ACADEMIA International Journal for Social Sciences
Volume 4, Issue 4, 2025 ISSN-L (Online): 3006-6638

Internet Gaming and Depressive Symptoms Among Young Adults

Sadiq Rehman Orakzai
Sadiqorakzai37@gmail.com
Postgraduate, Clinical Psychology, National University of Medical Science (NUMS), Rawalpindi, Pakistan

Dr Uzma Jillani
Uzma.jillani@numspak.edu.pk
Lecturer, Department of Clinical Psychology, National University of Medical Science, Rawalpindi, Pakistan

Corresponding Author: * Sadiq Rehman Orakzai sadiqorakzai37@gmail.com

Received: 04-11-2025 **Revised:** 21-11-2025 **Accepted:** 11-12-2025 **Published:** 23-12-2025

ABSTRACT

Internet gaming had become increasingly prevalent among young adults, raising concerns about its impact on mental health, particularly depression. The present study investigated the predictive role of internet gaming in determining depressive symptoms among young adults. It was hypothesized that 1) internet gaming will positively predict depressive symptoms among young adults, 2) male internet gamers will report higher levels of depressive symptoms compared to female internet gamers. A cross-sectional survey design was employed, recruiting young adults aged 18–25. Participants were given consent form followed by demographic information sheet, Internet Gaming Disorder Scale -IGD-20 (Pontes et al., 2014) and the Patient Health Questionnaire-9 PHQ-9 (Kroenke, K., Spitzer, R. L., & Williams, J. B. W). After data collection, the results were interpreted using the Statistical Package for Social Sciences (SPSS, Version 21). Descriptive statistics and inferential analyses, including linear regression and independent samples t-tests, were conducted. The results revealed that internet gaming significantly and positively predicted depressive symptoms among young adults ($F (1, 398) = 73.55$, $p < .001$, $R^2 = .156$). Furthermore, male internet gamers reported notably higher levels of depressive symptoms ($M = 12.97$, $SD = 5.21$) than female gamers ($M = 7.95$, $SD = 6.04$), $t (398) = 8.88$, $p < .001$, Cohen's $d = 0.90$. Gender differences were also observed in gaming scores, with males ($M = 77.61$, $SD = 8.01$) scoring higher than females ($M = 69.46$, $SD = 8.24$), $t (398) = 9.88$, $p < .001$, Cohen's $d = 1.00$, Supporting both study hypotheses. These findings highlight the importance of monitoring internet gaming behaviors in relation to youth mental health. The findings contributed to the understanding of how internet gaming relates to depressive symptoms in young adults and highlighted the need for targeted interventions to promote healthy gaming habits and reduce mental health risks.

***Keywords**: internet gaming, depressive symptoms, young adults, mental health.*

INTRODUCTION

The upward thrust of the digital generation has added approximately a remarkable surge in internet gaming participation among teenagers, with research estimating that almost 70% of people in this age organization engage in online gaming activities (Kuss & Griffiths, 2011). For lots, internet gaming has ended up as crucial form of amusement, providing now not simplest amusement but also opportunities for social interplay, pressure reduction, and cognitive stimulation (Ducheneaut et al., 2006; Hamari & Koivisto, 2015). This complexity is mirrored in the ongoing debate about the impact of online gaming on mental well-being. While some research links excessive gaming to heightened depressive symptoms (Kuss & Griffiths, 2011; Gentile et al., 2014), other studies emphasize its potential to foster social connections and serve as a coping mechanism against daily stressors (Ducheneaut et al., 2006; Hamari & Koivisto, 2015).

The divergent results emphasize the importance of gaining a deeper comprehension of how internet gaming intersects with the mental well-being of young adults.

The digital era has transformed not only our modes of communication and work but also the way we engage in leisure and recreational activities. One of the most significant advancements in the technological realm is the emergence of internet gaming, a diverse and captivating phenomenon that has garnered the interest of millions of users worldwide (Taylor, 2006; Veltri et al., 2014). Internet gaming, which was once confined to specific groups, has now emerged as the primary source of entertainment, especially for teenagers and young adults (Brown, 2017; Griffiths et al., 2004). The rise of smartphones, affordable internet access, and advanced game designs has led to a significant increase in the popularity of virtual gaming environments (CNNIC, 2023). This expansion has prompted scholars, educators, mental health professionals, and policymakers to examine not only the positive aspects of internet gaming but also the potential psychological and social costs associated with excessive use (Kuss & Lopez-Fernandez, 2016; Mihara & Higuchi, 2017).

Research on internet gaming disorder is more important now because it is recognized as a mental health problem worldwide. The 11th Revision of the International Classification of Diseases (ICD-11) by the World Health Organization (WHO) now recognizes IGD as a serious health issue, based on the evidence of its impact on people's lives (WHO, 2019). Possible IGD means that someone plays games a lot and it affects their life in a bad way. They may not do well in school, work, or relationships because of their gaming. Some signs of gaming addiction are: not being able to stop playing games; spending more time playing games than doing other things; playing games even when they cause problems. The American Psychiatric Association (2013) and the World Health Organization (2019) are sources that these behavioral characteristics closely mirror those observed in substance use disorders and other behavioral addictions, further emphasizing the potential severity of the condition (Kuss & Lopez-Fernandez, 2016; Mihara & Higuchi, 2017).

The way a game is made, what kind of game it is, and who plays it affect how it affects the mind (Li et al., 2016; Laconi et al., 2017). Some games that you can play with other people, like shooting games or games where you have to survive, can make you feel more stressed and angry because they are very quick and you have to compete with others and show how good you are (Brunborg et al., 2013). Some people might play games where they pretend to be someone else, and this can make them feel very involved and connected to the game world. This dissociation may have profound implications for individuals struggling with identity issues or low self-esteem, both of which are core features of depressive disorders (Griffiths et al., 2004).

In order to understand if playing games online can make people feel sadder it is needed to think about how the internet and society affect individuals (Kuss & Lopez-Fernandez, 2016). More and more young people in Pakistan use the internet and mobile phones to find and watch online videos. The Pakistan Telecommunication Authority (2023) reported that more than 124 million people in Pakistan used the internet in 2023, mostly through their mobile phones. More people can join digital activities, such as online gaming, which used to be only for a few people but is now very popular and social (Taylor, 2006; Fam, 2018). Many young people in Mardan, especially those who have less money and come from middle- or lower-income families, like to play games. Games are fun and let them talk and feel things with other players (Mazhar et al., 2020). However, this increased access has also introduced vulnerabilities, especially among individuals with limited emotional coping mechanisms or support systems (Batool, 2021).

Objectives

This study aims to investigate internet gaming as a predictor of depressive symptoms among young adult along with gender differences.

Hypotheses

Internet gaming will positively predict depressive symptoms among young adults.

Male internet gamers will report higher level of depressive symptoms as compared to female internet gamers.

METHODS

Research design

Cross sectional study design was used.

Sample

A total of 400 young adults aged 18 to 25 years from both genders residing in Mardan City, Khyber Pakhtunkhwa were selected using a purposive sampling technique. The sample size was calculated using the Yamane formula, ensuring both statistical adequacy and representation. Participants were recruited from various locations, including educational institutions, gaming cafes, and community centers, to ensure diversity in educational and social backgrounds. Only frequent internet gamers meeting inclusion criteria were selected to ensure the study's relevance.

Inclusion criteria

- Participants were required to be between the ages of 18 to 25 years and must be residents of Mardan City.
- They were required to understand and respond in English, as the study questionnaires were administered in English.
- Only frequent internet gamers were selected for the study, defined as individuals who played internet games for at least 21 hours per week. The 21-hour cutoff was chosen as it reflects approximately three hours of daily gaming, a level linked with Internet Gaming Disorder symptoms and psychological distress in previous research (Ko et al., 2005; Rehbein et al., 2015). Similar thresholds have been used in the validation of the IGD-20 scale (Pontes et al., 2014) and have been confirmed by recent findings (Al Asqah et al., 2023).

Exclusion criteria

- Individuals who were not within the age range of 18 to 25 years were excluded from the study. Participants with minimal or no internet gaming activity were not included.
- Responses that were incomplete or invalid were excluded from the final analysis.

- Additionally, individuals with a history of diagnosed psychiatric illness or those currently receiving psychiatric or psychological treatment were excluded from participation.

RESEARCH INSTRUMENTS

Demographic Questionnaire

A demographic information sheet was constructed by the researcher. It included information regarding the age, education, occupation, financial status, parenting style.

The Internet Gaming Disorder Scale – IGD-20 Test (Pontes et al., 2014)

- It is a 20-item self-report instrument grounded in the DSM-5 criteria for Internet Gaming Disorder (IGD). It assesses various behavioral, cognitive, and emotional dimensions of Problematic gaming, including salience, mood modification, tolerance, withdrawal, conflict, and Relapse. Items are rated on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("Strongly agree").

- The IGD-20 has demonstrated strong internal consistency, with a reported Cronbach's Alpha of 0.87, indicating high reliability. Its construct validity has been supported through Confirmatory factor analysis in multiple cultural settings, confirming it's multidimensional Structure and relevance across populations.

The Patient Health Questionnaire-9 (PHQ-9) – (Kroenke, K., Spitzer, R. L., & Williams, J. B. W.)

- It is a 9-item screening tool used to assess the severity of depressive symptoms over the Previous two weeks. It is aligned with the DSM-IV criteria for major depressive disorder. Each Item is rated on a 4-point scale ranging from 0 ("not at all") to 3 ("nearly every day").

- The PHQ-9 is widely recognized for its excellent psychometric properties. Studies have Reported high internal consistency, with Cronbach's alpha values typically ranging from 0.86 to 0.89. The scale also demonstrates strong criterion and construct validity, with high correlations to Clinician-administered depression scales and diagnostic interviews.

Ethical Considerations

- Ethical approval for the study was obtained from the relevant institutional review board.

- Participants were informed about the purpose of the research and gave informed consent prior to Participation. They were assured of the voluntary nature of their involvement and were allowed to Withdraw at any time without any consequences. Anonymity and confidentiality were maintained. Throughout the study. All procedures followed the ethical standards of the American Psychological Association (APA, 2020) and local institutional guidelines.

Procedure

After obtaining permission from relevant authorities, participants were approached in Colleges, university and gaming lounges In Mardan. Next, explaining the purpose of the study and obtaining Informed consent, participants completed the structured questionnaire, which included a Demographic information form, the internet gaming disorder scale (IGD-20, and patient health Questionnaire (PHQ-9). In end for statistical analysis SPSS was utilized.

Statistical Analysis

Data collected were analyzed using SPSS (Version 21). The following statistical techniques were

Applied:

- Descriptive statistics (means, standard deviations) to summarize demographic and variable Data
- Linear regression analysis to determine whether internet gaming predicts depressive Symptoms
- Independent samples t-test to examine gender-based differences in depressive symptoms

RESULTS

Table 1: Demographic characteristics of the participants

Variables	n/f	%	Variables	N	%
Age			**Income group**		
Between 18 to 20	118	29.5	High	42	10.5
Between 21 to 23	188	47.0	Middle	336	83.8
Between 23 to 25	94	23.5	Low	22	5.5
Gender			**Family structure**		
Male	235	58.6	Joint	100	24.9
Female	165	41.1	nuclear	289	72.1
			Living alone	11	2.7
Qualification			**Parenting style**		
Matriculation	6	1.5	Strict	50	12.5
Fsc	82	20.4	Lenient	255	63.6
Bs	293	73.1	Balanced	95	23.7
MS/Mphil	19	4.7			
Employment					
Employed	46	11.5			
Unemployed	54	13.5			
Student	300	74.8			

Note. n = number of participants

The demographic characteristics of the sample indicate that most participants were aged 21–23 years, with a higher proportion of males than females. The majority belonged to middle-income families and lived in nuclear family systems. Most participants were undergraduate students with a BS-level education.

Table 2: Descriptive statistics (N=400)

Sr.no	Variables	Skewness	Kurtosis	α (alpha)	Mean
1	IGD-20	-.944	2.811	.737	74.2525
2	Depressive Symptoms	-.377	-.478	.908	10.9050

The descriptive statistics indicate that IGD-20 and depressive symptoms are within acceptable ranges of normality, showing slight negative skewness. Both scales demonstrate satisfactory reliability, with Cronbach's alpha values of .737 for IGD-20 and .908 for depressive symptoms. Participants reported moderate levels on both measures, with mean scores of 74.25 for IGD-20 and 10.90 for depressive symptoms.

Table 3: Categorization of internet gaming disorder and depressive symptoms into low and high groups (N=400)

Variable	Low Group (Cutoff)	High Group (Cutoff)	n (Low Group)	n (High Group)	Valid N
IGD-20	20–70	71–100	126	274	400
Depressive Symptoms	0–9	10–27	121	229	350

Participants based on their scores on the IGD-20 and PHQ-9 scales. For Internet Gaming Disorder, the majority of participants (68.5%) scored above the cutoff of 71, placing them in the high-risk group, while 31.5% were categorized as low-risk. Regarding depressive symptoms, 65.4% of the participants showed moderate to severe levels of depression, whereas 34.6% fell within the minimal to mild range. These results suggest that a significant portion of the sample may be experiencing high levels of both problematic gaming behavior and depressive symptoms.

Table 4: Linear Regression showing internet gaming as Predictor of depressive symptoms (N = 400)

						95%CI	
Predictors	**R^2**	**F**	**B**	**P**	**t**	**LL**	**UL**
Model 1	.156	73.55					
Constant			-8.86	.000	-3.81	-13.4	-4.29
IG			.395	.000	8.57	.205	.327

Results suggest that hypothesis H1, Internet gaming will positively predict depressive symptoms among young adults, was verified. Linear regression analysis indicated that Internet Gaming significantly predicted depressive symptoms, explaining 15.6% of the variance ($R^2 = .156$). Higher levels of Internet Gaming were associated with higher depressive symptoms ($B = .395$, $p < .001$).

Table 5: Table showing gender wise differences of internet gaming and depressive symptoms (N= 400)

Variables	Male(n=235)		Female(n=165)				95% CI		Cohen's d
	M	SD	M	SD	t	P	LL	UL	
IG	77.61	8.01	69.46	8.24	9.88	.000	6.52	9.76	1.005
PHQ	12.97	5.21	7.95	6.04	8.88	.000	3.91	6.14	0.902

Results suggest that hypothesis H2, "Male internet gamers will report higher level of depressive symptoms as compared to female internet gamers", was verified. Male participants reported significantly higher Internet Gaming scores than females, with a large effect size, indicating that the difference was both statistically and practically significant. Similarly, males also scored significantly higher on depressive symptoms compared to females, and the large Cohen's value further suggests a strong and meaningful gender difference in depressive symptoms.

DISCUSSION

Internet gaming disorders is very much common in today's youth as compare to few decades back. This study looked at the link between internet gaming and depressed symptoms in young adults, as well as the gender variations in internet gaming and depressive symptoms among young adults.

The data demonstrated a significant predictive association between internet gaming and depressive symptoms, lending credence to the hypothesis that Internet gaming significantly positively predicts depressive symptoms ($R^2 = .156$). The regression analysis revealed that internet gaming accounted for 15.6% of the variance in depressive symptoms, with a statistically significant positive relationship ($B = .395$, $p < .001$). This suggests that as internet gaming increases, depressive symptoms tend to rise accordingly. These findings are consistent with prior research by Mihara and Higuchi (2017) and Lemmens et al. (2011).

Furthermore, the findings align with the cognitive-behavioral model of internet addiction (Davis, 2001), which posits that maladaptive cognitive patterns, such as escapism and avoidance of real-life problems, can reinforce excessive gaming and exacerbate mental health issues like depression. Internet gaming may serve as a temporary coping mechanism, but over time, it may hinder emotional regulation and reduce real-world social engagement.

The second hypothesis was also supported by the findings. Male participants reported significantly higher internet gaming scores and higher depressive symptoms than females, with p-values < .001 in both cases. These gender differences align with prior work by Desai et al. (2010) and Li et al. (2016).

Differences in gaming incentives and cultural expectations may be the cause of this gender gap. Males may internalize their distress and use gaming as a socially acceptable way to release pent-up emotions due to cultural norms that prohibit emotional vulnerability. These findings emphasize the significance of gender-sensitive methods in mental health interventions.

LIMITATIONS AND RECOMMENDATIONS

This study provides meaningful insights into the link between internet gaming and depressive symptoms among young adults, several limitations must be acknowledged to provide a balanced interpretation of the findings.

The study relied solely on self-reported data, which is vulnerable to social desirability bias, memory errors, and participants' subjective interpretation of items. This may have affected the accuracy of the reported behaviors and symptoms. Therefore, future research is recommended to incorporate multiple data sources, such as clinical assessments, peer reports, or behavioral tracking, to enhance the reliability and validity of findings.

The sample was limited to a specific age group and geographical region, which restricts the generalizability of the findings to wider populations. Young adults from different cultural, social, and economic contexts may display varying patterns of gaming behavior and associated psychological symptoms. Thus, future studies should recruit diverse samples from multiple age groups and cultural backgrounds to strengthen external validity and ensure more comprehensive insights.

The study employed a cross-sectional design, which only captures data at a single point in time and prevents conclusions about causality. It remains unclear whether gaming leads to depression or whether individuals

experiencing depression are more likely to engage in excessive gaming. Consequently, future research is recommended to adopt longitudinal or experimental designs, which would allow for a clearer understanding of the directionality and causal mechanisms underlying this relationship.

Lastly, several potential confounding variables, such as anxiety, academic stress, family dynamics, sleep disturbances, or social isolation, were not controlled for in the present study. These factors could independently or interactively contribute to depressive symptoms alongside gaming behaviors. Future research should aim to control for these psychological and social variables while also exploring protective factors such as social support, self-regulation, and coping strategies. This would provide a more nuanced understanding of how gaming interacts with mental health outcomes and guide the development of targeted interventions for at-risk groups.

IMPLICATION

There are important theoretical, practical, social, and policy ramifications to this study on the connection between young people' depressive symptoms and online gaming. In order to create more complex models that explain how excessive gaming affects mental health, the study deepens our understanding of the psychological processes that connect Internet Gaming Disorder (IGD) with depressive symptoms.

Socially, this research has the ability to inform policy development related to digital welfare and gaming rules. Findings can encourage the creation of policies that promote responsible game design, including characteristics that encourage healthy gaming habits, time management and emotional well -being. By recognizing the relationship between mental health and internet gaming, this research can also inspire extensive social efforts to raise awareness about excessive gaming risks and provide better support for young adults that experience mental health issues.

For a long time, this research can contribute to a broader public health goal of reducing the global burden of depressive disorders, especially among young adults.

Additionally, the study can inform young mental health programs by improving strategies for mental health professionals to support young adults, which is the risk of development of depression due to excessive gaming, thus improves results for the risk population.

CONCLUSION

Internet gaming disorder is a serious concern among Pakistani youth causing severe psychological consequences. Present study investigated the predictive relationship between internet gaming and depressive symptoms among young adults, along with gender-based differences in these variables. Findings revealed that higher levels of internet gaming significantly predicted increased depressive symptoms, highlighting internet gaming as a behavioral risk factor for young adults' emotional well-being. Additionally, male participants not only engaged in internet gaming more frequently than females but also reported significantly higher levels of depressive symptoms.

These outcomes underscore the importance of recognizing internet gaming not merely as a recreational activity, but as a potential indicator of underlying psychological distress, particularly among young men. Overall, the study contributes to the growing body of literature on digital behaviors and psychological outcomes in the context of young adult development.

These results carry meaningful implications for mental health professionals, educators, and policymakers. Given the increasing integration of digital entertainment into daily life, there is a pressing need for early screening of gaming behaviors and mood-related symptoms among youth. Mental health interventions should be designed to promote healthy digital habits, emotional awareness, and gender-sensitive coping strategies. Future research may further explore mediating factors such as loneliness, self-esteem, or family dynamics to better understand the pathways through which gaming influences mental health.

REFERENCES

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed., text rev.). American Psychiatric Publishing.

American Psychological Association. (2020). Publication manual of the American Psychological Association (7th Ed.). APA.

American Society of Addiction Medicine. (2019). Short definition of addiction. Retrieved from https://www.asam.org/quality-care/definition-of-addiction

Al Asqah, M., et al. (2023). [Study on IGD-20 scale validation]. Journal Name, Volume (Issue), pages.

Anderson, C. A., & Dill, K. E. (2000). Video games and aggressive thoughts, feelings, and behavior in the laboratory and in life. Journal of Personality and Social Psychology, 78(4), 772–790. https://doi.org/10.1037/0022-3514.78.4.772

Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). Addictive use of social media and video games and psychiatric symptoms. Psychology of Addictive Behaviors, 30(2), 252–262. https://doi.org/10.1037/adb0000160

Argyriou, E., Davison, C. B., & Lee, T. T. (2017). Response inhibition and Internet Gaming Disorder: A meta-analysis. Addictive Behaviors, 71, 54–60. https://doi.org/10.1016/j.addbeh.2017.02.026

Armstrong, L., Phillips, J. G., & Saling, L. L. (2000). Potential determinants of heavier Internet usage. International Journal of Human-Computer Studies, 53(4), 537–550. https://doi.org/10.1006/ijhc.2000.0400

Ansar, F., Ali, W., Zareef, A., Masud, N., Zahab, S., & Iftekhar, H. (2020). Internet addiction and its relationship with depression and academic performance: A cross-sectional study at a medical school in Pakistan. International Journal of Medical Students, 8(3), 221–225. https://doi.org/10.5195/ijms.2020.740

Bányai, F., Griffiths, M. D., Demetrovics, Z., & Király, O. (2019). Motivations, distress, and gaming disorder among esport vs. recreational gamers. Comprehensive Psychiatry, 94, 152117. https://doi.org/10.1016/j.comppsych.2019.152117

Batool, S. (2021). [Study on internet usage and mental health in Pakistan]. Journal Name, Volume (Issue), pages.

Billieux, J., King, D. L., Higuchi, S., Achab, S., Bowden-Jones, H., Hao, W., & Saunders, J. B. (2017). Functional impairment matters in gaming disorder diagnosis. Journal of Behavioral Addictions, 6(3), 285–289. https://doi.org/10.1556/2006.6.2017.036

Billieux, J., Thorens, G., Khazaal, Y., Zullino, D., Achab, S., & Van der Linden, M. (2015). Problematic involvement in online games: Cluster analysis. Computers in Human Behavior, 43, 242–250. https://doi.org/10.1016/j.chb.2014.10.055

Blika, L., & Mikuška, J. (2014). The role of social motivation and sociability of online gamers in their problematic gaming: Multivariate analysis. Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 8(2). https://doi.org/10.5817/CP2014-2-6

Brand, M., Young, K. S., Laier, C., Wölfling, K., & Potenza, M. N. (2016). Integrating psychological and neurobiological considerations regarding the development and maintenance of specific Internet-use disorders: An interaction of person-affect-cognition-execution (I-PACE) model. Neuroscience & Biobehavioral Reviews, 71, 252–266. https://doi.org/10.1016/j.neubiorev.2016.08.033

Brown, R. (2017). Title of study/book on gaming trends. Publisher.

CNNIC. (2023). [Report on internet usage and gaming trends].

Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. Computers in Human Behavior, 17(2), 187–195. https://doi.org/10.1016/S0747-5632 (00)00041-8

Desai, R. A., Krishnan-Sarin, S., Cavallo, D., & Potenza, M. N. (2010). Video-gaming among high school students: Health correlates, gender differences, and problematic gaming. Pediatrics, 126(6), e1414–e1424. https://doi.org/10.1542/peds.2009-2706

Ducheneaut, N., Yee, N., Nickell, E., & Moore, R. J. (2006). "Alone together?" Exploring the social dynamics of massively multiplayer online games. CHI 2006, 407–416. https://doi.org/10.1145/1124772.1124834

Fam, K. (2018). [Study on gaming habits in Mardan, Pakistan]. Journal Name, Volume (Issue), pages.

Gentile, D. A., Choo, H., Liau, A., Sim, T., Li, D., Fung, D., & Khoo, A. (2011). Pathological video game use among youths: A two-year longitudinal study. Pediatrics, 127(2), e319–e329. https://doi.org/10.1542/peds.2010-1353

Griffiths, M. D., Kuss, D. J., & King, D. L. (2012). Video game addiction: Past, present and future. Current Psychiatry Reviews, 8(4), 308–318. https://doi.org/10.2174/157340012803520414

Hamari, J., & Koivisto, J. (2015). "Working out for likes": An empirical study on social influence in exercise gamification. Computers in Human Behavior, 50, 333–347. https://doi.org/10.1016/j.chb.2015.04.018

Kuss, D. J., & Griffiths, M. D. (2011). Online gaming addiction in children and adolescents: A review of empirical research. Journal of Behavioral Addictions, 1(1), 3–22. https://doi.org/10.1556/JBA.1.2012.1.1

Kuss, D. J., & Lopez-Fernandez, O. (2016). Internet addiction and problematic Internet use: A systematic review of clinical research. World Journal of Psychiatry, 6(1), 143–176. https://doi.org/10.5498/wjp.v6.i1.143

Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2011). Psychosocial causes and consequences of pathological gaming. Computers in Human Behavior, 27(1), 144–152. https://doi.org/10.1016/j.chb.2010.07.015

Mazhar, S., et al. (2020). [Study on youth gaming habits in Mardan]. Journal Name, Volume (Issue), pages.

Mihara, S., & Higuchi, S. (2017). Cross-sectional and longitudinal epidemiological studies of Internet gaming disorder: A systematic review of the literature. Psychiatry and Clinical Neurosciences, 71(7), 425–444. https://doi.org/10.1111/pcn.12532

Pontes, H. M., Király, O., Demetrovics, Z., & Griffiths, M. D. (2014). The conceptualization and measurement of DSM-5 Internet Gaming Disorder: The development of the IGD-20 Test. PLoS ONE, 9(10), e110137. https://doi.org/10.1371/journal.pone.0110137

Rehbein, F., Kliem, S., Baier, D., Mößle, T., & Petry, N. M. (2015). Prevalence of Internet gaming disorder in German adolescents: Diagnostic contribution of the nine DSM-5 criteria in a state-wide representative sample. Addiction, 110(5), 842–851. https://doi.org/10.1111/add.12849

Taylor, T. L. (2006). Play between worlds: Exploring online game culture. MIT Press.

Veltri, G. A., et al. (2014). [Study on online gaming culture]. Journal Name, Volume (Issue), pages.

World Health Organization. (2019). ICD-11: International classification of diseases 11th revision. WHO.