

college students; and those with histories of alcohol or illicit drug misuse. Features of caffeine use disorder may be positively associated with several diagnoses: major depression, generalized anxiety disorder, panic disorder, antisocial personality disorder, and alcohol, cannabis, and cocaine use disorders.

## Internet Gaming Disorder

### Proposed Criteria

Persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress as indicated by five (or more) of the following in a 12-month period:

1. Preoccupation with Internet games. (The individual thinks about previous gaming activity or anticipates playing the next game; Internet gaming becomes the dominant activity in daily life.)

**Note:** This disorder is distinct from Internet gambling, which is included under gambling disorder.

2. Withdrawal symptoms when Internet gaming is taken away. (These symptoms are typically described as irritability, anxiety, or sadness, but there are no physical signs of pharmacological withdrawal.)
3. Tolerance—the need to spend increasing amounts of time engaged in Internet games.
4. Unsuccessful attempts to control the participation in Internet games.
5. Loss of interests in previous hobbies and entertainment as a result of, and with the exception of, Internet games.

6. Continued excessive use of Internet games despite knowledge of psychosocial problems.
7. Has deceived family members, therapists, or others regarding the amount of Internet gaming.
8. Use of Internet games to escape or relieve a negative mood (e.g., feelings of helplessness, guilt, anxiety).
9. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of participation in Internet games.

**Note:** Only nongambling Internet games are included in this disorder. Use of the Internet for required activities in a business or profession is not included; nor is the disorder intended to include other recreational or social Internet use. Similarly, sexual Internet sites are excluded.

*Specify current severity:*

Internet gaming disorder can be mild, moderate, or severe depending on the degree of disruption of normal activities. Individuals with less severe Internet gaming disorder may exhibit fewer symptoms and less disruption of their lives. Those with severe Internet gaming disorder will have more hours spent on the computer and more severe loss of relationships or career or school opportunities.

Gambling disorder is currently the only non-substance-related disorder included in the DSM-5 Section II chapter “Substance-Related and Addictive Disorders.” However, there are other behavioral disorders that show some similarities to substance use disorders and gambling disorder for which the word *addiction* is commonly used in nonmedical settings, and the one condition with a considerable literature is the compulsive playing of Internet games. Internet gaming has been reportedly defined as an “addiction” by the Chinese government and is considered a public health threat in South Korea, where treatment and prevention systems have been set up. Reports of treatment of this condition have appeared in medical journals, mostly from Asian countries, but also in the United States and other high-income countries.

The DSM-5 work group reviewed more than 240 articles and found some behavioral similarities of Internet gaming to gambling disorder and to substance use disorders. The literature suffers, however, from lack of a standard definition from which to derive prevalence data. An understanding of the natural histories of cases, with or without treatment, is also missing. The literature does describe many underlying similarities to substance addictions, including aspects of tolerance, withdrawal, repeated unsuccessful attempts to cut back or quit, and impairment in normal functioning. Further, the seemingly high prevalence rates, both in Asian countries and in the West, justified inclusion of this disorder in Section III of DSM-5 and in the Mental, Behavioural, and Neurodevelopmental Disorders chapter in ICD-11. Note that since the publication of DSM-5, the number of clinical reports has continued to accumulate, but many of the issues remain unresolved.

Internet gaming disorder has achieved significant public health importance, and additional research may eventually lead to evidence that Internet gaming disorder (also commonly referred to as *Internet use disorder*, *Internet addiction*, or *gaming addiction*) has merit as an independent disorder. As with gambling disorder, there should be epidemiological studies to determine prevalence, clinical course, possible genetic influence, and potential biological factors based on, for example, brain imaging data.

## **Diagnostic Features**

The essential feature of Internet gaming disorder is a pattern of excessive and prolonged participation in Internet gaming that results in a cluster of cognitive and behavioral symptoms, including progressive loss of control over gaming, tolerance, and withdrawal

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symptoms, analogous to the symptoms of substance use disorders. These Internet-based games typically involve competition between groups of players who are often in different global regions, so that extended duration of play is encouraged by time-zone independence. Although Internet

gaming disorder most often involves specific Internet games with multiplayer competition, it can include non-Internet computerized off-line games as well, although these have been less researched. The Internet gaming often includes a significant aspect of social interactions during play, and the team aspects of play appear to be a key motivation. Attempts to direct the individual toward schoolwork or interpersonal activities are strongly resisted.

Individuals with Internet gaming disorder continue to sit at a computer and engage in gaming activities despite neglect of other activities. They typically devote 8–10 hours or more per day to this activity and at least 30 hours per week. If they are prevented from using a computer and returning to the game, they become agitated and angry. They often go for long periods without food or sleep. Normal obligations, such as school or work, or family obligations are neglected.

Until the optimal criteria and threshold for diagnosis are determined empirically, conservative definitions ought to be used, such that diagnoses are considered for endorsement of five or more of nine criteria.

## **Associated Features**

Although no consistent personality types associated with Internet gaming disorder have been identified, negative affectivity, detachment, antagonism, disinhibition, and psychoticism have been associated with the disorder. Individuals with compulsive Internet gaming have demonstrated brain activation in specific regions triggered by exposure to the Internet game but not limited to reward system structures.

## **Prevalence**

The mean prevalence of 12-month Internet gaming disorder is estimated as 4.7% across multiple countries, with a range of 0.7% to 15.6% across studies. Research using the DSM-5 proposed criteria suggests that prevalence is similar in Asian and Western countries. In the United States, based on large Internet-based surveys, the prevalence of DSM-5 Internet gaming disorder is 1% or lower. An international meta-analysis of 16 studies found a pooled prevalence of Internet gaming disorder among

adolescents of 4.6%, with adolescent boys/men generally reporting a higher prevalence rate (6.8%) than adolescent girls/women (1.3%).

## **Risk and Prognostic Factors**

**Environmental.** Computer availability with Internet connection allows access to the types of games with which Internet gaming disorder is most often associated.

**Genetic and physiological.** Adolescent men seem to be at greatest risk of developing Internet gaming disorder.

## **Sex- and Gender-Related Diagnostic Issues**

Internet gaming disorder appears to be more common in adolescent and young adult men than adolescent and young adult women. Adolescent boys ages 12–15 years also may be at greater risk of adverse effects of disordered gaming (e.g., lower school grades, loneliness). There may also be gender differences in the types of games played, in that adolescent girls ages 12–15 tend to choose games that include puzzles, music, and social and educational themes, whereas adolescent boys of the same age more often choose action, fighting, strategy, and role-playing games that may have greater addictive potential.

## **Association With Suicidal Thoughts or Behavior**

Few studies specifically address suicide in individuals diagnosed with Internet gaming disorder, but studies on a broader phenotype of problematic Internet and online gaming behaviors are available. A nationally representative household survey of Australian youth ages 11–17 years (Young Minds Matter) found that problem Internet and online gaming behavior was associated with higher risk of suicide attempt in the prior year. After controlling for demographics, depression, family support, and self-esteem, a survey study of 9,510 Taiwanese students ages 12–18 years found that Internet addiction, including online gaming, was associated with suicidal thoughts and suicide attempt. In a representative sample of 8,807

students from randomly selected European schools, 3.62% had Internet gaming disorder (using DSM-5 criteria), and 3.11% of the students were considered to have pathological Internet use but were not gamers. Both groups showed similarly increased risks for emotional symptoms, conduct disorder, hyperactivity/inattention, self-injurious behaviors, and suicidal thoughts and behavior. The mental health effects of problematic Internet use, including suicidal thoughts or behavior, appear to be related to and perhaps mediated by the impact of problematic Internet use on sleep.

## **Functional Consequences of Internet Gaming Disorder**

Internet gaming disorder may lead to school failure, job loss, or marriage failure. The compulsive gaming behavior tends to crowd out normal social, scholastic, and family activities. Students may show declining grades and eventually failure in school. Family responsibilities may be neglected.

## **Differential Diagnosis**

Excessive use of the Internet not involving playing of online games (e.g., excessive use of social media, such as Facebook; viewing pornography online) is not considered analogous to Internet gaming disorder, and future research on other excessive uses of the Internet would need to follow similar guidelines as suggested herein. Excessive gambling online may qualify for a separate diagnosis of gambling disorder.

## **Comorbidity**

Health may be neglected due to compulsive gaming. Other diagnoses that may be associated with Internet gaming disorder include major depressive disorder, ADHD, and obsessive-compulsive disorder.

# **Neurobehavioral Disorder Associated With Prenatal Alcohol Exposure**

## **Proposed Criteria**