The Importance of Classmate Support for Problematic Online Gaming: A Study of Macedonian Adolescents

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Abstract

Adolescents are at particularly high risk of excessive use of digital technology, which can negatively impact their mental and physical health, the dynamics and quality of their interactions within their families, peer groups, schools and wider communities as well as behavioral problems (deviant behavior, self-harm). Hence, the impact that new technologies have on adolescents' mental and physical health and well-being is a particular research challenge in the new digital age. The literature suggests that adolescents may develop gaming addictions similar to substance addictions. Alongside gambling disorder, gaming disorder is one of the few forms of problematic internet use that has been formally classified as a disorder. According to the American Psychiatric Association (2013), it is defined as Internet Gaming Disorder (IGD) in the DSM-5 with the notation "condition for further study", according to the World Health Organization as Gaming Disorder (GD) in the ICD-11. This study aimed to examine the correlation between classmate support with the tendency for excessive or problematic online gaming. The main research question is formulated as: How is peer/classmate support related to the expression of Problematic Online Gaming behaviors among adolescents? A survey was conducted during 2021 and 2022 across 10 high schools in Macedonia using the Qualtrics platform, with 301 adolescents (49.8% male, 50.2% female) aged 15 to 18. A convenience sample was used, selected based on parental and student consent. The study used well-established psychometric instruments: the Internet Gaming Disorder Scale (IGDS9-SF), and the Classmate Support Subscale from Child and Adolescent Classmate's Support Scale (CASSS). Findings indicated that classmate support is associated with a lower tendency for Problematic Online Gaming ($r = -0.21$, $p < 0.01$). The CASSS subscales—emotional, instrumental, appraisal, and informational support—showed that emotional, instrumental, and appraisal support were negatively correlated with problematic internet gaming, whereas informational support was not significantly correlated with problematic internet gaming. It can be assumed that classroom/peer support can be identified as a protective factor (or, if insufficient, as risk factor) for prevention of Problematic Online Gaming among adolescents.

Keywords: Internet gaming disorder, problematic online gaming, classmate support, adolescents, protective and risk factors

Introduction

Adolescents are particularly vulnerable to excessive use of digital technology as they have grown up in digital environments. In this context, problematic internet use (PIU) has emerged as a significant concern in the digital age, posing challenges for researchers and practitioners alike. PIU is commonly defined as an individual's inability to control internet use, resulting in adverse effects on daily functioning (Fineberg et al., 2018). It is more often viewed as a behavioral pattern that negatively affects daily life—such as reduced productivity, lower academic achievement, and impaired social relationships (Caplan, 2002). One of the most prominent forms of PIU is gaming disorder, which involves excessive engagement with online games that influences essential daily activities such as socializing, studying, working, eating, sleeping and self-care. This condition is marked by a loss of behavioral control and significant impairment in areas of psychosocial and physical functioning. The accessibility of games via portable devices, the opportunity for multiplayer interaction, and the potential for financial rewards or status enhancement contribute to the addictive potential of online gaming. Excessive gaming as a form of PIU is recognized as a form of **behavioral addiction** (Griffiths, 2005). Behavioral addictions are defined as repetitive, compulsive behaviors that lead to significant psychological distress and functional impairment, despite the absence of a psychoactive substance. These behaviors are marked by a progressive loss of control, continued engagement despite negative consequences, difficulty delaying gratification, and a persistent urge to recreate the initial euphoric experience associated with the behavior (Kuss & Griffiths, 2012). Individuals often experience several symptoms, including **obsession** (a persistent preoccupation with online activities), **neglect** (the abandonment of offline responsibilities and relationships), and **loss of control** (an inability to reduce or stop internet use, even when intending to do so). This perspective aligns with the biopsychosocial model of addiction (Griffiths, 2005), which emphasizes that addiction is not defined solely by the behavior itself, but by its context, consequences, and the individual's inability to regulate it. It also supports the view that gaming addiction should be understood as a context-dependent phenomenon, shaped by personal vulnerabilities and environmental factors (Kardefelt-Winther, 2014).

Global trends in digital behavior are increasingly reflected in Macedonian society. Children and adolescents actively engage and communicate in online spaces, frequently participating in digital or online gaming. In an effort to explore both protective and risk factors—and to determine whether cultural differences influence excessive gaming behavior—a multinational research study was conducted. Alongside Macedonia, the study included participants from the Czech Republic, Serbia, Finland, Kosovo, the United States, Chile, and Slovakia. The project was coordinated by Palacký University in Olomouc, Czech Republic. The primary aim of this international study was to gain a deeper understanding of the underlying causes that lead adolescents to engage in problematic gaming, to assess their level of psychological dependence, and to examine the extent to which this specific form of addiction affects their mental health and adaptation to their social environment. The research focus of this paper is to explore the role of classmate support in problematic gaming.

Considering that the sample was non-clinical, the broader construct of Problematic Online Gaming is employed in this study. Unlike Internet Gaming Disorder (IGD), which is a clinically defined disorder recognized in the DSM-5, Problematic Online Gaming (POG) is used more

flexibly to capture harmful gaming behaviors in non-clinical populations. Some authors (Király, Nagygyörgy, Griffiths, & Demetrovics, 2014) use the term "problematic online gaming" to avoid the terms *addiction* and *disorder*, thereby describing a broader range of unhealthy or excessive gaming behaviors.

The Dual Impact of Digital Games and Online Tools

While excessive gaming poses risks, digital games and online tools can also offer developmental benefits when used appropriately. According to Kim, Nam, and Keum (2022), moderate online gaming can enhance adolescent well-being by fostering social connections, improving memory, and developing problem-solving skills. However, when gaming becomes excessive, it may lead to impulsivity, aggression, and social withdrawal.

Adolescents who engage in online communication—whether through games, apps, or social media—become part of virtual communities that expand their access to information, learning, entertainment, and social support. Online gaming can help shy or socially withdrawn adolescents build friendships, maintain existing relationships, and develop new social ties (Domahidi et al., 2014; Valkenburg & Peter, 2007; Kuss & Griffiths, 2012, in Colder Carras et al., 2017). Many games incorporate text or voice chat features that facilitate collaboration and social bonding, often extending beyond the game itself (Trepte, Reinecke, & Juechems, 2012).

Moreover, digital tools and games can stimulate cognitive functions. Research has shown that even older adults exhibit increased neural activity during internet use. Certain applications can enhance memory, multitasking, and fluid intelligence, while others offer self-management and mental health interventions.

As the gaming industry continues to grow, digital games have diversified across genres—from strategic simulations requiring teamwork to simpler arcade-style games. Research has begun to explore how specific game characteristics influence players' psychological states. Findings suggest that the psychological effects of gaming vary depending on the nature of the game (Kim et al., 2022). King et al. (2010a, in Kim et al., 2022) categorize game structure into four key dimensions: social features, manipulation and control, narrative and identity, and reward and presentation. Griffiths (2010, in Kim et al., 2022) emphasizes that gaming addiction stems not from the medium itself, but from the design features of games. However, further research is needed to better understand the mechanisms and long-term effects of these technologies on brain function.

From a developmental perspective, online games can play a crucial role in adolescent socialization. In some cases, games even prompt players to explore aspects of their social identity. Salen and Zimmerman (2004) further emphasize that games often function as social contracts, where players agree to interact according to shared rules and meanings. This introduces children and adolescents to the importance of norms in social interaction. Williams et al. (2018) expand on this by describing how online games are structured through shared frameworks that guide behavior, identity, and communication. These frameworks help players distinguish between in-game and out-of-game roles, reinforcing social learning.

Massively multiplayer online role-playing games (MMORPGs) exemplify the social dimension of gaming. Unlike single-player games, MMORPGs require collaboration, competition, and communication with other human players. Participants not only play together but also form relationships, exchange information, and co-create norms that sustain the gaming environment (Eklund, 2015). Supporting this view, Gonçalves et al. (2023) conducted a systematic review of studies published between 1995 and 2020, highlighting the social outcomes of multiplayer gaming. Their findings reveal that digital games foster social interaction through shared interests, community building, and mutual support. This aligns with Feld's theory (1981) that social bonds often form around common activities. Multiplayer gaming provides both a focal point and a sense of belonging, which are key motivators for adolescent engagement (Trepte, Reinecke, & Juechems, 2012).

Online games are increasingly used as a medium for communication among players. Beyond extending interactions with offline friends, their appeal lies in the ability to choose companions based on shared interests, overcome geographical barriers, and communicate in ways that align with personal preferences (de Almeida et al., 2015).

Mental Health Implications of Digital Gaming among Adolescents

The line between healthy engagement and problematic gaming is crossed when the intensity and frequency of gaming begin to interfere with other essential life domains—such as family relationships, academic or work responsibilities, and offline hobbies. According to Jukschat (2021), it is only when extensive gaming leads to neglect of real-life obligations and conflict with social norms, values, and expectations that it becomes a social problem and may be classified as gaming addiction.

In recent years, it has been increasingly recognized that online gaming, particularly among younger users, may elevate the risk of social isolation by displacing time spent nurturing offline friendships (Trepte, Reinecke, & Juechems, 2012). This erosion of face-to-face social bonds is often attributed to the immersive and time-consuming nature of multiplayer games. Moreover, players are frequently exposed to cyberbullying and other forms of online aggression, which can have serious psychological consequences.

Recognizing the severity of excessive gaming, the World Health Organization (WHO, 2019) classified Gaming Disorder as a fully recognized mental health disorder within the category of behavioral addiction in the 11th Revision of the International Classification of Diseases (ICD-11). Similarly, the American Psychiatric Association (APA, 2013) included Internet Gaming Disorder in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), but it is listed as a "condition for further study" meaning that there is a need for more research before being formally diagnosed (Chew & Wong, 2022). The ICD-11 defines Gaming Disorder as: A pattern of persistent or recurrent gaming behavior ('digital gaming' or 'video-gaming'), which may be online or offline, characterized by impaired control over gaming; increasing priority given to gaming over other activities, and continuation or escalation of gaming despite negative consequences. To be diagnosed all three core criteria must be met. For diagnosis, symptoms must persist for at least 12 months (or less in severe cases) and cause significant impairment in personal, social, educational, or occupational functioning (WHO, 2019).

The DSM-5 includes Internet Gaming Disorder as a condition for further study and not a formal disorder (Internet Gaming, n.d.). Unlike the ICD-11, it excludes general internet use,

online gambling, and social media. According to the DSM-5, there are nine diagnostic criteria (to be diagnosed, 5 out of 9 criteria must be met.) The proposed nine criteria include: preoccupation with gaming; withdrawal symptoms (e.g., sadness, anxiety, irritability); tolerance (needing more time to achieve satisfaction); loss of control over gaming time; neglect of previously enjoyed activities; continued gaming despite problems; deception about gaming habits; use of gaming to escape negative emotions; risk to relationships, education, or employment.

Prevalence estimates of Gaming Disorder (GD) reported in epidemiological studies across countries indicate relatively low but significant prevalence rates. For instance, in Germany, GD affects approximately 5.7% of adolescents and young adults aged 12–25 (Wartberg, Kriston, & Thomasius, 2017). In South Korea, prevalence is around 4.0% among adults aged 18–39 and 5.9% among adolescents aged 13–15 (Yu & Cho, 2016). In Slovenia, about 2.1% of 13-year-olds meet criteria for GD (Pontes, Macur, & Griffiths, 2016). There is no accurate data for Macedonia because ICD-11 has not yet been adopted. Problematic gaming is diagnosed according to ICD-10 under the category "other".

Although these figures represent a minority, the severity of GD's impact on physical and mental health justifies continued scientific attention (Schivinski et al., 2018).

Problematic gaming is frequently linked to broader mental health concerns (Tuncturk et al., 2023). High levels of internet addiction correlate with suicidal ideation and self-harm (Evren et al., 2014), and intentional self-harm is a major global public health issue with long-term consequences (Hawton, Saunders, & O'Connor, 2012). In terms of behavioral predictors, Miller et al. (2015) found that the intensity of problematic gaming is associated with rule-breaking behaviors. Other studies suggest that adolescents who exhibit problematic gaming are more likely to experience depressive moods (Yen et al., 2019).

Research highlights the impact of problematic gaming on adolescents' daily routines and physical well-being. Gaming and internet addiction have been associated with increased sleep duration, disruptions in the sleep–wake cycle, and reduced sleep quality (Hawi, Samaha, & Griffiths, 2018; King & Delfabbro, 2019). These behaviors often extend to unhealthy eating patterns (Tetik et al., 2018). Moreover, increased sedentary screen time—including gaming, television viewing, and computer use—has been significantly correlated with obesity. Emerging research also draws parallels between pathological overeating and substance abuse (Carlier et al., 2015). In this context, Mallorquí-Bagué et al. (2017) found that individuals may exhibit a higher incidence of food addiction symptoms, suggesting overlapping mechanisms of behavioral deregulation.

Risk and Protective Factors for Gaming Disorder

Research into the risk and protective factors associated with problematic gaming highlights the influence of individual, familial, and social variables. Some adolescents turn to gaming as a means of forming relationships (Seok et al., 2018), while others exhibit problematic gaming behaviors linked to factors such as lack of close friendships, negative body image, and substance use (Männikkö et al., 2020). Mihara and Higuchi (2017) found that it is often associated with peer-related issues, including bullying—both as victims and perpetrators.

Family dynamics play a critical role. Greater emotional support from family members is associated with lower rates of gaming addiction (Kim, 2015), whereas high parental control and low warmth increase vulnerability (Schneider, King, & Delfabbro, 2017).

Peer relationships play a complex and influential role in the development and maintenance of problematic gaming, particularly during adolescence—a period marked by heightened sensitivity to social dynamics. Positive peer support can act as a protective factor against problematic gaming behaviors. Adolescents who feel emotionally supported and socially connected are less likely to engage in excessive gaming, as they have alternative sources of validation and companionship. Supportive peer environments promote healthy coping strategies and reduce the need to escape into virtual worlds. Conversely, peer rejection, conflict, and feelings of inferiority are strongly associated with intensive gaming symptoms. A 2024 study (Tan et al., 2024) found that peer-related distress was more central to the development of GD than parent-child or teacher-student relationships, highlighting the critical role of peer dynamics in adolescent gaming behavior. A 2025 longitudinal study revealed a bidirectional relationship between peer relationships and problematic gaming. Adolescents who lost significant relationships due to gaming were more likely to affiliate with peers who engaged in antisocial behaviors, such as substance use or theft. These affiliations, in turn, reinforced problematic gaming patterns (Gao et al., 2025).

Research Methodology

The main research question of the study is:

How does classmate support relate to the expression of Problematic Online Gaming behaviors among adolescents?

The hypothesis derived from the main research question is: *Higher levels of classmate support are associated with lower levels of Problematic Online Gaming among adolescents*.

Given the involvement of high school students, ethical approval was obtained from the Ministry of Education and Science. School principals were informed and consented to participate. The study was conducted by school-based pedagogical-psychological services. Participation was voluntary, and informed consent was obtained from both students and their parents/guardians. The consent form included: the purpose and procedures of the study; potential risks and benefits; assurance of voluntary participation and the right to withdraw at any time. To address potential distress from sensitive questions, contact information for the school psychologist was provided. The psychologist collaborated closely with the research coordinator.

The study was conducted between October 2021 and January 2022 using the Qualtrics platform (licensed by the University of Kentucky, a research partner). Data collection took place in school settings under the supervision of school psychologists. Students completed the survey on their mobile phones, with a completion time of between 20 and 40 minutes.

Sample

The study sample consisted of adolescents aged 15 to 19 years, drawn from ten high schools across Macedonia. Selection was based on school conditions and the willingness of students and their parents/guardians to provide informed consent.

A total of 301 students participated in the study, with a balanced gender distribution (49.8% male, 50.2% female). The mean age was 16.50 years (SD = 1.12). Regarding ethnicity, 91.4% of participants identified as Macedonian.

Instruments

Prior to cultural adaptation, permission was obtained from the original authors of each instrument. The adaptation process followed the back-translation method. After expert review, a final version was prepared and a pilot study was then conducted with ten adolescents. Table 1 presents the variables, instruments, and their authors.

Table 1.

Overview of Variables and Instruments

Variable	Instrument	Author(s)
Demographic Characteristics (age, gender)	Open-ended questions	Project Team
Gaming Addiction	Internet Gaming Disorder Scale – Short Form (IGDS9-SF)	Pontes & Griffiths (2015)
Classmate Support	Classmate Support Subscale[1]	Kerres, Malecki, & Kilpatrick Demaray (2002)

The study employed validated instruments to assess internet gaming-related behaviour: the Internet Gaming Disorder Scale – Short Form (IGDS9-SF), aligned with DSM-5 criteria. The Cronbach's alpha for the Macedonian translation of the IGDS9-SF was 0.86, indicating high internal consistency. Classmate support in this study was assessed using the Classmate Support subscale from the Child and Adolescent Social Support Scale (CASSS) (Kerres Malecki, & Kilpatrick Demaray, 2002). The CASSS is grounded in Tardy's Model of Social Support (Tardy, 1985, as cited in Kerres Malecki, & Kilpatrick Demaray, 2002). The CASSS (Kerres Malecki & Demaray, 2002) is based on social support, which conceptualizes support as multidimensional. The CASSS measures perceived support from different sources in a child/adolescent's environment (Parent, Teacher, Classmate, and Close Friend Support). The Classmate Support Subscale (measures general peer support within the school context) has 12 items and two response dimensions: Frequency of support/perceived support (how often support is received) and Importance of support (how important that support is to the

[1] Classmate Support is a subscale of the Child and Adolescent Social Support Scale (CASSS). CASSS has four subscales: Parent Support, Teacher Support, Classmate Support, and Close Friend Support.

respondent). For the purpose of this study only the response dimension that measures frequency of support was included.

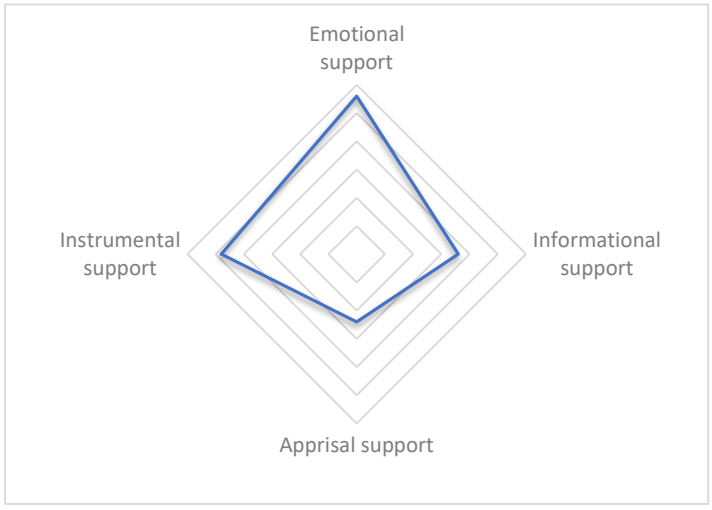
Research Results

A) Prevalence of Gaming Addiction

Before analyzing the interconnection between classmate/peer relation and problematic internet gaming, the prevalence rate will be presented. Although a score of 32 is commonly used as a clinical cutoff score on the IGDS9-SF, caution is advised in interpreting this cutoff, as the present study was conducted with a non-clinical population. Therefore, the classification should be viewed as indicative of elevated risk rather than a definitive clinical diagnosis. The results from the Internet Gaming Disorder Scale – Short Form (IGDS9-SF) indicated that 2% of respondents met the criteria for Internet Gaming Disorder (IGD).

B) Classmate Support

In this study, the Classmate support subscale of the Child and Adolescent Social Support Scale (CASSS) was used. It reflects cooperation, mutual respect, and is focused on peer/classmate relationships within the classroom. This scale measures how often adolescents receive support from their classmates. It is constructed of four subscales, each measuring four types of support: emotional, instrumental, appraisal, and informational. The scale consists of 12 questions and each of the four subscales has 3 questions. Answers are given on a five-point Likert-type scale (from 1 to 5). The following figure presents the participants' responses to the four subscales.



Emotional support	*13.3*
Instrumental support	*12.9*
Appraisal support	*11.7*
Informational support	*12.3*

Figure 1. Perceived Peer/Classmate Support among Adolescents Based on Mean Scores on Each Subscale

Figure 1 shows the arithmetic means (the minimum score for each subscale is 3, and the maximum is 15) of the results obtained on the four subscales: a) emotional support (for example: "They treat me nicely"); b) informational support (for example: "My classmates give me good advice"); c) appraisal support (referring to feedback, for example: "My classmates notice when I work hard"); and d) instrumental support (for example: "My classmates help me with school projects"). According to findings, emotional support scored the highest (13.3), which indicates empathy and care among classmates. Next is instrumental support (12.9), which reflects practical help related to school activities followed by moderate informational support (12.3), which refers to guidance, advice, and sharing knowledge. Appraisal support (11.7) is lowest, which means that constructive feedback and affirmation are perceived as least available. In general, it can be concluded that the respondents received high scores on all four subscales, which points to the conclusion that they perceive that they receive adequate support from their classmates. According to the results, the support system that adolescents receive from their classmates is expressed in emotional and informational dimensions, but it would be necessary to strengthen it in the informational and appraisal aspect of support which can create a more balanced and comprehensive support.

c) Relationship between Classmate Support and Problematic Gaming

Pearson's correlation coefficient was used to measure the strength and direction of the linear relationship between two variables: perceived classmate support (measured by the Classmate Support Scale, subscale of the CASSS) and problematic internet gaming behavior (measured by the IGDS9-SF). The results show a significant negative correlation ($r = -0.21$, $p < 0.01$). This type of association between two variables indicates that individuals who perceive that they often receive peer/classmate support are less likely to manifest problematic gaming. Namely, adolescents who have higher scores on the Classmate Support Scale have lower scores on IGDS9-SF. The obtained statistical significance highlights classmate support as a protective factor, i.e., if adolescents feel supported by their classmates, they are less likely to engage in excessive or maladaptive gaming patterns.

The coefficients of correlation between four subscales of the Classmate Support Scale (emotional, informational, appraisal, and instrumental) and IGDS9-SF are presented in Table 2.

Table 2.

Correlation between Problematic Gaming and Aspects of Classmate Support

Subscales of Perception of frequency of received classmate support	**IGDS9-SF (r)**
Emotional	-.18 ($p < 0.01$)
Informational	-.09 ns
Appraisal	-.22 ($p < 0.01$)
Instrumental	-.25 ($p < 0.01$)

The obtained values of the Pearson correlation coefficient show that some aspects of peer/classmate support are significantly associated with problematic internet gaming. Instrumental support ($r = -.25$, $p < 0.01$) and appraisal support ($r = -.22$, $p < 0.01$) have a significant negative association with problematic internet gaming. These data indicate that in the case when classmates provide practical help or give constructive feedback, adolescents are less likely to exhibit problematic online gaming behaviors. The same tendency, but less pronounced, is observed in relation to Emotional support ($r = -.18$, $p < 0.01$). Namely, these data indicate that empathy and care for classmates have the potential to reduce the intensity and manifestation of problematic internet gaming. On the other hand, no correlation was found with problematic internet gaming and informational support ($r = -.09$). This data indicates that advice or guidance from classmates does not appear to influence the way adolescents play internet games. A summary conclusion can be drawn that certain aspects of classmate support (instrumental, appraisal, and emotional) negatively correlate with problematic internet gaming, while informational support may not be sufficient to act as a protective factor.

Conclusion

This study offers important insights into the psychosocial correlates of problematic gaming among adolescents in Macedonia, contributing to the broader international discourse on gaming-related behavioral addictions. By employing widely recognized and psychometrically validated instruments, including the IGDS9-SF based on DSM-5 criteria, this research provides an understanding of how disordered gaming manifests in a non-clinical adolescent population. The findings revealed that 2% of participants met the threshold for Internet Gaming Disorder according to the results on the IGDS9-SF scale (cutoff score = 32). These prevalence rates, though relatively low, are consistent with international estimates and underscore the importance of early identification and monitoring of at-risk youth (Pontes et al., 2019). The data obtained from Classmates Support Subscale of the Child and Adolescent Social Support Scale (CASSS) reported that adolescents have the perception that they are receiving classmate support frequently.

The present analysis demonstrates that peer/classmate support is significantly associated with lower levels of problematic gaming among adolescents. Using Pearson correlation coefficients, the results revealed that emotional, instrumental, and appraisal support are negatively correlated with gaming problems, with instrumental and appraisal support showing the strongest protective effects. Emotional support plays an important role, though to a slightly lesser degree, while informational support did not show a significant relationship. The negative correlation between classmate support and problematic online gaming highlights the critical role of peer/classmate relationships in adolescent development and suggest that strong social support networks may be a protective factor against the development of problematic internet gaming behaviors (Hellström et al., 2012).

Implications and Recommendations

The findings of this study carry important implications for educators, parents, mental health professionals, and policymakers. Given the complex interplay of individual and social factors contributing to problematic internet gaming, prevention and intervention efforts must be multi-layered. Schools should incorporate digital literacy and emotional resilience training into their curricula to help adolescents develop healthy online habits and coping strategies. Peer support networks should be fostered through inclusive school environments and

extracurricular activities that promote collaboration and belonging. Finally, policymakers should support evidence-based programs that address digital well-being and fund further research to refine diagnostic tools and intervention strategies. By adopting a holistic, socio-ecological approach, stakeholders can more effectively safeguard adolescent mental health in the digital age. For professionals working with children and adolescents, the implications are clear. Interventions should prioritize strengthening emotional bonds, fostering constructive peer feedback, and ensuring access to tangible assistance, as these forms of support are most effective in buffering against problematic gaming behaviors.

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