

Internet Addiction and Other Behavioral Addictions



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KEYWORDS

- Internet addiction • Internet gaming disorder • Compulsive internet use
- Behavioral addiction • Adolescence

KEY POINTS

- Teens are spending increasing amounts of time online. Although there are many benefits, there are also risks related to excessive use.
- Internet addiction is a type of behavioral addiction. Precise definitions vary and establishing clear diagnostic criteria is needed.
- It is important to recognize signs and symptoms of problematic Internet use and addiction including compulsive use, withdrawal, tolerance, and adverse consequences.
- Internet addiction is highly associated with depression, attention deficit hyperactivity disorder, and other substance use disorders. Treatment involves identifying and treating these comorbid conditions.
- More research is needed on targeted treatments for Internet addiction.

INTRODUCTION

Behavioral Addiction

Certain behaviors can produce short-term rewards or “highs.” When this leads to diminished control over the behavior despite adverse consequences, the behavior itself can become the source of addiction rather than a psychoactive substance.^{1–3}

Pathologic gambling is the best characterized behavioral addiction,^{2,4} making a debut in the fifth version of the *Diagnostic and Statistical Manual of Mental Health Disorders* (DSM-5) under substance-related and addictive disorders.⁵ Other behaviors that can produce similar short-term rewards include compulsive buying, sexual addiction, and excessive use of the Internet.^{3,6,7} There is debate about which behaviors to include as behavioral addictions, because some may be better classified as impulse

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Abbreviations

ADHD	Attention deficit hyperactivity disorder
CBT	Cognitive-behavioral therapy
DSM	<i>Diagnostic and Statistical Manual of Mental Health Disorders</i>
IA	Internet addiction

control disorders.^{2,3} Growing evidence suggests that problematic Internet use should be conceptualized as a behavioral addiction.^{8–12} Internet gaming disorder was identified in Section III of the DSM-5 as an area of future research⁵ and is the next most likely candidate to join pathologic gambling as a behavioral addiction.

Behavioral addictions resemble substance use disorders in terms of phenomenology, natural history, and neurobiology.^{3,13,14} The typical onset of behavioral addiction occurs in adolescence and young adulthood and follows a chronic course with remissions and exacerbations.³ Adolescence is a developmentally vulnerable period for the initiation of addictive behavior, a time when social demands (increasingly online) are high, risk-taking behavior is expected, and novel situations are encouraged.¹⁴

Increasing Use and Misuse of the Internet

The influence of the Internet is undeniable, particularly in the lives of young people. It is not surprising that time spent online is increasing. According to the most recent 2013 Youth Risk Behavior Survey, 41.3% of adolescents in the United States spent more than 3 hours online on school days for something that was not school work, increasing from 22% in 2003.¹⁵ Online gaming is increasingly popular, notably massively multiplayer role-playing games or MMORGs.¹⁶ Just as overall Internet use is increasing, problematic Internet use has become clinically concerning. There are a number of reports highlighting the negative consequences of overuse including problems with sleep, mood, and interpersonal relationships.^{9,17–20} In some Asian countries, Internet addiction (IA) is considered a major public health issue.²¹

Many terms have been applied to this problem, including Internet gaming disorder, excessive Internet use, compulsive Internet use, problematic Internet usage, and pathologic Internet usage. For the purpose of this article, Internet Addiction (IA) will be used.

Aims

The purpose of this paper is to review the current literature on the neurobiological underpinnings, epidemiology, clinical presentation, diagnosis, and treatment of IA in adolescence.

NEUROBIOLOGY

The addictive process involves problems with aberrant reward systems and impulsivity.^{14,22} Past research suggests that neural circuits in the brain involving reward get hijacked and rewired during the process of addiction.^{14,23} Specifically, mesolimbic dopaminergic projections to the nucleus accumbens from the ventral tegmental area have been implicated.¹⁴ Dopamine increases in the nucleus accumbens with the administration of drugs of abuse or certain behaviors (gaming, gambling, sexual behavior).¹⁴ It has also been recognized that use of dopaminergic medication in Parkinson's patients can lead to pathologic gambling and other addictive behaviors such as binge eating and hypersexuality.²⁴

Like other addictions, the development of behavioral addiction, including IA, is associated with an overall reward deficiency and involvement of these dopaminergic

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