

Internet Gaming Disorder in Adolescence: A Literature Review

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Abstract: Problematic gaming behavior is a global issue. This study synthesized and analyzed previous gaming disorder (GD) research, including internal and external factors and treatment options. This study also identified possible future research directions, including the development of new treatments, the combination of gaming and wagering, the positive psychology perspective of the gaming, and cross-cultural studies of gaming disorders. Even though numerous studies have been conducted, there is still a considerable distance to go before fully comprehending GD.

1. Introduction

Gaming disorder (GD) has been added to the 11th revision of the International Classification of Diseases (ICD-11) and has garnered the interest of researchers. As a result of the advancement of electronic technology, problematic gaming behaviour has become a global issue, particularly among adolescents. Adolescents have unique psychological characteristics and may be particularly susceptible to the adverse effects of problematic gaming behaviour. The prevalence of GD in adolescents in the included studies ranged from 1.6% to 19.9%, according to a systematic review (1). In addition, a study involving participants from the United States, the United Kingdom, Germany, and Canada revealed that over 86% of 18- to 24-year-olds have recently played online games (2). Several related studies, including those on adolescents' internal and external factors, psychological, physical, and social consequences, and the treatment of GD, have been conducted. Unlike substance use disorders, however, GD is a relatively new disorder that requires additional research.

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) of the American Psychiatric Association, the condition is known as internet gaming disorder (IGD). IGD is characterized by

- a significant amount of time spent on gaming,
1. Playing games to combat negative feelings,
2. Causing related negative results and continuing to play games when negative results occur,
3. Losing interest in previously favored interests as a result of gaming,
4. Failed attempts to stop gaming,
5. The desire to play video games more frequently to satisfy an urge,
6. Withdrawal symptoms appearing when gaming is prohibited or restricted, and
7. Preoccupation with gaming.

Similarly, ICD-11 defines GD as (a) impaired control over gaming, (b) gaming prioritization, and (c) continuation and escalation of gaming despite adverse consequences.

However, there are numerous debates regarding GD, such as whether excessive gaming is a symptom of other mental disorders as opposed to a distinct disorder or addiction. In addition, there are some debates about how to differentiate

between individuals who spend a great deal of time playing games due to a passion for the activity, similar to other interests, and pathological gaming addicts. Lastly, the negative consequences of GD and how to treat GD are also contentious issues.

This literature review analyses and synthesises previous studies and seeks to address this issue and suggest future research directions.

2. Results of Previous Studies

2.1. Internal Factors

2.1.1. Personality

Using the Mini International Item Pool to assess personality traits, a study based on a large sample in Norway found that GD was negatively associated with conscientiousness and positively associated with neuroticism (3). Extraversion, conscientiousness, neuroticism, agreeableness, openness, sensation seeking, narcissism, schizotypal personality trait, negative valence, detachment, negative affectivity, Type D personality, novelty seeking, and harm avoidance traits were significantly associated with GD (4), according to a systematic review that included 24 types of personality traits. For instance, a significant positive correlation existed between neuroticism and GD. Specifically, individuals with a high level of neuroticism perceive situations as more distressing (5), causing them to engage in gaming to avoid negative emotions. However, there are some controversies and contradictory results, necessitating the conduct of additional studies in the future.

2.1.2. Emotions and Emotion Regulation

Previous research (6) has demonstrated that individuals with GD are more susceptible to depression than the control group and regular gamers. Anxiety, depression, and GD were found to have a significant positive correlation, according to a cross-sectional study (7). Depression, anxiety, and other negative emotions can be alleviated through gaming behavior; however, gaming behavior can also cause these negative emotions (6). Studies on emotion regulation commence based on the findings regarding the relationship between emotions and GD. Two aspects of emotion regulation are reappraisal and suppression. Reappraisal is the process of lessening the emotional impact of a situation by altering how it is perceived, whereas suppression is the inhibition of the external

manifestations of underlying emotions (8). Previous research has demonstrated a significant positive relationship between emotional regulation and addiction potential, and emotional regulation predicts addiction potential significantly (9). In addition, a study revealed that reappraisal and suppression were considerably lower in adolescents with GD than in those without GD. That reappraisal negatively predicted GD, and suppression positively predicted GD (10). Adolescents with poor emotional regulation skills may engage in problematic behavior (such as gaming and Internet use) to manage negative emotions. In other words, emotional regulation can inhibit the progression of addiction (11). A study examining the relationship between emotional regulation, depression, and GD revealed a significant relationship between emotional regulation and depression (6).

2.1.3. Aloneness

Previous research has disclosed the relationship between aloneness and GD, specifically, a significant positive association between aloneness and GD (12). The relationship between aloneness and GD is complex in that aloneness can induce GD, GD can also cause aloneness, and GD's interaction with aloneness can deteriorate both (13). On the one hand, loneliness can stimulate gaming behaviour to alleviate negative emotions caused by social interaction or isolation, but excessive gaming behaviour has limited effects on developing and maintaining a social relationship in reality; on the other hand, excessive gaming behaviour rather than interacting, in reality, can deteriorate or exacerbate real-world interpersonal relationships (13).

2.1.4. Self-esteem

Regarding the association between self-esteem and GD, self-esteem was a risk factor for GD; more specifically, reduced self-esteem was substantially associated with GD. (14). Similarly, a systematic literature review and meta-analysis study reached the same conclusion: nearly all studies (15) reported a significant correlation between reduced self-esteem and GD. Longevity studies have yielded varied results. For instance, some studies concluded that reduced self-esteem at baseline was a significant predictor of GD scores at follow-up, while others concluded that the effect was insignificant (15). In addition, results regarding whether GD scores at baseline significantly predicted self-esteem at follow-up were controversial (15). The relationship between self-esteem and GD must be investigated further in the future. In addition, self-esteem plays a complex role in GD. People can initially acquire self-esteem through gaming by increasing their game account level, game abilities, and game equipment, which allows them to receive commendation from other gamers (16). Moreover, achieving success in real life, such as academic achievement, is relatively complex and requires long-term effort, whereas achieving success in the gaming world is relatively more straightforward and faster than in real life, resulting in immediate self-esteem satisfaction (17).

2.1.5. Cyberbullying and Aggressive Behaviors

A study examining the relationship between aggressive behavior and GD revealed that adolescents with GD were more likely to engage in aggressive behavior during the previous year, with the association being stronger among adolescents in junior high schools (18) than in senior high schools/vocational schools. Similarly, the relationship between social bullying and GD has been identified, with GD as a predictor of social bullying (19). Comparing cyberbullying and GD, the two variables had a significant

positive correlation (20). In addition, the longitudinal study found that problematic gaming behavior at baseline substantially predicted cyberbullying at follow-up. Meeting strangers online is essential in this relationship; however, additional research is required (20). GD causes adolescents to experience more negative emotions, which may result in aggressive online and offline behavior. Moreover, the experience of online abuse victimization was significantly associated with GD (21). On the one hand, victimization experiences provide a negative value to adolescents, which leads to excessive gaming behavior; on the other hand, excessive gaming behavior is a coping strategy for inhibiting negative emotions and alleviating negative feelings following cyberbullying (21).

2.1.6. Life Satisfaction

Previous research has demonstrated a significant correlation between life satisfaction and GD, such that adolescents with higher GD scores report reduced life satisfaction (22). A study based on the DSM-5 criteria for GD divided participants into conventional and pathological game users and found that pathological game users had lower life satisfaction than ordinary game users (23). Similarly, the fundamental mechanism underlying the impact of GD on life satisfaction is intricate. Not only was GD the cause of lower life satisfaction, but lower life satisfaction also prompted adolescents to play video games to alleviate their negative emotions.

2.2. External Factors

2.2.1. Family Factors

The relationship between parenting styles, parenting behavior, parental monitoring, parental attachment, parent-child relationship, and GD in adolescents has been established by prior research. Initially, parenting attitudes and behavior influence GD; specifically, parental emotional tenderness was negatively associated with GD, whereas parental rejection and overprotection were positively associated with GD (24). In addition, adolescents with GD affirmed that their parents' parenting styles lacked emotional tenderness, were over-involved, dismissive, and punitive, and the parenting behaviors were over-intrusive, punitive, and unresponsive (25). Moreover, Lin and Lin (26) suggested that supportive and participatory parental monitoring decreases GD tendencies; that is, parental monitoring prevents GD. In addition, a study investigated the influence of parental attachment and parenting on GD; the findings revealed that mother-child mutual trust, communication level in the mother, alienation from parents, and perception of parents' rearing attitude were negatively correlated with GD (27). In addition, a qualitative study concluded that the troubled parent-child relationship, the cultivation of competitive children, the neglect of parents, the loneliness and anxiety of children, and the effortless parenting style have contributed to the development of GD in children (28). Finally, parental psychological control, marital conflict, and physical/verbal maltreatment were significantly correlated with GD (29, 30).

2.2.2. School Factors

GD is influenced by instructor behaviour, teacher-student relationships, school climate, and low academic performance. Previous studies have suggested the impact of school-related factors on GD; for example, Yang and Jiang (29) hypothesised that teachers' verbal maltreatment was substantially associated with GD. In addition, there was a negative correlation between the teacher-student relationship and GD

(30). A study compared adolescents with GD, problematic Internet use, and no problematic Internet use, and the results revealed that adolescents with GD and problematic Internet use had poorer interpersonal relationships with their teachers than adolescents without problematic Internet use (31). In addition, a second study that examined the influence of school climate on GD concluded that both teacher–student support and student–student support were negatively correlated with GD (32). Finally, poor academic performance was identified as a risk factor for GD, and a significant correlation was found between poor academic performance and GD (33).

2.3. Treatment of GD and the effectiveness

Psychological interventions such as cognitive-behavioral therapy (CBT) and motivational interviewing (MI), pharmacological interventions such as methylphenidate and bupropion, and electroacupuncture are widely used to treat GD, according to previous research (34–38). Nonetheless, a global systematic review conducted by King and Delfabbro (39) revealed that the majority of studies on GD treatment have shortcomings, such as a lack of follow-up studies and uncertain treatment details, casting doubt on the efficacy of these interventions. Moreover, the majority of treatments are based on drug abuse treatment, including related-stimulus regulation, learning appropriate coping strategies, cognitive intervention, and related problem-solving skills, but they disregard the distinction between GD and substance use disorder (40). Moreover, Torres-Rodriguez and Griffiths (40) suggested that current treatments do not account for comorbid diseases and psychological issues, which may contribute to the relatively limited efficacy of current treatments for GD. Moreover, given the higher prevalence of GD among adolescents and the absence of remedies for GD that specifically target adolescents, it is imperative to develop a new treatment (41).

Torres-Rodriguez and Griffiths (42) developed a new treatment for GD called the PIPATIC treatment, intended for adolescents aged 12 to 18. The PIPATIC program is an integrated therapy based on multiple psychotherapeutic strategies that incorporate the common elements of psychological interventions, thereby increasing the efficacy of treatment (43–45). In terms of structure, the treatment lasts for six months and consists of 22 45-minute weekly sessions, the duration of which is determined by the GD risk factors. This treatment's sessions, strategies, and techniques have all been adapted for adolescents (42). The pilot study revealed that the PIPATIC treatment improved the severity and symptoms of comorbidities and GD, interpersonal interactions, and family relationships among adolescents with gaming-related problems (40).

2.4. Future Research

2.4.1. New Specific and Comprehensive Treatment Program

Considering future research, there is a distinct need for developing a new, comprehensive treatment program that incorporates individual, family, and social factors. Mihara and Higuchi (1) identified several risk factors, including time spent playing video games, active attitudes, single-parent families, loneliness, impulsiveness, conduct problems, reduced levels of participation in sports and exercise, and more. Similarly, protective factors include higher levels of social competence, self-esteem, social integration into the classroom, school-related well-being, perceived behavioral

control, and support for teacher autonomy (1). Future treatment programs could be an integrated specific program based on risk factors and protective factors; more specifically, the treatment program could include traditional psychology sessions led by counselors and sports check-ins to increase the time spent exercising. In addition, the program could include school personnel (e.g., a teacher or a counselor) to facilitate their reintegration or return to class. Finally, the family should be included in the program, as suggested by Bonnaire and Liddle (46). After developing a novel treatment program, scientists should conduct a feasibility study and randomized controlled trial to determine the treatment's efficacy.

2.4.2. Positive Psychology Perspective of Gaming

However, gaming, whether online or offline, is an instinctive behaviour of children and has numerous positive effects. In some countries, including China, the majority of adolescents were born after the one-child policy, so they have no or few siblings with whom to play (47). Therefore, by interacting with other participants while playing, they may be able to satisfy their social requirements, resulting in positive effects. In addition, playing online activities may facilitate their integration into the classroom. As previously mentioned, more than half of the population has played or is currently playing games; therefore, online games provide a common topic for the majority of students, which may allow them to develop stronger relationships with their classmates. In addition, researchers must concur that playing itself could be identified as a coping mechanism and that moderate or non-problematic online gaming behaviour could assist individuals in reducing negative emotions. In addition, electronic sports and online gaming video creation are becoming increasingly popular, particularly in China, where a large number of adolescents aspire to become professional players, resulting in excessive gaming behaviour to improve gaming skills. Therefore, can we conclude that this type of gamer engages in excessive gaming to accomplish their motivational goals? In conclusion, future research could explore the positive effect of moderate or non-problematic online gaming behaviour to determine whether video gaming has positive effects and conduct research to determine how to balance gaming behaviour to increase its positive effects, which would help policymakers develop and modify relevant policies.

To better comprehend gaming behaviour, future research should consider perceived tension. In today's society, adolescent pressures, such as academic pressure, interpersonal pressure, and family pressure, are increasing. Previous studies have demonstrated the relationship between perceived stress and GD and demonstrated that the GD group had a higher stress level than the control group (48). Nonetheless, the researcher of this study suggests that various forms of stress may produce distinct outcomes. Particularly, if a person is about to take a significant exam and is under academic pressure, it is worthwhile to investigate whether they will increase their gaming time to unwind or decrease it to study, as well as the internal factors that will influence their decision. Additionally, the genre of activities played is an essential factor. Many students acknowledge that certain stress-relieving games can indeed help them unwind, whereas playing certain MOBA games may make players more irritable. Finally, resilience, a key concept in positive psychology, can cause individuals to respond differently to identical situations. Many adolescents are also exposed to the risk factors of GD, but their outcomes may be moderated by

a number of positive psychosocial variables, such as resilience. Future research could focus on the positive effects of video games and investigate how to prevent moderate gaming behaviour from becoming problematic. Researchers cannot counsel minors not to play video games, just as they cannot advise the broader public not to use illicit drugs. In the future, is it possible to divide a recommended range of game usage time like alcohol? For instance, a person is considered a risk player if they devote more time per week to a specific type of online game than a certain value.

2.4.3. The Combination of Gaming and Gambling

Currently, Internet games incorporate a wide variety of elements and functions. Rare equipment, character outfits, and game characters must be won through a paid online lottery, which is analogous to wagering, in almost all game types. In numerous games, players can invest a great deal of time playing to earn tokens and draw virtual items they desire. However, it typically takes a year or longer to accumulate tokens, and such long-term and frequent gaming behaviour increases their risk of developing GD. In addition, after accumulating a large number of tokens by spending a great deal of time playing or recharging a large sum of money, it is difficult for players to cease playing the game because it would be futile. Last but not least, the matching mechanism of many MOBA games enables players to experience a game process in which the probability of winning and losing is nearly equal, so if they wish to advance to a higher game level, they must extend the game duration. In this process, players have a mentality resembling that of a speculator, wagering on whether they will win or lose the next game, because the winning or losing of multiplayer online battle arena (MOBA) games is determined more by their comrades than by themselves, and the allocation of teammates is a random event. Overall, future related studies should incorporate wagering in order to reveal the GD process in greater detail.

2.4.4. Cross-cultural Studies

As discussed previously, the prevalence of GD varied across countries (1), provoking researchers' interest in undertaking cross-cultural studies, comparing Asia to Europe and the United States in particular. A study that recruited participants from Australia and the United States found that residing with parents exacerbated GD in Australian gamers, but this effect was not significant in American gamers (49). Future research can investigate GD across various cultures, including diagnostic criteria, risk factors, protective factors, and treatment. With the accelerated economic development of China, for instance, the pressure on adolescents and middle-aged individuals is relatively high. For teenagers, they are under a great deal of pressure, particularly academic pressure, which has a direct impact on their gaming behaviour; for parents of teenagers, they frequently must work overtime to achieve career success, influencing their Children's gaming behaviour by family-related factors (e.g., family support, family resilience). In some developed nations with superior social welfare, however, this relationship may be distinct. In addition, the popularity of the electronic sports industry in China, which has become a mainstream industry, will have an effect on the GD of adolescents. In countries where esports are not broadly popular, however, this effect may be relatively limited. To investigate GD in the future, it is necessary to conduct cross-cultural investigations.

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