



## An exploratory Cross-Sectional study to assess Internet Usage among Engineering Students

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### Abstract

**Background:** *What is the internet? It is a network of millions of computers that are interconnected. In this highly digitalized era to live without computers, to think of mobiles without internet packages is impossible. Internet is a user-friendly communication medium that is cost-effective and a useful tool in education. All people to access information are increasingly using it across the globe, especially young adults and students. Therefore, it has become an important part of daily life of students for both academic and recreational purposes. Even parents accept it as a necessity and do not find the need to question the usage. While the advantages of the internet are no doubt innumerable, it also brings forward the question of over usage and whether it can lead to addiction. To answer this question, which has previously been posed by and dealt with by media, we have conducted this exploratory study among engineering students to assess the extent of usage and some correlated factors.*

### Aim:

1. To assess the internet use and internet addiction among young adults.
2. To correlate internet addiction with other socio-demographic factors.
3. To study the association between internet addiction, self-esteem, and satisfaction with life to try to identify any predisposing or risk factors for internet addiction.

**Materials and Methods:** *We conducted an exploratory cross-sectional study among the students of an Engineering College. The nature of the study was explained to all the II and III year students and those meeting the inclusion criteria were requested to volunteer. A100 students were selected by random sampling from the volunteers. All the participants were given a set of four questionnaires which included a semi structured self prepared performa, Internet Addiction Test (IAT), Satisfaction with Life scale, Rosenberg Self esteem scale. The scales were explained in the language comfortable to the students and were encouraged to answer all the items. Incomplete sets were discarded. The scores were then calculated and data computed. The results were analyzed using SPSS 13.0 using appropriate statistical methods such as means, frequency, standard deviation, chi square.*

**Results:** *The non-users in our sample were a minor percentage of 8.08% while Normal users were 52.52%. Endangered users were 39.39%, which is a significant number. Our sample did not have any*

users falling under the severe addiction category. Among the endangered users majority were males i.e. 71.79%. There was a significant correlation between working mothers and internet usage, 70.96% of endangered users had working mothers. Approximately 70% of low self-esteem participants were found to belong to the endangered users category. We also discovered that as the satisfaction with life decreased the internet usage increased.

**Conclusion:** A significant number of users belonged to the endangered category. Males seem to have more propensities towards excessive usage. Parental supervision, low self-esteem and dissatisfaction with life can affect the usage of internet and lead to addiction. The problem of internet addiction needs to be considered seriously and necessary steps to prevent it should be taken.

**Keywords:** 1) Internet Addiction 2) Endangered users 3) Low self-esteem 4) Satisfaction With Life.

## Introduction

We live in a world of technology and digitalization. The internet is the world's biggest technology platform. As per 2018 statistics, 49% of the world's internet users are from Asia. The next largest number of users being in Europe about 16.8%, followed by Africa at 11%, Latin America and Caribbean 10.4%, 8.2% in North America and Middle East 3.9%, Oceania and Australia 0.7%.<sup>1</sup> In Asia, China alone has 802 million users and India has 462 million users. Young adults constitute 45% of the world's internet users. In the developing countries, 30% of the below 25 years age group are internet users. The internet is a source of information, knowledge, and entertainment. However, the internet seems to have a dark side to it. These statistics make us wonder. Should we be concerned regarding the possibility of excessive usage?

Dr. Ivan Goldberg first coined the term internet addiction for describing the excessive and pathological use of the internet that interferes with daily life<sup>2</sup>. However, it has not yet been included in the current DSM-V<sup>3</sup>. An article from the WHO Working Group on Classification of Obsessive-Compulsive and Related Disorders, while deliberating on this area as a "key controversy," concluded that, "based on the limited, current data, it would therefore seem premature to include it in the ICD-11<sup>4</sup>. There exists tremendous Nosological ambiguity surrounding it. Is the excessive use of internet detrimental to health? Should we officially recognize internet addiction as a disorder? Can it be termed as an addiction? Is internet addiction as much of a problem in India

as it is in the developed countries? Do people turn to the internet as a source of comfort and companionship? In an attempt to answer some of these questions, we have conducted this study to estimate the extent of internet addiction and to correlate the excessive usage of the internet with some factors.

## Objectives

- To assess the internet use and internet addiction among young adults.
- To correlate internet addiction with other socio-demographic factors.
- To study the association between internet addiction and self-esteem and satisfaction with life to try and identify any predisposing or risk factors for internet addiction.

## Materials and Methodology

### Sample and Setting

We carried out the study in an Engineering college in Bangalore. We approached all the II and III year students of all the branches of engineering for the study. Two hundred and forty students volunteered for the study out of which we selected one hundred by random sampling method.

### Inclusion Criteria

- Age groups 18 to 25 years
- Access to the internet
- A minimum of 6 months of internet exposure

### Exclusion Criteria

- No Written and informed consent

### Instruments and Tools

- A Semi- Structured Performa

A self-prepared semi structured proforma was used to collect data on chronological age, gender, education field of participants, employment status of Mother's of participants, and the various applications used while using the internet.

- Internet Addiction Test

The most frequently used questionnaire until now is Young's Internet addiction test (YIAT20)<sup>5</sup>. It is a 20-item questionnaire, answered in a five-point Likert scale. It covers the degree to which their Internet use affects their daily routine, social life, productivity, sleeping pattern, and feelings. The minimum score is 20, and the maximum is 100; the higher the score, the greater the problems Internet use causes. Young suggests that a score of 20-39 points is an average online user who has complete control over his/her usage, A score of 40-69 signifies frequent problems due to Internet usage, and a score of 70-100 means that the Internet is causing significant problems<sup>6</sup>. A meta-analysis of the reliability of Young's Internet Addiction Test showed that it is more reliable in college students and probably in Asia than in Europe<sup>7</sup>. Hence, this scale has been selected for the purpose of this study.

- Satisfaction With Life Scale (SWLS) was developed by Ed Diener et al. to assess the cognitive component of subjective well-being. The SWLS is shown to have favorable psychometric properties, including high internal consistency and high temporal reliability. Scores on the SWLS correlate moderately to high with other measures of subjective well-being, and correlate predictably with specific personality characteristics<sup>8</sup>. The scale includes five items, which assess the level of individual's satisfaction with life. Respondents answer in a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Items are added up in order to yield a total score of life satisfaction. The possible range of scores is 5 to 35, with greater scores signifying higher satisfaction with life. For the purpose of this study the scores have been grouped as follows based on previous research<sup>9</sup>

- 30 - 35 Highly satisfied
- 25 - 29 Satisfied
- 21 - 24 Slightly satisfied
- 20 Neutral
- 15 - 19 Slightly dissatisfied
- 10 - 14 Dissatisfied
- 5 - 9 Extremely dissatisfied

- Rosenberg Self Esteem Scale (RSE) this scale was developed by sociologist Rosenberg<sup>10</sup> to measure self-esteem in various groups including high school students and adults. It is a 10 item scale with four options ranging from strongly agree to strongly disagree for each item. Five of the items have positively worded statements and five have negatively worded ones. The scale measures state self-esteem by asking the respondents to reflect on their current feelings. The RSES is considered a reliable and valid quantitative tool for self-esteem assessment The subjects are encouraged to reflect carefully on each item and tick the right correct option. The total scores range from 0-30, scores between 15-25 are within normal range while scores below 15 suggest low self-esteem.

### Procedure of the Study

We conducted an exploratory cross-sectional study among the students of an Engineering College. We got the ethical clearance from MVJ Medical College and Research Hospital's ethical committee to conduct the study. We also took the necessary permissions from the management of the engineering college where we conducted the study. We approached all the II and III year students of all the branches of engineering for the study. We explained the nature of the study to all

the students and asked those meeting the inclusion criteria to volunteer. Two hundred and forty students volunteered for the study out of which we selected one hundred by random sampling method. We gave each of the students a set of the four questionnaires. All the questionnaires were in English and self-administrative. We explained each questionnaire and its respective options in detail to the students and asked them to answer the questionnaires. We clarified any doubts the students had along the way. When needed we explained the questionnaires in the language in which the student was comfortable with. The students took approximately 30 to 40 minutes to complete the questionnaires. We then scored the questionnaires and computed the data. Out of the 100 questionnaires one was excluded due to incompleteness of questions and the final sample size was N = 99.

**Statistical Data Analysis**

The data was analyzed using the SPSS software version 13.0. Descriptive statistics were performed. We used appropriate statistical methods such as frequency distribution tables, mean, standard deviation, probability and chi square, ANOVA, Spearman correlation coefficient for analyzing the data.

**Results**

We divided the sample population into 4 groups based on their scores on the Internet Addiction Test.

- Non users <20
- Normal users 20 to 49
- Slight Addiction/Endangered Users 50 to 79
- Severe Addiction 80 to 100

**Table1:** Frequencies & Percentages of IAT Groups

IAT GROUPS	No: of subjects Frequency	Percentage
NON USERS	8	8.08%
NORMAL USERS	52	52.52%
ENDANGERED USERS	39	39.39%
SEVERE ADDICTION	0	0

**Table 2:** Frequency distribution of the three groups based on gender

GENDER	NON USERS		NORMAL USERS		ENDANGERED USERS	
	frequency	percentage	frequency	percentage	frequency	percentage
MALE	3	37.5%	29	55.76%	28	71.79%
FEMALE	5	62.5%	23	44.23%	11	28.20%

**Table 3:** Frequency distribution of 3 groups based on education field

EDUCATION FIELD	NON USERS		NORMAL USERS		ENDANGERED USERS	
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
ECE	3	37.5%	9	17.30%	6	15.38%
CSE	1	12.5%	16	30.77%	18	46.15%
MECHANICAL	0	0	11	21.15%	9	23.07%
INFO SCIENCES	4	50%	16	30.77%	6	15.38%

**Table 4:** Applications used online

APPLICATIONS	NON USERS	NORMAL USERS	ENDANGERED USERS
ACADEMIC ACTIVITIES (15%)	6 (9.10 %)	34 (51.50 %)	26 (39.39 %)
SOCIAL NETWORKING(14%)	3 (4.91 %)	31 (50.81 %)	27 (44.26 %)
BROWSING (15%)	1 (1.60 %)	29 (46.03 %)	33 (52.38 %)
CHAT ROOMS (6.7%)	3 (10.71 %)	12 (42.85 %)	13 (46.42 %)
GAMES & HOBBIES (8.7%)	3 (8.10 %)	17 (45.94 %)	17 (45.94 %)
E-MAIL (13.4%)	5 (8.77 %)	32 (56.14 %)	30 (52.63 %)
NEWS(3.78%)	1 (6.25 %)	7 (43.75 %)	8 (50 %)
PORNOGRAPHY (4.5%)	0	4 (21.05 %)	15 (78.94 %)
ENTERTAINMENT (15.6%)	0	33 (50 %)	33 (50 %)
BUSINESS (2.3%)	0	4 (40 %)	6 (60%)

**Table 5:** Frequency distribution for the 3 IAT groups based on Mothers Occupation

MOTHERS OCCUPATION	NON USERS		NORMAL USERS		ENDANGERED USERS	
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
MOTHERS AT HOME (68)	5	7.3%	46	67.4%	17	25%
WORKING MOTHERS (31)	3	9.67%	6	19.35%	22	70.96%

**Table 6:** Mean and Standard deviations of certain factors

IAT GROUPS	MEAN DURATION OF INTERNET USE IN YEARS	AVERAGE USAGE OF INTERNET AS HOURS/DAY	AVERAGE AMOUNT SPENT ON INTERNET RS/MONTH
NON USERS	2.47 ±1.044	1.18 ±1.55	184
NORMAL USERS	3.1 ±1.18	1.63 ±1.09	269
ENDANGERED USERS	<b>4.68 ±2.72</b>	<b>3.17 ±1.69</b>	<b>582</b>

**Table 7:** Correlations of IAT Groups with Self Esteem

IAT GROUPS	LOW SELF ESTEEM	NORMAL SELF ESTEEM
NON USERS	0	8
NORMAL USERS	4 (26.66 %)	<b>48 (57.14 %)</b>
ENDANGERED USERS	<b>11 (73.33 %)</b>	28 (33.33 %)
TOTAL	15	84

**Table 8:** Correlation of IAT Groups with SWLS

IAT GROUPS	EXTREMELY SATISFIED	SATISFIED	SLIGHTLY SATISFIED	NEUTRAL	SLIGHTLY DISSATISFIED	DISSATISFIED	EXTREMELY DISSATISFIED
NON USERS	1	2	2	0	3	0	0
NORMAL USERS	0	4	15	2	27	4	0
ENDANGERED USERS	0	1	12	2	13	<b>10</b>	1
TOTAL	1	7	29	4	43	14	1

**Discussion**

- The mean age of our sample is 20 years and majority of them come from a rural background.
- Endangered users and severe addiction categories are considered as being addicted to internet. The prevalence of internet addiction was 39.39% i.e. approximately 40%

belonging to the slight addiction/endangered users category and 52.52% were normal users. A very small percentage of 8.08% were non-users. In our sample, there was no severe addiction. A study conducted among the Urmia University students in Iran demonstrated that overall prevalence was 37.26%, which is similar to our study

results<sup>11</sup>. Another similar study conducted by Suresh Kumar et al.<sup>12</sup> among engineering college students in India assessed internet addiction using IAT and found that overall internet addiction was 30%, while 27% were problem users and 3% were pathological users. A study by Ghamari et al.<sup>13</sup> resulted in overall prevalence of internet addiction of 10.8%, which is less than our study finding. Their study had 2.8% of severe addiction whereas we had none. The difference in the results could be because of different methodologies employed during research, data collection and probably because of the socio-cultural differences between the participants.

- When we looked at the gender distribution across the various categories, we found that among normal users the distribution of males and females was more equal (55.76% and 44.23% respectively) than among the endangered users category. Nearly 72% of endangered users were males. Our result showed that males were more prone for addiction than females ( $p < 0.001$ ). Ghamari et al.<sup>13</sup> in their study found similar observations that the male gender was one of the main predictors of internet addiction with a 3.5 fold probability of internet addiction as compared to females<sup>13</sup>. Studies by Firouzeh S et al<sup>11</sup>, Ceyhan et al<sup>14</sup> in Turkey, Tsai et al.<sup>15</sup>, Deng et al.<sup>16</sup> also observed a significant difference between the genders.
- We also looked at the education field of the participants. We had students from electronics and communications, computer science engineering, mechanical and information sciences in our sample. There was no statistically significant difference between fields of education for normal users ( $p > 0.05$ ). However, the endangered users and computer science engineering field students had a significant association with a  $p$  value  $< 0.05$ .

- The purpose of internet use was another variable that we looked at in our study. The various applications studied were academic activities, social networking, browsing, chat rooms, games and hobbies, E-mail, news, pornography, entertainment, and business related purposes. Academic work was only 15% compared to all other activities the students did online and at par with social networking, browsing, and entertainment (approximate 15% each) among the normal users. A closer look at the usage of pornography shows that nearly 79% of its users belonged to the endangered category. Between the different applications there was no significant difference found between the non-users and endangered users except in pornography. Similar results for academic work and pornographic content were seen in Suresh Kumar et al.<sup>12</sup> study but their results differed in chatting and e-mailing which was significantly higher than our study<sup>12</sup>. Siomos et al.<sup>17</sup> also in their study on Internet addiction concluded that online pornography was most associated with internet addiction which is similar to our study findings. Goel et al.<sup>18</sup> in their study on prevalence of addiction among Indian adolescents concluded that moderate users and the possible addicts used the internet mostly for social networking, academic purposes, chatting, emailing, gaming, and downloading media files and pornography. However, the purpose of using the internet was significantly different for addicts. They indulged more in social networking, chatting, and downloading media files. Kanwal Nalwa et al<sup>19</sup> also found no major differences emerging in the applications being used by dependents and non-dependents. Whereas Ghamari et al<sup>13</sup> found that chat room usage ranked the highest in usage.
- Another important finding of our study was the difference between internet usage among students who had at home mothers versus

those with working mothers. 67.64% of mothers at home had kids who were normal users while 70.9% of working mothers had children who were in the endangered users category ( $p < 0.05\%$ ). This finding goes to show that parental supervision might play a role in reducing the excessive internet usage.

### Conclusion

- Internet addiction is a reality and not just mere fiction. A prevalence of 40% of internet addiction is a significant number.
- Internet has many advantages and is an excellent tool for academic and research use. However, as we have seen students utilize it more for less valuable purposes, educating them about internet addiction and its hazards is of utmost importance.
- There is a need to educate not just the young adults but also their parents as our findings show that students with working mothers had more problematic usage probably because of lack of supervision.
- More has to be done to boost the self-morale of students and they should be shown other avenues to explore like developing hobbies etc to overcome their low self esteem and overall dissatisfaction with life.

### Limitations

- Small sample size
- Sample limited to one engineering college students alone.
- The scales used are validated and reliable but not standardized for the Indian population.

### Future Directions

To expand the research to students of all fields of education and to urban populations.

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