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Academic Anxiety and Online Gaming Addiction: The Moderation Effect of Emotional Regulation in Adolescent

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Abstract

Background: The rising prevalence of online gaming addiction among adolescents underscores the need to understand its contributing factors. Psychological factors, such as academic anxiety and emotion regulation, may play a crucial role. **Objective:** This study aims to examine whether emotion regulation moderates the relationship between academic anxiety and online gaming addiction in adolescents. **Method**: A cross-sectional design was used, with 173 adolescents aged 17-21 years. Measurements included scales for academic anxiety, emotion regulation, and online gaming addiction. Moderation analysis was performed. **Results**: The results showed a significant positive relationship between academic anxiety and online gaming addiction (SE = 0.0771, p < .001), as well as between emotion regulation and online gaming addiction (SE = 0.0378, p = 0.043). However, the interaction between academic anxiety and emotion regulation was not statistically significant (SE = 0.0109, p = 0.646). **Conclusion**: Academic anxiety and emotion regulation are both associated with online gaming addiction, but emotion regulation does not moderate their relationship. Interventions to reduce academic anxiety and improve emotion regulation are needed to prevent gaming addiction among adolescents.

Keywords: Academic anxiety; adolescent; emotional regulation; online gaming addiction

Abstrak

Latar Belakang: Meningkatnya prevalensi kecanduan game online di kalangan remaja menunjukkan pentingnya pemahaman terhadap faktor-faktor yang mempengaruhi. Aspek psikologis, seperti kecemasan akademik dan regulasi emosi dapat memainkan peran penting. **Tujuan:** Penelitian ini bertujuan untuk menyelidiki efek moderasi regulasi emosi terhadap hubungan antara kecemasan akademik dan kecanduan game online di kalangan remaja. **Metode**: Desain penelitian *cross-sectional* dengan melibatkan 173 sampel remaja usia 17-21 tahun. Pengukuran dengan skala kecemasan akademik, regulasi emosi, dan kecanduan game online. Teknik analisis moderasi digunakan untuk menganalisis data. **Hasil**: Temuan menunjukkan adanya korelasi positif yang signifikan antara kecemasan akademik dan kecanduan game online (SE = 0.0771, p < .001), serta hubungan positif antara regulasi emosi dan kecanduan game online (SE = 0.0378, p = 0.043). Namun, interaksi antara kecemasan akademik dan regulasi emosi tidak signifikan (SE = 0.0109, p = 0.646). **Simpulan**: Penelitian ini menegaskan bahwa kecemasan akademik dan regulasi emosi berkontribusi terhadap kecanduan game online, tetapi regulasi emosi tidak mempengaruhi kekuatan hubungan tersebut. Intervensi untuk menurunkan kecemasan akademik dan meningkatkan regulasi emosi diperlukan untuk mencegah kecanduan game online di kalangan remaja.

Keywords: Kecemasan akademik; remaja; regulasi emosi; kecanduan game online

Introduction

The usage of gadgets such as smartphones, tablets, and computers has become an integral part of adolescents' lives in the current digital era (Dienlin & Johannes, 2020; Herdianto & Syahidin, 2020). This phenomenon is attributed to various factors, including rapid technological advancements, widespread internet accessibility, and the growth of social media platforms (Haddock et al., 2022). Adolescents tend to utilize gadgets for communication with friends through text messaging, voice calls, or social media applications like WhatsApp, Instagram, or Snapchat (Best et al., 2014). Additionally, adolescents use gadgets to access information from various sources, including the internet, websites, and applications (Lahti et al., 2021). Gadgets are also employed by adolescents for entertainment purposes, enabling them to watch videos on YouTube, listen to music via streaming apps, play games, or watch television series and movies through streaming platforms such as Netflix or Disney+ (Cascio et al., 2023; Moreno et al., 2022).

In the current digital era, online gaming has become a significant aspect of adolescents' lives (Ponce-Blandón et al., 2020). These games provide immersive and interactive experiences, allowing adolescents to engage in global competitions, collaborations, and social interactions (Király et al., 2015; Nisson et al., 2022). Adolescents use gadgets for online gaming primarily for entertainment, competition, and social engagement (Hellström et al., 2015; Li et al., 2023). However, excessive use of these gadgets for gaming can lead to problems, including addiction (Kim et al., 2023; Ryoo et al., 2021).

Online gaming addiction is characterized by persistent and recurrent usage of online games leading to significant impairment or distress. This condition is marked by a tendency towards internet gaming, psychological withdrawal, development of tolerance towards gaming, escalating need for increased gaming usage, significant loss of interest in other activities, internet gaming usage despite negative consequences, and significant decline in social and occupational domains (Sachdeva & Verma, 2015). Online gaming addiction is a serious concern as it can disrupt adolescents' daily functioning. Online gaming addiction has been reported to disrupt mental health, increase depression (Labana et al., 2020), anxiety (Idris et al., 2023), and psychosis, as well as disrupt family relationships (De Pasquale et al., 2020), decrease quality of life (Beranuy et al., 2020), increase social phobia (Wei et al., 2012), decrease school performance, and increase sleep deprivation (Chamarro et al., 2020; Fauzi & Rusli, 2024; Király et al., 2015). Online gaming addiction can also affect adolescents' eating patterns, physical activity, and social interactions, which may disrupt their overall emotional and social development (Griffiths, 2022; Haberlin & Atkin, 2022). This disruption can manifest as changes in dietary habits, reduced physical exercise, and impaired social engagement, all contributing to a broader decline in well-being and development.

Online gaming addiction is influenced by several complex factors. Firstly, game characteristics such as addictive reward systems and increasing difficulty levels can trigger emotional and chemical responses in the brain, such as increased dopamine, making players continuously desire to play (Weinstein & Lejoyeux, 2020). Additionally, individuals with high levels of stress, anxiety, or depression tend to seek escape in the gaming world to avoid real-life issues (Pallavicini et al., 2022). Social interaction within games also plays a crucial role, as it can provide feelings of inclusion and community for those who feel isolated or lonely in their daily lives (Heng et al., 2021). Personal factors such as lack of self-control, imbalance between online and offline life, and inability to cope with frustration and failure in games can exacerbate online gaming addiction issues (Xiang et al., 2022). Therefore, online gaming addiction is a serious issue that requires attention.

Academic stress has been found to be associated with addictive behaviors such as internet addiction or online gaming addiction (Jun & Choi, 2015). Anxiety is known to act as a mediator in the relationship between stress and internet addiction (Shen et al., 2023). Academic anxiety can play a significant role in influencing online gaming addiction. Academic anxiety arises when individuals feel pressured or worried about their academic performance, including pressure to achieve high grades, meet parental or teacher expectations, or compete with peers (Gào, 2023). When experiencing high academic anxiety, individuals may seek escape or distraction, and online gaming can be an easily accessible option (Di Blasi et al., 2019; Sege et al., 2018). However, the relationship between academic anxiety and online gaming addiction remains limited in its research.

In the context of online gaming addiction, emotional regulation plays a crucial role (Lin et al., 2020; Schettler et al., 2023; Yen et al., 2018). Individuals experiencing difficulties in regulating their emotions tend to seek ways to avoid or escape from the negative feelings they experience. Online games offer an easily

accessible escape, where players can feel safe to express their emotions or divert attention from real-life problems.

Previous research has shown that separately, academic anxiety and emotional regulation can influence one's tendency to seek escape in online gaming behavior (Jun & Choi, 2015; Lin et al., 2020; Schettler et al., 2023; Yen et al., 2018). However, there is still limited research exploring the role of emotional regulation in moderating the relationship between academic anxiety and online gaming addiction in adolescents. Therefore, this study aims to provide deeper insights into the complexity of the relationship between psychological factors in online gaming addiction, particularly in identifying to what extent emotional regulation can influence the relationship between academic anxiety and online gaming addiction in adolescents.

Identifying factors moderating emotional regulation opens opportunities for developing effective prevention programs that can benefit various stakeholders, such as parents, educators, mental health professionals, and policymakers.Understanding the factors that moderate emotional regulation in adolescents provides a pathway to designing targeted interventions aimed at mitigating the risks associated with online gaming addiction. By recognizing the role of emotional regulation in shaping adolescents' responses to academic stressors and online gaming stimuli, prevention programs can be tailored to address specific vulnerabilities and promote healthier coping strategies.

Method

This research employs a quantitative correlational approach to examine the relationship between variables, particularly within the context of emotional regulation as a moderator in the relationship between academic anxiety and online gaming addiction.

Sample

The sample included in this study were classified as late adolescents, typically encompassing individuals transitioning from adolescence to young adulthood. The study involved a total of 173 participants, with ages ranging from 17 to 21 years, a mean age of 19.68 years, and a standard deviation of 1.55. This indicates that the majority of the sample fell within the late adolescent age range, with slight variations observed around the mean age. Participants were selected using a convenience sampling technique, which involves selecting individuals who are readily available and willing to participate. This sampling method ensures that the sample is representative of the target population within the constraints of the study's resources.

Data Measurement

The research instruments comprised the Emotion Regulation Questionnaire (ERQ) for assessing emotional regulation, the Academic Anxiety Scale (AAS) for measuring academic anxiety, and the Indonesian Ten-item Internet Gaming Disorder Test for evaluating online gaming addiction. The ERQ, developed by Gross & John (2003), consists of 10 items that gauge two emotional regulation strategies: cognitive reappraisal and expressive suppression. The Indonesian version of ERQ was utilized, which has undergone reliability testing, yielding internal consistencies of 0.951 for cognitive reappraisal and 0.790 for expressive suppression (Radde et al., 2021).

The Academic Anxiety Scale (AAS), adapted from aspects developed by Cassady (2010), encompasses bodily symptoms, worry, tension, and test irrelevant thinking. Comprising 11 statement items, the scale exhibited strong internal consistency with $\alpha = 0.883$ (Cassady et al., 2019).

For assessing online gaming addiction, the Indonesian Ten-item Internet Gaming Disorder Test was employed. Developed by Király et al. (2017), this scale evaluates Internet Gaming Disorder (IGD) based on the diagnostic criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). The test comprises 10 items, with items 1 to 8 representing individual diagnostic criteria of IGD, while items 9 and 10 collectively identify negative consequence domains. Psychometric properties of the Indonesian version of the IGDT-10 were examined, revealing a unidimensional structure with Cronbach's alpha of 0.72 and composite reliability of 0.92 (Siste et al., 2022).

Data collection was facilitated through the utilization of an online survey form specifically designed for adolescents. To ensure effective outreach to the target demographic, the survey link was extensively distributed across various social media platforms commonly frequented by adolescents. This dissemination strategy aimed to maximize participation from the adolescent population, thereby enhancing the representativeness and validity of the collected data.

Data Analysis

Data analysis comprises descriptive analysis, assumption verification, and moderation testing. All analytical procedures are carried out utilizing the statistical software Jamovi. The moderation analysis utilizes the medmod module. By means of moderation analysis, the study assesses if the association between the examined variables is affected by a third variable, namely emotional regulation (The Jamovi Project, 2023).

Result

Based on the data analysis results, it was found that the majority of respondents in this research sample exhibited a moderate level of online gaming addiction, with an average score of approximately 29.6 (SD = 3.98). Although there were variations, most respondents showed a similar level of addiction close to the average score. Academic anxiety levels tended to be high, with an average score of around 31.3 (SD = 4.49), indicating significant variation in academic anxiety responses among respondents. Meanwhile, the average score for emotional regulation was approximately 53.6 (SD = 7.13), suggesting that overall, respondents exhibited a relatively good level of emotional regulation. However, significant variation in emotional regulation levels was also observed among respondents. These findings provide an initial overview of the research sample characteristics, which are crucial for further understanding the relationships between the observed variables. Descriptive data are presented in Table 1.

Table 1. Descriptives Statistic

	N	Missing	Mean	Median	SD	Min	Max
Game addiction	173	0	29.6	30.0	3.98	20.0	39.0
Academic anxiety	173	0	31.3	31.0	4.49	22.0	41.0
Emotion Regulation	173	0	53.6	54	7.13	28	70

Based on the assumption testing results, it was indicated that the data followed a normal distribution, as evidenced by p = 0.603. Additionally, there was no multicollinearity observed between the predictor variables, with a VIF value of 1.00 (VIF < 10), and a Tolerance value of 0.994 (p > 0.01).

Table 2. Moderation Estimates

	Estimate	SE	Z	p
Academic Anxiety	0.28096	0.0771	3.643	< .001
Emotion Regulation	0.07665	0.0378	2.026	0.043
Academic Anxiety ✻ Emotion Regulation	-0.00501	0.0109	-0.459	0.646

The moderation analysis results revealed that academic anxiety had a significant positive influence on online gaming addiction (B = 0.28096, SE = 0.0771, p < .001). This indicates that higher levels of academic anxiety are associated with a greater likelihood of experiencing online gaming addiction. Similarly, emotional regulation also had a significant positive influence on online gaming addiction (B = 0.07665, SE = 0.0378, p = 0.043). This suggests that individuals with better emotional regulation are more likely to experience online gaming addiction. Although the effect size is smaller compared to academic anxiety, this result remains statistically significant.

However, the interaction between academic anxiety and emotional regulation (academic anxiety ✻ emotional regulation) was not statistically significant (B = -0.00501, SE = 0.0109, p = 0.646). This indicates that the combined effect of academic anxiety and emotional regulation does not have a significant impact on online gaming addiction. In other words, while both factors individually influence online gaming addiction, there is no significant interaction between them in this context. The moderation analysis results are presented in Table 3.

Table 3. Simple Slope Estimates

	Estimate	SE	Z	p
Average	0.281	0.0770	3.65	< .001
Low (-1SD)	0.317	0.0991	3.19	0.001
High (+1SD)	0.245	0.1173	2.09	0.036

Note. shows the effect of the predictor on the dependent variable at different levels of the moderator

The simple slope analysis presented in Table 3. explores the effect of the predictor variable academic anxiety on the dependent variable online gaming addiction at various levels of the moderator emotional regulation. The results indicate that at the average level of emotional regulation, the predictor academic anxiety has a significant effect on online gaming addiction (B = 0.281, SE = 0.0770, z = 3.65, p < .001).

When emotional regulation is at a low level (1 standard deviation below the mean), the effect of academic anxiety on online gaming addiction remains significant (B = 0.317, SE = 0.0991, z = 3.19, p = 0.001). This suggests that individuals with low levels of emotional regulation tend to have a greater response to academic anxiety regarding online gaming addiction.

On the other hand, at high levels of emotional regulation (1 standard deviation above the mean), the effect of academic anxiety on online gaming addiction remains significant (B = 0.245, SE = 0.1173, z = 2.09, p = 0.036). This indicates that high emotional regulation does not significantly reduce the impact of academic anxiety on online gaming addiction. Thus, this simple slope analysis provides a deeper understanding of how emotional regulation moderates the relationship between academic anxiety and online gaming addiction, showing that the level of emotional regulation does not change the significance of the effect of academic anxiety on online gaming addiction.

Discussion

The findings of this study demonstrate that academic anxiety significantly correlates positively with online gaming addiction. This association aligns with the findings of several previous studies that have identified the relationship between psychological factors such as anxiety and addictive behaviors, including internet addiction (Shen et al., 2023; Xie et al., 2022). Previous research has highlighted the relationship between stress, anxiety, and addiction in various contexts, including online gaming addiction. For instance, Cho et al. (2021) found that high levels of stress are associated with a greater tendency to experience online gaming addiction. These findings suggest that psychological pressure, such as anxiety, may play a significant role in the development and maintenance of excessive gaming habits (Wang et al., 2022).

The results of the study are also reflect the psychological theories of coping and avoidance, indicating that individuals may use online gaming as a mechanism to cope with stress or anxiety related to academic pressures or other life stressors (Di Blasi et al., 2019; Lewinson et al., 2023). Online games offer a temporary escape from academic demands, providing enjoyment and relaxation that may mitigate stress. However, this coping strategy can lead to a negative cycle where gaming addiction exacerbates social isolation and other issues, which in turn increases anxiety and stress, reinforcing the cycle of addiction.

Academic anxiety often leads to high levels of stress, prompting individuals to seek relief through distractions or escapes that offer enjoyable experiences. One such escape is playing online games, which can provide temporary relief from academic pressures and stress. Online games offer immersive environments where individuals can momentarily forget about their academic challenges and experience relaxation and enjoyment (Gros et al., 2020).

Moreover, online games frequently include features that facilitate social interaction among players, such as team play or gaming communities. For individuals who may feel isolated or lonely due to academic stress, these social aspects of gaming can offer significant support. Engaging with friends or participating in online communities can help alleviate feelings of loneliness and provide a sense of belonging and enjoyment (Ballard & Spencer, 2022). This social interaction can be particularly appealing to those who are struggling with academic-related stress, as it offers an avenue for both emotional support and distraction from their academic concerns.

In this context, the role of online gaming as both a coping mechanism and a source of social support highlights its dual function in the lives of adolescents. While it can provide temporary relief and social connection, it is crucial to recognize that excessive gaming may also exacerbate existing issues, including academic anxiety, and potentially contribute to the development of gaming addiction.

The study results also indicate a positive relationship between emotional regulation and online gaming addiction. This finding is consistent with previous literature showing a relationship between emotional regulation and addictive behavior (Liang et al., 2021; Quaglieri et al., 2021; Tsai et al., 2020). An individual who is able to regulate their emotions well may tend to use online games as a means to cope with stress or other emotional disturbances. Therefore, poor emotional regulation may be a contributing risk factor to the development of online gaming addiction.

Individuals with poor emotional regulation tend to struggle with managing and coping with negative emotions, such as stress, anxiety, or frustration (Kozubal et al., 2023; Young et al., 2019). In an effort to avoid or reduce these unpleasant emotional experiences, they may turn to maladaptive behaviors like playing online games. This activity can provide them with an opportunity to temporarily forget about or avoid the negative feelings they are experiencing (Xu et al., 2021).

Online games are often designed with strong reinforcement systems, where players are rewarded or positively reinforced with points, level-ups, or other achievements (Lorenz et al., 2015). For individuals with poor emotional regulation, receiving rewards in the game can provide a sense of comfort and satisfaction that they may not achieve in their daily lives, thereby increasing the urge to continue playing, which in turn can increase the risk of addiction (Duven et al., 2014; Hahn et al., 2014).

The results indicating that the interaction between academic anxiety and emotional regulation is not statistically significant. The non-significant interaction between academic anxiety and emotional regulation suggests that although individuals with high academic anxiety may have different abilities in regulating their emotions, emotional regulation does not significantly affect the level of online gaming addiction.

Playing online games often involves strong reinforcement systems, where players are rewarded or positively reinforced with points, level-ups, or other achievements (Raiha et al., 2020; Wu & Santana, 2022). For individuals with academic anxiety, the experience of positive reinforcement in the game may be highly enticing and compelling, regardless of their emotional regulation abilities. Poor emotional regulation may not moderate this effect because the reinforcement experience in the game can be inherently strong for individuals feeling academic anxiety.

Individuals with academic anxiety often experience a heightened need for emotional support, both from themselves and others (Laksmiwati & Tondok, 2023). When they struggle with emotional regulation, they face challenges in fulfilling these support needs effectively. Consequently, to address their emotional needs, they may engage in activities that offer immediate positive experiences, such as playing online games, without fully considering the long-term consequences. This tendency to seek instant relief through online gaming is not significantly moderated by emotional regulation skills, as the underlying need for emotional support remains high regardless of an individual's ability to manage their emotions effectively.

The results also indicate that at high levels of emotional regulation, the effect of academic anxiety on online gaming addiction remains significant. This suggests that even though individuals have high levels of emotional regulation, they remain vulnerable to the negative effects of academic anxiety on online gaming addiction. High emotional regulation does not provide significant protection against the impact of academic anxiety on online gaming addiction.

These findings collectively indicate that overall, emotional regulation does not change the significance of the effect of academic anxiety on online gaming addiction. This highlights the complexity of the relationship between these psychological factors and suggests that emotional regulation may be just one of many factors to consider in the development of online gaming addiction.

This research provides a deeper understanding of the relationship between academic anxiety, emotional regulation, and online gaming addiction among adolescents. It is important for guiding more effective prevention and intervention efforts in addressing the problem of online gaming addiction. While emotional regulation has a significant influence on online gaming addiction individually, this study shows that emotional regulation does not moderate the relationship between academic anxiety and online gaming addiction. This highlights the complexity of the psychological factors involved in the development of online gaming addiction and suggests that emotional regulation may be just one of many factors to consider.

The implications of this research emphasize the need for a holistic approach to understanding and addressing online gaming addiction. In addition to considering psychological factors such as academic anxiety and emotional regulation, other factors such as social environment, game characteristics, and biological factors need to be considered in designing effective interventions.

The use of a cross-sectional design in this study resulted in limitations in drawing causal conclusions. Future research could expand on this study by using longitudinal or experimental designs to further understand the relationship between the observed variables. Additionally, the study sample was limited to adolescents aged 17-21 years. This limitation restricts the generalizability of the study findings to a wider population. Future studies could expand the sample coverage to obtain a more comprehensive understanding of the phenomenon of online gaming addiction.

Longitudinal research could be conducted to understand the development of online gaming addiction over time and identify the risk factors involved in behavioral changes towards addiction. Additionally, comparative studies among different adolescent populations in cultural, environmental, and socioeconomic contexts could help understand differences in the prevalence and risk factors of online gaming addiction.

Conclusion

The research findings indicate a positive relationship between academic anxiety and online gaming addiction among high school students. This suggests that individuals who experience higher levels of academic anxiety are more likely to develop symptoms of online gaming addiction. Additionally, emotional regulation was found to have a significant relationship with online gaming addiction, indicating that individuals with poorer emotional regulation tend to show higher levels of addiction. However, the interaction effect between academic anxiety and emotional regulation was not statistically significant, suggesting that emotional regulation does not moderate the impact of academic anxiety on online gaming addiction in this sample. The results highlight the importance of addressing both academic stress and emotional regulation in interventions aimed at reducing online gaming addiction among adolescents.

To enhance our understanding of adolescent online gaming addiction, several recommendations for further research and stakeholder involvement can be suggested. Firstly, future research endeavors could benefit from employing longitudinal study designs to monitor the progression of online gaming addiction over time. Such longitudinal investigations would shed light on the factors contributing to the transition from adolescence to adulthood concerning gaming addiction. Additionally, conducting comparative research across diverse adolescent populations, considering cultural, environmental, and socioeconomic factors, would provide valuable insights into the varying prevalence rates and risk factors associated with online gaming addiction among different demographic groups. Moreover, it is essential to conduct experimental studies aimed at testing interventions designed to alleviate online gaming addiction. Exploring the development of intervention programs aimed at enhancing emotional regulation and effectively managing academic anxiety through such experimental approaches is crucial.

Regarding stakeholders, educational institutions play a pivotal role in addressing online gaming addiction among students. They can contribute by offering mental health services and resources to help students cope with academic anxiety and enhance their emotional regulation skills. Furthermore, the online gaming industry bears responsibility for the well-being of its users. Hence, implementing features within games that facilitate controlling playing time and reducing reinforcement effects that may trigger addiction is imperative. Through collaborative efforts between researchers and stakeholders, comprehensive strategies for preventing and addressing online gaming addiction among adolescents can be developed, ultimately promoting healthier gaming habits and overall well-being.

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