

THE ASSOCIATION OF INTERNET GAMING DISORDER WITH SLEEP DISTURBANCES AND DEPRESSIVE SYMPTOMS AMONG YOUNG ADULTS

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Abstract

Objective: The study examined the relationship between Internet Gaming Disorder (IGD), depression, and sleep quality among young adults in Pakistan. It specifically examined how demographic and behavioral factors such as age, gender, game type, and gaming duration influence these associations.

Method: A cross-sectional survey was conducted with 350 young adults aged 18–26, including MBBS, BS Computer Science, and F.Sc students from Islamabad and Rawalpindi. Participants completed a structured questionnaire comprising demographic details, the IGDS9-SF for IGD severity, the PHQ-9 for depressive symptoms, and the PSQI for sleep quality. Data were analyzed using SPSS, with chi-square tests to assess associations between variables.

Results: Results showed a significant link between IGD severity and both depression ($p = 0.007$) and poor sleep quality (p -values ranging from 0.000 to 0.006 across sleep components). Younger adults (age 18–21) reported higher levels of depression and IGD. Game genre particularly action and strategy were significantly associated with higher IGD, more severe depressive symptoms, and poorer sleep outcomes. Gender also influenced depression levels ($p = 0.005$), but not IGD severity or sleep quality. Gaming duration alone did not show significant effects, which make the gaming content as a more influential factor.

Conclusion: The study underscores that IGD is not just about time spent gaming, but also about the type of games played and their psychological impact. Young adults, especially those aged 18–21, are particularly vulnerable to the negative mental health and sleep-related consequences of disordered gaming. It helps in designing increased awareness, early screening, and targeted mental health interventions focused on gaming behavior.

INTRODUCTION

Internet Gaming Disorder is defined as a persistent and recurrent engagement in online games leading to significant functional impairments in personal, academic, and social domains (1) emerged as an

important issue. It is as a behavioral addiction associated with cognitive, emotional, and neurobiological impairment (2). As online gaming continues to expand, IGD has become increasingly

prevalent among young adults worldwide. Global and regional data underscore its public health significance. IGD prevalence ranges from 4.7% in Slovenian adolescents (3) to 24.3% in a large U.S. sample of young adults (1). Studies in Asia similarly report alarming rates—15.2% among Indian medical students (4), 9.86% in Malaysian undergraduates (5), and 12.5% in Pakistani adults during the COVID-19 pandemic (6). Longitudinal research carried out in China showed a 7.7% one-year incidence among adolescents (7), and 7.5% of South Korean children were found at high risk (8).

Risk factors associated with this include male gender as well as depressive symptoms along with excessive gaming duration with low impulse control coupled with poor sleep hygiene (9) (10) (11). Vulnerability stems from psychosocial factors such as violent game content, single-parent backgrounds, and parental communication gap (4, 8) (3). IGD is often comorbid along with psychiatric conditions like depression as well as social anxiety. Suicidal ideation is presented as well (12) (5).

The relationship between IGD and sleep disruption has emerged as a central concern. Studies do indicate that IGD associates with poor sleep quality and that people do deprive themselves of sleep and do procrastinate at bedtime (6) (13) (4). These sleep disturbances might worsen mental health resulting in particular symptoms that are depressive (14) (7). IGD, alongside increased screen time plus emotional arousal, impair sleep and contribute to psychological distress, researchers show (10) (15).

Wide-ranging literature associates IGD with either depression or sleep. A significant research gap exists regarding depression and sleep disturbances mediated by internet gaming disorder in Pakistan. While Internet Gaming Disorder (IGD) has been linked to both depression and sleep disturbances in adolescents (16) (17) limited cross-sectional research explores how IGD may mediate the relationship between depression and poor sleep quality, particularly among the young adult population.

The aim of this study is to examine the impact of Internet Gaming Disorder (IGD) on depressive symptoms and sleep quality among young adults. It explores how demographic and behavioral factors (e.g., gender, game type, gaming duration) influence

these relationships, drawing on evidence linking IGD to poor mental health and sleep disruption

The objectives of the study are as follows:

1. Evaluate the association between IGD severity and levels of depression in young adults.
2. To identify demographic and behavioral factors (e.g., gender, gaming duration, game type) that may influence the impact of IGD, depression and sleep quality
3. To assess the relationship between IGD severity and sleep quality (sleep duration latency, and daytime dysfunction)

Methodology

Study design consisted of a cross-sectional survey design to gather quantitative data regarding the relationship of Internet Gaming Disorder on Depression and Sleep Disturbances among Young Adults in Pakistan. The target population for this study was young adults in Pakistan, specifically students from diverse academic backgrounds. The study focused on individuals enrolled in undergraduate programs, including MBBS (Bachelor of Medicine, Bachelor of Surgery) and BS Computer Science, as well as students at the F. Sc (Faculty of Science) pre-university level. These groups were selected because they represent a significant segment of the young adult population that is frequently exposed to internet gaming and potentially at risk for related psychological and behavioral effects. The estimated sample size consisted of 350 participants. The sample comprised MBBS students, BS Computer Science students, and F. Sc students, ensuring representation across different academic and stress-exposure levels to assess the impact of internet gaming on depression and sleep patterns comprehensively.

The study employed a structured questionnaire comprising four components: a self-designed demographic and behavioral section, the IGDS9-SF to assess IGD severity, the PHQ-9 to measure depressive symptoms, and the PSQI to evaluate sleep quality across various domains. Data was collected via online (via Google Form) from the survey link was shared through academic platforms, institutional email groups, and social media channels (e.g., WhatsApp and Facebook

groups) targeting students enrolled in MBBS, BS Computer Science, and F. Sc programs across various educational institutions in Islamabad and Rawalpindi, Pakistan. Informed consent was obtained from all participants. Confidentiality and voluntary participation were ensured.

Quantitative data was analyzed using SPSS software. Descriptive statistics (frequencies) had summarized participant characteristics and behavior. Chi square test was used to assess relationship between IGD and sleep along with depression.

Result

Table 1 : Demographic of the Study Population (n=350)

Variables	Category	Frequency (%)
Gender	Male	197 (56.3%)
	Female	153 (43.7%)
Education Level	Medical students	198 (56.6%)
	Computer Science students	117 (33.4%)
	Others	35 (10.0%)
Age	18-21	195 (55.7%)
	22-26	155 (44.3%)
Gaming Time	2 hrs	214 (61.1%)
	4-6 hrs	122 (34.9%)
	more than 6 hrs	14 (4.0%)
Game Genre	Action	98 (28.0%)
	Strategy	94 (26.9%)
	Sports	64 (18.3%)
	Simulation	56 (16.0%)
	Other	38 (10.9%)
Device Used	Mobile	288 (82.3%)
	PC	40 (11.4%)
	Console	22 (6.3%)
Violent Games	Players	82 (23.4%)
	Non-Player	268 (76.6%)

The demographic data from Table 1 reveals a diverse group of 350 participants, with a slight majority being male (56.3%) compared to female (43.7%). The education level shows a strong representation of medical students (56.6%), followed by CS students (33.4%) and others (10.0%). Age distribution indicates that most participants are between 18-21 years (55.7%) and 22-26 years (44.3%). In terms of

gaming habits, the majority spend 2 hours gaming (61.1%), with 34.9% spending 4-6 hours and only 4.0% exceeding 6 hours daily. Game genre preferences lean towards action (28.0%) and strategy (26.9%), while sports, simulation, and other genres are less popular. Device usage is dominated by mobile (82.3%), with PC (11.4%) and console (6.3%) being less common. Additionally, 23.4% of participants play violent games, while the majority (76.6%) do not.

Table 2

Association between IGD Severity and Levels of Depression Among Adults (n=350)

Variables	Category	Young Adults	Late Adults	p-value
IGD Severity(n)	Low	100	99	0.007
	Moderate	69	31	
	High	26	25	

Depression Level	Minimal or None	11	8	0.021
	Mild	24	27	
	Moderate	48	54	
	Moderately Severe	78	37	
	Severe	34	29	

Table 2 highlights significant associations between Internet Gaming Disorder (IGD) severity and depression levels among adults, analyzed across two age groups: Young Adults (18-21) and Late Adults (22-26). The Chi-square test indicates a statistically significant association between IGD severity and age group ($p = 0.007$), with Young Adults showing a higher prevalence of low IGD (100 vs. 99) and moderate IGD (69 vs. 31), while high IGD is relatively

balanced (26 vs. 25). Similarly, depression levels show a significant association with age group ($p = 0.021$), with Young Adults exhibiting higher rates of moderately severe depression (78 vs. 37) and severe depression (34 vs. 29), whereas Late Adults have more moderate depression cases (54 vs. 48). These findings suggest that younger adults may be more vulnerable to both severe IGD and depression, warranting targeted interventions for this group.

Table 3

Association of Demographic and Behavioral Factors with IGD Severity, Depression, and Sleep Quality (n=350)

Factor	Category	Frequency (%)	IGD Severity p-value	Depression Level p-value	Sleep Quality p-value
Gender	Male	197 (56.3%)	$p = 0.710$	$p = 0.005$	$p = 0.520$
	Female	153 (43.7%)			
Gaming Duration	2 hrs	214 (61.1%)	$p = 0.550$	$p = 0.904$	$p = 0.119$
	4-6 hrs	122 (34.9%)			
	> 6 hrs	14 (4.0%)			
Game Genre	Action	98 (28.0%)	$p = 0.000$	$p = 0.000$	$p = 0.000$
	Strategy	94 (26.9%)			
	Sports	64 (18.3%)			
	Simulation	56 (16.0%)			
	Other	38 (10.9%)			

Table 3 presents the demographic and behavioral factors influencing Internet Gaming Disorder (IGD) severity, depression levels, and sleep quality among participants. Gender distribution showed a slight male predominance (56.3% male vs. 43.7% female), with a significant association between gender and depression levels ($p = 0.005$), suggesting males or females may experience differing depression outcomes, though no significant links were found with IGD severity ($p = 0.710$) or sleep quality ($p = 0.520$). Gaming duration, predominantly 2 hours

(61.1%), followed by 4-6 hours (34.9%) and over 6 hours (4.0%), showed no significant impact on IGD severity ($p = 0.550$), depression ($p = 0.904$), or sleep quality ($p = 0.119$), indicating that time spent gaming may not strongly influence these outcomes. Game genre, however, demonstrated a significant association with all three outcomes (IGD severity: $p = 0.000$; depression: $p = 0.000$; sleep quality: $p = 0.000$), with action (28.0%) and strategy (26.9%) genres being most prevalent, suggesting that specific game types may differentially affect mental health and sleep quality.

Table 4:

Relationship Between IGD Severity and Sleep Quality Components (Duration, Latency, Daytime Dysfunction) (n=350)

Sleep Component	Category	Low Severity	IGD	Moderate Severity	IGD	High Severity	IGD	p-value
Sleep Duration	>7 hrs	45		24		7		
	6-7 hrs	50		33		7		
	5-6 hrs	66		26		30		
	<5 hrs	38		17		7		0.006
Sleep Latency	<15 minutes	68		21		6		
	16-30 minutes	70		32		18		
	31-60 minutes	34		40		27		
	>60 minutes	27		7		0		0.000
Daytime Dysfunction	Not during the past month	121		32		10		
	Less than once a week	26		29		11		
	Once or twice a week	37		23		8		
	Three or more times a week	15		16		22		0.000

Table 4 presents the relationship between IGD severity levels (low, moderate, high) and specific components of sleep quality: sleep duration, sleep latency, and daytime dysfunction. The results show significant associations across all three components, as indicated by the p-values (sleep duration: $p = 0.006$, sleep latency: $p = 0.000$, daytime dysfunction: $p = 0.000$). Individuals with high IGD severity were more likely to experience shorter sleep durations, with 30 participants in the high IGD group sleeping only 5-6 hours and 7 sleeping less than 5 hours. In terms of sleep latency, those with higher IGD scores reported longer times to fall asleep—27 participants in the high IGD group took 31-60 minutes, and none reported falling asleep in more than 60 minutes. Daytime dysfunction was most pronounced among high IGD individuals, with 22 participants reporting dysfunction three or more times a week. In contrast, the low IGD group had better sleep quality across all dimensions, including 121 participants reporting no daytime dysfunction and 68 falling asleep in under 15 minutes. These findings indicate a clear trend: as IGD severity increases, sleep quality significantly deteriorates, particularly in the form of reduced sleep duration, prolonged sleep latency, and increased daytime dysfunction.

Discussion

This study utilized a cross-sectional study design consisting of 350 participants, used to investigate the relationship between Internet gaming disorder, sleep quality and depression. The study findings revealed a clear and significant association between IGD severity and depression, particularly among younger individuals aged 18-21, supporting prior studies (18, 19) that emphasize IGD as a contributing factor to psychological distress in this age group.

To evaluate association between IGD severity and depression, Table 2 shows that higher IGD severity correlates with increased depression levels, with a statistically significant association ($p = 0.007$). Participants aged 18-21 reported higher rates of moderately severe and severe depression, suggesting increased vulnerability in early adulthood. These results reinforce earlier findings that IGD may exacerbate depressive symptoms and signal the need for early screening and intervention (20-22).

Table 3 offers compelling insight into the psychological impact of gaming, revealing gender as a significant factor influencing depression. It highlights the role of demographic and behavioral factors. Gender showed a significant link with depression ($p = 0.005$) but not IGD severity or sleep quality. (23, 24). Game genre emerged as a critical behavioral factor, with action and strategy games significantly associated

with increased IGD severity, depression, and poor sleep ($p = 0.000$ across all outcomes) (25, 26). While gaming duration did not significantly affect outcomes, (9, 21) who noted that game content may have a greater psychological impact than total playtime.

A strong association is present between IGD severity and poor sleep outcomes, including shorter sleep duration ($p = 0.006$), prolonged sleep latency ($p = 0.000$), and increased daytime dysfunction ($p = 0.000$). Sleep disturbances are classified as a common consequence of disordered gaming (27, 28). High-IGD individuals were more likely to sleep fewer hours, take longer to fall asleep, and experience frequent daytime dysfunction.

Conclusion

The present study has demonstrated a significant association between IGD, depression, and poor sleep quality among young adults, especially in the age group of 18–21. More severe IGD severity was in general related to higher levels of depressive symptoms and worse sleep, such as short sleep, sleep difficulty and daytime dysfunction. Notably, the type of games played had a stronger association with mental health compared with play time. Both action games and strategy games were particularly associated with higher IGD levels, depression, and sleep issues. Gender also had a say, with deep discrepancies on how depression was felt. Games are native imaginative outlets for children, and these perceptions provide a beneficial empirical basis for considering the very real activities and experiences of children of all ages. These findings point towards the need for early support and awareness, particularly for younger gamers. Focusing on game content, mental health screening, and better sleep habits could help reduce the negative effects of excessive or problematic gaming.

Limitations and Recommendations

This study provides valuable perceptions into how IGD, depression, and sleep quality relate, several limitations must be acknowledged. For university students from within a quite specific age group of 18–26 in a region, their limited sample possibly was not reflecting broader populations', adolescents', or older adults' experiences. Other potential confounders such as socioeconomic status, academic stress, or underlying psychiatric conditions were not explored

in depth. Further research should prioritize longitudinal or experimental studies to clarify the causal relationship between Internet Gaming Disorder (IGD) and its psychological and behavioral effects. Including participants from varied age groups, educational backgrounds, and geographic locations would enhance the generalizability of findings. Further research should explore how specific game characteristics such as competitive versus cooperative gameplay or in-game reward mechanisms contribute to the risk of developing Internet Gaming Disorder.

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