

Logged in or Locked in? A Narrative Review of Internet Addiction in India

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ABSTRACT

In the present era, the Internet is one of the most important parts of our day-to-day activities. Our personal, social, professional life, all are driven by the internet. It has made our life easier and more communicative. But every coin has two sides, in the same fashion internet also has a different side, which is darker. This internet-based fast technology usage among all age groups is increasing the threat of Internet addiction among the masses. People are spending more and more time on the internet sometimes doing lucrative work, and most of the time, visiting social networking sites, gaming sites and many more through their electronic gadgets. They do not have a clue that, they are spending most of the time remaining online, avoiding their family, friends, and other important works. The purpose of this narrative review is to highlight that excessive use of the internet, is harming the physical and psychological health of the individual leading to behavioral addiction.

Keywords: Behavior Addiction, Mental Health Issues, India.

The history of the Internet in India started with the launch of the Educational Research Network (ERNET) in 1986. During that time the network was only available for a few premier educational institutes of India for education and research purpose. It was the year 1995 when Videsh Sanchar Nigam Limited (VSNL) made the availability of the Internet for common people (TelanganaToday, 2020). Internet is a revolution in the communication sector and contributes significantly to the growth of India. According to a recent survey report of 2020, India is estimated to have nearly 700 million active internet users, which was estimated to cross 800 million in the year 2021 (Total internet users in India, Statista, 2021).

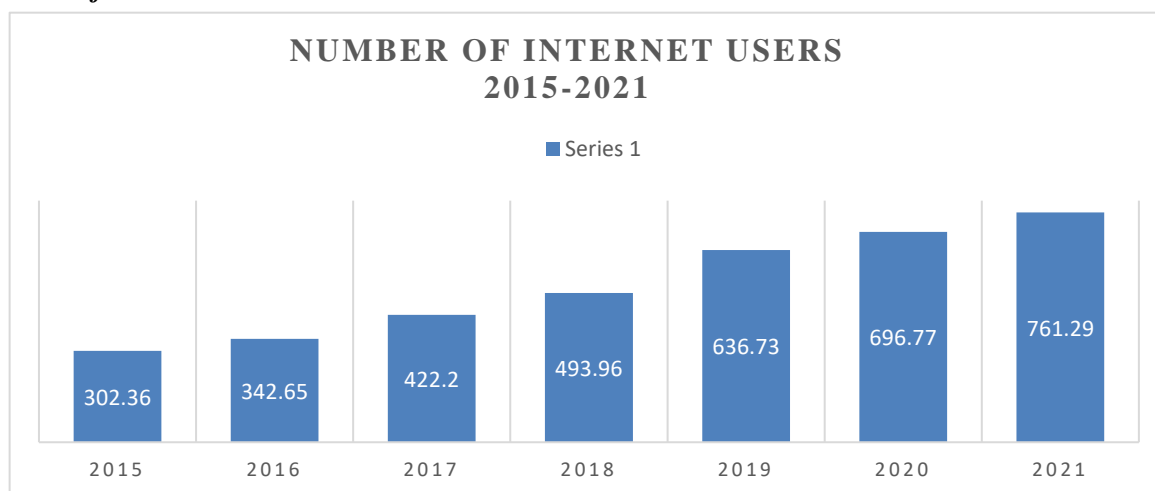
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Figure 1: The figure is a graphical representation of the total number of active users in India from 2015 to date.

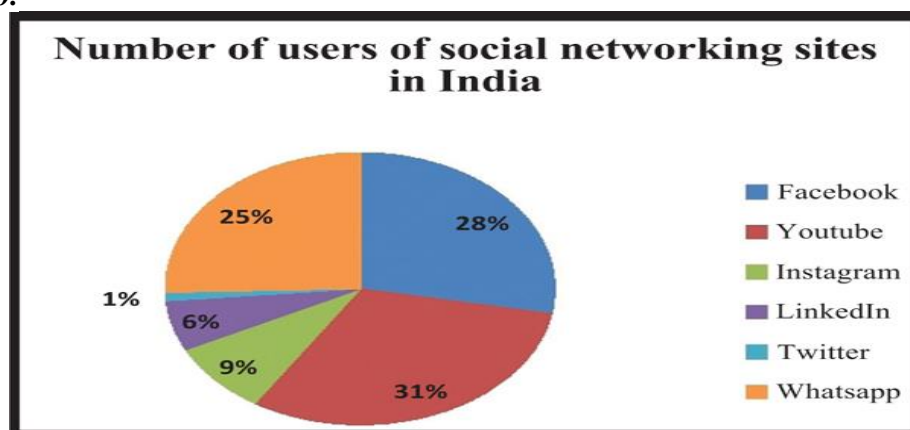


Source: Total internet users in India (Statista, 2021).

Concept of Internet Addiction

Internet remarkably has given exponential growth to India, but it has a darker side also. People in the present era are more inclined towards the negative use of the internet. Smartphones, laptops, and other technology-driven social networking sites have caused an increase in internet usage in all age groups of people. This has caused internet usage to the level of behavioral addiction (Aziz et al., 2020).

Figure 2: The Pie-chart is showing the total number of active social media users in India in 2020.

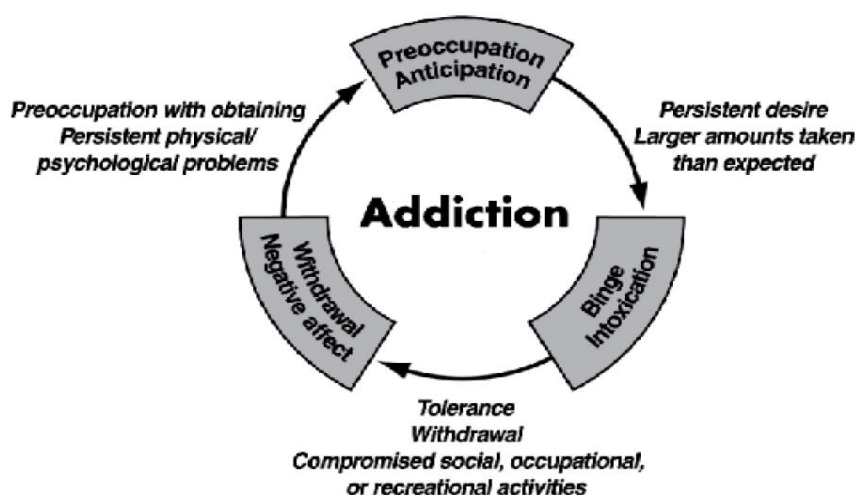


Source: Number of users of social networking sites in India. (Aziz et al., 2020)

The term internet addiction was first used by Dr. Ivan K. Goldberg in 1995 for pathological compulsive internet use (Goldberg, 1996). Later on, Young in 1998, associated excessive internet use with pathological gambling based on DSM IV. Internet addiction is a complex phenomenon and most researchers have used different terms to describe the same phenomenon of excessive internet use. Since the mid-1990s, internet addiction has been proposed as a new type of addiction and mental health problem, similar to alcoholism and compulsive gambling (Gedam et al., 2017). Internet addiction disorder (IAD) is used interchangeably with problematic/ pathologic internet use, internet addictive disorder, internet abuse/ overuse/ harmful use/ dependency, problematic computer use, compulsive

internet use, etc (Maheshwari and Preksha, 2018). But till now internet addiction as a mental disorder is not included in the current version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V in 2013) and it is noted that the only internet-related gaming disorder (one type of IAD) which is included in DSM-V (American Psychiatric Association (2013) also needs more extensive research to be considered as a full disorder. Moreover, studies have found various risk factors associated with internet addiction such as social factors (social anxiety, loneliness, poor support), socio-demographic factors like (urban living, gender, maximum time consumption in traffic, age of parents, and long hours of working of parents, nuclear living), psychological factors such as (loneliness, social phobia, compulsive behavior, depression). Moreover, they also highlighted that Internet addiction severely affects physical health (obesity, visual impairment, high blood pressure, backache, nerve issue) as well as psychological health (irritability, poor concentration, anxiety, stress, and depression) (Malak, Khalifeh & Shuhaiber, 2017; Maheshwari & Preksha, 2018).

Figure 3: The figure depicts the phenomenon of Behaviour Addiction



Source- Greenfield (2017): The center for internet and technology addiction, University of Connecticut, School of Medicine and American Psychiatric Publishing

Definitions of Internet Addiction

- **According to Goldberg (1995)**, Internet addiction was described as having the symptoms of important social or occupational activities that are given up or reduced because of Internet use, fantasies or dreams about the Internet, and voluntary or involuntary typing movements of the fingers.
- **According to Black et al (1999)**, compulsive computer use that had contributed to personal distress, or social, occupational, financial, and legal consequences.
- According to Beard & Wolf (2001), “an individual is addicted when an individual ‘s psychological state, which includes both mental and emotional states, as well as their scholastic, occupational and social interactions, is impaired by the overuse of Internet”.
- **According to Shapira et al. (2003)**, who further refined the concept of problematic internet use by emphasizing operational criteria that emphasize the cognitive and behavioral aspect of the disorder as well as impairment characterized by subjective distress and interference in social and occupational functioning.
- **According to Johnsson & Gotestam (2004)**, Internet addiction is a psychological dependence on the Internet, regardless of the type of activity once logged on.

Criteria for a clinical diagnosis of Internet Addiction Disorder

By adapting the Diagnostic and Statistical Manual for Mental Disorders, 4th Edition: DSM-IV criteria for pathological gambling, Young (1998) proposed one of the first integrated sets of criteria. According to him, the person who fulfills any **five** of the eight adopted criteria (pre-occupation with Internet, need for increased time spent online to achieve the same amount of satisfaction; repeated efforts to curtail Internet use; irritability, depression, or mood lability when Internet use is limited; staying online longer than anticipated; putting a job or relationship in jeopardy to use the Internet; lying to others about how much time is spent online, and using the Internet as a means of regulating mood.) would be regarded as Internet-addicted.

But, the Diagnostic and Statistical Manual for Mental Disorders, 5th Edition: DSM-5 enlisted the criteria for Internet Gaming Disorder (IGD), instead of internet addiction. According to the manual, five of the following eight criteria must be met within one year for an internet gaming disorder, which includes - preoccupation or obsession with internet games; withdrawal symptoms when not playing internet games; build-up of tolerance—more time needs to be spent playing the games; the person has tried to stop or curb playing Internet games but has failed to do so, the person has had a loss of interest in other life activities such as hobbies; a person has had continued overuse of Internet games even with the knowledge of how much they impact a person's life; the person lied to others about his or her internet game usage; the person uses Internet games to relieve anxiety or guilt—it's a way to escape; the person has lost or put at risk and opportunity or relationship because of Internet games.

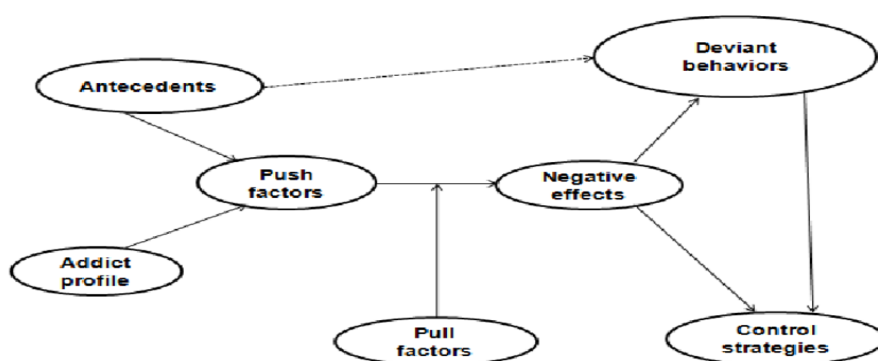
Prevalence of Internet Addiction in India

A recent study by Jain et al (2020) showed a high prevalence level of 15.51% in their respondents, who were found to be internet-addicted, and around 49.19% were found to be over internet users. Abhijeet et al (2020) found that 40.3% of respondents are pathological online gaming users and around 45.2% of respondents are excessive online gaming users. The prevalence of social media addiction was found to be 36.9% among users leading to health problems such as strain on the eyes (38.4%), anger (25.5%), and sleep disturbance (26.1%) (Masthi, Pruthvi & Phaneendra, 2018). A study on online pornography addiction revealed that 10.9% of men and 5.6% of women were addicted to pornographic materials on Internet (Sharma et al., 2019).

Theoretical Models of Internet Addiction

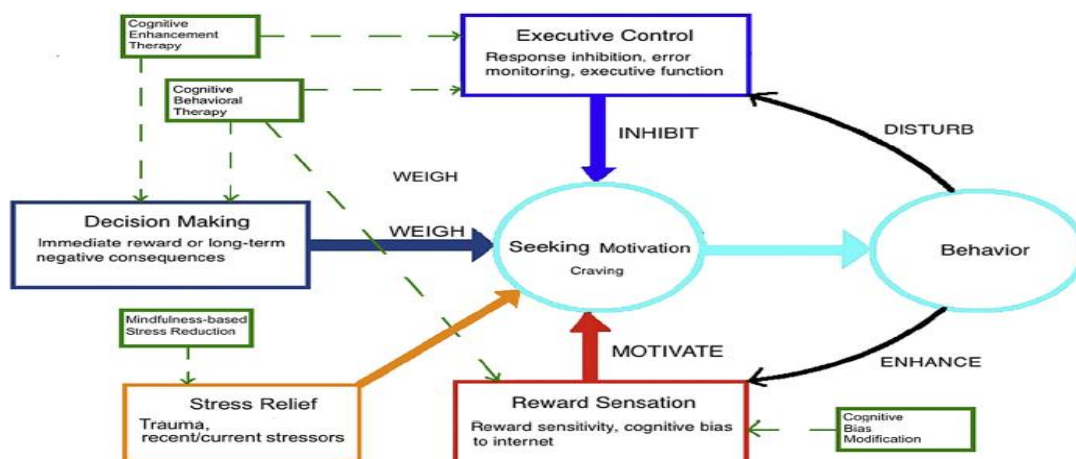
Cognitive-behavioral model (Davis, 2001) – In this model, the author had described that the presence of psychopathology as well as lack of social support and subsequent social isolation is the major cause of problematic internet use. These can manifest in the form of distorted cognition and belief about self, further resulting in the development of self-doubt and low self-efficacy. As a consequence of this negative belief about self, the individual may form negative self-appraisal for example —I am good only on the Internet. The individual may further go on to develop negative appraisal about the world as well as such as —The Internet is the only place where I am respected. He concluded that underlying psychopathology predisposes the individual to become vulnerable in the presence of a stressor. This also has been previously highlighted in several other studies that underlying psychopathology such as depression, substance misuse or dependence, and social anxiety, can be a major cause of overuse of the Internet (Kraut et al., 1999).

Internet Identity Model (Douglas et al., 2008): Through this model, they suggested that excessive internet use is determined by mostly internet requirements and the individual's motivation such as the ability to conceal the identity, distress revealing and relaxing effect and meeting social needs (**the push factors**) as well as the perceived attractive aspect of the environment such as gambling, access to an addictive application like games and chat, easy access to the internet, ease of social interaction and easier communication through the internet as compared to other media (**the pull factor**). However personal inclination is also important which may be promoted by antecedents such as being in environments allowing internet use like student hostels, internet use for many years and feeling of being misunderstood by others and having very little or no social life, and lack of self-confidence. The model mentions that the pull factor and the push factor ease the relationship between the excessive use of the internet and the severity of the negative effect.



Source: Internet Identity Model (Douglas et al., 2008)

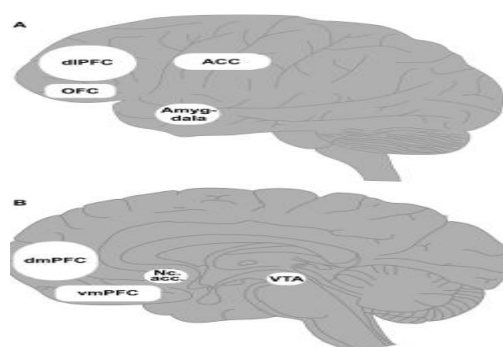
Cognitive Behaviour Model (Dong & Potenza, 2014). The model focuses on three domains and their roles in addictive behaviors. The three domains include motivational drives related to reward-seeking and stress-reduction, behavioral control relating to executive inhibition, and decision-making that involves weighing the pros and cons of engaging in motivated behaviors. Motivational drives linked to reward-seeking contribute importantly to IGD and diminished executive function/cognitive control over these motivational drives contribute to decision-making that leads to persistent engagement in Internet game-playing in IGD. The model further explains that online gaming behaviors might further disturb executive control and reinforce rewarding online experiences, which may lead to a vicious cycle of addictive Internet game-playing.



Dong & Potenza (2014). A cognitive-behavioral model of Internet gaming disorder

Neuropsychological Model of Internet Addiction (Brand, Young, & Laier, 2014).

According to this model, cognitive control refers to the ability to control one’s actions, behavior, and even thoughts, and has an impact on executive functioning. Executive functions are control systems allowing us to regulate our behavior that is planned, goal-oriented, flexible, and effective. These functions are strongly linked to parts of the prefrontal cortex. The excessive Internet users had problems in performing the day-to-day task, indicating decision-making deficits, which had frequently been linked to addictive behaviors. Internet gamers make more risky and disadvantageous choices, even when the rules for positive and negative consequences are explicitly explained. Consequently, the model suggested that patients with Internet addiction may have reductions in prefrontal control and other executive functioning.



Source: Brand, Young, & Laier (2014).

(A) Shows the lateral view of the brain including medial parts such as the anterior cingulate gyrus and amygdala, and (B) illustrates the medio-sagittal view of the prefrontal cortex.

The orbitofrontal cortex (OFC) and the ventromedial prefrontal cortex (vmPFC); The dorsomedial prefrontal cortex (dmPFC) and the anterior cingulate cortex (ACC); ventral tegmental area (VTA); dorsolateral prefrontal cortex (dlPFC); nucleus accumbens, Nc. Acc

REVIEW OF THE LITERATURE

This review of the literature was conducted between October 2020 to March 2021(06 Months). The first objective of the review of the literature was to find out all the Indian studies conducted on the prevalence of internet addiction in the last decade. The second objective was to find out all internet-based intervention studies conducted.

S N	Authors and Year and Place	N	Sampling	Research design	Tools	Findings
1	Goel, Subramanyam & Kamath (2013), Mumbai.	987 adolescents	Convenient Sampling	Cross-sectional study	Semi-structured Performa, Internet Addiction Test, and Duke Health Profile	74.5% were found to be moderate (average) users and 0.7% were found to be addicts. Those with excessive use internet had high scores on anxiety, depression, and anxiety depression.
2	Srijampana et al. (2014), Guntur	211 medical college students	Simple random sampling	cross-sectional study	Internet Related Addictive Behavior Inventory, Young’s Internet Addiction Test	11.8% of respondents were found to be excessive users, whereas, 0.4% were internet

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					(IAT)	addicts. The study also found that medical students used the internet mostly for social networking (59.7%), downloading media files (18.9%), online gaming (12.3%), and academic purposes (0.1%).
3	Krishnamurthy & Chetlapalli (2015), Bengaluru.	515 college students	Multi-staged sampling	Cross-sectional study	Semi-structured Performance and Young's Internet Addiction Test (IAT)	34% of the female respondents reported mild to moderate levels of internet addiction. Respondents were more inclined towards online activities like making new friendships online and getting into relationships online.
4	Sharma et al., (2016), Mumbai	603 school-going adolescents	Convenient sampling	Cross-sectional study	Young's Internet Addiction Test (IAT), Depression, anxiety, and stress scale (DASS21)	15% of the respondents were found themselves to be internet addicted.
5	Bhatia, Rajpoot, & Dwivedi, (2016), Gwalior	300 school students	Simple Random Sampling	Cross-sectional study	Young's Internet Addiction Test (IAT)	24.0% of the respondents were having moderate addiction and 6.33% of the respondents were having severe addiction
6	Gedam et al. (2017), Maharashtra	846 students (undergraduate health professionals)	Convenient Sampling	Cross-sectional survey	Semi-structured Performance and Internet Addiction Test	The total prevalence of internet addiction was 19.85%, with moderate and severe addiction being 19.5% and 0.4%, respectively. It was also associated with anxiety, depression, loss of emotional/behavioral control, emotional ties, life satisfaction, psychological

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						distress, and lower psychological well-being
7	Arthanari et al. (2017), Tamil Nadu.	1020 school students	Multi-staged Sampling	Cross-sectional study	Young's Internet Addiction Test (IAT)	About 35.6% of the students had internet addiction.
8	Upadhyay, Jain & Tripathy, (2017), Lucknow	1150 college students	Multi-staged sampling	Cross-sectional study	Semi-structured Performa, Internet Addiction Test, and Duke Health Profile	74.5% were potential internet addicts, they also had problems related to anxiety, depression.
9	Kumar & Mondol, 2018, Kolkata	200 college students	Simple Random Sampling	Cross-sectional study	Young's Internet Addiction Scale, Symptom Checklist-90-Revised, and Rosenberg Self-Esteem Scale	39.5% of the respondents were found to be severe addicts with poor self-esteem
10	Goswami, Singh, Kumar (2018), Rewa	502 school students	Simple random sampling	Cross-sectional study	Young's Internet Addiction Test (IAT)	<i>Results highlighted that 16.3% of the respondents were having a moderate level of internet addiction and 0.4% were having severe internet addiction. Respondents were found to be more engaged in surfing social networking sites.</i>
11	Sharma et al. (2018), Manipal	304 undergraduate students	Two-stage cluster sampling	Cross-sectional study	Semi-structured datasheet, Young's Internet addiction test, Depression, anxiety, and stress scale (DASS21)	The prevalence of internet addiction was found to be 44% and it was significantly associated with factors such as gender, father's occupation, mother's education, availability of personal gadgets, use of a smartphone, exposure to the internet at a young age; and with an increase in internet addiction, there was a subsequent increase in the level of depression, anxiety, and stress.
12	Thakur et al., (2018),	425 college students	Multi-stage	Cross-sectional	Young's Internet Addiction Test	55 % and 17.67 % of the participants

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	Jabalpur		stratified random sampling	study	(IAT)	were found to be mild and moderate internet addicts whereas 1.33 % of the participants were found to be severely addicted to the internet.
13	Kumar et al. (2018), Indore	384 dental students	Stratified sampling	Cross-sectional study	Young Internet Addiction test, Beck's depression inventory	The prevalence of Internet addiction and depression among respondents were found to be 6% and 21.5% respectively.
14	Ali et al. (2019), Tezpur	900 school-going adolescents	Simple random sampling	Cross-sectional study	Semi-structured Performa, Young's Internet Addiction Test (IAT), Depression, anxiety, and stress scale (DASS21), Online Cognition Scale	The prevalence of internet addiction was found to be 34% (severe internet addiction). The study reported the presence of depression (11.3% mild level and 4.6 % moderate level), anxiety (6.5 % mild level and 4.6 % moderate level), and 14 stress (20% mild level and 6.6% moderate level). Online cognition score had a significant positive correlation with depression, anxiety, and stress.
15	Singh et al. 2019	1782 professionals (such as teachers, engineers, nurses, and students)	-	web-based cross-sectional study	Sociodemographic details, Young's internet addiction test (IAT), and Epworth sleepiness scale (ESS).	About 1.0% of the total sample population had severe internet addiction whereas 13% were in the range of moderate internet addiction. The mean scores of ESS were significantly higher in individuals with moderate and severe addiction
16	Bagban, Patil & Angolkar (2020), Belgavi	160 university students	Simple random sampling	Cross-sectional study	Young Internet Addiction test	11.3% of participants were found to be severely addicted to the internet
17	Bisen & Deshpande (2020), Navi	1600 college students	Stratified sampling	Cross-sectional study	Youngs Internet Addiction test, Beck Anxiety	11.43% of the respondents were found to be

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	Mumbai.				Inventory (BAI), Beck Depression Inventory (BDI), Barratt Impulsiveness Scale-11 (BIS-11).	frequent users, 1.06% were found to be internet addicted. Depression, anxiety, and impulsivity were significantly higher in the IAD than in the N-IAD group.
18	Jain et al. (2020), Rajasthan	954 university students	Systematic Random Sampling	Cross-sectional study	Semi-structured Performance, Internet Addiction Test, Physical Health Questionnaire, Insomnia Severity Index.	15.51% of study subjects were internet addicts and 49.19% were over users. Depression and insomnia are more common in internet addicts and overusers
19	Abhijeet et al. (2020), Tezpur	100 college students	Simple random sampling	Cross-sectional study	Socio-demographic datasheet, Internet Addiction Test, University of California Los Angeles Scale, Multi-dimensional scale for perceived social support	A high level of loneliness (92%), social anxiety in 21%, social phobia in 22%, and severe internet addiction were present in 15% of the respondents. Loneliness has a significant positive correlation with social anxiety
20	Abhijeet et al. (2020), Tezpur	409 school-going adolescents	Convenient Sampling	Cross-sectional study	Semi-structured interview schedule, Online Gaming Scale, Self-regulation scale, Strength and Difficulty Questionnaire	40.3% of respondents were found to be internet-addicted, with emotional and behavioral problems

Psychosocial Intervention in Internet Addiction

There is literature that talks about the importance of psychosocial intervention in internet addiction, where individuals' psychosocial factors must be taken into consideration for providing management (Lee, Lee & Choo, 2017). Psychological factors such as depression, low self-esteem, attention deficits may act as an important predictor for internet addiction at the intrapersonal level, whereas, poor peer relation, poor parent-child relationship, and poor social support may act as a strong predictor for internet addiction at the interpersonal level (Koo & Kwon, 2014). Hence psychosocial management must be planned to keep given the potential factors associated with internet addiction.

- **Motivation Interviewing** – It helps the client to identify the type of feeling or thought involved before going online and how these feelings or thoughts are justified by the behavior client shows through online activities. For example, “feeling of loneliness gets diminished as I start chatting online”. The objective of motivational interviewing is to handle the feelings of ambivalence, as it acts as a barrier in bringing positive change in the client (Chou, Condon, & Belland, 2005).

- **Cognitive Behaviour Therapy** – It is a form of psychotherapy that focuses on how an individual thought, belief, and attitude affects their feeling and behavior (Malak, 2018). Researchers have identified that internet addiction affects cognition (Davis, 2001; Brand, Young & Laier, 2014), and hence cognitive behavior therapy becomes an effective treatment (Davis, 2001). It is seen that internet addiction develops because of poor social and family support (Abhijeet et al., 2020), resulting in maladaptive cognitions (Lee, Lee & Choo, 2017). In cognitive behavior therapy, process like cognitive restructuring to counter negative thoughts, behavioral exercises, and exposure therapy is often used (Malak, 2018; Zhang, Zhang, Xu, 2019).

Young (1999) proposed eight techniques for managing internet addiction

- **Practice the opposite** – In this technique, the client's pattern of internet usage is observed and a new schedule is provided to the client, to disrupt his/her pattern of routine internet usage.
- **External Stoppers** – Here, external stoppers like an alarm clock are used as a warning signal to stop internet usage, and the client is indicated to switch to other lucrative works, like going to school, or playing outdoor games.
- **Setting Goals** – In this technique, the online activities of the client with a time limit are pre-scheduled, and the client is advised to follow the schedule.
- **Abstinence from certain Application** – Here, a few frequently used sites are locked, and an alternative task is provided, such as framing an email, working in a word document, a bibliographic search of their school projects.
- **Reminders Cards** – Here cost and benefits of internet addiction are formed on cards, and often produced in front of the client, like merits or demerits of internet addiction.
- **Personal Inventory** – Here alternative activities are planned for the client, and the client is made to understand how these activities can be beneficial for him/her.
- **Support Groups** - Lack of support (social or family) leads to internet addiction, hence, support groups are necessary.
- **Family Therapy** - Family interventions are necessary to address relational problems that may have contributed to or resulted from internet addictions.

Treatment Centres

- **The Centre for Internet Addiction Recovery (<http://www.netaddiction.com/>)** – Is a web-based treatment program, where self-help books, motivational interviewing, and self-help groups interventions are planned.
- **Service for Healthy Use of Technology (SHUT) Clinic** – It was developed by NIMHANS in 2014, where efforts are made by professionals to enhance the wellbeing of clients with internet addiction and other technology addictions. Various rehabilitation programs, vocation training programs, support groups are a part of this clinic. It is known as the first off-line clinic for technology addiction clients in Bengaluru, Karnataka.

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Conflict of Interest

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