

Prevalence of Gaming Disorder among Middle School Students and Its Correlation with Parental Perception on Problematic Internet Usage in Chennai

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Abstract

Background: Recently the internet and internet-related activities have seen a tremendous increase in its users, coming with its advantages and disadvantages. Internet gaming disorder (IGD) is one such disadvantage which was recognized by WHO in 2018 in ICD-11 as a health concern. IGD along with problematic internet usage (PIU) can cause a detrimental effect on an adolescent's health and also has a public health implication by paving the way for addiction at a later age, if necessary timely interventions are not done at the initial stages. This study aims to detect the prevalence of internet gaming disorder in the 10 to 14 age group and the parents' perception of their wards' internet usage.

Methods: An analytical cross-sectional study among 10- to 14-year-old students conducted among 6th to 8th grade (selected randomly from 2 different schools in Chennai). For this study, parent version of Young's diagnostic questionnaire, internet gaming disorder scale short form, along with self-report forms were used. The data was collected over a period of two months and analyzed using SPSS software.

Results: This study with the participation of 285 adolescents and 285 parents found a prevalence of IGD to be at 2.1% (95% CI: 0.4 - 3.7) and with a prevalence of problematic internet usage at 16.8% (95% CI: 12.5 - 21). A correlation was present between IGD and PIU (p-value <0.001, sensitivity 83.3%, specificity 84.3%, positive predictive value 10.4%, negative predictive value 99.5%).

Conclusion: This study reports that among the participants, 2.1% had IGD and 16.8% had PIU (parental perception). Both of these conditions had a correlation with statistically significant association (p<0.001). Reduction in physical activity, academic performance, and interaction with family were perceived as detrimental by the parents.

Keywords: Adolescents, Internet Gaming Disorder (IGD), Parental Perception On Problematic Internet Usage (PIU).

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Introduction

In recent years, video games have seen tremendous growth in innovation and popularity, especially among children and adolescents. The Covid-19 pandemic forced schools to switch to an online mode of functioning to prevent disruption of education. This resulted in physical and social isolation and increased exposure of students to the internet and gadgets. Adolescence, especially early adolescence is a crucial period for the emotional growth of an individual.

This is the period of transition between childhood and adolescence, which is also aggravated by peer pressure and the desire to be accepted, which pushes them to indulge in these activities. [1] The pandemic has restricted face-to-face communications among adolescents and they tend

to search for alternatives that can fulfil their lack of interaction. [1,2] These interactions can become an obsession, making the children unwilling to perform daily activities. Massively multiplayer online role-playing games (MMORPGs) uses this need as an advantage to target the young population by providing a virtual platform for interaction of players around the world. [3]

Individuals who consider using the internet to cope with negative moods are more likely to develop compulsive behaviours like internet gaming disorders. So far studies have been based on gaming disorders, but very few have addressed the parent's perception of excessive internet usage, for which internet gaming could be a risk factor or an outcome [4]. Excessive internet usage is also linked

to poor academic performance as well as family and relationship problems. Improving family functionality has positive effects on the mental health of early adolescents and reduces their compulsive behaviour. [5] This study aims to determine the correlation between internet gaming and parental perception of problematic internet usage in children in the early adolescence period.

This study aims to detect the prevalence of internet gaming disorder in the 10 to 14 age group and the parents' perception of their wards' internet usage. There are not many studies that show a correlation between the two entities and this study aims to correlate the two findings and determine their relationship.

Materials and Methods

Study Design: This is an analytical cross-sectional analytical study on middle school students (10-14 years) regarding internet gaming disorder and analysis of their internet usage from their parent's perspective to study problematic internet usage. This study was done in private schools in Chennai, Tamil Nadu for a duration of 2 months. School-going 10-14 year old students living with both/single parent or guardians and who gave written informed consent and assent were included in the study.

Based on the review of literature, the proportion of school students with Internet Gaming Disorder was found to be 1.3%-19.9%, so a prevalence of 20% is considered for this study⁶,

Sample size calculation for the study:

$$N = Z\alpha^2pq / d^2$$

The sample size was found to be 246 and was statistically adjusted for non-response rate to 300.

Study Tool: The following scales were used as study tools:

1. Internet gaming disorder scale – short form (IGDS9-SF)
2. Parental version of Young Diagnostic Questionnaire (PYDQ)

Both the above-mentioned scales comprise of a self-report form and a questionnaire as follows.

1) Student Form: Self-report form plus the Internet Gaming Disorder scale – short form (IGDS9-SF), a 9-item scale developed by Pontes & Griffiths in 2015. It is graded as never, rarely, sometimes, often, and very often. The score ranges from a minimum of 9 to a maximum of 45 points. A score of 32 and above was taken as the cut-off to report as having Internet gaming disorder (sensitivity of 98.0% and specificity of 91.9%)⁷.

2) Parent Form: Parental version of Young Diagnostic Questionnaire (PYDQ) is an 8-item questionnaire adapted for parents' perspective by Lutz Wartburg et al from the Young Diagnostic Questionnaire by Kimberly S Young, it records responses as Yes (1) or No (0). The score ranges from a minimum of 0 to a maximum of 8 points. A score of 5 and more was used as the cut-off to report problematic internet usage⁴.

Ethical Consideration: This study was approved by the Institutional Ethics Committee (certificate No: 22072022).

Data Analysis: The data collected was entered in MS Excel. Data analysis was done using Statistical Package for the Social Sciences 23 (SPSS) software.

Continuous data were represented as means with standard deviation. Categorical data was represented as frequency and percentages. Analytical tests like chi-square test and t test were used appropriately.

Results

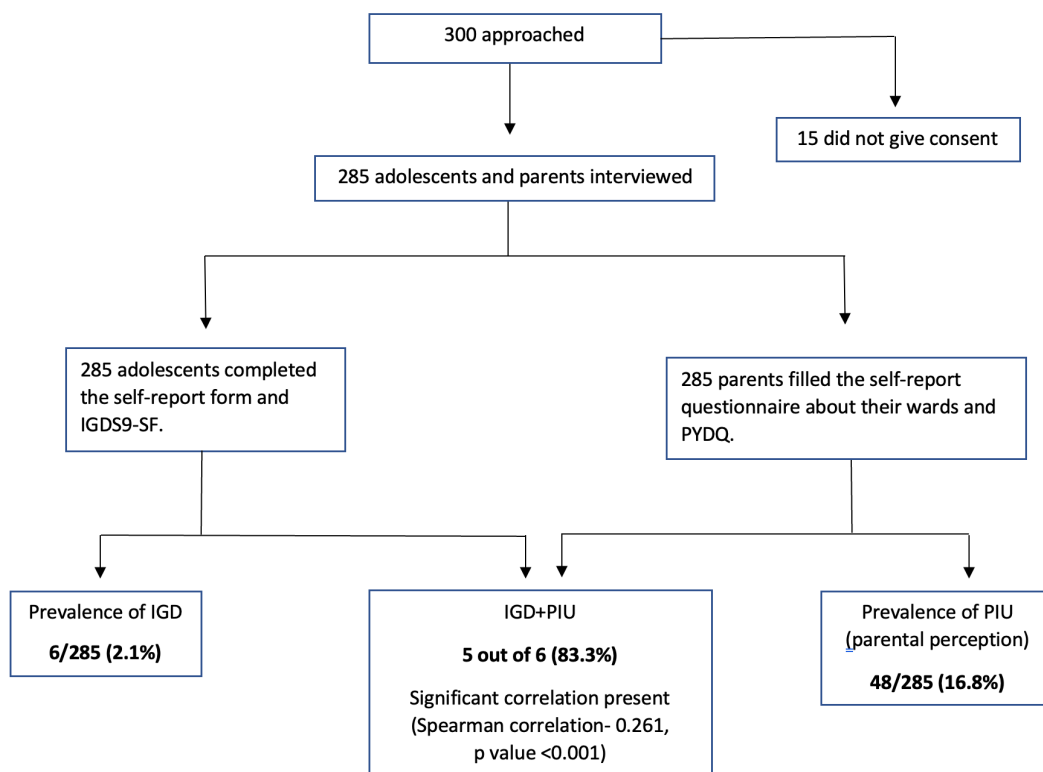


Figure 1: Methodology Cascade with prevalence of Internet Gaming Disorder (IGD) and Problematic Internet Usage (PIU)

Table 1: Baseline characteristics of the study participants (n=300)

Demographic Characteristics	Frequency	Range/Percentage
Mean Age of the Participants (Years)	11.7±1.09 Years	10-14 Years
Mean Age of The Parents (Years)	41.77±4.6 Years	30-56 Years
Gender Of the Participants	Male	141 49.5%
	Female	144 50.5%
Relation Of Parent to the Student	Mother	176 61.8%
	Father	109 38.2%
Working Parent	186	65.3%
Not A Working Parent	99	34.7%
Approximate Duration Of Time Spent By Child Using The Internet Per Day	120 Minutes (IQR)	0-480 Minutes
Mean Age Of Onset Of Gaming	7.5±1.6 Years	3-13 Years
No. Of Participants	Playing Video Games	191 67%
	Not Playing Video Games	94 33%
No. Of Participants	With Access To Private Device	133 36.1%
	Without Access To Private Device	152 53.3%

The mean age of participants were 11.7 ± 1.09 years. The mean age of the parents was 41.77±4.6 years.

The student participants consisted of 141 males (49.5%) and 44 females (50.5%). Among the parents, 176 mothers (61.8%) and 109 fathers (39.2%) took part in the study, out of which 186

(65.3%) were working parents (n=285). The approximate amount of time spent by the child using the internet per day was found as 120 minutes (inter-quartile range).

Out of the 285 participants, 191 (67%) said that they played video games with a mean age of onset at 7.5 ± 1.6 years. (Table 1)

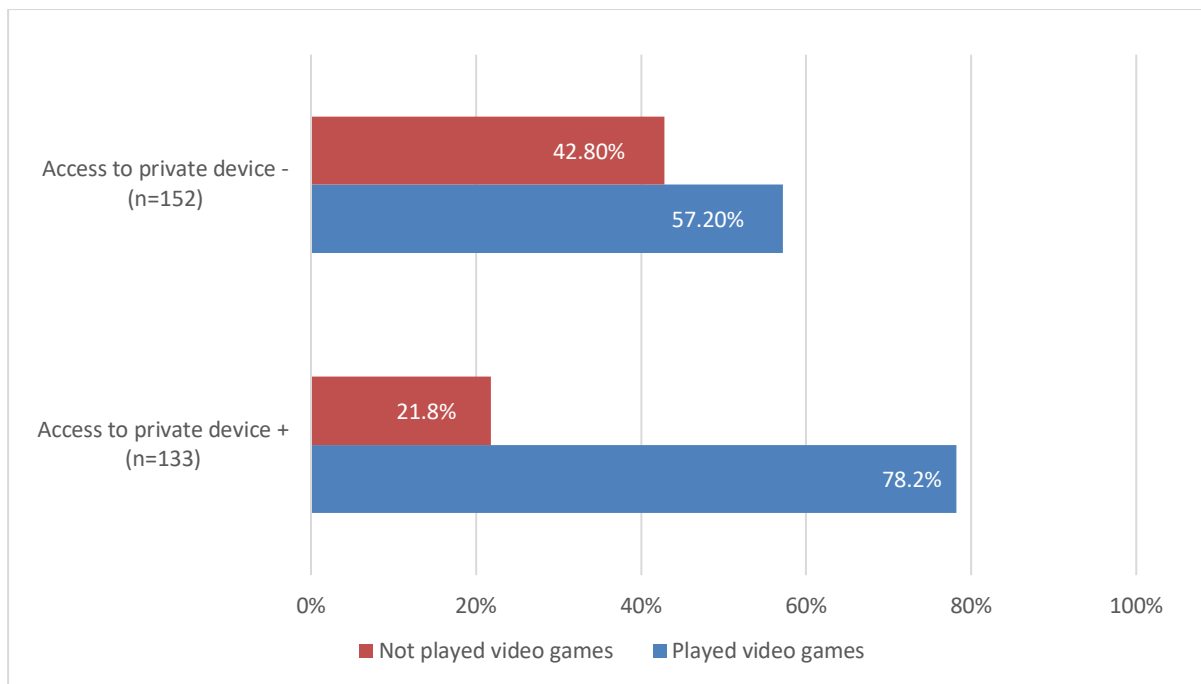


Figure 2: Distribution of study participants having access to private device and playing video games (n=285)

Among the study participants, 133 (36.1%) had access to private devices, while 152(53.3%) did not have access.

Among those with access to private devices, 104 (78.2%) played video games whereas those without access to a private device 87 (57.2%) played video

games. There is a statistically significant relationship between students who have access to a private device and playing video games ($p < 0.001$). (Fig.2). among the study participants who had access to a private device, 40.3% were girls and 53.3% were boys.

Table 2: Distribution of participants based on the prevalence of Internet Gaming Disorder (IGD) and/or Problematic Internet Usage (PIU) (N=285)

Variables	Frequency (n=285)
Prevalence Of Internet Gaming Disorder (IGD) Among 10-14 Year Olds	6 (2.1%)
Prevalence Of Parents Perception On Problematic Internet Usage (PIU) Among Their Children	48 (16.8%)
No IGD/PIU	231 (81.1%)

Among the study participants, 6 (2.1%) were identified to have internet gaming disorder. Based on the parents’ perception on problematic internet usage, 48 (16.8%) parents of the participated students perceived their child to have problematic internet usage. It is prudent to note that among the 6 student participants who were identified with

internet gaming disorder, the parents of 5 of them perceived problematic internet usage among their wards. (Table. 2). This study reports a weak correlation ($r=0.26$) between internet gaming disorder and parental perception of problematic internet usage among the study participants, which was statistically significant ($p < 0.01$).

Table 3: Factors Influencing Internet Gaming Disorder among study participants (N=6)

Factors influencing Internet Gaming Disorder among study participants		Frequency (%)	p-value
Gender	Boys	4 (2.8%)	0.444
	Girls	2 (1.4%)	
Access to a private device	Yes	5 (3.8%)	
	No	1 (0.7%)	
Age at onset of gaming		7.5 ± 1.6 years	0.164
No. of hours spent playing video games per day (weekdays)	Never played	1 (16.7%)	0.03
	< 1 hour	2 (33.3%)	
	1– 2 hours	0 (0%)	
	> 2 hours	3 (50%)	
No. of hours spent playing video games per day (weekends)	Never played	0 (0%)	0.002
	< 2 hours	2 (33.3%)	
	2 – 4 hours	2 (33.3%)	
	> 4 hours	2 (33.3%)	
Hours of sleep per day	< 7 hours	2 (33.3%)	0.258
	7– 8 hours	4 (66.7%)	
	> 10 hours	0 (0%)	
Parental perception of the child (over the past year):	Reduced physical activity	6 (100%)	0.040
	Reduced academic performance	5 (83.3%)	<0.043
	Reduced interaction with family members	6 (100%)	<0.002
Correlation between excessive gaming and excessive internet usage as perceived		5 (83.3%)	0.103

Among the study participants: 6 (2.1%) had internet gaming disorder, 5 of whom had access to a private device. The age of onset among the IGD individuals was 7.5 ± 1.6 years. Nearly 50% of the participants who had IGD, played video games for >2 hours on the weekdays (p<0.03), and 33.3% played for > 4 hours on the weekends (p=0.002). However, there was no statistically significant

association between hours of video games played and hours slept.

The parents of those identified with IGD, during the past 1 year, perceived their wards to have reduced physical activity (p<0.040), reduced interaction with family members (p<0.002) and reduction in academic performance (p<0.043) which was statistically significant. (Table. 3)

Table 4: Factors Influencing Problematic Internet Usage (PIU)

Factors influencing Problematic Internet Usage (PIU)		Frequency (%)	p-value
Gender	Boys		0.096
	Girls	19 (13.2%)	
Access to a private device	Yes	26 (19.5%)	0.253
	No	22 (14.5%)	
Age of onset of gaming		8.14 ± 2.2 years	0.085
No. of hours spent playing video games per day (weekdays)	Never played	15 (13.4%)	0.003
	< 1 hour	12 (11.9%)	
	1– 2 hours	11 (23.4%)	
	> 2 hours	10 (40%)	
No. of hours spent playing video games per day (weekends)	Never played	11 (9.3%)	<0.001
	< 2 hours	19 (17%)	
	2– 4 hours	16 (35.6%)	
	> 4 hours	2 (20%)	
Hours of sleep per day	< 7 hours	9 (18.8%)	0.477
	7– 8 hours	35 (72.9%)	
	> 10 hours	4 (8.3)	
Parental perception of the child (over the past 1 year):	Reduced physical activity	42 (87.5%)	<0.001
	Reduced academic performance	41 (85.4%)	<0.001
	Reduced interaction with family members	43 (89.6%)	<0.001
Correlation between excessive gaming and excessive internet usage as perceived by the parent		42 (87.5%)	<0.001

Our study reports the prevalence of problematic internet usage at 16.8% (n=285). Among the participants 26 (19.5%) had access to private devices. A correlation was observed between PIU and hours of gaming among the study participants who played both during weekdays and weekends which was statistically significant. 87.5% of parents reported a reduction in physical activity ($p < 0.001$), 85.4% reported a reduction in academic performance ($p < 0.001$) and, 89.6% reported reduced interaction of their child with family members ($p < 0.001$) which were statistically significant. (Table:4)

Discussion

The widespread access to the internet 2 decades ago along with the smartphone boom in the recent 10 years have contributed significantly in terms of ease of access and connectivity. Many studies with a focus on adolescents have concentrated on problematic internet usage and internet gaming disorders but very few of them analysed both entities and studied their relationship.

This study with the participation of 285 adolescents and 285 parents found a prevalence of IGD to be at 2.1% (95% CI: 0.4 - 3.7) and with a prevalence of problematic internet usage at 16.8% (95% CI: 12.5 - 21). A correlation was present between IGD and PIU (p -value < 0.001 , sensitivity 83.3%, specificity 84.3%, positive predictive value 10.4%, negative predictive value 99.5%).

This study examined the prevalence of IGD, PIU, and the correlation between them among 285 school-going adolescents between 10 – 14 age group. The mean age of the participants was 11.7 ± 1.09 years, out of the 285 adolescents 40.5% were females. Among the parents of the 285 student participants, 61.8% were mothers and 65.3% of the parents were working. The mean age of the parents was 41.77 ± 4.6 years. The approximate amount of time the children spent using the internet was reported as 120 minutes. This study reports that 191 (67%) of participants played video games regularly or sometimes. The age of onset reported for playing video games was as early as 3 years of age. 133 (36%) participants had access to a private device (smartphone or a personal computer or both), while the remaining used their parent's mobile. A significant gender disparity was seen among those having access to a private device, 53.2% of boys had access against 40.3% of girls (n=133, p -value < 0.029). However, a correlation was not seen between access to private devices and IGD or PIU, which is in contrast to previous studies who reported a strong link between the two⁸.

2.1% (n=285) of the study participants were identified with IGD (95% CI: 0.4 - 3.7) according to IGDS-SF. This prevalence was similar among

studies conducted among adolescent population [6,9]. The mean age of onset of gaming was 7.5 ± 1.6 years for those found with IGD when compared to non-IGD individuals who had a mean age of onset of 8.7 ± 2 years; however, there was no statistical significance appreciated between IGD and age of onset of playing video games (p -value 0.164). This study reports no gender disparity unlike studies conducted done before or during the COVID-19 pandemic [9–12].

This study reports that females are equally likely to develop IGD as compared to their male counterparts. Although there was a significant relationship between access to private devices and playing video games (p -value < 0.001), this access did not show a statistical significance between those developing IGD, among video game players (3.8%, $p < 0.069$). This study reports a strong association between the number of hours of playing video games on weekdays and weekends and the developing of IGD, which is in agreement with findings reported by previous studies [9,13]. In our study, 50% of the study participants played for more than 2 hours on the weekdays (p -value 0.03) and 66.6% of the study participants played for 2 or more hours on the weekends (p -value 0.002). However, there was no statistically significant association between the hours slept per day and playing video games.

This study reports no statistically significant association between the parents' perception of problematic internet usage and those participants having IGD (p -value= 0.103). Based on the parents' perception, this study reports a reduction in interaction with family members, physical activity, and academic performance of their children which was statistically significant. These findings are in line with previous similar studies, which also reports the use of online/offline games as a mode of escapism from reality [14].

The study reports problematic internet usage (PIU) to be at 16.8% based on the Parental version of Young Diagnostic Questionnaire. There was no statistical significance association between gender and PIU in our study, unlike other studies which reported a female predominance [9,15,16]. Any gender is prone to develop IGD as well as PIU, so healthcare workers and parents should be on the lookout for signs of these conditions in all children and adolescents. Nearly 72.9% of those having problematic internet usage reported that they sleep for 7-8 hours. There was no statistically significant correlation between PIU and sleep observed in the study population. However, care should be taken to impart knowledge about good sleep habits from the early adolescence period to prevent the development of sleep disorders in the future.

This study reports that those identified with problematic internet usage had an increased duration of playing video games which was statistically significant. During weekdays there was a progressive decline in the number of non-problematic internet usage participants playing video games for long hours (40.9% said they never played, while 6.3% played for >2hrs) unlike PIU participants (43.7%) who admitted to playing for 1 or more hours per day during weekdays.

When adolescents spend a significant time involved in online activities at the expense of physical exercises and playtime, they are prone to develop early onset obesity which leads to the development of metabolic syndromes as an adult [17]. Similar findings were reported in this study with 87.5% of the parents perceiving their children's physical activity being reduced over the past year ($p < 0.001$). Therefore, early detection of these signs by parents and caregivers along with and timely interventions may help the child in the long run [18]. The pandemic could be one of the leading factors for this perception because the children were confined to homes due to COVID-19 prevention strategies [19]. It is essential to reintroduce them to pre-pandemic physical sports that they enjoyed and encourage them to be physically fit. Reduction in academic performance (85.4%, $p < 0.001$) and decreased interaction with family (87.5%, $p < 0.001$) was statistically significant among problematic internet usage individuals. Reduced family interaction may be a cause or an effect of problematic internet usage and it should be addressed at the earliest with utmost patience and positive reinforcement.

Limitations: This study relies upon self-reported questionnaires, thus making it prone to varied responses and human errors. The study setting was in urban private schools; hence the results may vary for rural, suburban, and government or aided schools. It is a cross-sectional study and the responses from the same participant are subject to change according to time. A prospective study on adolescents will be beneficial to study the dynamic nature of internet gaming disorder.

References:

- Zhou J, Li X, Tian L, Huebner ES. Longitudinal association between low self-esteem and depression in early adolescents: The role of rejection sensitivity and loneliness. *Psychology and Psychotherapy: Theory, Research and Practice*. 2020 Mar 28;93(1):54–71.
- Granic I, Lobel A, Engels RCME. The benefits of playing video games. *American Psychologist*. 2014 Jan;69(1):66–78.
- Ng BD, Wiemer-Hastings P. Addiction to massively multiplayer online role-playing games. *Annual Review of Cyber Therapy and Telemedicine* [Internet]. 2004;2:97–101. Available from: <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2008-04557-012&site=ehost-live&scope=site>
- Yamada M, Sekine M, Tatsuse T, Asaka Y. Prevalence and associated factors of pathological internet use and online risky behaviors among Japanese elementary school children. *J Epidemiol*. 2021;31(10):537–44.
- Chen HC, Wang JY, Lin YL, Yang SY. Association of internet addiction with family functionality, depression, self-efficacy and self-esteem among early adolescents. *Int J Environ Res Public Health*. 2020;17(23).
- Undavalli VK, Rani GS, Kumar JR. Prevalence of internet gaming disorder in India: a technological hazard among adolescents. *Int J Community Med Public Health*. 2020 Jan 28;7(2):688.
- Qin L, Cheng L, Hu M, Liu Q, Tong J, Hao W, et al. Clarification of the Cut-off Score for Nine-Item Internet Gaming Disorder Scale-Short Form (IGDS9-SF) in a Chinese Context. *Front Psychiatry*. 2020;11:470.
- Paik SH, Cho H, Chun JW, Jeong JE, Kim DJ. Gaming device usage patterns predict internet gaming disorder: Comparison across different gaming device usage patterns. *Int J Environ Res Public Health*. 2017;14(12).
- Machimbarrena JM, Beranuy M, Vergara-Moragues E, Fernández-González L, Calvete E, González-Cabrera J. Problematic Internet use and Internet gaming disorder: Overlap and relationship with health-related quality of life in adolescents. *Adicciones*. 2022 Sep 29;0(0):1494.
- Yang X, Jiang X, Mo PKH, Cai Y, Ma L, Lau JTF. Prevalence and interpersonal correlates of internet gaming disorders among Chinese adolescents. *Int J Environ Res Public Health*. 2020;17(2).
- Undavalli VK, Rani GS, Kumar JR. Prevalence of internet gaming disorder in India: a technological hazard among adolescents. *Int J Community Med Public Health*. 2020;7(2).
- Mihara S, Higuchi S. Cross-sectional and longitudinal epidemiological studies of Internet gaming disorder: A systematic review of the literature. Vol. 71, *Psychiatry and Clinical Neurosciences*. 2017.
- Kim D, Lee J. Addictive internet gaming usage among Korean adolescents before and after the outbreak of the COVID-19 pandemic: A comparison of the latent profiles in 2018 and 2020. *Int J Environ Res Public Health*. 2021;18(14).

14. Gámez-Guadix M, Orue I, Calvete E. Evaluation of the cognitive-behavioral model of generalized and problematic Internet use in Spanish adolescents. *Psicothema*. 2013;25(3):299–306.
15. Gu M. Understanding the relationship between distress intolerance and problematic Internet use: The mediating role of coping motives and the moderating role of need frustration. *J Adolesc*. 2022;94(4):497–512.
16. Kamaşak T, Topbaş M, Ozen N, Esenülkü G, Yıldız N, Şahin S, et al. An Investigation of Changing Attitudes and Behaviors and Problematic Internet Use in Children Aged 8 to 17 Years During the COVID-19 Pandemic. *Clin Pediatr (Phila)*. 2022;61(2):194–205.
17. Pacheco LS, Blanco E, Burrows R, Reyes M, Lozoff B, Gahagan S. Early onset obesity and risk of metabolic syndrome among Chilean adolescents. *Prev Chronic Dis*. 2017;14(10).
18. Kacar D, Ayaz-Alkaya S. The effect of traditional children's games on internet addiction, social skills and stress level. *Arch Psychiatr Nurs*. 2022;40:50–5.
19. Yen JY, Higuchi S, Ko CH, Su SF. Screening, Brief Intervention, and Referral to Treatment Model Based on ICD-11 Criteria of Gaming Disorder and Hazardous Gaming During the COVID-19 Pandemic. *Curr Addict Rep*. 2022 Sep 26;9(4):571–4.