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Psychological Attributes of Problematic Internet Use among Students of Selected Engineering Colleges in Chennai

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Abstract: **The internet is considered as a user-friendly communication medium but at the same time unregulated internet use can cause significant difficulties in some individuals affecting their ability to control their online use. The objective of the study was to identify the problematic internet users (PIU) among engineering college students and to explore the associations between problematic internet use and various personality traits.**
Method: The present study was constructed using a cross sectional survey in two different engineering colleges in the city of Chennai. Ten private engineering colleges were contacted and only two colleges expressed their willingness to participate in the study. A total of 455 students in the age-range of 18-25 years of both gender having access to the internet for at least six months participated. The General Health Questionnaire (GHQ - 12) was used as a screening instrument. Based on the scores of Internet Addiction Test (IAT), participants were divided into problematic internet users (50 and above) and average users(less than 50). A total of 87 problematic internet users were identified and data was collected using socio-demographic data sheet, NEO-Five Factor Inventory, Barratt Impulsiveness Scale, Buss-Durkee Hostility Inventory and Sensation Seeking Scale. They were compared with equal number of average users.
Results: Problematic internet users are likely to be impulsive, more hostile, experience psychological distress, exhibit less trust and dependability with high levels of sensation seeking behavior.
Conclusion: The study suggests that certain personality traits may be important in the acquisition, development, and maintenance of problematic internet use.

Keywords: **Problematic internet use; Students; Personality traits.**

I. INTRODUCTION

The internet is a new technology that has impacted the world and provided many benefits to its users. Internet has found applications in virtually every aspect of modern life and has become an indispensible tool in education. At the same time, it has negative ramifications. Some people are increasingly using the internet for longer periods of time than planned, unable to control their online use and then become dependent on the internet.

The term internet addiction was proposed by the New York Psychiatrist Ivan Goldberg for pathological compulsive internet usage. He combined the criteria for substance use and impulse control disorders and presented them as the criteria for internet addiction. Detecting and diagnosing the internet addiction is often difficult. Researchers have likened internet addiction to addictive syndromes similar to impulse control disorders and have utilized various forms of DSM – IV based criteria to define internet addiction. Of all the conditions referenced in the DSM – IV, pathological gambling was seen as

most akin to this phenomenon. Shapira et al (1) put forth a more comprehensive approach to diagnose internet addiction under the general heading of impulse control disorders as per the DSM-IV- TR criteria which are as follows: A) Maladaptive preoccupation with internet use, as indicated by at least one of the following: 1. Preoccupations with use of the internet that are experienced as irresistible. 2. Excessive use of the internet for periods of time longer than planned. B) The use of the internet or the preoccupation with its use causes clinically significant distress or impairment in social, occupational, or other important areas of functioning. C) The excessive internet use does not occur exclusively during periods of hypomania or mania and is not better accounted for by other Axis one disorders. Problematic internet use can be defined as uncontrolled use of the internet that leads to significant psychosocial and functional impairments. This pattern of use is not better accounted for by a primary psychiatric disorder such as mania or the physiological effects of a substance (2). The term problematic internet use was used in this study to remain descriptive and to focus on internet based behaviours.

The prevalence found by Bakken et al (3) was about 1.0% among the general population, while Morahan – Martin & Schumacher (4) found it to be 8.1% among the college students. In India, the use of internet is enormous especially in the younger population. More recently, Goel et al (5) found a prevalence of 0.7% among college students in Mumbai, India. College students appear to be more likely to become dependent on the internet probably because they have a strong drive to develop a firm sense of identity and to develop meaningful relationships (6).

Many researchers studied the personality characteristics of problematic internet users and they have linked internet use to specific individual characteristics. Several studies (7, 8) observed that internet use may help extroverts to garner more social support but allow introverts to remain isolated and lonely. In another study, Young and Rodgers (9) examined the personality traits of individuals who were considered dependent using the Sixteen Factor Personality Inventory (16PF). Dependent users were found to rank highly in terms of self – reliance (i.e., they did not feel a sense of alienation others feels when sitting alone, possibly because of the interactive functioning of the internet), emotional sensitivity and reactivity (i.e., they are drawn to the mental stimulation through endless databases and information available online), vigilance, low- disclosure, and non- conformist characteristics (i.e., they might be drawn to the anonymity of the internet).

Problematic internet use is correlated to increased impulsivity, (10, 11) hostility, (12, 13) and sensation seeking (14, 15). There is a concern amongst educators about the impact of the internet on the well – being of the students because of the psychological addictive characteristics of the internet. With this background, the present study was undertaken to find out the problematic internet users among engineering college students and also to explore the associations between problematic internet use and various personality traits.

II. METHODS

The present study was conducted using cross – sectional survey in two different engineering colleges in the city of Chennai. Ten private engineering colleges were contacted and only two colleges expressed their willingness to participate in the study The participants (undergraduate engineering students) were selected from these two engineering colleges which were located on the outskirts of Chennai. The study was carried out after obtaining the approval from the Institutional Ethics Committee and permission was sought from the college authorities where the study was undertaken. The eligibility criteria included: a) undergraduate engineering students in the age – range of 18 – 25 years of both gender having access to the internet for the past 6 months, b) individuals who obtain a score of 2 on the GHQ – 12. Students who obtain a score of 3 on the GHQ -- 12 and those who are unwilling to participate in the study were excluded from the study.

A total of 455 students enrolled into the study, of them 410 participants (297 males, 113 females) completed all the questionnaires resulting in a response rate of 90.11 percent. All participants were fully informed of the purpose of the study and were invited to participate voluntarily. The written informed consent was obtained from all the participating students before administering the questionnaires.

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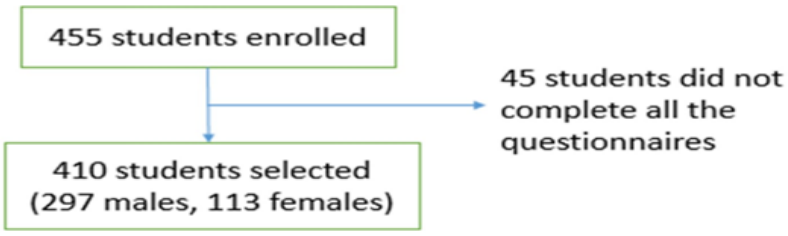

Fig. 1: Flow chart of sample selection

Measures:

The survey comprised a battery of questionnaires including the General Health Questionnaire, (16) Internet Addiction Test, (17) NEO – Five Factor Inventory, (18) Barratt Impulsiveness scale, (19) Buss – Durkee Hostility Inventory (20) and the Sensation Seeking Scale (21). Additionally, a sociodemographic data sheet was developed to collect the sociodemographic details of the participants.

General Health Questionnaire

The GHQ was originally developed in the UK. This 12 – item measure was used as a screening instrument for the possible presence of psychological distress in the participants. Threshold scores of 2 and 3 (16) were taken up to include and discard the participants from the study.

Internet Addiction Test (IAT)

Young developed the IAT (17) to measure the severity of self – reported compulsive use of the internet. It contains 20 questions with six factors relating to salience, excessive use, neglect of work, anticipation, lack of control, and neglect of social life. Each statement is scored on a 5 – point Likert scale (1, rarely to 5, always). The minimum score is 20, and the maximum is 100; the higher the score, the greater the problems internet use causes. Young suggested that a score of 20 – 49 represent average online users with complete control of their internet use, scores 50 – 79 represent frequent problems caused by the internet usage, and scores 80 – 100 shows that internet usage is causing significant problems. The scale showed very good internal consistency, with an alpha co-efficient of 0.93 in the present study.

NEO – Five Factor Inventory (NEO – FFI)

NEO – FFI (18) is a short 60 – item version of the NEO Personality Inventory – Revised, which provides a brief, comprehensive measure of the domains of the five factor model of personality: neuroticism, extraversion, openness, agreeableness, and conscientiousness. Each subscale has 12 items rated on a five point scale. The scale shows considerably high internal consistency as well as good retest reliability.

Barratt Impulsiveness Scale (BIS)

The BIS (19) was used to measure impulsivity. It is a 30 item measure on a scale from 1 (rarely/never) to 4(almost /always). Total scores range from 0 to 120, with higher scores indicating greater impulsivity. Possible scores range from 30 to 120. Total scores between 52 and 71 should be considered within the normal range of impulsivity. Scores of 72 or greater can be used to designate high trait impulsivity. The scale demonstrated good internal consistency with an alpha coefficient of 0.85 over a one month test –retest interval.

Buss – Durkee Hostility Inventory (BDHI)

The BDHI (20) was used to assess hostility. It is a 75 item self – report questionnaire with a true – false format. The total maximum score is 66. The test – retest correlations for the total score were reported to be good (r =0.82) over a two week period.

Sensation Seeking Scale (SSS)

The SSS (21) was used to measure sensation seeking. It is a 40 – question self – report instrument with four subscales. The total maximum score is 40. The total score was moderately reliable with an alpha coefficient of 0.75 (22).

Procedure:

Following informed consent procedures, participants were instructed to read the background of the study that explained the aims of the research. The details regarding the socio-demographic variables were collected. Each participant was screened by the GHQ – 12 and it took about 10 min to complete. After the screening, the participants were inducted into the study group. The internet addiction test was administered in the classroom, each with roughly 40 students, after the class hours. Participants were instructed to consider only the time spent online for non-academic or non-job (or recreational) purposes when answering the questions. The participants were divided into two groups based upon their scores on the IAT, i.e., 50 and above as problematic internet users and less than 50 as average users. Thus 87 problematic internet users were identified and the questionnaire package comprising 4 measures (NEO – FFI, BIS, BDHI and SSS) were administered on them in small groups each with ten students. Instructions were read out and explained and queries about how to answer the items were addressed. The problematic internet users were compared with equal number of average users. Given the length of the questionnaire, the survey took up to 60 min for the participants to complete. Data were collected during the period of August – September 2013. After collecting data and coding and entering the SPSS software, analysis was done by t – test. The significant level was set at 0.05.

III. RESULTS

Information on socio-demographic characteristics and the factors associated with internet usage are presented in Table 1. The mean age of the participants in the PIU group was 19.41 years, and it was 19.84 years in the average users group. A comparison of sex representation showed that male students outnumbered female students in both groups. With respect to hours per day, 47% of problematic internet users spent less than two hours online per day, 45% spent 2-4 hours per day, 5.7%spent 4-6 hours per day and 2.3% spent more than 6 hours per day. Among the average users, 65% spent less than two hours per day online and 35% spent 2-4 hours per day. This does suggest that excessive usage may be a characteristic of those who develop dependence on the internet. The most important objectives of the problematic internet users in using the internet were: academics (26.4%), social networking (24.2%), entertainment (40.2%) and for other purposes (9.2%). Regarding the purpose of the internet usage, about 44% of the average users used it for academic activities in comparison to 27% of the problematic internet users. Internet was mainly used for entertainment by 40.2% of the problematic internet users in contrast to 16.09% of the average users. It shows that entertainment in the form of playing online games and engaging in social networking sites for longer periods of time than the non-dependents are the characteristics of persons with problematic internet use. The mean score of the problematic internet users on the IAT was 57.74 (with a standard deviation of 9.38) indicating that they have frequent problems caused by their internet use. The mean score of the average users was 40.53 (with a standard deviation of 8.84).

Table 1: Socio-demographic characteristics and factors associated with internet usage

Variables	PIU Group N (%)	Average Users N (%)
Mean Age (in years)	19.41	19.84
Gender		
Males	77 (88.5)	48 (55.2)
Females	10 (11.5)	39 (44.8)
Duration of Internet Usage (per day)		
Less than 2 hours		
2-4 hours	41 (47.2)	57 (65.5)
4-6 hours	39 (44.8)	30 (34.5)
More than 6 hours	5 (5.7)	--
	2 (2.3)	--
Purpose of Internet Usage		
Academics	23 (26.4)	38 (43.70)
Social Networking	21 (24.2)	28 (32.20)
Entertainment	35 (40.2)	14 (16.09)
Others	8 (9.2)	7 (8.05)

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Table 2: Personality characteristics of study sample

Factors	Problematic Internet Users		Average Users		t
	Mean	SD	Mean	SD	
Neuroticism	59.40	7.03	54.32	6.45	4.99***
Extraversion	53.29	8.64	51.31	7.82	1.58
Openness	43.46	7.91	42.61	5.95	0.80
Agreeableness	34.72	7.78	38.97	10.91	2.94***
Conscientiousness	38.10	7.80	41.57	9.47	2.64***

** P < 0.001.

The results in Table 2 reveal that, except for extraversion and openness, there were significant differences between the problematic internet users and the average users on the factors of neuroticism, agreeableness and conscientiousness.

Table 3 shows significant differences between the two groups on the measures of impulsivity, hostility and sensation seeking. Problematic internet users reported greater impulsivity, more hostile, and are prone to engage in high levels of sensation seeking behaviours than the average users.

Table 3: Personality traits of study sample

Traits measured (scale used)	Problematic Internet Users		Average Users		t
	Mean	SD	Mean	SD	
Impulsivity (BIS)	74.74	9.72	57.17	11.65	10.68***
Hostility (BDHI)	38.30	7.92	30.56	6.85	6.92***
Sensation Seeking (SSS)	19.14	4.24	10.52	3.65	14.48***

4.24

*** P < 0.001.

IV. DISCUSSION

The present study examined the association of problematic internet use to various personality traits. Personality traits may play a role in addictive behaviour. Certain vulnerable individuals seem to have personalities that may predispose them to use the internet excessively and become dependent on it. Researchers have focused on studying the personality characteristics of problematic internet users based on the five-factor model. The five main domains assessed by NEO-FFI are extraversion (e.g., being outgoing, talkative), agreeableness (e.g., being sympathetic and warm), conscientiousness (e.g., being organized and prompt), neuroticism (e.g., being nervous and moody), and openness to experience (e.g., being creative and intellectually oriented) (23).

The results of the present study, using the NEO-FFI, indicated significant differences between the two groups on the factors of neuroticism, agreeableness, and conscientiousness. Neuroticism involves attributes like shyness, guiltiness, being tense, and being moody. Several researchers have observed that those who were high on the trait of neuroticism likely to use the internet as a coping strategy (24). Neurotic individuals are prone to problematic internet use and they use internet as a way of counteracting their negative emotions. The results of the present study also support the findings reported in other studies, (25, 26) that problematic internet use have a negative impact on well-being and that neurotic individuals are more likely to be dependent on the internet than non-neurotic individuals.

On the factor of agreeableness, the problematic internet users obtained low scores. Individuals who score high on agreeableness tend to be prosocial, warm, trusting, and friendly to others, whereas the problematic internet users are found to be less pleasant to others, argumentative, and harsh. Similar findings were reported by Buckner et al (27). Those who score high on conscientiousness have control over their impulses, orderly, diligent, and strive to achieve goals. In contrast, problematic internet users have obtained low scores on conscientiousness factor. They are found to be predisposed toward acting impulsively, being disorganized, and use social media as a way of procrastinating. The above findings are consistent with the findings of Buckner et al (27) and Wilson et al (28).

There is no significant difference between the two groups on extraversion. It has been suggested that extroverts use social media for social enhancement, whereas introverts use it for social compensation, each of which appears to be associated with elevated use. The results of this study show that problematic internet users are found to be neither extroverts nor introverts and they overuse the internet both for social enhancement and social compensation. The results of this study support the findings of Kuss and Griffiths (29) reported in the literature.

The results of the present study demonstrated significant differences between the problematic internet users and the average users on the traits of impulsivity, hostility and sensation seeking contradicting our hypothesis. Problematic internet users have shown greater impulsivity as measured by the Barratt Impulsiveness Scale which is regarded as a trait measure of impulsivity. The results of this study and those of other studies (30, 31) showed that impulsivity is related to excessive internet use and considered as a risk factor for problematic internet use.

Like impulsivity, problematic internet users have obtained high scores on hostility and found to be more hostile than the average users. It has been reported in many studies (32, 33) that young males with significant hostility were more likely to develop problematic internet use than those without it. One explanation for this may be that young males prefer to play violent games rather than non-violent ones both online and offline. Many internet activities, especially online gaming provide a world in which hostility can be expressed and violence perpetrated without restriction. The results of this study and those of other studies (34) showed that hostility may facilitate the development of problematic internet use.

Consistent with the literature, problematic internet users are found to be engaged in high levels of sensation seeking behaviours than the average users, perhaps because sensation seeking provides a coping mechanism to overcome their boredom (35). This is unsurprising because the internet provides a constantly novel and psychologically rewarding environment. The results of this study is in accord with the findings of Mehroof and Griffiths (36) which reported that a variety of reward mechanisms underlie addictive behaviour suggesting that the behaviour will be repeated and will lead to problematic internet use in some individuals.

Our study results suggest that certain personality traits may play a role in the acquisition, development and maintenance of problematic internet use. Future studies should investigate whether similar personality traits may be an etiologic factor in the development of other addictive behaviours such as social networking sites, mobile phone, gambling, etc.

The study has the following limitations. First, the sample size of problematic internet users is too small to represent the overall characteristics of the population of problematic internet users. Second, all information was obtained from the participants which excludes their parents.

Despite limitations, this study examined the associations between problematic internet use and various traits based on data from the sample of certain engineering college students in Chennai. Our study suggests that problematic internet use is fairly common among college students in Chennai. The personality traits identified (high neuroticism, low on agreeableness and conscientiousness, impulsive behaviour, hostility, and high levels of sensation seeking) appear to explain the profile of an individual whose pattern of internet use is problematic. Our results might help educational institutions design suitable internet addiction prevention programs geared toward the college population.

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