

## Review Article

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# Internet Addiction in adolescents – an overview

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### ABSTRACT

Internet addiction is a new age addiction that is affecting adolescents in schools and colleges alike. The current review summarizes the causative factors, models and types of internet addiction along with the methods used in its management. It is important to realise that there is a need for a holistic management in cases of internet addiction as very often there are associated comorbid psychiatric disorders that need management as well. The review though not exhaustive summarizes the basic models of internet addiction and looks at management approach from a clinician as well as teacher and parent perspective.

**Key Words:** Internet addiction, adolescents, schools, parents, internet.

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### INTRODUCTION

Although some argue that the term ‘addiction’ should be applied to cases involving chemical substances, similar diagnostic criteria have been applied to a number of problematic behaviors such as pathological gambling [1]. Early research, studied the ‘computer addiction’ of some computer scientists and technicians. The research participant was male loner with long standing interest in technology, but with the enormous development of technology and easy access to web, internet addictions have encroached into all strata of society. Adolescents may have limited coping skills, and the Internet is a convenient and available way for them to try to deal with the tension [3]. Another reason is the ability to express one’s true self, which can be particularly attractive to an adolescent dealing with identity development and self-concept issues. Adolescents may be much more willing to engage in the bullying or harassing of others, gain access to pornography, be exposed to sexual behaviors, and find opportunities to be rebellious toward authority figures [4]. It has been reported that nearly half of adolescents who are using the Internet do so in their homes and with a broadband connection. Accessing the Internet at school or a friend’s house are other popular places to get online [5].

Over years the concept of Internet addiction has grown in terms of its acceptance as a legitimate clinical disorder often requiring treatment. Hospitals and clinics have emerged with outpatient treatment services for Internet addiction; addiction rehabilitation centers have admitted new cases of Internet addicts [6]. Several names for internet addiction have been proposed starting with Internet addiction, Pathological Internet use, Excessive Internet use, Compulsive Internet and Internet dependence [7]. Massive multiple player online role playing games (MMORPGs) are the most used application now a days. These are the role playing virtual world, where thousands of players are present at a same time. A player can perform wide range of activities to build his avatar’s character in positive (conversation) and negative way

(aggression) [8]. These games are persistent, despite of player logs off, which leads to players feeling losing power as compared to his fellow players who are going ahead of him/her [9].

Most (90%) of the players are adult male than adolescents as contrast to what was expected. The age of the female player is approximately 32 years suggesting that female players are introduced to MMORPGs by their male partner. Studies have shown that players spent around 8 to 10 hours in a session in playing these games [10]. Yee explained the components of these games into three categories – Achievement (the notion of advancement in levels and equipments), Social commitment (encourages to play in groups called Guild and the third motivation component is Immersion ( identifying with the one's avatar) [11].

Adolescents have greater tendency to connect with their avatar and consider success in games as personal success. This apparently could be related to the origination of self-efficacy and self-esteem, both of which are most significant during adolescence [12]. Recently, pathological video gaming is included in Diagnostic and Statistical Manual 5 (DSM 5) by American Psychiatric Association after a group of experts who reviewed more than 240 publications enlightened the strong evidence of gaming disorder [13]. Inclusion in DSM5 is not intended to diagnose the disorder based on criteria but give a standardized definition of the disorder to encourage further research in the prevalence, etiology, risk factors and psychopathology associated with the condition, to acknowledge the concern regarding seriousness of the issue and inclusion it in future edition of DSM5 [14].

### CAUSATIVE FACTORS IN INTERNET ADDICTION

Addictions are defined as the habitual compulsion to engage in a certain activity or utilize a substance, not withstanding the devastating consequences on the individual's physical, social, spiritual, mental, and financial well-being [15]. Addiction is manifested in physical and psychological dependence both. Physical dependence occurs when a body experiences withdrawal symptoms upon discontinuing the substance or behavior such as drugs, alcohol or gambling. Initially addictive substance induces pleasure to the user, the continued consumption is driven more by a need to eliminate the anxiety brought about by its absence, thus leading the individual to compulsive behavior [16]. Psychological dependency is when the individual experiences withdrawal symptoms such as depression, cravings, insomnia, and irritability on the absence of the substance or behavior [16].

Various models have been given by researchers for better understanding of the causes of internet addiction

#### **Cognitive Behavioral Model**

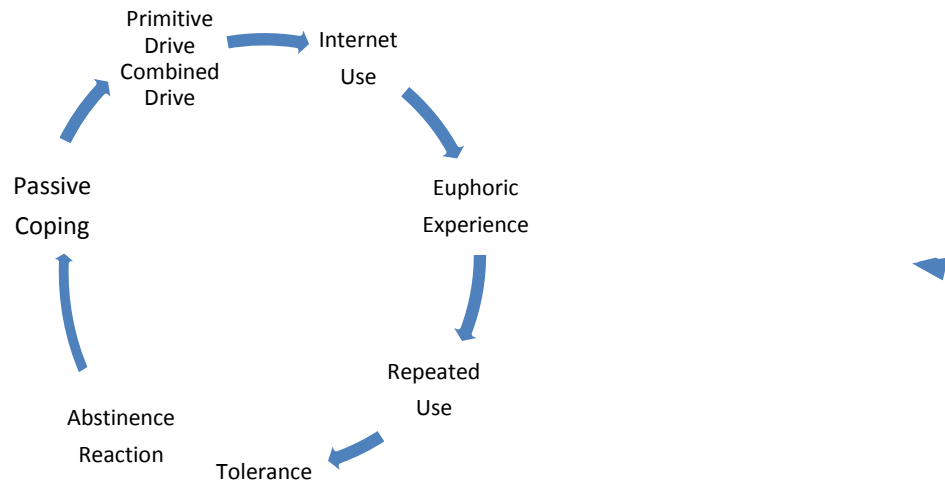
This model was given by Caplan who considered internet addiction as a behavioral addiction, which is featured by components of addiction i.e., salience, mood modification, tolerance, withdrawal, conflict, and relapse. According to him, addicts displayed a salience for the activity, often experiencing cravings and feeling preoccupied with the Internet when offline. Using the Internet for them is a way to escape troubling feelings, developing tolerance to achieve the desired effects or satisfaction, experiencing withdrawal in absence of internet, suffering from interpersonal stress and decreased productivity in other areas of life [17]. Davis [18] introduced a cognitive-behavioral theory of pathological Internet use (PIU) as more than a behavioral addiction. Accordingly to his model, there are two distinct forms of PIU: specific and generalized. Specific PIU involves overuse or abuse of content-specific functions of the Internet (e.g. gambling, stock trading, and viewing pornography). Generalized PIU is a multidimensional overuse of the Internet in a individual who is drawn to the experience of being online in and of itself, and demonstrates a preference for virtual, rather than face-to-face, interpersonal communication.

#### **Neuropsychological Model**

In its 2005 report, the China Youth Association for Network Development (CYAND) puts forward, for the first time, a standard to judge the Internet addiction as having one prerequisite and three conditions [19]. The prerequisite is that the Internet addiction must severely jeopardize a young person's social functioning and interpersonal communication. An individual would be classified as an Internet addict as

long as he or she meets any one of the following three conditions: (1) one would feel that it is easier to achieve self-actualization online than in real life, (2) one would experience dysphoria or depression whenever access to the Internet is broken or ceases to function; (3) one would try to hide his or her true usage time from family members. The brain reward system is largely responsible for producing a drug's potent addictive properties [19].

**Figure 1 - Neuropsychological chain model of Internet addiction [20]**



Primitive drive is the instinct of an individual to pursue pleasure and avoid pain, which is representative of various motives and impulses to use the Internet. Euphoric experience - internet related activity leads to euphoric feeling to the individual, which drives him to use in continuously to maintain the experience. Tolerance - repeated use of the Internet increase the sensory threshold in order to achieve the same euphoric experience, which increase the time of use of internet.

Abstinence reaction- The physical and psychological syndromes happen once the individual stops or after decreased Internet use, mainly including dysphoria, insomnia, emotional instability, irritability etc.

Passive coping- Passive behaviors accommodating to the environment form once the individual is confronted with frustration or receives outside harmful effects, which include passive behaviors such as adverse event imputation, cognition falsification, and the formed suppression, escape, and aggression.

Avalanche effects - passive experience consisting of tolerance and abstinence reaction, and combined drive consisting of individual passive coping styles on the basis of the primitive drive.

### **Compensation Theory**

This theory was given by Institute of Psychology of the Chinese Academy of Sciences [21] where by engaging in Internet activities, the young people also look for compensation for spiritual compensation, self-identity, self-esteem and social networking. Online, a person can create a social network of new relationships. With routine visits to a particular group (i.e., a specific chat area, online game, or Facebook), a person can establish a high degree of familiarity with other group members, thus creating a sense of community. Once membership in a particular group has been established, Internet addicts rely on the conversation exchange for companionship, advice, understanding, and even romance. The formation of such virtual arenas creates a group dynamic of social support to answer a deep and compelling need in people whose real lives are interpersonally impoverished and devoid of intimacy. Internet use can become highly reinforcing to overcome low self-esteem, social awkwardness, loneliness, and depression. Those who suffer from these problems may be more at risk and vulnerable to developing the disorder. Treatment models with this in mind need to examine other comorbid factors the client may be dealing with.

### **Situational Factors**

The Internet can become a psychological escape that distracts a user from a real-life problem or difficult situation such as a recent divorce, relocation, or a death. Their behavior may be temporary and even fade over time. However, in cases where the behavior becomes persistent and continuous, online activities can become all-consuming. People who have addictive personalities may be more likely to use alcohol, cigarettes, drugs, food, or sex as a way of dealing with problems [22].

### **PREVALENCE OF INTERNET ADDICTION**

Prevalence statistics vary widely across cultures and societies. Researchers are developing various different instruments to measure prevalence of internet addiction, which is making the comparison difficult across the studies. In one of first studies done on college students at the University of Texas it was found that 13% of the sample population is showing signs of dependency to internet [23]. It was found in another study that 14% students in a college at Rhode Island met the criteria of internet addiction [24]. Similar study was done in Finland in adolescents, where using the Young's Internet Addiction Diagnostic Questionnaire, 4.7% in girls and 4.6% in boys fulfilled the criteria of internet addiction [25]. In a statistical report on a world wide scale, adolescents in China made the largest chunk of about 9.72%- 11.06% of internet users [26].

In India, the studies are in their initial stages. In 2006 a mass study was done by I-Cube, which enrolled 65,000 individuals says that 38% of individuals are heavy users(8.2 hours/week) mainly for the purpose of including e-mail and instant messaging (98%), job search (51%), banking (32%), bill payment (18%), stock trading (15%), and matrimonial search (15%). The age group which was showing highest frequency of internet addiction was young males [27]. In a study in school going adolescents authors have reported after interviewing 603 adolescents that the prevalence of internet addiction was noted to be 3.96% in boys and 1.62% of girls. Over 15% of the total sample showed overuse of internet but below internet addiction criteria. Stress scores were significantly correlated with the internet use patterns in both sexes. The main use of the internet in either sex was for social networking [28].

### **CLINICAL FEATURES OF INTERNET ADDICTION**

Warning signs that the child is heading towards Internet Addiction Disorder –

1. A preoccupation or obsession with Facebook, gaming, YouTube, porn, etc.
2. Lying or hiding online gaming and Internet use.
3. Disobedience to time limits.
4. Diminished interest in other activities (that used to be pleasurable).
5. Social withdrawal from family and non-virtual friends.
6. Psychological withdrawal from the game (when player stops) or the Web (when offline).
7. Using gaming as a psychological escape from depression, anxiety, spiritual or existential void, etc.
8. Continuing to game or be online despite the negative consequences to sleep, physical or emotional health, relationships, school, or work.
9. Engaging in illegal activities, such as cyber-bullying or hacking.

The main features of Internet Addiction Disorder are –

1. The child or adolescent feels preoccupied with the Internet (think about previous on-line activity or anticipate next on-line session).
2. There is a need to use the Internet with increasing amounts of time in order to achieve satisfaction.
3. There have been repeated unsuccessful efforts to control, cut back, or stop Internet use.
4. The child or adolescent feels restless, moody, depressed, or irritable when attempting to cut down or stop Internet use.
5. The child and adolescent stay on-line longer than originally intended.

6. School work and social engagements have been jeopardized or risked due to excessive internet use.
7. The child or adolescent has lied to family members, counsellors or others to conceal the extent of involvement with the Internet.
8. The internet is used as a way of escaping from problems.
9. A major portion of the day is spent on the internet (excluding the time spent in school).

If 5 or 6 of the above points mentioned are true then it is essential that help is sought and that a mental health professional is consulted [29].

### **ASSESSMENT OF INTERNET ADDICTION**

Unlike alcohol and other addictive substance, which is not a essential part of our lives, internet offers benefits as the technology advances. So considering an individual as internet addict in a single interview is impossible. Adolescents may come to professional help with the complaints of depression, anxiety, obsessive and compulsive disorder, later on in detail history underling internet addiction can be diagnosed Internet addiction could be described and diagnosed, such as the well described set of diagnostic criteria provided by Goldberg [30] and six criteria developed by Griffith [31]. The use of internet should be compared with the criteria of any other DSM diagnosis like impulse control disorder in DSM-IVTR [32]. As research into Internet addiction continued, checklists were developed whereby data could be collected from willing, self-reporting respondents about their patterns of Internet use.

In 1998, Internet Addiction Diagnostic Questionnaire first screening tool was developed by Young which was a simply yes/no question used for online survey, telephonic interviews, self assessment [33]. Later efforts in the same line was done by Beard and Wolf [34] who further modified the criteria, according to them the diagnosis of Internet addiction cannot be made if the addiction is causing impairment in their daily functioning [34]. Finally in 2003, Shapiro developed a approach a model based on impulse control disorder as per DSM-IV, which included irresistible preoccupation with the Internet or excessive use of the Internet for periods of time longer than planned which is causing impairment in social, occupation and other important areas of functioning [35].

Later on the work on internet addiction became sophisticated and more questions were included in the measurement tools like a 13-question 'Pathological use scale' which was developed to assess whether heavy Internet use negatively affects academic and other work, interpersonal relations, individual stress levels, social withdrawal, and mood alteration [36]. Brenner [37] also developed an Internet-Related Addictive Behavior Inventory (IRABI). The IRABI has 32 true-false questions that assess users' Internet experiences. Instead of a yes or no questionnaire, 4 point likert scale was developed like the Chinese Internet Addiction Scale (CIAS) [38].

### **COMORBID PSYCHOPATHOLOGY IN INTERNET ADDICTION**

Continuous use of internet leads to time distortion, failure to manage time, sleep disturbances, missing meals, unhealthy lifestyles [39]. Scherer have reported that Internet use had interfered with academic work, professional performance and failure to fulfill social obligations and relationship issues [40]. A few studies have explored the personality variable and psychosocial factors responsible of users become a addict easily such as sensation seeking, pleasure experience, use and gratification, loneliness, depression, social anxiety, low social skill, and introversion [41-42].

Studies have shown that depressed people tend to interact with strangers more on internet and are found to disclosure of their personal life as compared to healthy controls. In particular, low self esteem, poor motivation, fear of rejection and need of approval seen in depression contribute to increase Internet addiction and on the contrary, excessive time online might increase levels of social isolation, resulting in increased depression [43]. Internet use in adolescents have worse self regulation, more time is spend on editing messages, profile pictures. According to one early study, whereas non-dependent Internet users spend most of their time online using e-mail and surfing web sites, dependent users spent most of their time online meeting new people through chat rooms, instant messaging [44].

Self-harming youths tend to chat more online with strangers and more likely to have close relationship with them [45]. Individuals with the most severe social anxiety disorder may gain comfort with cyberspace interactions, particularly if they spend greater amounts of time doing so. However, these gains may prove to be elusive, belying greater isolation, anxiety, and impairment associated with non-cyberspace interactions [46].

### MANAGEMENT OF INTERNET ADDICTION

- **Encourage other interests and social activities** - Get your child out from behind the computer screen. Expose kids to other hobbies and activities, such as team sports, Scouts, and afterschool clubs.
- **Monitor computer use and set clear limits** - Restrict the use of computers or tablets to a common area of the house where you can keep an eye on your child's online activity, and limit time online. This will be most effective if you as a parent follow suit. If you can't stay offline, chances are your child won't either.
- **Use apps to limit your child's smartphone use** - If your child has his or her own smartphone, it's very difficult to directly monitor their time on the Internet. However, there are a number of apps available that can effectively do the monitoring for you by limiting your child's data usage or restricting his or her texting and web browsing to certain times of the day. Most of the major carriers offer parental control apps. Other third-party apps are also available that eliminate texting and emailing capabilities while in motion, so you can prevent your teen using a smartphone while driving. See Resources & References section below for more information.
- **Talk to your child about underlying issues** - Compulsive computer use can be the sign of deeper problems. Is your child having problems fitting in? Has there been a recent major change, like a move or divorce, which is causing stress?

### NON PHARMACOLOGICAL TREATMENT

Young claims that many people believe the only way to cure Internet addiction is to stop using the Internet, to unplug or to throw out the computer. However, not all scholars agree with this 'all or nothing' treatment plan. Orzack and Orzack [47], for example, argue that the treatment of Internet addiction cannot be total abstinence; it should be treated like an eating disorder where the goal is to normalize network use in order to survive.

With regard to psychotherapeutic intervention, there is little data available and no therapy has been posited as the gold standard for treatment. Supportive therapy and counseling along with family intervention have helped in few patients. Although recently some researchers have supported the use of cognitive behavioral therapy and motivational interviewing as the most efficient treatment for internet addiction [48].

Motivational interviewing (MI) is a client-centered yet directive method for enhancing intrinsic motivation to change by exploring and resolving client ambivalence. Using techniques such as open-ended questions, reflective listening, affirmation, and summarization, it helps the individuals give up addictive behaviors and learn new behavioral skills to help individuals express their concerns about change. Unfortunately, there are currently no studies addressing the efficacy of MI in treating IAD, as compared to alcohol, drug addiction, and diet/exercise problems where MI is found to be efficacious [49].

Interventions involving family members and other significant members in 'Community Reinforcement and Family Training' could be useful in enhancing the motivation of an internet addict to cut down his internet use, although existing data is unsatisfactory [50].

Reality therapy (RT) is a behavior therapy which include sessions to show clients that addiction is a choice and to give them training in time management and encourage them to change their behavior by introducing alternative activities [51].

There had been many case reports showing efficacy of Cognitive behavior therapy in internet addiction as well as in the treatment of other behavioral addictions/impulse-control disorders, such as pathological

gambling, compulsive shopping, bulimia nervosa, and binge eating-disorders. Wolfing has described a behavioral treatment includes identification of sustaining conditions, establishing of intrinsic motivation to reduce the amount of time being online, learning alternative behaviors, engagement in new social real-life contacts, psycho-education and exposure therapy, but unfortunately clinical evidence for the efficacy of these strategies is not mentioned [52].

As Internet addicts tend to neglect their hobbies and other interests due to the time spent searching for virtual interests, the individual is encouraged to complete a personal inventory containing the activities that used to be carried out and were disregarded after the problem emerged. The aim of the exercise is to help them to be aware of the choices and resume to the activities which have been lost due to excessive internet use [53].

Another technique is to identify some stimulant to log off (External Stoppers Technique); with the new agenda already developed for the Internet the use of an alarm clock to function as a warning for the patient that it is time to turn off the computer and carry out some other offline activity, such as going to work or school or, when it is late at night, simply going to bed to have some rest and try to sleep [54].

The reSTART program is an inpatient Internet addiction recovery program which integrates technology detoxification (no technology for 45 to 90 days), drug and alcohol treatment, 12 step work, cognitive behavioral therapy (CBT), experiential adventure based therapy, Acceptance and Commitment therapy (ACT), brain enhancing interventions, animal assisted therapy, motivational interviewing (MI), mindfulness based relapse prevention (MBRP), Mindfulness based stress reduction (MBSR), interpersonal group psychotherapy, individual psychotherapy, individualized treatments for co-occurring disorders, psycho-educational groups (life visioning, addiction education, communication and assertiveness training, social skills, life skills, Life balance plan), aftercare treatments (monitoring of technology use, ongoing psychotherapy and group work), and continuing care (outpatient treatment) in an individualized, holistic approach [55].

Support groups tailored to the patient's particular life situation will enhance the patient's ability to make friends who are in a similar situation and decrease their dependence upon on-line cohorts. If a patient leads one of the above mentioned "lonely lifestyles" then perhaps the patient may join a local interpersonal growth group. Addiction recovery groups will address the maladaptive cognitions leading to such feelings and provide an opportunity to build real life relationships that will release their social inhibitions and need for Internet companionship [56].

Lastly, family therapy may be necessary among addicts whose family relationships have been disrupted and negatively influenced by Internet addiction. Intervention with the family should focus on several main areas: (a) educate the family on how addictive the Internet can be, (b) reduce blame on the addict for behaviors, (c) improve open communication about the pre-morbid problems in the family which drove the addict to seek out psychological fulfillment of emotional needs on-line, and (d) encourage the family to assist with the addict's recovery such as finding new hobbies, taking a long over-do vacation, or listening to the addict's feelings. A strong sense of family support may enable the patient to recover from Internet addiction [57].

## **PHARMACOLOGICAL TREATMENT**

The associations between Internet addiction and psychiatric disorders, including ADHD, depression, social anxiety disorder, substance use disorder, and aggressive behaviors, should be thoroughly assessed and treated for cases of Internet addiction. There had been a few case reports of treatments with SSRIs, SNRIs as Bupropion as well as anti-craving drugs and low dose antipsychotic drugs [58-62]. The supporting data for use of drugs is very limited.

### **TIPS FOR PARENTS AND TEACHERS [63]**

- It is prudent to introduce limited Internet usage with children from the outset, to help them become accustomed to the Internet being time-limited.
- It may be appropriate to limit the time spent on the Internet with a timer which you set after agreeing a time limit with your child.

- Keep your computer in a shared family room, not in a child's bedroom.
- Find out how much time your child is spending online.
- Ask yourself if your child's Internet use is affecting his or her school performance, health, and relationships with family and friends.
- Don't ban the Internet - it is an important part of most children's social lives.
- Instead, establish reasonable rules about where your children can go online and what they can do there - and stick to them.
- Such rules might include: an Internet time log, i.e. to limit the amount of time online each day (though remember that mobile phones, Internet cafes and friends' houses may provide alternative Internet access points)
- No surfing or instant messaging until they complete their homework; you might have a policy to limit the access to chat rooms.
- There is computer software that can help to limit the amount of time spent online.
- Talk to your child about why they are spending so much time online, and what they are spending their time doing.
- Discuss this with the view to encourage and support your child's participation in other activities - particularly physical activities – and help your child to socialise offline with other children.
- Finding and encouraging your child into an offline activity that links in with their online interests could be a possibility here.
- Consider speaking to your school's counsellor. They may be able to provide the necessary support for your child.
- If your child is demonstrating strong signs of Internet addiction, consider seeking professional counselling.
- Excessive time spent on the Internet is not healthy for the overall well-being of our children, may impair interpersonal skills, and may lead to unrealistic relationship realities.
- Do not allow cell phones, computers, tablets, or other internet-enabled devices in bedrooms, especially at night.
- Consider “unplugging” the whole family from screens periodically.
- Limit your own use of digital media to set a good example, including turning off smartphones and computers during family meals. Avoid texting while driving.

## CONCLUSIONS

Internet Addiction, Internet Addiction Disorder, Compulsive Internet Use, Computer Addiction, Internet Dependence and Problematic Internet Use - all of these are essentially terms that have been applied to those that spend excessive amounts of time online at the expense of and to the detriment of other aspects of their lives.

The obsessive behaviour takes the form of particular activities, and might include any or all of the following:

1. Relationships: spending excessive amounts of time starting and maintaining online friendships in chat rooms, which replace real-life friends and family and even falling in love and indulging in serious relationships online with others.
2. Money: compulsively gambling online, playing poker and compulsive online shopping.
3. Information searching: compulsive web surfing or database searches.
4. Gaming: obsessive computer game playing, including multi-user games.
5. Sex: addiction to adult chat rooms, sexual chatting or pornography on the Internet.
6. Smartphone Addiction: this excessive internet use results in all these behaviours being enacted via a mobile phone rather than a laptop and this leads to a phenomenon called smartphone addiction.

It is essential that treatment is sought at the earliest and various methods used in combination in a holistic and synergistic approach.



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