

Academic Performance and Internet Gaming Disorder: A Cross-Sectional Study

Ambareen Fatima^{1*}, Rizwana Amin²**Abstract**

In recent years, Internet Gaming Disorder (IGD) has become a global issue as people have gotten overly enthusiastic about playing excessive internet games. Adolescents who play excessively on the internet develop IGD, which impacts their academic performance. In the present study, a comparative research design has opted to explore the impact of IGD across gender, academic performance, and adolescence. A total of 357 adolescents (males = 220, females = 137) from various private schools and colleges of Rawalpindi and Islamabad were selected to obtain data on Internet Gaming Disorder Scale 9- Short Form (IGDS9-SF). The results of one-way ANOVA showed a significant main effect of IGD across gender (males & females). They indicated the evidence of the significance of the main effect for the assessment of IGD with $F(1,355) = 11.36$, $p = .001$. The results of two-way mixed factorial ANCOVA showed that there is a significant main effect for IGD across Academic Performance Groups (A, B, C, D & F grades). They indicated the evidence of the significance of the main effect for the assessment of IGD with $(F(4,352) = [9.806])$, $p < .001$. Further results of two-way mixed factorial ANCOVA showed that there is a significant main effect for IGD across Groups (early & late adolescence). They indicated the evidence of the significance of the main effect for the assessment of IGD with $F(1,355) = 6.594$, $p = .011$. These findings may aid in the development of a policy for the efficient use of the Internet, as well as the development of awareness programs to educate parents about the harmful use of Internet games, as well as the identification and formulation of intervention plans for adolescents suffering from IGD symptoms and performing poorly in school.

Keywords: Academic Performance, Early and Late Adolescence, Internet Gaming Disorder

Received: 07 November 2023; Revised
Received: 11 December 2023; Accepted: 11
December 2023

^{1*}Lecturer/PhD Scholar, Department of Professional Psychology, Bahria University, Islamabad Campus, Pakistan.

²Adjunct Senior Associate Professor, Department of Professional Psychology, Bahria University, Islamabad Campus, Pakistan.

***Corresponding Author Email:**
ambreen1.ambreen2@gmail.com

Introduction

With the emergence of technology and the internet, adolescents and adults spend their free time playing online games. Internet gaming has achieved its pinnacle in today's

world. It should be noted, however, that playing video games is not a disorder; rather, interference in individuals' daily lives and functioning is what counts as a condition. This gradually rising excessive use of internet gaming is causing many violent occurrences and behavioral changes (Imataka et al., 2022; Rettner, 2019). The World Health Organization (WHO) considers gaming disorder a medical condition if it has persisted for at least 12 months and impairs personal, familial, social, educational, occupational, or other critical areas of functioning. IGD was recognized as a subtype of internet addiction and named "IGD" as a medical condition in ICD-11 following years of debate and discussion among specialists (Jo et al., 2019). In the latest DSM-5-TR revision, clinicians use the

This article is distributed under the terms of the Creative Commons Attribution Non Commercial 4.0 International License (<https://www.creativecommons.org/licenses/by-nc/4.0/>) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified.

© Copyright: The Authors (2023)

American Psychiatric Association's (APA) nine IGD diagnostic criteria. It says "IGD has value as a distinct disease, most typically involving specific Internet games" (Eisert et al., 2023).

According to DSM-5-TR, persistent and repeated use of the internet to play games, usually with others, resulting in clinically significant impairment or distress as evidenced by five or more of the following in 12 months: (1) preoccupation with internet games; (2) withdrawal symptoms when internet gaming is removed; (3) tolerance—the need to spend more time playing; (4) unsuccessful attempts to control internet game participation; (5) loss of interest in previous hobbies and entertainment with the exception of internet games; (6) continued excessive use of internet games despite psychosocial problems; (7) has misled family, therapists, or others about internet use; (8) uses internet games to escape a bad mood; and (9) has jeopardized or lost a significant relationship, employment, or educational or career opportunity due to internet use [American Psychiatric Association (APA), 2022].

According to the Bio psychological model of internet-addictive behavior, personality traits such as excitability, impulsiveness, lack of attention, and behavioral and emotional disorders are produced by a functional defect of the Central Nervous System in online addicts. As a result of such settings, adolescents seek refuge in virtual environments such as games, where adaptation is simpler (Malygin et al., 2014). However, the Theory of Flow Experience and Attribution Theory have helped explain why games may offer a safe way for gamers to learn about action outcomes through experience. Internet and computer games can improve self-monitoring and coping. Video games played to avoid or escape other activities are more likely to lead to addiction (Caldera, 2022; Hu et al., 2019).

Flow theory and Humanistic wants theory were used to investigate Taiwanese Internet addict adolescents' motivations. The results showed that flow state of individuals who are addicted to gaming are lower than the individual who don't play. This only shows that flow state is not involved in any psychological mechanism of addiction in players (Wan et al., 2006). However, a recent study revealed that the psychological needs of online gamers were close to two-factor theory depicting the dimensions of satisfaction and dissatisfaction (Buren et al., 2023).

IGD in Adolescents

A recent study has explored the epidemiology and basis of IGD across various demographics ranging from 13-17 years old and above (Khalid & Mukhtar, 2022). For example, research has indicated that IGD prevalence is higher in younger age groups (16-21 years) than in adults (Sun, 2023). Researchers have found that adolescents are drawn to this component of the Internet and may be more prone to engaging in this behavior since they are frequently dissatisfied with their appearance and other internal issues (Biswas et al., 2022; Zhu et al., 2022).

The Internet allows the adolescent the opportunity to experiment with many personalities to see what fits them and might satisfy unmet needs. Adolescents can create online personalities using a variety of tools, including chat rooms and online role-playing games (Sun, 2023; Zhu et al., 2022). Because these platforms are anonymous, adolescents can use screen names or nicknames that don't match their real names. Despite being less anonymous, social media users can choose which parts of their personalities or photographs to show. They can be smarter and more in charge of their appearance (Musetti et al., 2022).

Additionally, there has been some concern that adopting many personas could possibly

postpone the proper resolution of an identity crisis. As their online identity develops, adolescents may confuse their real-life traits with their online persona. Some suggest that while these new identities and behaviors may alarm adults, they may not be as detrimental as thought and may even be a good outlet for experimentation and self-expression (Tovar et al., 2023). Adolescents who impersonate someone online are more likely to do so to tease their peers than to explore a future identity. The Internet has given individuals a new method to connect, which most want. Teens may be tempted by the Internet because they feel isolated. Thus, online interactions become more crucial to adolescents. Unfortunately, these links might be faked and dissolved with a mouse click, thus the Internet could only give the image of a close relationship (Caldera, 2022).

Gender and IGD

Most of the research regarding IGD is in preliminary stages in which prevalence and gender differences are investigated. However, numerous amounts of research have been done on IGD in Pakistan. Investigations indicated that computer gaming is popular among both male and female university students in Pakistan. The study concluded that male university students played more online than females (Zehra et al., 2019). Additionally, playing games online had larger connections with IGD than playing games offline. Gender and game genre preferences may also be factors in excessive gaming (Gan et al., 2022). Gender variations in IGD have been reported in multiple studies (Buono et al., 2020; Gomez et al., 2022; Soares et al., 2019).

Gender differences are also shown in online game motives. In online games, boys have stronger accomplishment incentives and girls have higher sociability objectives, according to Yang et al. (2023). Thus, Yang et al. (2023) found that males report higher IGD levels than females. Gan et al. (2022) found

that boys and girls play games for the same socialization reasons, while Xiang et al. (2022) found that boys are much more likely than girls to play for fun, to compete with others, to win, for the challenge of learning the game, and for several emotional reasons. Nearly equal numbers of boys and girls are driven by creativity and curiosity.

A positive correlation was observed of depression and anxiety with IGD and males were high in both depression and anxiety as compare to females but stress level was almost the same across the gender (Kakul & Javed, 2023). Another study found out that IGD level was high in males as compared to females (Wang et al., 2022). Furthermore, a recent study on Internet addiction reported that IGD is directly linked with the male gender (Yu et al., 2021).

Academic Performance and IGD

Academic performance refers to the extent to which an individual has achieved an educational goal, typically measured by grades or highest level of educational attainment (MacCann et al., 2020). IGD negatively influences academic performance and it is generally linked to lower academic performance in schools. However, Samaha and Hawi (2016) found no correlation between smartphone and internet addiction and academic performance. According to Karnadi and Pangestu's research (2021), the influence of IGD on academic performance is insignificant. The study included 390 Indonesian students and discovered that IGD has no significant effect on GPA. Income and gender, on the other hand, are important predictors of grades. It should be noted that these findings are not conclusive, and more study is required to assess the impact of IGD on academic achievement.

Pakistan is a nation situated in South Asia, characterized by a demographic composition wherein about two-thirds of its populace consists of individuals below the age of 21. Pakistan, a developing country with a

considerable population, has witnessed a substantial surge in internet usage over the past decades, as indicated by World Bank figures in 2022. There is a limited body of research in this nation that examines IGD and its related aspects. The available evidence indicates that the excessive use of the Internet has an impact on various aspects of young individuals' lives, including their academic performance, physical well-being, social interactions, and psychological well-being (Khan & Muqtadir, 2016; Suhail & Bargees, 2006; Thakur et al., 2020).

In short, IGD is more common among adolescents whom it has affected so much that it has become a serious concern. Boys seem to be more affected than girls and it is influencing their academic performance (in terms of grades). All over the world IGD is increasing and it has started to increase in Pakistan heavily now as well. It is becoming a serious issue for the adolescents of Pakistan as prevalence is increasing especially in males as compared to females. There is a limited data available which signifies an impact of IGD on academic performance exclusively among adolescent males and females. It is essential to determine the effect of IGD on academic performance among adolescents who indulge in playing excessive internet games compared to those who do not. To fill this gap in literature, present study aimed to explore the impact of IGD on academic performance exclusively among adolescent population in Pakistan.

Hypotheses

- IGD level is higher in adolescent boys as compared to adolescent girls.
- Mean scores of IGD would differ across academic performance groups of adolescents.
- Mean scores of IGD would differ in early and late adolescence.

Method

Research Design & Participants

A cross-sectional study design has been opted to explore the differences in

aforementioned hypotheses via convenient sampling technique. The study included 357 participants (males = 220, females = 137) ranging in age from 10-19, from various private schools and colleges of twin cities. Sample size was calculated by using G-Power. Only those participants who were willing to participate and who spoke English well enough to understand and fill out the forms were included in the study. There were no restrictions based on gender or socioeconomic status. Adolescents who do not play online video games, have a severe mental illness, have been suspended, or have dropped out of school/college were excluded.

Measures

Participants were requested to respond on the demographic data sheet which included basic data on sex, age, education, and so on. They also completed a questionnaire i.e., IGDS9-SF (IGD Scale-Short Form; Pontes & Griffiths, 2015).

Demographic Variable Sheet

The demographic sheet contained information concerning age, gender, education, Socio-economic status, and academic performance in terms of grades of adolescents.

IGDS9-SF

The IGDS9-SF was developed by Pontes and Griffiths in 2015. It was based on criteria of IGD explained in DSM-5 (2013). The overall score can be calculated by adding up participant's answers to the nine items from 9 to 45, and eventually higher score will lead to higher IGD. Authors reported adequate reliability of the scale after evaluating the results of additional analysis.

Procedure

A sample consisting of 357 participants (males = 220, females = 137) with the age range of 10-19 were selected from different schools and colleges of twin cities (Rawalpindi & Islamabad). Convenient sampling technique was used to obtain the data from the participants. Data was collected

in two phases; first phase included data collection and second phase included, analysis of data. An informed consent was collected from the sample and after giving their consent, they filled the questionnaire. After the collection of the data, it was analyzed through the SPSS 25. Data analyzed through one-way ANOVA and mixed (two-way) factorial ANCOVA in SPSS.

Ethical Considerations

The written consent was taken from the participants, in which ample information regarding the research was shared. It was ensured to them that the results will be kept confidential. The participants participated voluntarily and they were given full right to back out from the research at any time. Lastly, participants were appreciated for participating in the research study.

Results

Table 1

Frequencies and Percentages of the Demographic Characteristics of Participants of the Study (N = 357)

Characteristics of the Participants	Categories	<i>f</i>	%
Age	10-14	53	14.8
	15-19	304	85.2
Adolescence	Early	53	14.8
	Late	304	85.2
Gender	Males	220	61.6
	Females	137	38.4
Education	Primary	16	4.5
	Secondary	57	16
	Matric	81	22.7
	F.Sc.	163	45.7
	Undergraduate students	40	11.2
	Academic Performance	A grade: 90%-100%	73
	B grade: 80%-89%	141	39.5
	C grade: 70%-79%	99	27.7
	D grade: 60%-69%	39	10.9
	F grade: 59% & below	05	1.4

Note: *f* = Frequency, % = Percentage

Table 2

One-way ANOVA for the Assessment of IGD across Males and Females (N = 357)

Variables	Male (N=220)		Female (N= 137)		<i>F</i> (1,355)	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
IGD	24.86	8.01	21.80	8.82	11.367	.001	.031

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

The results of one-way ANOVA showed that there is a significant main effect of IGD across gender (males & females). Results indicated the evidence of significant of the main effect for the assessment IGD with $F(1,355) = 11.367, p = .001$ (Figure 1).

Figure 1

Mean Differences of IGD across Males and Females

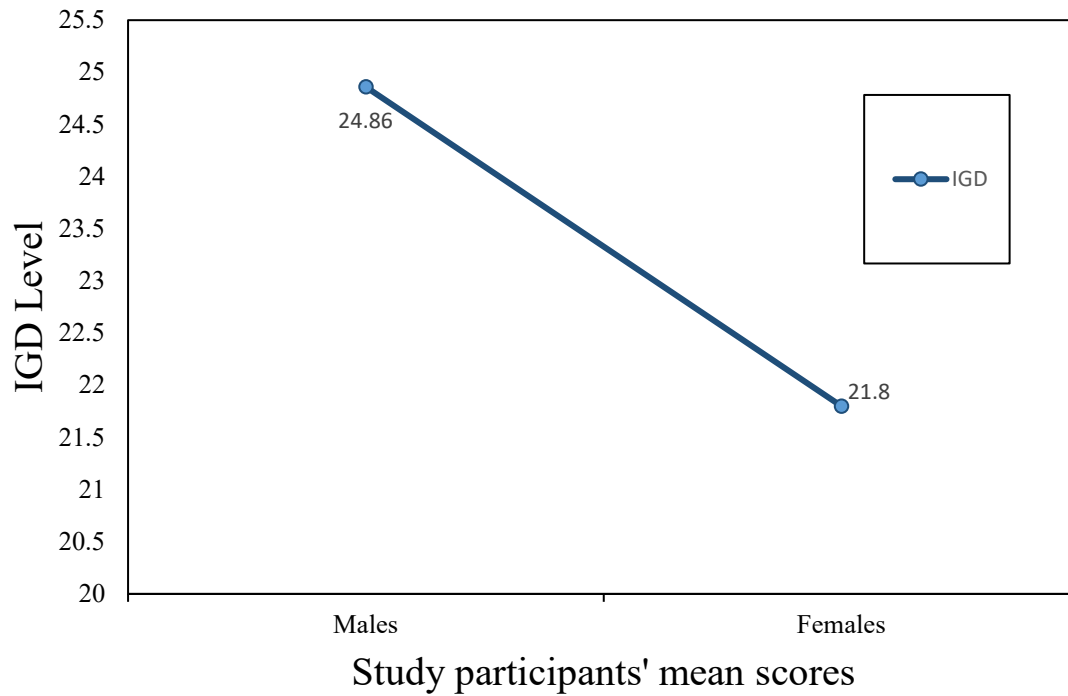


Table 3*Mixed (2x2) Factorial ANCOVA for the Assessment of IGD across 5 Groups of Academic Performance (N =357)*

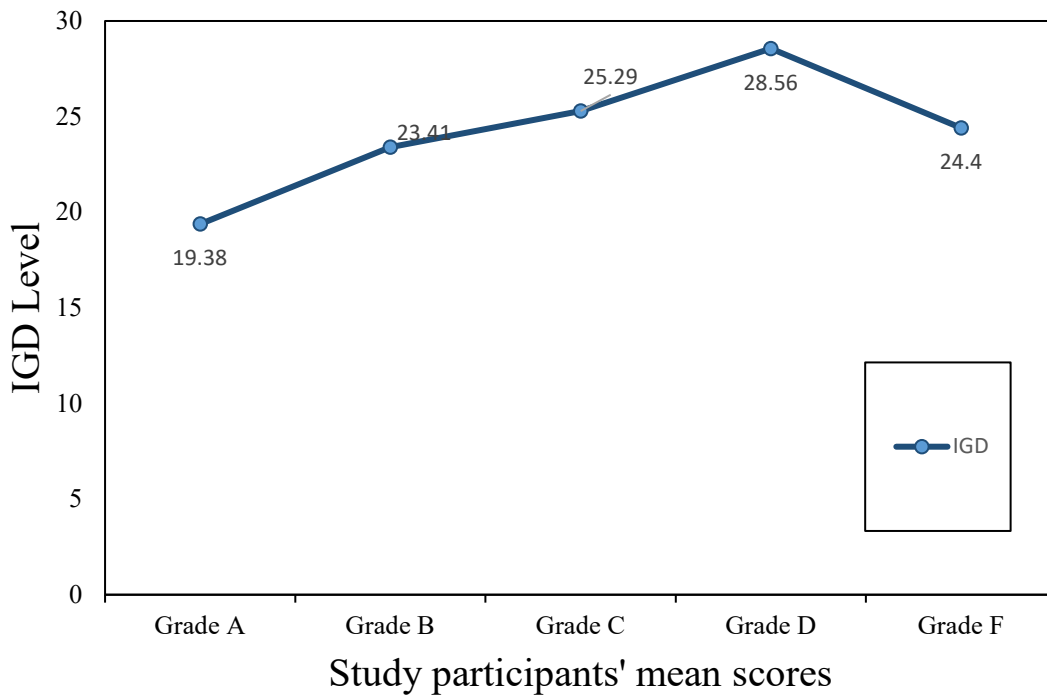
	<i>A grade: 90%-100% (N= 73)</i>		<i>B grade: 80%-89% (N= 141)</i>		<i>C grade: 70%-79% (N= 99)</i>		<i>D grade: 60%-69% (N= 39)</i>		<i>F grade: 59% & below (N=5)</i>		<i>F (4,352)</i>	<i>p</i>	<i>η²</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
IGD	19.38	6.48	23.41	8.57	25.29	8.77	28.56	7.29	24.40	0.55	9.806	.001	.100
Covariates	-	-	-	-	-	-	-	-	-	-	-	-	-
Age	-	-	-	-	-	-	-	-	-	-	.852	.049	.010
Gender	-	-	-	-	-	-	-	-	-	-	1.053	.038	.012
Education	-	-	-	-	-	-	-	-	-	-	1.944	.289	.022

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

The results of two-way mixed factorial ANCOVA after controlling the effect for age, gender and education, showed that there is a significant main effect for IGD across Academic Performance Groups (A, B, C, D & F grades). Results indicated the evidence of significant of the main effect for the assessment IGD with ($F(4,352) = [9.806], p < .001$) (Figure 2).

Figure 2

Mean Differences of IGD across Academic Performance Groups (A, B, C, D & F grades) of the Adolescents

**Table 4**

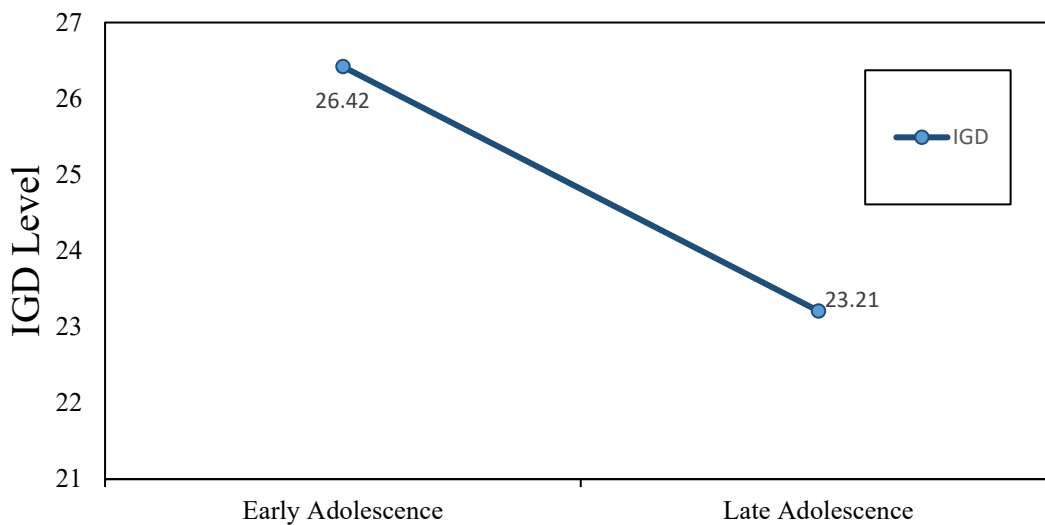
Mixed (2x2) Factorial ANCOVA for the Assessment of IGD across Early and Late Adolescence ($N = 357$)

Variables	Early Adolescence		Late Adolescence		$F (1,355)$	p	η^2
	M	SD	M	SD			
IGD	26.42	9.31	23.21	8.21	6.594	.011	.018
Covariates	-	-	-	-	-	-	-
Age	-	-	-	-	55.423	.001	.610
Gender	-	-	-	-	2.036	.155	.006
Education	-	-	-	-	282.094	.001	.443

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

The results of two-way mixed factorial ANCOVA after controlling the effect for age, gender and education, showed that there is a significant main effect for IGD across

Groups (early & late adolescence). Results indicated the evidence of significant of the main effect for the assessment IGD with $F (1,355) = 6.594, p = .011$ (Figure 3).

Figure 3*Mean Differences of IGD across Early and Late Adolescence***Study participants' mean scores****Discussion**

IGD has become a topic of increasing research interest worldwide but little research has been carried out in Pakistan. The present study aimed to assess the IGD level in Pakistani adolescents. Three hypotheses have been formulated to assess the IGD in Pakistani adolescent males and females. First hypothesis stated that IGD level is higher in adolescent boys as compared to adolescent girls. The results of one-way ANOVA showed that there is a significant main effect of IGD across gender (males & females). Results indicated the evidence of significant of the main effect for the assessment IGD with $F(1,355) = 11.36, p = .001$. Figure 1 illustrated the clear picture of IGD levels across adolescent boys and adolescent girls. Results supported the hypothesis and concluded that adolescent males have higher IGD levels in contrast with adolescent females.

Literature also supported the results and confirmed the hypothesis as according to the Entertainment Software Association of Canada (2020), more adolescent boys than adolescent girls are gamers, i.e., 53%

adolescent boys and 47% adolescent girls, between ages 13 to 17. Dong and Potenza (2022) explained gaming in terms of gender differences, and concluded that males are more susceptible to developing IGD compared to females. According to Dong and Potenza's perspective on neuroscience, short-term gaming cause increased arousal of gaming signals in males than females due to which games are played more by the males and more problems are developed from gaming and leading IGD. According to a study by Zahra et al. (2019), on Pakistani students, males scored higher on IGD scale compared to females. In addition, studies have shown that young students spend a disproportionate amount of time on the internet, raising the risk that they will develop IGD. Additional risk factors for IGD were identified including being younger and male. A recent study by Rasheed et al. (2022) found that characteristics including self-evaluation and gender, namely being male, can predict the susceptibility to IGD among Pakistani adolescents. According to Stevens et al. (2019), a thorough analysis of the available corpus of research on IGD reveals a

male predominance with a ratio of 2.5:1. Adolescent boys, according to the data and the academic literature, have a higher prevalence of IGD than adolescent girls.

Second hypothesis stated that the mean scores of IGD would differ across academic performance groups of adolescents. The results of two-way mixed factorial ANCOVA after controlling the effect for age, gender and education, showed that there is a significant main effect of IGD across Academic Performance Groups (A, B, C, D & F grades). Results indicated the evidence of significant of the main effect for the assessment IGD with ($F(4,352) = [9.80], p < .001$). See figure 2 illustrated a clear image of mean score differences obtained on IGD across academic performance groups of adolescents. Results supported the hypothesis and concluded that the means scores of IGD varies across academic performance groups of adolescents. Literature also supported the findings as numerous studies revealed that children of all ages are at a risk of addiction to video games and it is likely to have a negative impact on a child's academic performance. For instance, children who are involved in excessive internet gaming, most likely to get lower grades as compared to those who are not involved in excessive internet gaming (Jeong et al., 2021; Macur & Pontes, 2021). Another incredible study revealed that internet addiction in the form of excessive usage of smartphones and computers to play online games is associated with poorer grades in adolescents. It also concluded that time duration spent on playing internet games also affects academic performance in adolescents (Domoff et al., 2020). Therefore, it's been concluded that IGD level would differ across academic performance groups of adolescents. Last hypothesis stated that mean scores of IGD would differ in early and late adolescence. The results of two-way mixed factorial ANCOVA after controlling the effect for age, gender and education, showed

that there is a significant main effect for IGD across Groups (early & late adolescence). Results indicated the evidence of significant of the main effect for the assessment of IGD with $F(1,355) = 6.59, p = .011$. See figure 3 illustrated a noticeable difference in mean scores of IGD across early adolescence and late adolescence. Results supported the hypothesis and concluded that mean scores of IGD are different in early and late adolescence.

According to the literature, children who start playing video games in early adolescence are more prone to developing IGD rather than those in late adolescence (Brevers et al., 2020). A recent study revealed that there's a difference in the prevalence of excessive internet use between the groups of early adolescents (12-14 years old) and late adolescents (Paulus et al., 2022). Numerous studies concluded that IGD is prevalent in adolescents but IGD level varies across early, mid and late adolescence (Gentile et al., 2017; Imataka et al., 2022; Wartberg et al., 2019). Literature supported the findings and confirmed the hypothesis.

Conclusion & Implications

IGD has an effect on academic performance among adolescents male and female. From the findings it is concluded that IGD is related to gender, academic performance, and early and late adolescent population in various ways. Findings of the study may aid in the development of a policy for the efficient use of the Internet, the development of awareness programs to educate parents about the harmful use of Internet games, as well as the identification and formulation of intervention plans for adolescents suffering from IGD symptoms and performing poorly in school.

Limitations & Recommendations

Present study was conducted in Islamabad and Rawalpindi, it could have been done in diverse area comprising of diverse population. If same study was done in any village or area of any lower socioeconomic

class of Pakistan, results would have been different. As Pakistan itself is an under developed country not all people here have an easy access to electronic gadgets and internet. So we cannot generalize our results to all population. This study involved less demographic variables otherwise if more demographic variables were involved then richer information could have been gathered and different habits and activities of gamers would have been highlighted.

It is suggested that the amount of time spent on gaming by children should be controlled or made limited. Parents should keep track of the place or environment in which their children like to play games the most, like lounge, or bedroom etc. to limit their gaming time. IGD can further contribute in causing behavioral and psychological problems such as depression, anxiety and stress etc. To prevent severe symptoms of IGD, parents should also encourage gamers to indulge more in outdoor activities as well. Parents' role in terms of their children's academic performance is also very important as, gaming addicts usually have low or poor academic performance, so different conditions should be set by the parents for them, like studying for 2 hours daily, to get 2 hours of gaming time, and so on.

Further studies can be done with richer data for its authenticity, Validity and Reliability, more diverse research methodologies and strategies can be included. Rich information regarding IGD must be added in the demographic sheet which can get more information about gamers. Further studies can be done among people with different ethnic groups as ethnic groups have deep roots in our society. Study of IGD can be done in different socio economic backgrounds, specifically in Pakistan people living in rural areas have less access to electronic media and their lifestyle is different than urban areas. Investigating IGD with more variable and larger number of

population will give better generalization ability.

Contribution of Authors

Ambareen Fatima: Conceptualization, Investigation, Methodology, Data Curation, Formal Analysis, Writing – Original Draft
Rizwana Amin: Methodology, Writing - Reviewing & Editing, Supervision

Conflict of Interest

There is no conflict of interest declared by the authors.

Source of Funding

The authors declared no source of funding.

Data Availability Statement

The datasets of the current study are not available publicly due to ethical reasons but are available from the corresponding author [A.F.] upon the reasonable request.

References

- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
- Biswas, P. R., Ahammed, B., Rahman, M. S., Nirob, B. M., & Hossain, M. 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.
- Brevers, D., King, D. L., & Billieux, J. (2020). Delineating adaptive esports involvement from maladaptive gaming: a self-regulation perspective. *Current Opinion in Psychology*, 36, 141-146.
- 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.
- Burén, J., Nutley, S. B., Crisci, G., & Thorell, L. B. (2023). Evidence of a two-factor structure for Internet Gaming Disorder and Social Media Disorder: Psychometric properties of a new screening instrument for adolescents and adults. *Journal of Psychopathology and Behavioral Assessment*, 45(3), 702-715.
- Caldera, K. (2022). *Is Social Media Prolonging Identity Commitment? The Effects of Social Media Use on Adolescent Identity Formation* (Doctoral dissertation, Arizona State University).
- Domoff, S. E., Foley, R. P., & Ferkel, R. (2020). Addictive phone use and academic performance in adolescents. *Human Behavior and Emerging Technologies*, 2(1), 33-38.
- Dong, G. H., & Potenza, M. N. (2022). Considering gender differences in the study and treatment of internet gaming disorder. *Journal of Psychiatric Research*, 153, 25-29.
- Eisert, B. C., Bean, R. A., Oehler, L., & Lovell, T. W. (2023). Internet Gaming Disorder in Adolescents: Clinical Considerations and an Attachment-Based Treatment Approach. *The American Journal of Family Therapy*, 1-17.
- Entertainment Software Association of Canada (2020). *Real Canadian Gamer Essential Facts 2020*. ESA Canada <https://essentialfacts2020.ca/>
- Gan, X., Qin, K. N., Li, M., Li, H., Jin, X., & Yu, C. F. (2022). The relationship between positive youth development and internet gaming disorder in Chinese adolescents: A moderated mediation model. *Plos One*, 17(11), e0276174.
- Gentile, D. A., Bailey, K., Bavelier, D., Brockmyer, J. F., Cash, H., Coyne, S. M., Doan, A., Grant, D. S., Green, C. S., Griffiths, M., Markle, T., Petry, N. M., Prot, S., Rae, C. D., Rehbein, F., Rich, M., Sullivan, D., Wolley, E., & Young, K. (2017). Internet gaming disorder in children and adolescents [Supplemental material]. *Pediatrics*, 140 (2), 81-85.
- 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.
- Hu, E., Stavropoulos, V., Anderson, A., Scerri, M., & Collard, J. (2019). Internet gaming disorder: Feeling the flow of social games. *Addictive Behaviors Reports*, 9, 100140.
- 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.
- Jeong, H., Yim, H. W., Lee, S. Y., Lee, H. K., Potenza, M. N., & Lee, H. (2021). Factors associated with severity, incidence or persistence of internet gaming disorder in children and adolescents: a 2-year longitudinal study. *Addiction*, 116(7), 1828-1838.
- Jo, Y. S., Bhang, S. Y., Choi, J. S., Lee, H. K., Lee, S. Y., & Kweon, Y. S. (2019). Clinical characteristics of diagnosis for internet gaming disorder: comparison of DSM-5 IGD and ICD-11 GD diagnosis. *Journal of Clinical Medicine*, 8(7), 945.
- Kakul, F., & Javed, S. (2023). Internet gaming disorder: an interplay of cognitive psychopathology. *Asian*

- Journal of Social Health and Behavior*, 6(1), 36.
- Karnadi, E. B., & Pangestu, S. (2021). Does Internet Gaming Disorder Hinder Academic Performance?. *Jurnal Kajian Bimbingan dan Konseling*, 6(1), 1-14.
- Khalid, A., & Mukhtar, N. (2022). Internet Gaming Disorder and Mental Health in Pakistani youth: A Path Analysis with Impulsivity and Emotional Intelligence. (Preprint). *Research Square*, 1-16. DOI: <https://doi.org/10.21203/rs.3.rs-2296407/v1>
- Khan, A., & Muqtadir, R. (2016). Motives of Problematic and Nonproblematic Online Gaming among Adolescents and Young Adults. *Pakistan Journal of Psychological Research*, 31(1), 119-138.
- MacCann, C., Jiang, Y., Brown, L. E., Double, K. S., Bucich, M., & Minbashian, A. (2020). Emotional intelligence predicts academic performance: A meta-analysis. *Psychological Bulletin*, 146(2), 150.
- Macur, M., & Pontes, H. M. (2021). Internet Gaming Disorder in adolescence: investigating profiles and associated risk factors. *BMC Public Health*, 21, 1-9.
- Malygin, V., Merkurieva, Y., & Iskandirova, A. (2014). EPA-1212—Biopsychosocial model of internet-addictive behavior. *European Psychiatry*, 29, 1.
- 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.
- Paulus, F. W., Joas, J., Gerstner, I., Kühn, A., Wenning, M., Gehrke, T., Burckhart, H., Richter, U., Nonnenmacher, A., Zemline, M., Lucke, T., Brinkmann, F., Rothoef, T., Lehr, T., & Möhler, E. (2022). Problematic internet use among adolescents 18 months after the onset of the COVID-19 pandemic. *Children*, 9(11), 2-19. DOI: <https://doi.org/10.3390/children9111724>
- Pontes, H. M., & Griffiths, M. D. (2015). Internet Gaming Disorder Scale--9-Item Short Form (IGDS-SF9, IGDS9-SF). <https://doi.org/10.1037/t56703-000>
- Rasheed, A., Ahsan, S., & Masood, S. (2022). Impact of Problematic Internet Gaming On Achievement Motivation Among University Students: Moderating Role Of Education. *Journal of Positive School Psychology*, 6(8), 7042-7057.
- 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>
- Samaha, M., & Hawi, N. S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *Computers in Human Behavior*, 57, 321-325.
- Soares, A. S., Pais-Ribeiro, J. L., & Silva, I. (2019). Developmental assets predictors of life satisfaction in adolescents. *Frontiers in Psychology*, 236. <https://doi.org/10.3389/fpsyg.2019.00236>
- Stevens, M. W., King, D. L., Dorstyn, D., & Delfabbro, P. H. (2019). Cognitive-behavioral therapy for Internet gaming disorder: A systematic review and meta-analysis. *Clinical Psychology & Psychotherapy*, 26(2), 191-203.

- Suhail, K., & Bargees, Z. (2006). Effects of excessive Internet use on undergraduate students in Pakistan. *CyberPsychology & Behavior, 9*(3), 297-307.
- Sun, Y. (2023). The role of family on internet addiction: A model analysis of co-parenting effect. *Cogent Social Sciences, 9*(1), 2163530.
- Thakur, I., Azeem, A., & Gilani, N. (2020). Internet addiction, shyness, and self-esteem of Pakistani youth. *Sjesr, 3*(3), 83-89.
- Tovar, M., Rosillo, M., & Spaniard, A. (2023). Social Media's Influence on Identity Formation and Self Expression. In *Teens, Screens, and Social Connection: An Evidence-Based Guide to Key Problems and Solutions* (pp. 49-61). Cham: Springer International Publishing.
- Wan, C. H. & Chiou, W. B. (2006). Psychological motives and online games addiction: a test of flow theory and humanistic needs theory for Taiwanese adolescents. *Cyber Psychology Behavior, 9*(3), 317-324. <https://doi.10.1089/cpb.2006.9.317>
- 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*, Article e-107256. DOI: <https://doi.org/10.1016/j.addbeh.2022.107256>
- Wartberg, L., Kriston, L., Zieglmeier, M., Lincoln, T., & Kammerl, R. (2019). A longitudinal study on psychosocial causes and consequences of Internet gaming disorder in adolescence. *Psychological Medicine, 49*(2), 287-294.
- World Health Organization. (2019). *Gaming disorder*. Classification in Frequently asked questions, World Health Organization <https://www.who.int/standards/classifications/frequently-asked-questions/gaming-disorder>
- 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*, 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.
- Yu, Y., Mo, P. K., Zhang, J., Li, J., & Lau, J. T. (2021). Why is Internet gaming disorder more prevalent among Chinese male than female adolescents? The role of cognitive mediators. *Addictive Behaviors, 112*, 106637.
- Zahra, S., Kiani, S., & Shahbaz, K. (2019). Internet gaming disorder: an emerging addiction among Pakistani university students. *NUST Journal of Social Sciences and Humanities, 5*(1), 87-104.
- 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.