Lost online:
an overview of internet addiction†

Vijaya Murali & Sanju George

Abstract   A significant minority of people who use the internet develop 'internet addiction' – a relatively new concept in psychiatry not yet recognised by ICD–10 or DSM–IV. Preliminary research offers interesting insight into predisposing factors and psychosocial treatment options. Mental health professionals need a basic understanding of internet addiction so that they can recognise it early and intervene appropriately. In this article, we present an overview of the aetiological frameworks, assessment and treatments of internet addiction.

The internet is an integral part of modern life and for the vast majority of internet users its benefits far outweigh the adverse consequences secondary to excessive use. 'Internet addiction' is not yet a recognised ICD–10 or DSM–IV diagnostic category, and considerable nosological ambiguity surrounds the phenomenon, which has been variously conceptualised as an addiction and an impulse-control disorder. Young (1998) was first to describe excessive and problematic internet use as an addictive disorder (with features such as tolerance, preoccupation and inability to cut back) and she is credited with coining the term 'internet addiction disorder'. Early research tended to define internet addiction as use of the internet for more than 38 h a week. Although the true prevalence of internet addiction is not known, Young (1998) estimated the figure to be between 5 and 10% of all on-line users, which gives between two and five million 'internet addicts. An earlier study, by Shotton (1991), noted that addicted computer users were mainly male, highly educated and introverted. However, subsequent studies (Griffiths, 1997, 1998; O'Reilly, 1996; Young, 1998) reported contrasting findings: dependent internet users were mostly middle-aged women on home computers.

The nosological ambiguity and lack of conceptual clarity and specificity surrounding the concept of internet addiction have led many researchers to question its validity. Critics highlight the lack of empirical research and the untested construct validity, proposing that 'internet addiction' be replaced by terms such as excessive, maladaptive or problematic internet use. It is beyond the remit of this article to shed further light on this debate but we will present an overview of the aetiology, assessment and treatment of the concept of internet addiction.

Aetiology

As with most addictive behaviours, a range of psychological and behavioural theories has been proposed to explain internet addiction, some of which are outlined below. However, from a clinician's standpoint it is best to conceptualise the causation of internet addiction as being biopsychosocial in nature. Nevertheless, several unanswered questions remain about the varying addictive potential of different internet applications (activities), the interplay of individual personality variables and predisposition to internet addiction and, finally, the particular aspects of the internet to which people become addicted.

Aetiological models

Learning theory emphasises the positive reinforcing effects of internet use, which can induce feelings of well-being and euphoria in the user, and works

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on the principle of operant conditioning (Wallace, 1999). Internet use by a shy or anxious individual to avoid anxiety-provoking situations such as face-to-face interaction tends to reinforce use by avoidance conditioning. Davis (2001) proposed a cognitive–behavioural theory of problematic internet use, which he viewed as arising from a unique pattern of internet-related cognitions and behaviours.

The reward circuit in the brain is normally activated by 'natural' positive reinforcers such as food, water and sex, which are all vital to survival. However, 'unnatural' reinforcers such as drugs, alcohol, gambling and the internet can prove more powerful, causing people to neglect sex, grooming, work, even food and health. The reward-deficiency hypothesis suggests that those who achieve less satisfaction from natural rewards turn to substances to seek an enhanced stimulation of reward pathways (Blum *et al*, 1996). Internet use provides immediate reward with minimal delay, mimicking the stimulation provided by alcohol or drugs.

Impulsivity is seen as a risk factor for the development of addiction. Shaffer (1996) has suggested that internet use is linked to sensation-seeking behaviour, which is a sub-trait of impulsivity. Individuals who are impulsive tend to use the internet as a sensation-seeking tool and may become addicted to it.

Self-esteem in childhood is crucial to the development of a mature personality in adulthood. Low self-esteem may result from the absence of strong parental or peer support, which can culminate in feelings of inadequacy and worthlessness (Harter, 1993). This might lead individuals to turn to the internet as a way of escaping reality and finding a safe world in which they are not threatened or challenged. According to Shotton (1991), introverted, educated, technologically sophisticated males are more prone to develop pathological internet use. Individuals who have low self-esteem have a greater propensity to internet addiction. Shy individuals use the internet to overcome their deficiencies in social skills, communication and social relationships.

What are the addicts addicted to?

Despite these aetiological models, it is still not clear to what precisely internet addicts become addicted. Among the possibilities suggested are: the process of typing, the role of internet as a medium for communication, the information gained, particular applications (e.g. email, gambling, video games, pornography and multi-user domains/dungeons – MUDs) and the anonymity afforded by the internet (Griffiths, 1998; Caplan, 2002). Young (1998) showed that internet users become addicted to specific applications. Individuals who fear real

face-to-face interaction may choose to engage in internet relay chat and multi-user domains. The recent development of three-dimensional graphics in games enables the user to interact with others in virtual worlds. The extreme addictive potential of these 'massive multiplayer online role-playing games' (MMORPGs) has led some users to describe them as heroinware.

Subtypes of addiction

Researchers have attempted to identify subtypes or sub-categories of internet addiction. Davis (2001) subdivided problematic internet use into two types: specific (overuse of a particular function or application) and generalised ('multidimensional' overuse of the internet). Young (1999) categorised internet addiction into five types: cybersexual addiction; cyberrelationship addiction; net compulsion (e.g. gambling or shopping on the internet); information overload (e.g. compulsive database searching); and computer addiction (excessive game-playing).

Consequences of internet use

The internet is a vast repository of knowledge and information, and it enables almost instantaneous transfer of information. Among the positive consequences of internet use Clark *et al* (2004) identified enhanced self-confidence, increased frequency of communication with family and friends, and feelings of empowerment. Others have studied the benefits of the internet in establishing relationships and making friends through game-playing (McNamee, 1996; Parks & Floyd, 1996).

Internet use to the point of addiction, however, can have wide-ranging adverse consequences that affect many domains of the individual's life: interpersonal, social, occupational, psychological and physical. Perhaps the greatest negative impact tends to be on family and social life, as excessive time spent online often results in neglect of family, social activities and interests. The term 'cyberwidow' has been used to refer to the neglected partners of internet addicts. Internet addiction can lead to poor academic performance in school and college (Murphey, 1996; Scherer, 1997) and impaired functioning at work (Robert Half International, 1996). Employers have found that employees with access to the internet at their desks spend a considerable amount of their working day engaged in non-work-related internet use (Beard, 2002). Psychosocial consequences of note include loneliness (Kraut *et al*, 1998), frustration (Clark *et al*, 2004) and depression (Young & Rogers, 1998). Although not very common, some addicts who spend very long hours on the internet also

experience physical problems such as fatigue related to sleep deprivation, backache, and carpal and radial tunnel syndromes.

Assessment

It is important to be aware of how best to assess patients for suspected internet addiction, as a good assessment will help the clinician to formulate an effective treatment plan. Box 1 lists some key assessment points.

The recommended format for the initial assessment interview is essentially the same as that for a standard psychiatric interview – i.e. history-taking (presenting complaints, and past, psychiatric, family and personal histories) and mental state examination. In eliciting the history of presenting complaints, particular attention should be given to getting a clear and comprehensive picture of the nature and extent of internet use. It is best to trace chronologically the onset of internet use, progression, perpetuating factors and abstinence attempts. Key questions to

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Box 1 Key points in assessment for suspected internet addiction

- History-taking
  - Onset, initiating factors
  - Progression
  - Diary of use – pattern, duration, at work/at home, time of day, etc.
  - Maintaining factors
  - Favourite applications (e.g. chatting, shopping, gambling, MUDs)
  - Symptoms of dependence (craving, tolerance, withdrawal, salience, etc.)
  - Attempts to cut back or stop, and outcome
  - Previous attempts at treatment
  - Reason for presentation now
- Obtain corroborative information where needed
- Assess applications used, emotions, cognitions and life events
- Assess the impact of internet use on interpersonal, social and vocational areas
- Assess the level of motivation to engage in treatment (use the 'stages of change' framework)
- Conduct a standard mental state examination
- Rule out psychiatric comorbidity
- Combine clinical interview with other diagnostic/assessment instruments

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Box 2 The stages of change

- Precontemplation: the individual is not ready to consider change
- Contemplation: thought is given to changing
- Determination: the individual decides to change
- Action: active efforts to change are begun
- Maintenance: changes become habitual
- Relapse: the previous behaviour reinstates itself

(after Prochaska & DiClemente, 1992)

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ask include: 'How much time do you spend on the internet each day/week?', 'What applications/activities do you like most or spend most time on?' and 'How has internet use affected your day-to-day life?' Next, assess symptoms of internet addiction, such as salience (craving), tolerance, preoccupation and persistence. Assess the impact that internet use has had on the individual's interpersonal, social and vocational life.

As with most addictive behaviours, it is useful to obtain corroborative information from the patient's partner, relative or close friend. An accurate assessment of the patient's motivation to address their addiction should be attempted. This can best be obtained using Prochaska & DiClemente's (1992) 'stages of change' framework – precontemplation, contemplation, determination, action, maintenance and relapse (Box 2).

Internet addiction is rarely the sole psychiatric disorder in a patient, so psychiatric comorbidity should be suspected. The most common are affective disorders, other addictive disorders, impulse-control disorders and personality disorders. Conversely, before labelling someone an internet addict, it should be established that the symptoms of internet addiction are not secondary to an underlying psychiatric disorder such as mania, depression or psychosis, or to psychosexual disorders.

Young (1999), discussing the assessment of an internet addict, highlighted four specific cues that often triggered internet use or 'net binges'. She recommended that these areas be explored during the course of the clinical interview.

First, applications: this refers to the specific types of activity (e.g. games, chat rooms, search engines, pornography) to which the patient devotes most time. Often a pattern will emerge with individuals having their own preferences. Useful questions to ask are 'Which application of the internet do you like most?' and 'How much time do you spend on each application?'

Second is emotions. It is important to ask the individual how they feel emotionally when online and off-line. For some people, internet use is an attempt to block out unpleasant emotions; for others it results in pleasant and gratifying emotions. Once specific emotional triggers are identified, appropriate interventions can be formulated. Patients who find it difficult to describe their emotions can be encouraged to maintain a 'feelings diary'.

Third are cognitions. Maladaptive cognitions (e.g. low self-esteem and other depressive cognitions) can trigger excessive internet use. It is therefore important that underlying cognitive distortions are identified and addressed appropriately as part of treatment.

The final area is life events. Life events or ongoing stressors can trigger or perpetuate excessive internet use as an attempt to 'dull the pain'. Hence the patient's current life situation should be explored for opportunities for intervention.

Diagnostic and assessment tools

Diagnostic instruments

Young's diagnostic questionnaire

Young (1998) developed the first questionnaire for diagnosing internet addiction. This eight-item screening instrument was based on the DSM–IV diagnostic criteria for pathological gambling (American Psychiatric Association, 1994). The eight questions incorporated the following aspects of addiction: preoccupation with the internet; tolerance (needing to spend increasing amounts of time on the internet to achieve satisfaction); inability to cut back or stop internet use; spending more time online than intended; adverse consequences in interpersonal, educational or vocational spheres of life; lying to conceal the true extent of internet use; and use of the internet as an attempt to escape from problems. Five or more 'yes' responses were considered to be diagnostic of internet addiction. Note that the questions do not have an attached time reference (e.g. past month, past year) and hence yield only point prevalence.

Beard and Wolf's diagnostic criteria

Beard & Wolf (2001) criticised Young's questionnaire, saying that it was more rigid than that for pathological gambling (which required the presence of five out of ten criteria) and that her criteria would not identify internet addiction that was the result of an underlying psychiatric disorder. They therefore proposed the following for a diagnosis of internet addiction. The individual must display all of five criteria (preoccupation, tolerance, inability to cut

back, restlessness or moodiness when attempting to reduce use and spending more time online than intended) and at least one of a further three (adverse consequences, lying to conceal internet use and use of internet to escape from problems).

Griffiths' diagnostic criteria

In an attempt to operationalise a definition of addiction (including internet addiction), Griffiths (1998) proposed six criteria that had to be satisfied: salience, mood modification, tolerance, withdrawal symptoms, conflict and relapse. Although this seems sensible and easy to use, it has not been validated or empirically tested.

Internet Addiction Test

Young (1998) also developed the Internet Addiction Test, a 20-question, self-report questionnaire to diagnose internet addiction. Each question is rated on a five-point scale, from 1 (not at all) to 5 (always). As in her first diagnostic questionnaire, the questions are derived from the DSM–IV criteria for pathological gambling and alcohol dependence. From the total score obtained on the test the individual is placed into one of three categories: average online user; experiences frequent problems because of excessive internet use; has significant problems because of internet use that suggest the need for help.

Apart from aiding in the diagnosis of internet addiction, this questionnaire also helps determine the extent to which excessive internet use has affected the various aspects of the individual's life.

Assessment instruments

The Generalized Problematic Internet Use Scale

The Generalized Problematic Internet Use Scale (Caplan, 2002) is derived from Davis's (2001) cognitive–behavioural theory of internet addiction. It consists of 29 items (each item rated on a five-point scale: 1 = strongly disagree, 5 = strongly agree) and measures cognitions, behaviours and negative outcomes associated with problematic internet use. The seven sub-scales on this scale correlate with a range of psychosocial health variables such as depression, self-esteem and loneliness. Caplan reports evidence, albeit preliminary, for its reliability and validity.

Internet Consequences Scale

This is a 38-item Likert-type scale used to assess the consequences of internet use (Clark *et al*, 2004). It consists of 3 sub-scales: physical consequences (7 items); behavioural consequences (15 items); and

psychosocial consequences (16 items). Clark *et al* found that this instrument has good content validity and reliability.

Criticisms of diagnostic instruments

Beard (2005) eloquently summarised the key criticisms of the diagnostic instruments listed above. First, as they are based on different theoretical frameworks there is limited agreement between them on the crucial component, dimensions of internet addiction. Second, most are self-report instruments and hence are dependent on the respondent answering questions honestly, but none incorporates a 'lie scale' to correct for this. Third, none identifies the specific internet applications (e.g. chat rooms, email, pornography) to which the user is addicted.

None of the instruments discussed has undergone rigorous testing of reliability and validity and none wholly captures the various dimensions of excessive internet use and its wide-ranging consequences. This explains the lack of a universally acceptable gold-standard assessment or diagnostic tool.

In view of these limitations, it is advisable to rely heavily on the clinical interview and to use diagnostic tools only within a comprehensive framework of clinical assessment.

Treatment strategies for pathological internet use

This is very much an under-researched area and there are no treatments of established efficacy or effectiveness. Most of the available evidence, albeit preliminary, points to the usefulness of behavioural strategies in treating internet addiction (Young, 1999). No controlled trial has evaluated the role of pharmacological interventions. However, drawing parallels from research into pathological gambling (given the shared conceptual and phenomenological underpinnings – both are non-chemical addictions), it may be reasonable to assume that selective serotonin reuptake inhibitors and naltrexone may have a role (as yet untested and unproven) in the pharmacotherapy of internet addiction. Of course, drugs have a definite role in treating co-existing psychiatric disorders (whether primary or secondary), including affective disorders, anxiety-spectrum disorders and other addictive disorders.

Given the internet's numerous advantages and positive uses in day-to-day life, it is impractical to try the total abstinence model (as in treatment of substance addictions), even in those who are addicted to the internet. The guiding principle should be 'moderate and controlled use'.

Box 3 Behavioural strategies used to treat internet addiction

- Practice the opposite
- External stoppers
- Setting goals
- Reminder cards
- Personal inventory
- Abstinence

(Young, 1999)

Young (1999) has suggested a number of behavioural strategies for treating internet addiction (Box 3), and these are outlined below.

Practice the opposite

This involves identifying the exact pattern of the individual's internet use and then trying to break their online routine and habit by introducing 'neutral' activities. For example, if the routine involves spending all weekend online, it could be suggested that the individual spends Saturday afternoon on an outdoor activity.

External stoppers

The individual uses prompts (such as an alarm clock) to remind them when it is time to log off.

Setting goals

Despite high levels of motivation and support, internet addicts may fail in treatment if clear goals are not set. It is often helpful to use a daily or weekly planner showing specified times allocated to internet use. To begin with, these time slots should be frequent but brief. In the long term this planning is expected to give back to the individual a sense of control over their internet use.

Reminder cards

The individual is encouraged to write down (on cards) some of the negative consequences of internet use (e.g. problems at work) and the possible benefits of limiting time online (e.g. being able to spend more time with their partner). These cards are carried at all times, as constant reminders that help to prevent internet misuse at vulnerable times.

Personal inventory

As internet addicts often spend considerable time online, it follows that they neglect many of their other

hobbies and interests. The individual is encouraged to make a list of such 'lost' activities and to reflect on their life before excessive internet use, thereby rekindling their non-internet-based interests.

Abstinence

In this context the individual abstains from a particular internet application (e.g. using chat rooms or playing games) and uses other applications in moderation. This model of abstinence is recommended for those who have tried and failed to limit their use of a particular application.

Other treatments
Support groups

People who lack social support may turn to the internet as a way of forming relationships. If this results in addictive internet use, it is important to help such individuals integrate into a social circle of others in a similar situation and to improve their real-life social support network. This will help them to rely less on the internet for the reassurance and comfort that they miss in their real life. Twelve-step recovery programmes[†] that address alcohol or drug addiction can also help internet addicts to overcome their feelings of inadequacy and share their feelings and views with one another. This will provide the support and guidance they need to enhance their recovery.

There are specific support groups that help people deal with their addiction to the internet. One such is the Internet Addiction Support Group (http://health. groups.yahoo.com/group/Internet-addiction), run by the Center for Online Addiction in the USA. The Center is a web-based resource network, founded by Kimberley Young in 1995, which specialises in cyber-related problems. The support group provides education about internet addiction and advice on its management. The group describes itself as a safe place on the web that aims to restore the health and well-being of people addicted to the internet. As yet, there is limited empirical support for this treatment modality.

Family therapy

Internet addiction is likely to disrupt family relationships. If it does, family intervention should be part of the individual's treatment. This can educate family members about addiction, reduce the

blame they place on the internet addict, facilitate open communication among family members and promote the addict's recovery.

Cognitive therapy

Individuals who have a catastrophic thinking style tend to worry and anticipate negative events and to avoid real-life situations. They tend to use the internet as an escape from reality (Young, 1999). Cognitive therapy identifies maladaptive negative cognitions and faulty assumptions and reframes them to help the individual develop alternative, adaptive cognitions.

Conclusions

The concept of internet addiction as a psychiatric disorder is still in its infancy. Ongoing debate on the question of its validity as a psychiatric diagnostic category has probably hindered detailed research and this limits our current understanding of the aetiology and treatment of the problem. However, preliminary research offers interesting insights into the individual predisposing factors and psychosocial treatment options. With people's increasing reliance on the internet as an essential part of their everyday lives, the problems associated with excessive and problematic use of the internet are also set to rise. Psychiatrists need a basic understanding of this disorder so that they can recognise it early and intervene appropriately, especially in patients with other coexisting addictive disorders.

Declaration of interest

None.

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[†]For a description of the twelve-step approach of Alcoholics Anonymous see Luty, J. (2006) What works in alcohol use disorders? *Advances in Psychiatric Treatment*, **12**, 13–22. Ed.

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MCQs

1 Internet addiction:
a is a DSM–IV diagnosis
b is classified as an impulse-control disorder in ICD–10
c shares all characteristics of substance dependence
d is more common in men
e is a term coined by Young.

2 The following theories have been proposed to explain internet addiction:
a psychoanalytic theory
b cognitive–behavioural theory
c hyperdopaminergic theory
d GABA-deficiency theory
e locus of control theory.

3 The following are potential consequences of internet addiction:
a depression
b divorce
c carpal tunnel syndrome
d poor academic performance
e psychosis.

4 Treatment strategies used in internet addiction include:
a behavioural therapy
b carbamazepine
c aversive therapy
d ECT
e naltrexone.

5 Regarding assessment of internet addiction:
a assessment is best carried out online
b assessment of psychiatric comorbidity is not necessary
c the Internet Addiction Test is a self-report questionnaire
d the Online Cognitions Scale assesses the consequences of internet use
e the Internet Consequences Scale incorporates a lie scale.

MCQ answers

1	2	3	4	5
a F	a F	a F	a T	a F
b F	b T	b F	b F	b F
c F	c F	c F	c F	c T
d F	d F	d F	d F	d F
e T	e F	e T	e F	e F