RESEARCH ARTICLE

▪ Vol. 5, No. 2 (Spring 2024)
▪ p-ISSN: 2791-0237
▪ e-ISSN: 2791-0202
▪ Pages: 13 – 25
▪ DOI: 10.55737/qjss.119114325

Open Access

QLANTIC JOURNAL OF SOCIAL SCIENCES

Internet Gaming Disorder and Mental Health of Pakistani Adolescents: A Cross-Sectional Study

Ambreen Fatima [1] Farhana Ambreen [2] Rizwana Amin [3]

Abstract: *The escalating prevalence of Internet Gaming Disorder (IGD) worldwide has prompted heightened concern about its potential impact on the mental health of adolescents. In the context of Pakistan, a country experiencing rapid technological advancements, the intersection of IGD and mental health remains underexplored. This cross-sectional study examines IGD and mental health in adolescent boys (N = 240) and girls (N = 136) who play online games, recruited via a convenient sampling technique. The study also examines the mental health of Gamers (G1) and Non-gamers (G2). The results of two-way ANOVA show that adolescent boys and girls differ in IGD, depression, anxiety, and stress scores. In addition, results indicated evidence of the significance of the main effect for the assessment of Depression with F (1,374) = [4.105], p = .043, Anxiety with F (1,374) = [4.618], p = .032, and Stress with F (1,374) = [4.934], p = .027 respectively. Further results of Mixed Factorial ANOVA indicated significant differences in the mental health of G1 and G2, male and female participants. The findings emphasize the importance of monitoring and regulating adolescents' gaming behaviors, especially excessive gaming. Parents, educators, and healthcare professionals can help identify adolescents at risk of IGD and provide appropriate support and therapies. Promoting appropriate gaming habits and preventing the detrimental effects of excessive gaming in adolescents is essential.*

Key Words: IGD, Mental Health, Depression, Anxiety, Stress, Adolescents

Introduction

The Internet is crucial to daily life in this age of technological growth. Adolescents and emerging adults, on the other hand, may be at risk when using the Internet. Internet forums and other interactive components have attracted a wide global user base to a variety of websites and mobile apps, including online gaming sites (Steven et al., 2021). Due to self-regulation concerns, younger users may require assistance with mastering the internet (Wong et al., 2020). The addictive nature of these applications has been related to poor self-regulation in persons with dysregulated and disordered internet usage patterns, which exacerbates the concerns discussed above (Agbaria et al., 2020; Gu, 2020). Both adults and adolescents now spend their free time playing online games as a result of advances in technology and the internet. Internet gaming has reached its pinnacle in modern civilization. It is critical to remember that playing video games is not pathological. Disruption in daily living and functioning may indicate a health issue. Rising internet gaming is linked with poor mental health and behavioral changes (Rettner, 2019; Imataka et al., 2022).

The World Health Organization (WHO) has classified gaming disorder as a medical illness due to its significant impact on personal, familial, social, educational, occupational, and other aspects of life. This disorder is recognized when it lasts 12 months. After much controversy and acrimony, WHO recognized IGD as a separate form of online addiction and classified it as a medical illness in the International

[1] Senior Lecturer/Incharge, Department of Professional Psychology, Bahria University Islamabad Campus, Islamabad, Pakistan.
[2] MS/M.Phil. (Clinical Psychology), Department of Professional Psychology, Bahria University Islamabad Campus, Islamabad, Pakistan. Email: farhana.ambreen@yahoo.com
[3] Assistant Professor, Department of Psychology, Effat University, Jeddah, Kingdom of Saudi Arabia. Email: rizwana_aries@hotmail.com

▪ **Corresponding Author:** Ambareen Fatima (afatima.buic@bahria.edu.pk)
▪ **To Cite:** Fatima, A., Ambreen, F., & Amin, R. (2024). Internet Gaming Disorder and Mental Health of Pakistani Adolescents: A Cross-Sectional Study. *Qlantic Journal of Social Sciences*, 5(2), 13-25. https://doi.org/10.55737/qjss.119114325

Classification of Diseases (ICD-11). Healthcare practitioners apply the nine APA diagnostic criteria for IGD in the current Diagnostic and Statistical Manual (DSM) of Mental Disorders. According to the American Psychological Association (APA, 2022), IGD is a unique condition identified by excess online gaming.

As per the DSM-5-TR, persistent and recurring utilization of the internet for gaming purposes, usually involving interaction with other players, leading to considerable impairment or distress as demonstrated by the presence of at least five of the following criteria within a 12-month period: The criteria for diagnosing internet gaming disorder include: (1) excessive focus on internet games; (2) experiencing withdrawal symptoms when unable to engage in internet gaming; (3) developing a tolerance and needing to spend more time playing internet games; (4) unsuccessful attempts to control or limit internet game participation; (5) loss of interest in previous hobbies and entertainment, except for internet games; (6) persistent excessive use of internet games despite awareness of negative effects on one's social and psychological well-being; (7) deceiving family members, therapists, or others about the amount of time spent on the internet; (8) using internet games as a means to escape or alleviate negative moods; and (9) jeopardizing or losing important relationships, employment, educational, or career opportunities due to excessive involvement in internet games (APA, 2022).

IGD in Adolescents

In a recent study, Khalid and Mukhtar (2022) examined the epidemiology and underlying variables of IGD in two age groups: those aged 13-17 and older. Empirical studies have shown that IGD is more common among younger persons, particularly those aged 16 to 21 years, compared to adults (Sun, 2023). Recent studies have shown that adolescents tend to be drawn to a particular feature of the Internet, which may result in increased engagement in certain activities. This propensity can be ascribed to their recurrent discontent with bodily appearance and other internal preoccupations (Biswas et al., 2022; Zhu et al., 2022). Adolescents can use the Internet to experiment with several identities, helping them discover which ones match their particular preferences and potentially satisfy unmet psychological or social needs. Scholars have investigated how teenagers might create virtual identities using various platforms such as chat rooms and online role-playing games (Zhu et al., 2022; Sun, 2023).

Adolescents can create screen identities or use other pseudonyms on these platforms, which allows them to be anonymous and different from their real selves offline. While social networking site users may not enjoy absolute anonymity, they do have the ability to carefully curate their accounts and decide which aspects of their personality to showcase, as well as which images they deem to be an authentic representation of themselves. As per the findings of Musetti et al. (2022), people may demonstrate heightened perceptiveness and an improved ability to portray themselves.

Moreover, there was concern about the possible postponement of resolving an identity crisis that could emerge from the adoption of many personas. During adolescence, there is a possibility that the differences between an individual's real-life characteristics and their online persona may become less clear as their online identity evolves. Some scholars have suggested that the concerns adults have about these new identities and behaviors may not be as well-founded as previously thought. It is argued that these new forms of identity and behavior could potentially provide a safe and advantageous way for individuals to explore and express themselves (Tovar et al., 2023).

Adolescents who participate in online identity deception are more likely to continue engaging in such conduct to mock their friends, rather than to explore a desired or potential identity. The emergence of the Internet has offered folks a new method of forming connections, a pastime that appeals to the majority of people. Due to their inherent feelings of seclusion, adolescents may be especially vulnerable to the appeal of the Internet. As a result, online relationships have become more important in the lives of teenagers. Unfortunately, the Internet may only give the impression of a close association because there is a possibility of false and easily disconnected links that may be accessed with a single mouse click (Caldera, 2022).

Gender and IGD

The current state of research on IGD is primarily in its early phases, with a primary focus on investigating the extent of the illness and investigating possible differences between genders. Extensive research has

been carried out on IGD in Pakistan. Research findings indicate that computer gaming is widely popular among university students in Pakistan, regardless of their gender. Zahra et al. (2019) discovered that male university students displayed a greater prevalence of online gaming in comparison to females.

Subsequent inquiries aimed to evaluate the frequency of troublesome internet gaming among young adults and adolescents. The study's results revealed a greater occurrence of problematic gamers in comparison to non-problematic gamers, with males demonstrating a stronger inclination towards problematic gaming behavior (Ghous, 2014). Moreover, participating in online gaming has shown a more pronounced correlation with IGD in comparison to offline gaming. Gan et al. (2022) suggest that gender and game genre preferences can have an impact on excessive gaming.

Multiple studies have shown gender disparities in IGD (Soares et al., 2019; Buono et al., 2020; Gomez et al., 2022; Fatima et al., 2023). Gender differences are also evident in the motivations that drive involvement in online gaming. According to Yang et al. (2023), there is a significant disparity in achievement motivations between males and females when participating in online gaming. Boys generally have more pronounced achievement motives in comparison to girls. Conversely, girls appear to have greater motivation for engaging in online gaming due to socialization factors. Hence, the research conducted by Yang et al. (2023) revealed that males exhibit a higher susceptibility to reporting heightened levels of IGD in comparison to females.

Nevertheless, the research conducted by Gan et al. (2022) demonstrated that both males and females demonstrate similar socialization motivations when participating in gaming activities. In contrast, Xiang et al. (2022) found a significant gender gap, with boys showing a greater inclination than girls to engage in gaming for enjoyment, competition, achievement, cognitive stimulation, and emotional factors such as excitement, relaxation, and anger management. Furthermore, there is a virtually equal distribution of motivated individuals, both male and female, who demonstrate notable levels of drive derived from their creativity and curiosity.

Kakul and Javed (2023) discovered a notable and affirmative correlation between symptoms of sadness and anxiety and IGD. In addition, the study found that males displayed elevated levels of both despair and anxiety in comparison to females. Nevertheless, stress levels were discovered to be largely comparable among genders. A recent study conducted by Wang et al. (2022) found a significant discrepancy in the prevalence of IGD between males and females, with males showing higher levels of IGD. Furthermore, a distinct inquiry into Internet addiction discovered a substantial correlation between IGD and individuals self-identifying as masculine (Yu et al., 2021).

IGD and Mental Health

Participating in online gaming can be entertaining and allow for social connection. However, there are worries about the possible negative effects on mental health, specifically about IGD. This complex problem encompasses not just excessive gaming behaviors, but also nuanced connections with mental health difficulties such as depression, anxiety, and stress among adolescents (Macur & Pontes, 2021). The correlation between IGD and the mental health of adolescents has raised significant alarm, leading to intensive investigation aimed at comprehending the diverse aspects of this association. Multiple studies have demonstrated a direct correlation between IGD and depression among adolescents. Engaging in an excessive amount of gaming, particularly when it disrupts daily life activities and social contacts, can lead to feelings of loneliness and depression (Fazeli et al., 2020; Marchica et al., 2020; Ostinelli et al., 2021; Teng et al., 2021; Alhamoud et al., 2022).

Adolescents with IGD may undergo elevated levels of anxiety. The interactive and competitive aspects of online gaming, together with the fear of being socially excluded, can lead to heightened levels of stress and anxiety (Fazeli et al., 2020; Teng et al., 2021; Alhamoud et al., 2022; Huang et al., 2022). Prolonged engagement in gaming activities can result in elevated levels of stress among adolescents. The requirements of engaging in online gaming, along with the possibility of disregarding scholastic obligations and social connections, might lead to persistent stress (Fazeli et al., 2020; Alhamoud et al., 2022).

Although these studies offer vital insights into the overall correlation between IGD and mental health, there is still a significant knowledge vacuum when it comes to identifying the precise links with depression, anxiety, and stress in adolescents. This introduction provides a foundation for a thorough examination of recent studies that investigate the intricate relationship between IGD and the mental health of adolescents, specifically focusing on the impact on depression, anxiety, and stress. Gaining a more sophisticated comprehension of these connections is essential for guiding interventions and precautionary actions specifically designed to address the distinct difficulties encountered by adolescents in the digital era.

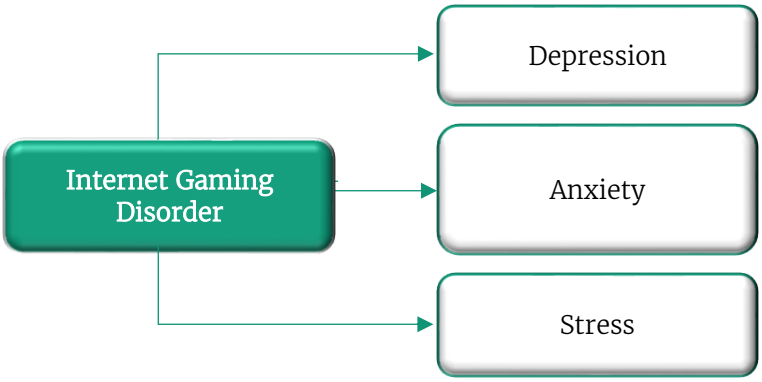
Hypotheses

- The level of IGD is higher in adolescent boys as compared to adolescent girls.
- The levels of depression, anxiety, and stress are higher in adolescent girls as compared to adolescent boys.
- Mean scores of depression, anxiety, and stress would differ across gamer and non-gamer adolescents.

Conceptual Model

Figure 1

Effect of IGD on mental health



Method

Research Design & Participants

The study has chosen a cross-sectional design to investigate the variations in the hypotheses indicated above, using a convenient sampling technique. The study comprised a total of 376 participants, with 240 males and 136 females. The age range of the participants was between 14 and 19 years. They were selected from a variety of private colleges and schools in the twin cities. The sample size was determined using G-Power software. The study included only those participants who voluntarily agreed to participate and possessed a sufficient level of English proficiency to comprehend and complete the forms.

Measures

Participants were instructed to provide their demographic information on a data sheet, which contained details such as gender, age, education level, and other relevant information. In addition, they filled out two questionnaires, namely the IGDS9-SF (Internet Gaming Disorder Scale 9-Short Form; Pontes & Griffiths, 2015) and the DASS-21 (Depression, Anxiety, and Stress Scale-21; Lovibond & Lovibond, 1995).

Demographic Variable Sheet

The demographic sheet included data on age, gender, education, and socio-economic status.

IGDS9-SF

The IGDS9-SF, also known as the Internet Gaming Disorder Scale – Short Form, was developed by Pontes and Griffiths in 2015. The criteria for IGD, as outlined in the DSM5 (2013), served as the basis for it. The

overall score can be determined by summing the responses of participants to the nine items, which range from 9 to 45. A higher score indicates a higher level of IGD. The authors confirmed the scale's adequate reliability by thoroughly analyzing the additional data.

DASS-21

The DASS-21 is a collection of three self-report subscales that are used to assess depression, anxiety, and stress (Lovibond & Lovibond, 1995). Items are rated on a four-point scale ranging from 0 (doesn't apply to me at all) to 3 (applicable most of the time). The correlations between variables were: depression and anxiety r = 0.42, anxiety and stress r = 0.46, and depression and stress r = 0.39.

Procedure

A cohort of 376 individuals (240 males, 136 females) aged between 14 and 19 were chosen from various educational institutions in the twin towns of Rawalpindi and Islamabad. The data from the participants was obtained using a convenient sampling technique. Data was gathered in two distinct phases: the initial phase encompassed the collecting of data, while the subsequent phase focused on the analysis of the collected data. A signed informed consent was obtained from the participants, and upon granting their consent, they proceeded to complete the questionnaire. The data was examined using SPSS 25 once it was collected. The data was subjected to two-way and mixed factorial analysis of variance (ANOVA) using SPSS.

Ethical Consideration

The participants were provided with comprehensive information about the research and obtained their written consent. They were guaranteed that the results would remain confidential. The individuals willingly participated and were granted complete autonomy to withdraw from the research at any point. Finally, the participants were appreciative of their involvement in the research project.

Results

Table 1

Frequencies and percentages of the demographic characteristics of participants of the study (N = 376).

Characteristics of the participants	Categories	f	%
Age	14-16	140	37.2
	17-19	236	62.8
Gender	Males	240	63.8
	Females	136	36.2
Education	Secondary	53	14.1
	Matric	89	23.7
	F.Sc.	153	40.7
	Undergraduate student	81	21.5
Socio-economic Status	Lower	55	14.6
	Middle	147	39.1
	Upper middle	141	37.5
	Upper class	33	8.8
Gaming groups	Non-Gamers	294	78.2
	Gamers	82	21.8

Note: f = Frequency, %= Percentage

The above table shows the descriptive statistics of demographic variables. Frequencies and percentages were calculated for categorical variables. This concludes that 140 (37.2%) participants lied in the 14-16 age group and 236 (62.8.5) participants lied in the 17-19 age group. Additionally, 240 (63.8%) were males and 136 (36.2%) were females. Moreover, 53 (14.1%) participants were secondary, 89 (23.7%) were matric, 153 (40.7%) were F.Sc., and 81 (21.5%) were undergraduate students. Furthermore, 55 (14.6%) participants were from the lower, 147 (39.1%) were from the middle, 141 (37.5%) were from the upper middle and 33 (8.8%) were from the upper class. However, 294 (78.2%) were non-gamers and 82 (21.8%) were gamers.

Table 2

Two-way (2x2) ANOVA for the assessment of IGD, depression, anxiety, and stress across male and female participants (N = 376).

Variables	Male (N = 240)		Female (N = 136)				
	M	SD	M	SD	F(1,374)	*p*	η^2
IGD	27.11	8.68	24.27	9.89	6.362	.014	.018
DASS-21							
D	8.28	3.87	9.12	3.84	4.105	.043	.011
A	8.15	3.50	8.95	3.34	4.618	.032	.012
S	9.97	3.64	10.83	3.60	4.934	.027	.013

Note: M = mean, SD = Standard Deviation, η^2 = eta square

The results of two-way ANOVA illustrated that there is a significant *main effect* of IGD, Depression, Anxiety, and Stress across male and female participants. Results indicated evidence of the *main effect* for the assessment of IGD with $F\ (1,374) = [6.362]$, $p = .014$ along with a large effect size estimated ($\eta^2 = .018$). See Figure 2. Further results indicated evidence of the significance of the *main effect* for the assessment of Depression with $F\ (1,374) = [4.105]$, $p = .043$ along with medium effect size estimated ($\eta^2 = .011$), Anxiety with $F\ (1,374) = [4.618]$, $p = .032$ along with medium effect size estimated ($\eta^2 = .012$), and Stress with $F\ (1,374) = [4.934]$, $p = .027$ along with medium effect size estimated ($\eta^2 = .013$) respectively. See Figure 3.

Figure 2

Mean differences in IGD across male and female participants

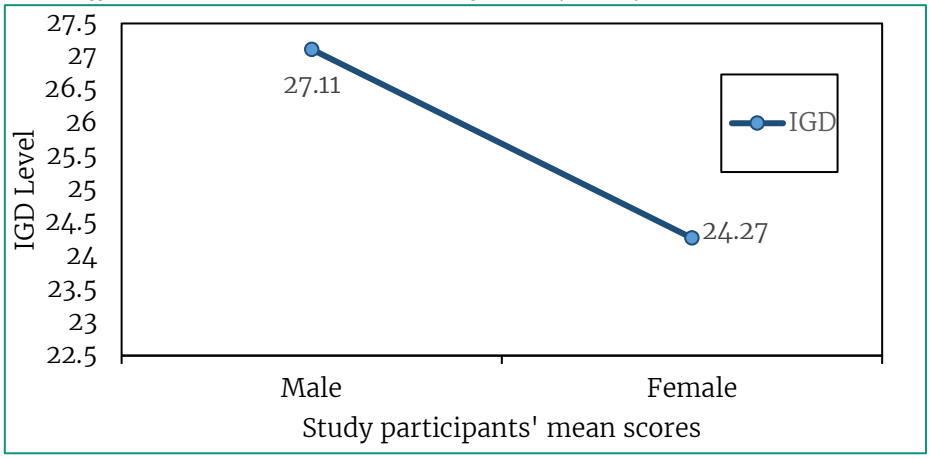


Figure 3

Mean Differences of Depression, Anxiety, and Stress across Male and Female Participants.

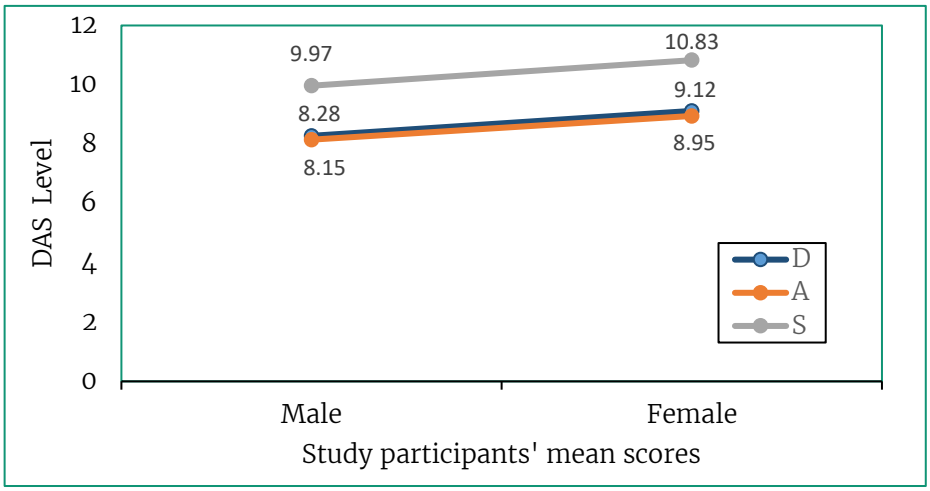


Table 3

Mixed factorial (2x2x2) ANOVA for the assessment of depression, anxiety, and stress across male and female participants of gamers and non-gamers groups (N = 376).

	Gamers (G1) (N = 82)				Non-Gamers (G2) (N = 294)						
Variables	Male (N = 63)		Female (N = 19)		Male (N = 177)		Female (N = 117)				
	M	SD	M	SD	M	SD	M	SD	*F(1,374)*	*p*	η^2
DASS-21											
D	9.63	3.61	11.05	3.92	7.80	3.85	8.80	3.75	13.797	.001	.036
A	9.62	3.35	9.95	2.70	7.63	3.41	8.79	3.42	14.249	.001	.037
S	11.21	3.51	12.58	3.80	9.53	3.60	10.55	3.50	12.623	.001	.033

Note: M = mean, SD = Standard Deviation, η^2 = eta square

The results of Mixed Factorial (2x2x2) ANOVA illustrated that there is a significant *main effect* of Depression, Anxiety, and Stress across male and female participants of both groups (G1 & G2). Results indicated evidence of the significance of the *main effect* for the assessment of Depression with *F (1,374) = [13.797], p < .001* along with large effect size estimated (η^2*= .036)*, Anxiety with *F (1,374) = [14.249], p < .001* along with large effect size estimated (η^2*= .037)*, and Stress with *F (1,374) = [12.623], p < .001* along with large effect size estimated (η^2*= .033)* respectively. See Figure 4, 5, and 6.

Figure 4

Mean differences in depression across male and female participants of G1 and G2

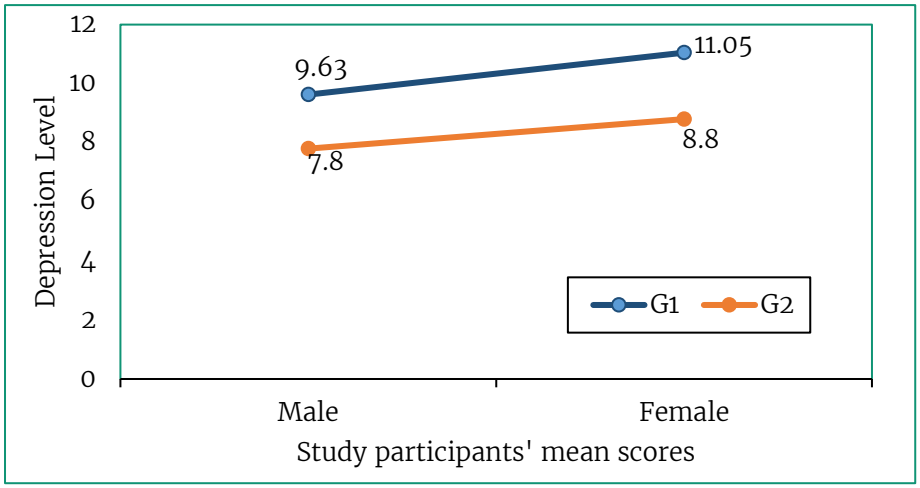


Figure 5

Mean differences in anxiety across male and female participants of G1 and G2

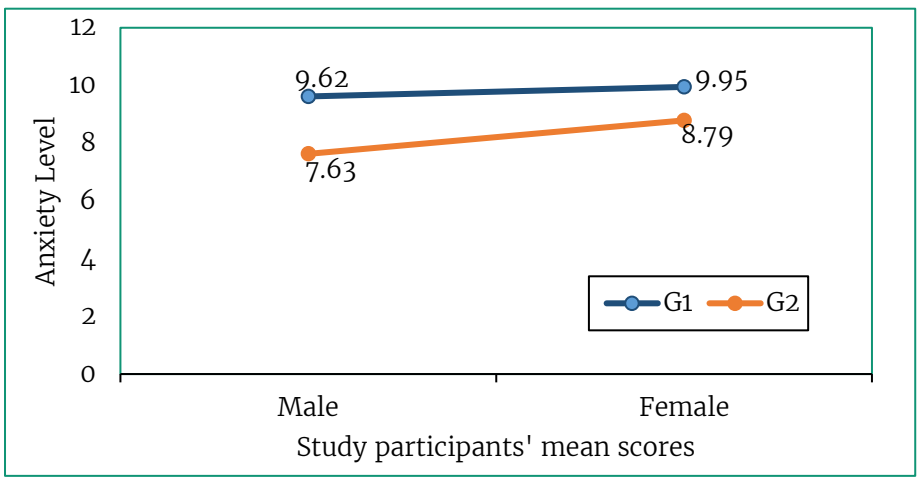
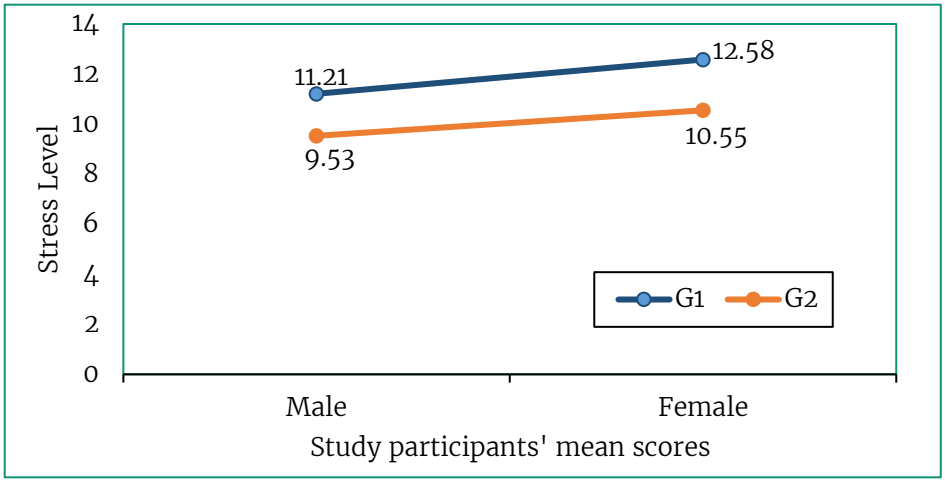


Figure 6

Mean differences of stress across male and female participants of G1 and G2



Discussion

IGD has garnered growing scientific attention globally, however, few studies have been conducted in Pakistan. The primary objective of this study was to evaluate the prevalence of IGD and the mental health of adolescents in Pakistan. This study aims to examine the relationship between IGD, gender, and mental health consequences in adolescents through the formulation of three hypotheses. The first hypothesis states that the level of IGD is higher in adolescent boys as compared to adolescent girls. The two-way ANOVA results indicate a statistically significant *main effect* of IGD among male and female participants. Results indicated evidence of the *main effect* for the assessment of IGD with $F\ (1,374) = [6.362]$, $p = .014$. Results supported the hypothesis and concluded that the level of IGD is higher in adolescent boys as compared to adolescent girls.

The initial hypothesis suggests that the prevalence of IGD is greater among adolescent males in comparison to adolescent females, and the findings are consistent with past study patterns. Research repeatedly demonstrates that boys exhibit higher levels of involvement in excessive gaming, both in terms of frequency and duration, as compared to girls. The gender disparity in gaming behavior can be explained by multiple reasons, such as social norms, individual gaming preferences, and peer effects (Soares et al., 2019; Buono et al., 2020; Gomez et al., 2022; Yang et al., 2023).

Moreover, the gaming industry has traditionally focused its efforts on appealing to a male demographic, hence contributing to the greater frequency of gaming among adolescent boys. In addition, Su et al. (2020) provide evidence that males are more prone to displaying elevated levels of IGD in boys compared to females. The study revealed that boys exhibited a greater susceptibility to pathological video game use, with a higher occurrence of symptoms linked to IGD. Therefore, the first hypothesis is confirmed by the results and past investigations.

The second hypothesis posits that the levels of depression, anxiety, and stress are higher in adolescent girls as compared to adolescent boys. The results of two-way ANOVA illustrated that there is a significant *main effect* of Depression, Anxiety, and Stress across male and female participants. Results indicated evidence of the significance of the *main effect* for the assessment of Depression with $F\ (1,374) = [4.105]$, $p = .043$, Anxiety with $F\ (1,374) = [4.618]$, $p = .032$, and Stress with $F\ (1,374) = [4.934]$, $p = .027$ respectively. Therefore, results supported the hypothesis and concluded that the levels of depression, anxiety, and stress are higher in adolescent girls as compared to adolescent boys.

According to this hypothesis, the prevalence of depression, anxiety, and stress is greater among adolescent girls compared to adolescent boys, and these findings are consistent with previous studies. IGD considered an addictive behavior, is believed to coincide with several cognitive and mental health conditions, including depression, anxiety, and stress (Wang et al., 2021). Moreover, numerous research studies have established a clear correlation between levels of depression and IGD. It's also been observed that depression is widespread among individuals with IGD and that the intensity of depression is strongly

linked to a rise in IGD. Nevertheless, the precise relationship over time between depression and IGD has not been fully established (Wartberg et al., 2019).

Numerous studies suggest a link between IGD and mental health problems (Fumero et al., 2020; Bottino et al., 2021; Teng et al., 2020;). Mannikko et al. (2020) also documented the favorable impact of IGD on depression, anxiety, and stress. Individuals experiencing elevated levels of anxiety and depression are at a greater risk of developing IGD, as they are prone to employ gaming as a means of managing negative emotions. Simultaneously, regression and moderation analyses demonstrated that depression was an independent risk factor for the onset of IGD (Lin et al., 2021). Previous research has indicated that girls exhibit a higher propensity for mental health issues compared to boys. These issues are frequently associated with pressures such as academic achievement, peer influence, and social seclusion. Female individuals exhibit a higher tendency to engage in rumination on their difficulties, which can result in the experience of depression and anxiety (Fumero et al., 2020; Teng et al., 2020; 2021). Therefore, it can be concluded that the levels of depression, anxiety, and stress are higher in adolescent girls as compared to adolescent boys.

The third hypothesis proposes that mean scores of depression, anxiety, and stress would differ across gamer and non-gamer adolescents. The hypothesis has been built on the assumption that excessive gaming is associated with adverse mental health outcomes (Khalafi., 2022). The results of Mixed Factorial ANOVA illustrated that there is a significant *main effect* of Depression, Anxiety, and Stress across male and female participants of both groups (G1 & G2). Results indicated evidence of the significance of the *main effect* for the assessment of Depression with $F\ (1,374) = [13.797]$, $p < .001$, Anxiety with $F\ (1,374) = [14.249]$, $p < .001$, and Stress with $F\ (1,374) = [12.623]$, $p < .001$ respectively.

This hypothesis is further corroborated by prior research, which has established a link between IGD and adverse mental health consequences. Adolescents who excessively engage in gaming are at a higher risk of experiencing depression, anxiety, and stress, in comparison to those who do not participate in gaming. This phenomenon may be attributed to the correlation between excessive gaming and many adverse effects on mental health, such as social isolation, reduced physical activity, and disrupted sleep patterns. Moreover, it has also been observed that there is a direct relationship between excessive gaming and mental health problems (Macur & Pontes, 2021).

Nevertheless, it is crucial to take into account the reciprocal nature of this connection. Excessive gaming can be a factor in the development of mental health issues. However, persons who are already dealing with depression, anxiety, or stress may be more likely to turn to gaming as a way to escape or cope with their emotions (Chung et al., 2020). Moreover, other elements contribute to the validation of this hypothesis. Certain individuals may resort to Internet games as a means of seeking relief from the pressures and challenges they face in their daily lives. Although gaming can serve as a legitimate coping tool for many individuals, excessive dependence on escapism has been linked to elevated levels of depression, anxiety, and stress (Melodia et al., 2020).

Studies have indicated that the underlying motivations for gaming could influence the correlation between IGD and mental health. Gaming's social dimension can impact mental health. Online multiplayer games offer avenues for social engagement, hence fostering potential advantages for mental health. Conversely, engaging in an excessive amount of independent gaming can lead to social isolation, which is associated with higher chances of experiencing anxiety and depression (Pallavicini et al., 2022). On the other hand, excessive emotional involvement in competitive games could potentially lead to increased levels of stress (Koban et al., 2021). Therefore, the last hypothesis is supported by the results and previous studies.

Significance of the Study

The study of IGD and mental health, including depression, anxiety, and stress, in Pakistani adolescents is significant for various reasons. IGD is recognized by the WHO in the International Classification of Diseases (ICD-11). Understanding the occurrence and effects of IGD is crucial for Pakistan and global mental health, as excessive gaming is a concern across cultures and regions. The association between IGD and mental health in Pakistani adolescents shows the need for culturally sensitive study. Technology, leisure, and

mental health views are heavily influenced by culture. The findings can help clarify the complex relationship between gaming and mental health in Pakistan.

Mental health during adolescence might have lasting effects. Examining the impact of IGD on mental health, including depression, anxiety, and stress, can reveal risk factors and intervention possibilities during key development. The study found a significant link between IGD and mental health issues, potentially impacting public health policies and interventions in Pakistan. Understanding IGD frequency and its impact on mental health provides targeted interventions to address and prevent these concerns. Understanding the links between IGD and mental health can help develop Pakistani adolescent-specific prevention and treatment strategies. These may include instructional programs, mental health services, and gaming advice.

This study contributes to the growing research on IGD and mental health. Research in other cultures improves scientific understanding of these difficulties, allowing for more comprehensive theories and models that may be used globally. The study shows a strong link between IGD and depression, anxiety, and stress, affecting therapeutic care. Pakistani mental health professionals can learn about excessive gaming risk factors to develop effective treatments. The study may lead to evidence-based policy suggestions to regulate and promote healthy adolescent gaming. This information is valuable for educational institutions, parents, and legislators in creating video game usage standards and laws. The study could help us understand the relationship between IGD and mental health in Pakistani adolescents, which could impact public health, clinical practice, and policy.

Conclusion & Implementation

It is crucial to exercise caution when considering these connections and acknowledge the complex interaction of different factors that influence both gaming behavior and mental health outcomes in adolescents. Further investigation should continue to examine these associations, taking into account many variables and using longitudinal methodologies to establish causation and enhance the understanding of intervention approaches. In general, the arguments put in this study are strongly backed by past research and make a significant contribution to the field of adolescent mental health. This study aims to examine the link between IGD, gender, and mental health outcomes. The findings could contribute to the creation of focused interventions and prevention methods that attempt to mitigate the adverse effects of gaming behavior in teenagers. Gaining a comprehensive understanding of the disparities in gaming habits and mental health consequences between genders is crucial to devising efficacious treatments for adolescents.

Limitations & Recommendations

Pakistan has a wide range of diversity, however, the focus of the study is only on adolescents. Generalizability may be constrained by cultural, economic, and geographical variables. The sample may not be representative of the entire population of Pakistani adolescents. Participants from specific regions or schools may not accurately reflect the variety of the overall community. Utilizing clinical interviews and diagnostic tools can enhance the accuracy and effectiveness of mental health assessments. The survey assesses levels of stress, anxiety, and depression. Additional psychological assessment would provide further insight into the mental health consequences of IGD.

Further recommendations for future researchers may include the investigation of cultural and environmental factors on the relationship between IGD and mental health in Pakistani adolescents, utilizing both quantitative and qualitative data. The utilization of clinical interviews and diagnostics enhances the process of assessing mental health. Mitigate the adverse effects of IGD on mental well-being by getting assistance from parents, teachers, and interpersonal communication. By acknowledging and considering the abovementioned limitations, as well as using these concepts to comprehend IGD and mental health, effective therapy and policy for Pakistani adolescents can be introduced.

References

Agbaria, Q. (2020). Internet Addiction and Aggression: The Mediating Roles of Self-Control and Positive Affect. *International Journal of Mental Health and Addiction*. *19*(4), 1227-1242. https://doi.org/10.1007/s11469-019-00220-z

Alhamoud, M., Alkhalifah, A., Althunyan, A., Mustafa, T., Alqahtani, H., & Al Awad, F. (2022). Internet gaming disorder: Its prevalence and associated gaming behavior, anxiety, and depression among high school male students, Dammam, Saudi Arabia. *Journal of Family and Community Medicine*, *29*(2), 93. https://doi.org/10.4103/jfcm.jfcm_48_22

American Psychiatric Association. (2022). *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed., Text Revision, American Psychiatric Publishing, 5(5), https://doi.org/10.1176/appi.books.9780890425787.

Biswas, P. R., Ahammed, B., Rahman, Md. S., Nirob, B. M., & Hossain, Md. T. (2022). Prevalence and determinants of internet addiction among adults during the COVID-19 pandemic in Bangladesh: An online cross-sectional study. *Heliyon*, *8*(7), e09967. https://doi.org/10.1016/j.heliyon.2022.e09967

Bottino, M. (2021). *Study on the effects of children's screen time activity on their mental health and brain structure* (Doctoral dissertation, Politecnico di Torino). 1-68. http://webthesis.biblio.polito.it/id/eprint/19858

Buono, F. D., Paul, E., Sprong, M. E., Smith, E. C., Garakani, A., & Griffiths, M. D. (2020). Gaming and Gaming Disorder: A Mediation Model Gender, Salience, Age of Gaming Onset, and Time Spent Gaming. *Cyberpsychology, Behavior, and Social Networking*, *23*(9), 647–651. https://doi.org/10.1089/cyber.2019.0445

Caldera, K. (2022). *Is Social Media Prolonging Identity Commitment? The Effects of Social Media Use on Adolescent Identity Formation* (Doctoral dissertation, Arizona State University). https://keep.lib.asu.edu/system/files/c7/Caldera_asu_0010N_21794.pdf

Chung, S. J., Jang, J. H., Lee, J. Y., Choi, A., Kim, B. M., Park, M. K., Jung, M. H., & Choi, J.-S. (2020). Self-Efficacy and Clinical Characteristics in Casual Gamers Compared to Excessive Gaming Users and Non-Gamers in Young Adults. *Journal of Clinical Medicine*, *9*(9), 2720. https://doi.org/10.3390/jcm9092720

Fatima, A., Ambreen, F., & Amin, R. (2023). Internet Gaming Disorder and Competitiveness: A Cross-Sectional Study. *Qlantic Journal of Social Sciences and Humanities*, *4*(4), 248-259. https://doi.org/10.55737/qjssh.849537145

Fazeli, S., Mohammadi Zeidi, I., Lin, C.-Y., Namdar, P., Griffiths, M. D., Ahorsu, D. K., & Pakpour, A. H. (2020). Depression, anxiety, and stress mediate the associations between internet gaming disorder, insomnia, and quality of life during the COVID-19 outbreak. *Addictive Behaviors Reports*, *12*, 100307. https://doi.org/10.1016/j.abrep.2020.100307

Fumero, A., Marrero, R. J., Bethencourt, J. M., & Peñate, W. (2020). Risk factors of internet gaming disorder symptoms in Spanish adolescents. *Computers in Human Behavior*, *111*, 106416. https://doi.org/10.1016/j.chb.2020.106416

Gan, X., Qin, K., Li, M., Li, H., Jin, X., & Yu, C. (2022). The relationship between positive youth development and internet gaming disorder in Chinese adolescents: A moderated mediation model. *PLOS ONE*, *17*(11), e0276174. https://doi.org/10.1371/journal.pone.0276174

Ghous, A. K. (2014). Problematic Online Gaming in Pakistan. *International Journal of Science and Research*, *3*(6), 22522.

Gomez, R., Stavropoulos, V., Tullett-Prado, D., Schivinski, B., & Chen, W. (2022). Network analyses of internet gaming disorder symptoms and their links with different types of motivation. *BMC Psychiatry*, *22*(1), 76. https://doi.org/10.1186/s12888-022-03708-6

Gu, M. (2020). A longitudinal study of daily hassles, internet expectancy, self-control, and problematic internet use in Chinese adolescents: A moderated mediation model. *Personality and Individual Differences*, *152*, 109571. https://doi.org/10.1016/j.paid.2019.109571

Huang, X., Shi, H., Li, H., Guo, W., Luo, D., & Xu, J. (2022). Differential Effects of Anxiety on Internet Gaming Disorder: A Large-Scale Cross-Sectional Survey. *Frontiers in Psychiatry*, *12*, 802513. https://doi.org/10.3389/fpsyt.2021.802513

Imataka, G., Sakuta, R., Maehashi, A., & Yoshihara, S. (2022). Current Status of Internet Gaming Disorder (IGD) in Japan: New Lifestyle-Related Disease in Children and Adolescents. *Journal of Clinical Medicine*, *11*(15), 4566. https://doi.org/10.3390/jcm11154566

Kakul, F., & Javed, S. (2023). Internet gaming disorder: an interplay of cognitive psychopathology. *Asian Journal of Social Health and Behavior*, *6*(1), 36. https://doi.org/10.4103/shb.shb_209_22

Khalafi, F. (2022). *Motivations to Play and Mental Health in Video Game Players* (Doctoral dissertation, The Chicago School of Professional Psychology). 1-100. https://www.proquest.com/openview/5a27d4ef1676f2a372f4dce801ccddbd/1?pq-origsite=gscholar&cbl=18750&diss=y

Khalid, A., & Mukhtar, N. (2022). Internet Gaming Disorder and Mental Health in Pakistani youth: A Path Analysis with Impulsivity and Emotional Intelligence.

Koban, K., Biehl, J., Bornemeier, J., & Ohler, P. (2021). Compensatory video gaming. Gaming behaviours and adverse outcomes and the moderating role of stress, social interaction anxiety, and loneliness. *Behaviour & Information Technology*, *41*(13), 1–18. https://doi.org/10.1080/0144929x.2021.1946154

Lin, P.-C., Yen, J.-Y., Lin, H.-C., Chou, W.-P., Liu, T.-L., & Ko, C.-H. (2021). Coping, Resilience, and Perceived Stress in Individuals with Internet Gaming Disorder in Taiwan. *International Journal of Environmental Research and Public Health*, *18*(4), 1771. https://doi.org/10.3390/ijerph18041771

Macur, M., & Pontes, H. M. (2021). Internet gaming disorder in adolescence: Investigating profiles and associated risk factors. *BMC Public Health*, *21*(1), 1–9. https://doi.org/10.1186/s12889-021-11394-4

Marchica, L. A., Mills, D. J., Keough, M. T., & Derevensky, J. L. (2020). Exploring Differences Among Video Gamers With and Without Depression: Contrasting Emotion Regulation and Mindfulness. *Cyberpsychology, Behavior and Social Networking*, *23*(2), 119–125. https://doi.org/10.1089/cyber.2019.0451

Melodia, F., Canale, N., & Griffiths, M. D. (2020). The role of avoidance coping and escape motives in problematic online gaming: A systematic literature review. *International Journal of Mental Health and Addiction*, *20* 1-27. https://doi.org/10.1007/s11469-020-00422-w

Musetti, A., Manari, T., Billieux, J., Starcevic, V., & Schimmenti, A. (2022). Problematic social networking sites use and attachment: A systematic review. *Computers in Human Behavior*, 107199. https://doi.org/10.1016/j.chb.2022.107199

Ostinelli, E. G., Zangani, C., Giordano, B., Maestri, D., Gambini, O., D'Agostino, A., Furukawa, T. A., & Purgato, M. (2021). Depressive symptoms and depression in individuals with internet gaming disorder: A systematic review and meta-analysis. *Journal of Affective Disorders*, *284*, 136–142. https://doi.org/10.1016/j.jad.2021.02.014

Pallavicini, F., Pepe, A., & Mantovani, F. (2022). The Effects of Playing Video Games on Stress, Anxiety, Depression, Loneliness, and Gaming Disorder During the Early Stages of the COVID-19 Pandemic: PRISMA Systematic Review. *Cyberpsychology, Behavior, and Social Networking*, *25*(6), 334-354. https://doi.org/10.1089/cyber.2021.0252

Pontes, H. M., & Griffiths, M. D. (2015). Measuring DSM-5 internet gaming disorder: Development and validation of a short psychometric scale. *Computers in Human Behavior*, *45*, 137–143. https://doi.org/10.1016/j.chb.2014.12.006

Rettner, R. (2019). Video Game Addiction Becomes Official Mental Disorder in Controversial Decision by WHO. https://www.livescience.com/65580-video-game-addiction-mental-health-disorder.html

Soares, A. S., Pais-Ribeiro, J. L., & Silva, I. (2019). Developmental Assets Predictors of Life Satisfaction in Adolescents. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.00236

Su, W., Han, X., Yu, H., Wu, Y., & Potenza, M. N. (2020). Do men become addicted to internet gaming and women to social media? A meta-analysis examining gender-related differences in specific internet addiction. *Computers in Human Behavior*, *113*, 106480. https://doi.org/10.1016/j.chb.2020.106480

Sun, Y. (2023). The role of family on internet addiction: A model analysis of co-parenting effect. *Cogent Social Sciences*, *9*(1), https://doi.org/10.1080/23311886.2022.2163530

Teng, Z., Pontes, H. M., Nie, Q., Griffiths, M. D., & Guo, C. (2021). Depression and anxiety symptoms associated with internet gaming disorder before and during the COVID-19 pandemic: A longitudinal study. *Journal of Behavioral Addictions*, *10*(1), 169–180. https://doi.org/10.1556/2006.2021.00016

Teng, Z., Pontes, H. M., Nie, Q., Xiang, G., Griffiths, M. D., & Guo, C. (2020). Internet gaming disorder and psychosocial well-being: A longitudinal study of older-aged adolescents and emerging adults. *Addictive Behaviors*, *110*, 106530. https://doi.org/10.1016/j.addbeh.2020.106530

Tovar, M., Rosillo, M., & Spaniardi, A. (2023). Social Media's Influence on Identity Formation and Self Expression. *Teens, Screens, and Social Connection*, 49–61. https://doi.org/10.1007/978-3-031-24804-7_4

Wang, P., Pan, R., Wu, X., Zhu, G., Wang, Y., Tian, M., Sun, Y., & Wang, J. (2022). Reciprocal associations between shyness, depression, and Internet gaming disorder among Chinese adolescents: A cross-lagged panel study. *Addictive Behaviors*, *129*, 107256. https://doi.org/10.1016/j.addbeh.2022.107256

Wartberg, L., Kriston, L., Zieglmeier, M., Lincoln, T., & Kammerl, R. (2018). A longitudinal study on psychosocial causes and consequences of Internet gaming disorder in adolescence. *Psychological Medicine*, *49*(2), 287–294. https://doi.org/10.1017/s003329171800082x

Wong, H. Y., Mo, H. Y., Potenza, M. N., Chan, M. N. M., Lau, W. M., Chui, T. K., Pakpour, A. H., & Lin, C.-Y. (2020). Relationships between Severity of Internet Gaming Disorder, Severity of Problematic Social Media Use, Sleep Quality and Psychological Distress. *International Journal of Environmental Research and Public Health*, *17*(6), 1879. https://doi.org/10.3390/ijerph17061879

Xiang, G.-X., Gan, X., Jin, X., Zhang, Y.-H., & Zhu, C.-S. (2022). Developmental Assets, Self-Control and Internet Gaming Disorder in Adolescence: Testing a Moderated Mediation Model in a Longitudinal Study. *Frontiers in Public Health*, *10*. https://doi.org/10.3389/fpubh.2022.808264

Yang, X., Ebo, T. O., Wong, K., & Wang, X. (2023). Relationships between psychological flexibility and internet gaming disorder among adolescents: Mediation effects of depression and maladaptive cognitions. *PLOS ONE*, *18*(2), e0281269. https://doi.org/10.1371/journal.pone.0281269

Yu, Y., Mo, P. K. H., Zhang, J., Li, J., & Lau, J. T. F. (2020). Why is Internet gaming disorder more prevalent among Chinese male than female adolescents? The role of cognitive mediators. *Addictive Behaviors*, *112*, 106637. https://doi.org/10.1016/j.addbeh.2020.106637

Zahra, S., Kiani, S., & Shahbaz, K. (2019). *Internet Gaming Disorder: An Emerging Addiction among Pakistani University Students*. *5*(1), 87–104. https://doi.org/10.51732/njssh.v5i1.40

Zhu, K., Xie, X., Liu, Q., Meng, H., & Song, R. (2022). Internet addiction: Prevalence and relationship with academic burnout among undergraduates during widespread online learning. *Perspectives in psychiatric care*, *58*(4), 2303-2309. https://doi.org/10.1111/ppc.13060