An Overview of the Expert Consensus on the Prevention and Treatment of Gaming Disorder in China (2019 Edition)

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Gaming disorder has gained considerable attention worldwide, including in China [1], where epidemiological surveys have found that its prevalence is as high as 17% [2]. The Bureau of Disease Control and Prevention run by the National Health and Health Commission in China recently released an expert consensus [2] that systematically describes the definition, clinical presentation, assessment, diagnosis, treatment, rehabilitation, and related areas of gaming disorder. As this consensus is published in Chinese, it is not readily accessible by the international readership. For this reason, we present here an overview of the expert consensus on gaming disorder in China.

Definition and Clinical Features

Gaming disorder refers to a behavioral pattern of continuous or repeated use of electronic or video games, manifested as having impaired control and giving priority to gaming over other daily activities, regardless of the adverse consequences of this behavior. This pattern usually persists for at least 12 months [3].

The main clinical presentation of gaming disorder includes loss of control over the occurrence, frequency, and duration of gaming. Gaming takes priority over other interests and daily life, and may continue or even escalate despite its negative consequences. Persons with gaming disorder may be subjectively aware of the desire for games, but may have difficulty in distinguishing between the virtual reality in games and the real world [4].

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Gaming disorder can lead to both physical (such as lack of sleep, circadian rhythm disorders, malnutrition, and seizures) and mental problems (such as irritability, anxiety, aggression, and depression), as well as impairment in social functioning (such as refusal to attend school, avoidance of social activities, family conflict, and impaired academic achievement) [5].

Factors Contributing to Gaming Disorder

The occurrence of gaming disorder is associated with psychological, social, and biological factors. Psychological factors include high impulsivity, high neuroticism, or introverted personality [6]. Some may show aggressive and violent behavior, poor mood regulation, loneliness, low self-esteem, low self-efficacy, poor life satisfaction, vulnerability to sensory overload, depression, and anxiety. Insufficient social support or interpersonal interaction and poor teacher-student or classmate relationships are also risk factors [7]. Brain imaging findings in persons with gaming disorder are similar to those in individuals with substance use or gambling disorders [8] in terms of structural and functional abnormalities in multiple areas of the frontal lobe, ventral striatum, and dorsal striatum, as well as functional abnormalities, such as reduced executive and control function [9].

Diagnosis and Evaluation

Early identification, diagnosis, and intervention are essential for the prevention and treatment of gaming disorder. Prior to the release of the International Classification of Diseases, 11th Revision (ICD-11), some scales had been developed to screen for gaming behaviors. However, these tools have limitations, such as inconsistent core symptoms and insufficient psychometric properties [10, 11]. Consequently, the World Health Organization is developing user-friendly screening assessment tools with satisfactory psychometric properties [12].

For the clinical diagnosis of those with suspected gaming disorder or at a high risk of the disorder, standardized guidelines are needed to ensure the accuracy of diagnosis within the health service. The core features of gaming disorder proposed in ICD-11 are: (1) a continuous or repeated pattern of gaming behavior, characterized by impaired control over gaming (e.g. lack of control over the occurrence, frequency, duration, and cessation of gaming behavior), which has a high priority in daily life, despite having related negative consequences (e.g. impaired rela-

tionships, adverse occupational or academic impact, and damage to health); (2) the pattern persists for at least 12 months (if the symptoms are severe enough and other diagnostic criteria are met, the duration of gaming behavior could be <12 months); and (3) the pattern of behavior leads to significant impairment in personal, family, and occupational functioning, interpersonal relationships, or other important areas. The disorder includes both online and offline gaming behavior [1].

Gaming disorder should be distinguished from normal gaming behavior. If the purpose of the behavior is to promote socialization, relieve boredom, or regulate emotions, and there are no other core features of gaming disorder, then a diagnosis is not warranted [13]. Cultural factors and the impact on an individual's social circle should be considered when diagnosing gaming disorder [14]. In addition, high-intensity gaming may be part of the job of individuals in the gaming industry, so they should not be diagnosed as having the disorder. Gaming disorder is a continuously-evolving process, starting from no gaming, *via* occasional play, to high-frequency gaming, and finally developing into uncontrolled gaming. Therefore, early recognition and prevention in this process are important.

The following differential diagnoses should be excluded when making a diagnosis of gaming disorder: (1) hazardous gaming behavior, which poses a health risk, but the disorder has not yet developed; this state requires further observation or treatment; (2) gambling disorder; the two disorders share certain clinical features, such as the presence of a craving state prior to engagement in addictive behaviors, continued engagement despite negative consequences, and the loss of control over engagement in such behaviors [6]. However, compared to gambling disorder, gaming disorder usually does not involve money. In cases when internet gaming involves gambling content (such as poker, mahjong, and probability sweepstakes), a diagnosis of gambling disorder should be made. In addition, patients with gaming disorder have higher impulsivity levels, while those with gambling disorder have higher compulsivity levels [15]; (3) other psychiatric disorders, such as anxiety disorders, depressive disorders, bipolar disorder, and personality disorders. Excessive gaming behavior may also occur during episodes of the above disorders. If both gaming disorder and other psychiatric disorders exist concurrently, the diagnosis of comorbid gaming disorder with other psychiatric disorders should be considered; and (4) substance use disorders. Gaming behavior often coexists with substance use, especially of alcohol. If the diagnostic criteria of both disorders are met at the same time, comorbid diagnoses can be considered [5, 16].

Comprehensive Intervention Principles and Measures

The general prevention and intervention principles of substance use and addictive behavioral disorders are relevant and needed for those at high risk or with diagnosis of gaming disorder. Gaming disorder is common in children and adolescents, and can evolve from recreational gaming behavior to gaming disorder. Preventive interventions for high-risk groups can significantly reduce the incidence of gaming disorder and the burden of the disorder. To date, there have been no specific effective interventions for gaming disorder. Patients often have comorbid physical and psychiatric disorders, so personalized intervention including psychological and pharmacological treatments and other treatment modalities should be considered. It should be noted that gaming disorder is similar to psychoactive substance use disorder and may recur or become chronic. To provide an integrated management plan, supervision and coordination of medical care, school, family, and society are needed.

In order to reduce the risk factors of gaming disorder, improve mental health, minimize recurrence, and increase the treatment rate, the adoption of a three-level prevention system—universal prevention, targeted prevention, and early detection and treatment—is important. For example, public mental health education to increase knowledge of gaming disorder, improve public mental health status, and reduce the risk factors of gaming disorder is helpful. For groups at high risks of gaming disorder, such as children and adolescents, it is helpful to adopt appropriate psychological interventions at the individual level, particularly in the areas of emotional regulation, cognitive control, and interpersonal communication. Within their family, school, and social environments, public health education on coping skills, improving family relationships and parent-child communication skills, and caring for the psychological needs of children and adolescents are also necessary.

Currently, there are no specific treatment guidelines for gaming disorder, but comprehensive treatments such as psychosocial interventions and medications improve the prognosis. Psychosocial interventions, such as cognitive-behavioral therapy, motivational interviewing, and family therapy are effective in reducing the uncontrolled gaming behaviors and improving the long-term prognosis [17]. At present, there are no medications with specific clinical indications for gaming disorder. Patients with the disorder who have mental, physical, and other comorbidities may require appropriate medications [5]. Researchers have shown that repetitive transcranial magnetic stimulation in patients with gaming disorder enhances brain control and

reduces the impulse for gaming, but large-scale studies are lacking [18, 19].

Similar to other substance-use disorders, the treatment goals for gaming disorder are to prevent recurrence and promote social functioning and social reintegration through psychosocial rehabilitation and follow-up management. Patients who are stabilized after treatment should continue receiving maintenance psychological therapy and, if necessary, pharmacotherapy as appropriate. Regular follow-up for stable patients can improve their treatment adherence. Their family members should provide support, participate in the rehabilitation activities of patients, and help to resolve their psychosocial problems in daily life.

Conclusions and Future Perspectives

Considering that the epidemiology, pathogenesis, preventive measures, and treatment strategies of gaming disorder need to be further developed, certain areas should be addressed in future. First, with the amendment of the Law of the Protection of Minors in China, relevant laws and regulations to protect the physical and mental health of children and adolescents that reduce the risk of gaming disorder should be developed. Second, multidisciplinary collaboration involving the health, education, industry and commerce, and culture sectors should be established to regulate and supervise health services for gaming disorder in order to improve access to professional assistance for patients and their families. Third, assessment, and diagnosis system for gaming disorder should be established by relevant academic organizations in China. Fourth, epidemiological surveys and studies to understand the prevalence in different populations, the impact of relevant factors on gaming disorder should be conducted. Fifth, research on medicinal and psychosocial treatments to inform relevant prevention, treatment guidelines, and policies for gaming disorder are warranted. Lastly, all addictive behaviors and problems of social adaptation, including gaming disorder, should be treated as a whole entity. Effective preventive measures and psychosocial interventions for gaming disorder should be developed urgently.

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Compliance with Ethical Standards

Conflict of interest Dr. Wei Hao was a member of work group on development of diagnostic guidance of ICD-11 on substance use related disorders, and participated in or organized WHO expert meetings on gaming disorders. Otherwise, the authors declare no conflicts of interest related to the topic of this insight.

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