problem. It consisted of 9 items under the criteria as suggested by the American Psychiatric Association in the latest edition of Diagnostic and Statistical Manual of Mental Disorder (DSM-5). Each item was rated on 1 to 5 score which is expressed as “never=1”, “rarely=2”, “sometimes=3”, “often=4” and “very often=5” where higher scores being indicative of higher degree of Internet Gaming Disorder. Similarly, Aggression Questionnaire (Buss & Perry, 1992) was used to measure the aggression among the students on school closure during COVID-19 pandemic. It consisted of 29 items under 4 factors: Physical Aggression (PA)-9 items, Verbal Aggression (VA) - 5 items, Anger (A)-7 items, and Hostility (H)-8 items. Each item was rated 1 to 5 score which is expressed as “extremely uncharacteristic of me=1”, “somewhat uncharacteristic of me=2”, “Neither uncharacteristic nor characteristic of me=3”, “somewhat characteristic of me=4”, “Extremely characteristic of me=5”. Higher score indicated higher levels of aggression. All the responses were measured in the last 4 weeks and the reliability coefficient of IGDS9-SF and Aggression Questionnaire were 0.96 and 0.89 respectively. The questionnaire was imported into Google Forms. Selected students were contacted through telephone call/email, explained the purpose of the study as well as voluntary participation in the study. After getting permission for the participation in the study, a link was sent to the students through various online medium (facebook messenger, viber, whatsapp etc.). The link was kept opened for the access to the students from 14th September 2020 to 15th October 2020. The survey response data was collected online and was only available to the researchers in a non-identifiable form. The data was exported to Microsoft Excel 2016

and was analyzed using IBM SPSS (Statistical Package for Social Sciences) version 20 for window. Descriptive statistics was used to describe the socio-demographic, aggression and online gaming disorders. Data normality was tested and data were normally distributed so parametric test such as Pearson correlation coefficient was calculated to determine the relationship among internet gaming disorder and aggression. Statistical significant was set at <0.005.

RESULTS

Out of 482 participants, response was obtained from 417 i.e. 86.5% response rate. The mean age was 17 years (Range: 13 -22 years). Majority of them were male (66.7%), belonged to nuclear family (78.9%), and 36% were studying in twelve standard. More than half (51.8%) of participants' father and 63.1% of participant's mother studied up to secondary level education. Forty percent of participant's father was involved in business and 65.2% participant's mother were home maker. Almost all participants lived (92.3%) with their family member during the COVID-19 outbreak (Table 1).

Table 1. Characteristics of the Participants. n= 417

Characteristics	Number	Percentage
Age (completed in years)		
Below 17	209	50.1
17 and above	208	49.9
<i>Mean (SD)=17(±1.411), Min-13 year ,Max-22 year</i>		
Sex		
Male	278	66.7
Female	139	33.3
Type of family		
Joint	88	21.1
Nuclear	329	78.9
Current grade		
Nine	62	14.9
Ten	81	19.4
Eleven	124	29.7
Twelve	150	36.0
Father's educational status		
General literate	39	9.3
Up to secondary	216	51.8
Bachelor's and above	162	38.8

Table 1. Characteristics of the Participants. n= 417

Mother's educational status	Number	Percentage
General literate	55	13.2
Up to Secondary level	263	63.1
Bachelor's and above	99	23.7
Father's occupation		
Agriculture	16	3.8
Business	167	40.0
Service	140	33.5
Others	94	22.5
Mother's occupation		
Home maker	272	65.2
Business	39	9.4
Service	76	18.2
Others	30	7.2
Living with family during outbreak		
Yes	385	92.3
No	32	7.7

Most of the participants (90.9%) were involved in online classes. The median duration of classes per day was 4 hours. Two third of participants (66.9%) were involved in violent games, 85.1% played games using mobile only, and more than half (53.7%) played online games in the day time. The average involvement in games by the participants was 1 hour before the school closure while it was 2 hrs after the school closure (Table 2).

Table 2. Participants' Internet Gaming related Variables. n= 417

Variables	Number	Percentage
Participation in online class		
Yes	379	90.9
No	38	9.1
Duration of online classes per day (n=379)		
Less than median 4 hrs	115	30.4
4 hrs and above	264	69.6
Types of online games played		
Violent	279	66.9
Non- violent	106	25.4
Both	32	7.7
Time involved in playing		
Day	224	53.7
Night	102	24.5
Anytime	91	21.8
Type of device used		

Table 2. Participants' Internet Gaming related Variables. n= 417

Variables	Number	Percentage
Only mobile	355	85.1
Only laptop	38	9.1
Multiple device	24	5.8
Median (IQR) Involvement in online game before school closure: 1 (0.5-1) hour		
Median (IQR) Involvement in online game after school closure 2 hours (1-3) hours		

Violent games: Call of duty, PUBG, clash of clans, free fire, among us, Clash Royale

Non - violent games: Ludo club, minecraft, jigsaw puzzle, Hay day, chess

Total internet gaming disorders (IGD) score was calculated by summing all the items and was further classified into two categories with the cut-off score as 32 i.e. disorders gamers (≥ 32) and non-disordered gamers (< 32). Out of 417 participants, most of them (97.1%) involved in non- disordered gamers whereas only 2.9% were involved in disordered gamers (Table 3).

Table 3. Participants' Level of Online Gaming Disorders.

Level of Online Gaming Disorders	Frequency	Percentage
Disordered Gamers (≥ 32)	12	2.9
Non- disordered Gamers (< 32)	405	97.1
Total	417	100.0

Possible IGD Score: 9-45, Cut-off Score: 32

Participants' overall aggression mean percentage was 57.79%. Participants' aggression mean percentage score was higher in verbal aggression (66.33%) followed by hostility (61.41%) and anger (56.80%) (Table 4).

Table 4. Participants' Score on Different Domains of Aggression.n=417

Aggression	Min-Max Score	Mean Score	SD	Mean Percentage
Physical aggression	9-45	22.77	6.89	50.60
Anger	7-35	19.88	5.33	56.80
Hostility	8-40	24.56	5.86	61.41
Verbal Aggression	5-25	16.58	3.73	66.33
Total Aggression	29-145	83.79	17.98	57.79

Each Item Possible Score: 1 to 5

Pearson correlation coefficient was performed to examine the strength and direction of relationship among the variables. The results showed that there

was a significant positive correlation between scores on online gaming disorders and domains of aggression (physical, anger and hostility) where r value ranging from 0.131 - 0.284, $p < 0.001$. In addition, online gaming disorder was positively correlated with total aggression ($p = 0.001$) which indicates that increase in involvement in online gaming ultimately increases aggression among students (Table 5).

Table 5. Relationship between Online Gaming and Aggression among the Participants. $n = 417$

Variables	r	p
Online game addiction vs. Total Aggression	0.239	<0.001
Online game addiction vs. Physical Aggression	0.284	<0.001
Online game addiction vs. Anger	0.182	<0.001
Online game addiction vs. Hostility	0.152	0.002
Online game addiction vs. Verbal Aggression	0.131	0.007

$p < 0.05$ $r =$ Pearson Correlation

DISCUSSION

The current state of alarm due to the COVID-19 pandemic has attracted youth towards online gaming in today's context changing the pattern of day to day activities. Due to the rapid use of problematic online games has led most of the students to the potential risk of internet gaming disorder and aggression. Though use of online games can be a solution to curtail the spread of the corona virus enforcing to stay at home, it may pose risks for younger generation at risk of gaming disorder. Hence, it has been a global concern to minimize the risk among the younger generation of society.

Present study revealed that only 2.9 % of students were disordered gamers with almost 97.1% as non-disordered gamers by applying the Internet Gaming Disorder Scale Short-Form (IGDS9-SF) and the standard cut off score-32.⁶ Our gaming addiction rate was lower compared to the studies done in Nepal⁷ and China⁸ where they reported higher preference (8.5% ,17.0 and 7.7%) for internet gaming disorder in COVID-19 pandemic. Likewise, evidences from various parts of the world reported the prevalence of 7.5% and 9.4% respectively among the participants who endorsed at least five criteria for IGD.^{10,11} Similarly, a community based survey reported almost consistent results with our study (2%).¹² On the contrary, the lowest prevalence (0.8%) was reported in Australian male sample, which came from a survey on video arcade game addiction among university students.¹³ Likewise, a systematic review of more than 45 studies reported the scores for

IGD ranging from 0.7 to 27.5%.¹⁴ Furthermore, Muller (2015)¹⁵ reported that 1.6% adolescents between 14 and 17 years met the full criteria for IGD in seven European countries, with further 5.1% being at risk for fulfilling up to four criteria.

In addition, numerous studies from other parts of the world also pointed out varying degrees of gaming addiction where, 8.5% of youth in United States met 6 of 11 criteria of IGD¹⁶, 5% of Australian youth met 4 of 9 criteria of IGD¹³, and 5.9% of Korean middle school students⁵ met the criteria of IGD. Similarly, the meta-analysis found the pooled prevalence rates of Internet gaming disorders in Southeast Asia to be 10.1%.¹⁷

The diversification observed may reflect real differences in the prevalence of IGD in different parts of the world. The variation in prevalence of IGD was likely to be due to the methodological differences applied in various studies, such as use of different assessment tools, cut-off scores, study sample characteristics, and survey methods employed for data collection. It is important to note that those who fall below the cut-off score may also have masked the tendency to be at risk.

Aggression is common among that person who have internet gaming disorders. Present study showed that students' overall mean aggression score was 83.79 ± 17.98 , where hostility score 24.56 ± 5.86 , physical aggression 22.77 ± 6.89 , and anger 19.88 ± 6.89 among the students during the school closure due to COVID-19 pandemic. This finding is in line with study done in turkey, which reported a consistent score for hostility (12.51 ± 6.60), anger (12.32 ± 5.33) and physical aggression (12.10 ± 6.92).¹⁸ Another study done by Kim reported the overall mean score of aggression to be 57.34 ± 15.00 which is somewhat lower than scores observed in our study.¹⁹ It may be possible due to the lack of the cooperative efforts and in conducive environment²⁰, and inability to regulate one's emotion can be the factors prompting the development of aggression in students.²¹

Our findings indicated that the four domains of aggression under consideration: verbal, physical, anger and hostility, all had positive relationship with the online gaming disorders and these findings are supported by other studies.^{22,23} This study provides further evidence that these factors need to be considered in designing psychosocial interventions for the students who are at risk of developing deviant behaviour. Another study revealed that the group with IGD had the highest mean score of physical aggression compared to the other types of gamer groups in korea.⁵ In harmony with the present study findings from other studies^{24,25} showed that aggression mediated the relationship between

Internet gaming addiction. While receiving help for an Internet gaming addiction, it is advisable to pay close attention to their aggression and social relationships. It is noteworthy that majority of our participants agreement on playing violent video games has been observed in increasing aggression in other studies.²⁶⁻²⁸ Similarly, the conclusion drawn from the present study also resonate with the previous literatures which attributed significant association between aggression and the risk of IGD ($r=0.32$, $p<0.001$).^{19,29} Furthermore, some studies showed the contrary finding which showed that there was no association between violent game and real-world aggression.³⁰ The possible reasons for the variation might be due to the pattern of change in internet gaming level and individual difference in developing the tendency of aggressive behaviour²⁹

This research adds value to the existing literature, through detailed analysis of students' online internet gaming disorder and aggression on school closure during the times of COVID-19 pandemic. It is still arguable that the frequent use of online games brings out the aggressive behaviour in students. Various factors need to be considered to find out the online gaming disorder and aggression such as socio-environmental variables such as parental attachment, parental supervision, teacher attachment, friend attachment, adaptation to school, and peer-group attachment and individual variables such as self-esteem, self-control, impulsivity, depression level, and stress level. Most importantly, potential confounders within gaming should be viewed with caution.

Based on the findings, we recommend the screening and diagnosis of the online gaming disorders and aggression among students on a more global basis which will allow valid comparisons of the prevalence of IGD worldwide. The present study has some limitations. First, it was limited in scope, since it is a cross-sectional study; it cannot analyse the chronological relationship between adolescents' aggression and internet gaming disorder. Participants were from Chitwan district, limiting the generalization of findings to other settings. Third, participants were non-clinical individuals and all scales were self-rated which limits the generalizability of findings. IGD is a clinical diagnosis that should be made by a clinician based on a diagnostic interview. Thus, the results of the present study should be supported by further research conducted in clinical samples.

CONCLUSIONS

Considerable percentages of students have internet gaming disorders and aggressive behaviours. There is positive relationship between online internet gaming disorder and aggression of the students. Hence, screening

of online internet gaming disorders and aggression as well as systematic psychosocial interventions for the vulnerable groups of students is needed to minimize the negative emotions and further consequences associated with it.

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CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, or publication of this article

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