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Digital Barriers in Online Gaming: An Emerging Psychosocial Challenge Among Children and Adolescents in the Post-Pandemic Era

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Abstract: ***Technology and media have become integral to the lives of children, from infancy to adolescent age. Children are beginning to use digital devices, such as tablets and smart phones, at a very young age, often engaging in activities like playing video games and using social media. The COVID-19 pandemic significantly disrupted children's lifestyles, introducing abrupt constraints such as school closures, which led to a substantial rise in screen time across all age groups. Internet gaming disorder (IGD) is defined as the persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress. Several studies reported a dramatic rise in the prevalence of Internet Gaming Disorder (IGD) during this post Covid-19 period. This review article addresses different dimensional approach with Homoeopathic remedies to promote digital wellness for infants, children and adolescents and to bring in control the increasing cases of IGD in post COVID-19 era.***

Keywords: Internet gaming disorder, Post COVID-19, Children, Homoeopathy

1. Introduction

The internet has become an integral part of daily life for people worldwide. With over 900 million users, India ranks as the second-largest online market globally, trailing only China. A significant factor driving the rapid adoption of the internet across diverse socio-economic groups was the launch of the Digital India initiative in 2015 [1].

Technology and media have become integral to the lives of children, from infancy to school age. In modern households, digital devices such as televisions, smart phones, tablets, digital toys, and computers are ubiquitous. Many young children are exposed to mobile gadgets early in life, often through video communication with distant family and friends facilitated by their parents. Infants are also exposed to background television while parents or siblings watch their programs. Additionally, parents and caregivers rely on media and digital devices as tools to calm children. Today's generation is growing up immersed in technology, with mobile and smart devices playing a significant role in both home and educational environments [2].

Research indicates that children are beginning to use digital devices, such as tablets and smart phones, at a very young age, often engaging in activities like playing video games and using social media [3]. Video games are primarily used by children for entertainment, excitement, and challenge, as well as for emotional coping and escaping reality [4]. Consequently, the importance of early detection of digital addiction in children is increasingly recognized as a pressing need.

The COVID-19 pandemic significantly disrupted children's lifestyles, introducing abrupt constraints such as school closures, which led to a substantial rise in screen time across all age groups. This increase was not only for educational purposes but also for recreation. Cross-sectional studies revealed that elevated screen time during the pandemic was linked to negative mental health outcomes in children, including internalizing and externalizing behaviors. While most longitudinal studies or retrospective reports compared screen time to pre-pandemic levels, relatively few studies tracked screen time consistently throughout the pandemic to assess its impact on children's cognitive and behavioral outcomes and explore key moderating factors. Notably, several studies reported a dramatic rise in the prevalence of Internet Gaming Disorder (IGD) during this period [5]-[8].

A recent global survey revealed that approximately 70% of internet users, particularly the younger generation, increased their smart phone usage as a direct consequence of the lockdown during the COVID-19 pandemic. Internet services experienced a surge in usage, ranging from 40% to 100% compared to pre-lockdown levels. According to the *International Journal of Preventive Medicine*, in India, 95% of children belong to families that use mobile phones, and 73% of these children are mobile users, with 70% falling within the 7–10-year age group. During the lockdown, school closures provided children with ample time to engage with mobile phones and televisions, leading to a significant increase in screen time. Nearly 49% of children reported spending over six hours per day on screens. This behavior among children and adolescents contributed to the development of internet gaming addiction. A study conducted in Jhalawar, Rajasthan, involving 421 students

from classes VIII to XII, found that the prevalence of internet addiction was 14% [9].

The World Health Organization (WHO) has recognized gaming disorder as part of the 11th Revision of the International Classification of Diseases (ICD-11). According to ICD-11, gaming disorder is defined as "a pattern of gaming behavior ('digital-gaming' or 'video-gaming') characterized by impaired control over gaming, prioritization of gaming over other activities to the extent that it takes precedence over other interests and daily responsibilities, and the continuation or escalation of gaming despite negative consequences" [10].

The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) categorizes Internet Gaming Disorder as a condition recommended for further study. It is defined as the "persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress." To meet the criteria, individuals must exhibit five or more specified symptoms within a 12-month period [11]:
To diagnose Internet Gaming Disorder, an individual must experience five or more of the following symptoms within a 12-month period:

1) **Preoccupation with internet games:** persistent thoughts about previous gaming activities or anticipation of the next gaming session, with Internet gaming becoming the primary focus of daily life.
2) **Withdrawal symptoms when gaming is restricted:** Experiencing irritability, anxiety, or sadness when Internet gaming is unavailable, though these symptoms do not involve physical withdrawal signs.
3) **Tolerance:** A need to spend increasing amounts of time playing Internet games to achieve the desired level of satisfaction.
4) **Unsuccessful attempts to limit gaming:** Repeated efforts to reduce or control gaming participation have been unsuccessful.
5) **Loss of interest in other activities:** A noticeable decline in interest in previous hobbies or forms of entertainment, except for Internet games.
6) **Continued excessive gaming despite psychosocial issues:** Persistent gaming behavior even when aware of its negative impact on psychological or social well-being.
7) **Deception about gaming:** Lying to family members, therapists, or others to hide the extent of gaming activity.
8) **Gaming as an escape:** Using Internet games to avoid or cope with negative emotions, such as helplessness, guilt, or anxiety.
9) **Jeopardized relationships or opportunities:** Significant relationships, jobs, or educational or career prospects have been at risk or lost due to gaming participation.

Grading of severity of Internet gaming disorder [11]:
The severity of Internet Gaming Disorder can vary based on the level of disruption to normal activities:

Less severe: Individuals display fewer symptoms and experience minimal disruption to their daily lives.

More severe: Individuals spend significantly more time gaming and suffer greater consequences, such as severe loss of relationships, or missed career or educational opportunities.

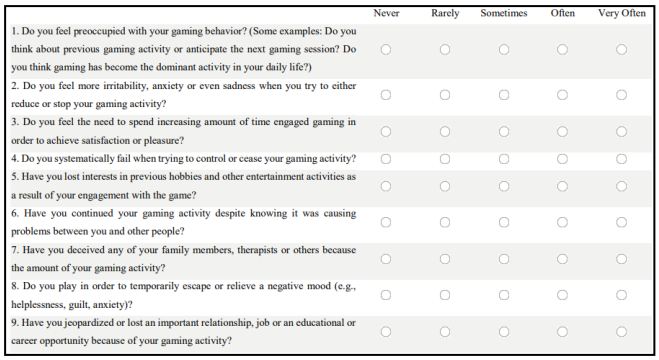
2. Diagnostic Features

Internet Gaming Disorder (IGD) is a pattern of excessive and prolonged internet gaming that leads to a range of cognitive and behavioral symptoms, such as a growing loss of control over gaming, tolerance, and withdrawal symptoms, similar to those found in substance use disorders [11].

Individuals with Internet Gaming Disorder typically display the following symptoms:

- Spending long hours sitting at a computer, engaging in gaming activities.
- Neglecting other activities and responsibilities.
- Devoting 8–10 hours or more each day, and at least 30 hours a week, to gaming.
- Feeling irritable or angry when unable to access gaming.
- Often going without food or sleep for extended periods due to gaming.
- Failing to meet normal obligations, such as school, work, or family duties.
- Engaging in persistent and repetitive gaming, especially in group-based games, for extended hours.
- Playing competitive multiplayer games where groups of players compete.
- Strongly resisting efforts to redirect attention to schoolwork or social activities.
- Using gaming as a way to escape boredom.

The **Internet Gaming Disorder Scale - Short Form (IGDS9-SF)**, (figure 1) developed by Pontes and Griffiths in 2015, is a diagnostic tool used to assess Internet Gaming Disorder (IGD) [12]:



	Never	Rarely	Sometimes	Often	Very Often
1. Do you feel preoccupied with your gaming behavior? (Some examples: Do you think about previous gaming activity or anticipate the next gaming session? Do you think gaming has become the dominant activity in your daily life?)	○	○	○	○	○
2. Do you feel more irritability, anxiety or even sadness when you try to either reduce or stop your gaming activity?	○	○	○	○	○
3. Do you feel the need to spend increasing amount of time engaged gaming in order to achieve satisfaction or pleasure?	○	○	○	○	○
4. Do you systematically fail when trying to control or cease your gaming activity?	○	○	○	○	○
5. Have you lost interests in previous hobbies and other entertainment activities as a result of your engagement with the game?	○	○	○	○	○
6. Have you continued your gaming activity despite knowing it was causing problems between you and other people?	○	○	○	○	○
7. Have you deceived any of your family members, therapists or others because the amount of your gaming activity?	○	○	○	○	○
8. Do you play in order to temporarily escape or relieve a negative mood (e.g., helplessness, guilt, anxiety)?	○	○	○	○	○
9. Have you jeopardized or lost an important relationship, job or an educational or career opportunity because of your gaming activity?	○	○	○	○	○

Figure 1: Internet Gaming Disorder scale- Short form (IGDS9-SF)

Scoring: 1- Never, 2- Rarely, 3- Sometimes, 4- Often, 5- Very often

Total scores on the IGDS9-SF are calculated by summing the responses to all nine items, with scores ranging from a minimum of 9 to a maximum of 45. Higher scores suggest a greater severity of Internet Gaming Disorder. To distinguish disordered gamers from non-disordered gamers, researchers should verify if participants have endorsed at least five of the nine criteria, considering responses marked as '5: Very Often' as an endorsement of the respective criterion.

Commonly associated symptoms with internet gaming disorder [9]:

- Psychological symptoms: Anxiety, stress, depression, low self- esteem, impulsivity, lower academic performance, difficulty in concentration
- Physical symptoms: Sleep disturbance, headache, earache, tinnitus, sense of fatigue, restlessness, face burning sensation

Associated features with IGD:

- Depressive disorders
- Attention-deficit/hyperactivity disorder (ADHD)
- Obsessive-compulsive disorder (OCD)

Prevalence:

The prevalence of problematic internet use (PIU) is highest among male adolescents aged 12–20 years, particularly in Asian countries. Numerous studies have been conducted in Asia, especially in China and South Korea, while reports from Europe and North America are fewer and show highly variable prevalence estimates. One Asian study found that the point prevalence of PIU among adolescents aged 15–19 years was 8.4% for males and 4.5% for females, using a threshold of five criteria. A meta-analysis across nine Indian cities reported PIU in 22% of adolescents. Similarly, a school-based study in Delhi revealed a PIU prevalence of 19% among children.

A recent cross-sectional school-based study in Tamil Nadu examined the prevalence of Internet Gaming Disorder (IGD) among adolescents and identified contributing factors. Among 1,795 participants, 398 were diagnosed with PIU. The study found that students with personal gadgets were more likely to exhibit PIU. Additional risk factors included studying in English-medium schools, scoring below 80% in academics, and having multiple gadgets at home [13].

Risk and Prognostic Factors [11]:

Environmental Factors: The availability of computers with internet connections facilitates access to the types of games commonly associated with Internet Gaming Disorder (IGD).

Genetic and Physiological Factors: Adolescent males are at the highest risk of developing IGD. Additionally, it has been speculated that an Asian environmental or genetic background might contribute to this increased susceptibility, although this relationship remains uncertain and requires further investigation.

Functional Consequences:

Academic Impact: Students with Internet Gaming Disorder (IGD) may experience declining academic performance, which can lead to failing grades and eventual school failure.

Social and Family Disruption: Excessive gaming can crowd out normal social, scholastic, and family activities, limiting opportunities for meaningful interpersonal interactions and balanced development.

Differential Diagnosis:

Excessive internet use that does not involve online gaming, such as excessive engagement with social media platforms (e.g. Facebook) or frequent viewing of online pornography.

Comorbidities:

- Compulsive gaming behavior
- Depressive disorders
- Attention-deficit/hyperactivity disorder (ADHD)
- Obsessive-compulsive disorder (OCD)

The Indian Academy of Pediatrics (IAP) has Provided Recommendations on Promoting Digital Wellness for Infants, Children And Adolescents [14]:

1) Guidelines for families and children

a) Infants and children aged 0-23 months:

- Children under the age of 2 should not be exposed to screens of any kind.
- Screen devices such as smart phones, tablets, or televisions should not be used as tools to facilitate feeding.
- Screens should not be relied upon as a quick solution to soothe a crying or distressed child.
- Parents should ensure children are not exposed to screens in their absence, such as when being cared for by domestic help.
- Parents are encouraged to engage children in activities like physical play, storytelling, music, movement (e.g., dance), and age-appropriate toys to support early childhood development.
- Limited and occasional screen time may be permitted for social interaction with distant family members.

b) Children aged 24-59 months:

- Limit screen time to a maximum of 1 hour per day, with individual sessions lasting no more than 20–30 minutes; less is always better.
- Use only one screen at a time and avoid introducing media multitasking habits.
- Screen time should always be supervised by caregivers.
- Caregivers must ensure that the content viewed is educational, age-appropriate, non-violent, healthy, and preferably interactive.
- Avoid using screen devices during meals, within an hour before bedtime, or while traveling.
- Children should engage in at least 3 hours of physical activity daily, including a minimum of 1 hour of moderate-to-vigorous intensity activity, and should get 10–14 hours of high-quality sleep each day, with younger children requiring more sleep.

c) Children aged 5-10 year:

- Limit screen time to less than 2 hours per day, with less being preferable.
- Screen usage should primarily focus on education, learning, and social interaction.
- Parents should supervise screen use for educational purposes to ensure children remain focused on lessons and do not divert their attention to games, browsing, or online chatting.
- Avoid using screens as a solution for boredom.

- The device used by the child should belong to a parent, and children should not have their own independent phone, tablet, or laptop.
- Parents should co-view and actively monitor digital media usage to ensure content is appropriate and to safeguard children's safety and security online.
- Social media use should not be allowed, except for educational, sports, or extracurricular purposes, as young adolescents are not yet mentally prepared to handle platforms like Facebook, Twitter, WhatsApp, or Instagram.
- Children in this age group should get 9–12 hours of sleep daily and engage in at least one hour of physical activity each day.

d) Adolescents (10-18 years age):

- Maintain a balance between screen time and other activities essential for overall development, such as at least one hour of outdoor physical activity, 8–9 hours of nighttime sleep, schoolwork, meals, hobbies, peer interactions, and family time.
- Use screen time for purposes such as education, communication, skill development, and fostering a healthy lifestyle and safety.
- Monitor adolescents' social media use to safeguard data privacy, ensure cyber security, and identify any signs of cyber bullying or media addiction.
- Ensure that screen usage does not interfere with academic performance, mental health, talent development, or the acquisition of values.
- Parents should have access to passwords and online accounts to protect adolescents and educate them about their digital footprint.
- Before permitting adolescents to engage with social media platforms or video games, parents should familiarize themselves with the platform and assess its appropriateness for the child's age.
- Parents should lead by example in promoting digital wellness within the family by limiting their own screen time and modeling healthy digital habits for children and adolescents.

2) Guidelines for the physician:

- Screen media should not be used as a distraction to facilitate examinations or medical procedures.
- During routine visits, physicians should inquire about or observe screen exposure habits in parents and adolescents and provide anticipatory guidance aligned with age-appropriate digital wellness guidelines.
- Children over the age of 5 and adolescents should be privately and confidentially interviewed about their screen usage, including duration, frequency, content, and its impact on their daily activities and development.
- Both parents should be actively involved in educational or counseling sessions to discuss strategies for reducing their children's screen time.

Management [9]:

A cognitive-behavioral approach is an effective short-term intervention for reducing Internet Gaming Disorder (IGD) and associated depressive symptoms. However, due to the complexity of the issues faced by these patients, treatment should adopt a multidisciplinary approach, incorporating cognitive-behavioral therapy, psychotropic medication, family therapy, and the involvement of case managers.

The cognitive-behavioral approach involves:

- Encourage practicing opposite timing for internet use by identifying the child's usage patterns and disrupting them with alternative schedules.
- Utilize external prompts, such as real-life events or activities, to encourage the child to log off.
- Set specific goals for internet usage, particularly concerning time limits.
- Avoid specific applications that the child finds difficult to control.
- Introduce reminder cards as visual cues to highlight the negative consequences of Internet Addiction Disorder (IAD) and the benefits of overcoming it.
- Join a support group to provide social support that may be lacking.
- Participate in family therapy to address and resolve relational issues within the family.

Homoeopathic Management:

A comprehensive symptom profile was developed by analyzing all review articles and case reports published during the pre- and post-COVID-19 periods on the rising cases of Internet Gaming Disorder in children and adolescents, along with its associated risk factors and co-morbidities [2]-[8]:

- Obsession with Internet gaming.
- Irritability, sadness, and anxiety when unable to play Internet games.
- Loss of interest in previous hobbies and forms of entertainment.
- Using Internet games to escape feelings of helplessness, guilt, and anxiety.
- Low self-esteem.
- Impulsivity.
- Decline in academic performance.
- Difficulty concentrating on studies.
- Sleep disturbances.
- Headaches.
- Earaches.
- Tinnitus (ringing in the ears).
- Persistent fatigue.
- Restlessness.
- Sensation of burning in the face.

Reportorial Rubrics for Internet gaming disorder in children in Synthesis 8.1V repertory in RADAR 10.0.028 version:

1) Mind- Absorbed
2) Mind- Addicted- Tendency to become
3) Mind- Anxiety- Do something; compelled to
4) Mind- Computers- Love for
5) Mind- Concentration- Difficult- Studying
6) Mind- Confidence- Want of self confidence- Children in
7) Mind- Impulsive
8) Mind- Interruption- Aggravation
9) Mind- Irritability- Disturbed, when
10) Mind- Playing- Desire to play- Nintendo
11) Mind- Restlessness
12) Head- Pain- Computer; working with
13) Ear- Noises in

14) Ear- Pain
15) Sleep- Disturbed

Homoeopathic therapeutics: After thorough study of Homoeopathic literature- Homoeopathic material medica, a group of Homoeopathic remedies indicated for Internet gaming disorder are mentioned below [15]-[17]:

1) **Belladona-** desire to play war games, fondness for the games of chances, very restless, wildly delirious, biting, violent mania. quarrelsome, patient lives in her own world, excitable, tendency to dance, sing, laugh and whistle. Fear of imaginary things and desire to escape or hide. Talk very fast.
2) **Tuberculinum-** desire to play war games and other video games, cannot stay in single place always wants to change place, to travel and to do something different, desire to curse and swear, sensitive to music, small things make her angry, hopeless, anxious, mania, melancholic, stupor and sleeplessness. Changing mood. Tubercular taint.
3) **Tarentula hispanica -** desire to play video games, dreams of games and amusement, followed by gloomy one, erratic, impulsive, destructive, lack of morality, likes to dance, mock, cunning, crafty, insensible but observe others how they are reacting to it. Desire to strike others or himself, ungrateful. Mental symptoms get better after eating.
4) **Calcarea carbonicum-** desire to play video games, likes to watch the games rather than playing, obstinate, wilful, cries about trifles.
5) **Silicea-** likes to play video games, mental acuteness with physical weakness, obstinate, sullen, lack of confidence, wishes to drown himself, complaints from anticipation.
6) **Calcarea iodata-** desire to play electronic games, suitable for scrofulous condition, flabby children who readily catch cold, indurated glands.
7) **Taxus baccata-** nervous, restless while playing computer games.
8) **Stramonium-** desire to play war games, live in their own world, do all sorts of crazy things, raving mania, violent speech, want to kill people or himself, self-accusing, sit silently, eyes on ground and picking on clothes.
9) **Coffea cruda-** it gives for ill effects of fear, fright, disappointed love, excessive excitability. Oversensitive. One moment is very happy, the next moment very gloomy. Ecstasy full of thoughts, fright from surprises, irritable & throw things, lamenting. It is suitable for choleric temperament. Nervous sleeplessness and insomnia after excitement. Trembling of hand, cannot even hold the pen.
10) **Ignatia Amara-** highly emotional person, sensitive to emotions, brooding, disappointed love, grief, fright, shock. Symptoms change rapidly, affecting both mind and physical, suitable for the person who starves for a cause or want, nervous temperament. Contradiction intolerance, sighing, sobbing, not communicative. Act on nervous affection like twitching and tremors.
11) **Dactylorhiza praetermissa (orchid)**-desire to party, games, fun, money, glamour. Joy in the midst of destruction and death, healing wounds of others, war; likes to play sexual games.
12) **Ephedra sinica-** Great fatigue. Extreme apathy.
13) **Nux vomica-** Very irritable and sensitive to all impressions. Overactive mind. Angry and impatient. Averse to work. Time passes too slowly. Headstrong, selfwilled. Fiery temperament. Obstinately resists the wishes of others. Quarrelsome when disturbed. Angry when consoled. Faultfinding. Impatient when spoken to, angry and violent without any provocation. Cannot endure slightest contradiction.
14) **Cannabis indica-** Absent minded. poor concentration and foggy mind. Emotional excitement and rapid change of moods. Great agitation, anxiety and nervousness.
15) **Kalium bromatum-** Brain fag from grief and anxiety. Failing brain power. Loss of memory. Ailments from emotional excitement.
16) **Mercurius solubilis-** Changes their mind constantly. Instability of ideas, which constantly drive away each other. Irresolution. Precocious. Weak memory. Moral dejection, with great listlessness, discouragement. Loss of will power. Poor self confidence. Indifference to everything, does not even care to eat. Indifference to loved ones.
17) **Sulphuricum acidum-** Irritable and impatience about trifles. Fretful and impatient. Hurried feeling. Must do everything in hurry. Sullen, impatient, angry because things move so slowly. Nervous fatigue and tendency to take fright.
18) **Sulphur-** Absent minded. Dullness of mind. Brain fatigue. Difficult thinking. Scatterbrained, burnt out brains. Awkwardness at his work. Aversion to do mental and physical work. Bored easily. Irritated greatly by least advice. Anxiety with an overactive mind, preventing sleep. Restlessness at night. Persistent thoughts, expressions and words heard recur to his mind.
19) **Zincum metallicum-** Brain and nerves are fatigued. Brain fatigue from night watching. Weak memory. Forgets what has been accomplished during day. Lethargic, stupid and forgetful. Anxiety from horrible apparition. Fears being arrested on account of an imagined crime. Great fear, as if persecuted by men or the devil on account of crimes which he has never done.

3. Conclusion

Homeopathic medicines, when prescribed based on the totality of symptoms and the individuality of the patient, can have a holistic effect by improving the behavioral patterns of children and alleviating the symptoms of Internet Gaming Disorder (IGD). This review article aims to raise awareness among physicians to screen children and adolescents for IGD and provide appropriate treatment. The homeopathic remedies mentioned above are suggested for IGD, but the final selection should be based on the patient's unique and characteristic symptoms. Further clinical studies are needed to verify the effectiveness of these remedies in treating IGD. Additionally, more research is required to establish homeopathy as a reliable treatment option for such cases.

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