

Original Research Article

Prevalence and factors associated with the use of internet, and its psychopathological effects among intermediate students in Hyderabad city, India

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ABSTRACT

Background: Excessive use of the internet has become one of the leading challenges of the modern society and causes both physical and mental impairment. There are various researches done worldwide to know the prevalence of internet addiction, factors influencing it and its impact on the lives of adolescent population. Keeping this in mind this study is planned to estimate the use of internet and its impact among intermediate students in Hyderabad city. To know the prevalence of internet use, depression, stress and anxiety among the students; and psychopathological effect of internet use among them.

Methods: Multi-centric, cross-sectional study was conducted among intermediate college students. A pre-designed questionnaire was used to assess the internet use and psychopathological effect like behavioural problems, loneliness, depression, anxiety and stress using appropriate scales. It was a self-reported questionnaire.

Results: Abnormal internet use was found in 55.9% of students. It was significantly found among those students living alone or sharing room with friends, who had phones before the age of 16 years. It was found more among males and those earning, but not significantly.

Conclusions: It can be seen that higher internet use causes sleep problems, behavioural issues, physical health problems, depression, anxiety and stress. But it is also seen that there are factors which have a great influence on the internet use, which can be easily controlled or modified.

Keywords: Internet use, Psychopathological effect, Students

INTRODUCTION

Internet use has increased worldwide. There has been an incredibly fast growth of internet from 1995 with 0.4% of world population using internet to 55.1% in June 2018. According to the global statistics, Asia accounts for 50.7% of world internet usage till June 2019 with the penetration rate of 54.2%. India ranks second in the world after China (829 million users) in terms of internet users with 560 million users till June 2019.¹ With the increase in the market size and number of companies offering

internet packages, there is a growing competition among these companies for providing fastest network with least cost. This has made mobile and internet very much accessible and affordable to a common man. Even the non-earning section of the society like students have an unlimited access to internet. The most relevant use is for communication, information and social interaction. This has made internet an indispensable part of our lives, collapsing our daily life. Though internet has improved the access to quality information and learning, it has some very harmful effects which might be visible in near

future. Excessive use of the internet has become one of the leading challenges of the modern society and causes both physical and mental impairment. Interactive technologies have the potential to engage the users psychologically and may facilitate maladaptive behaviours. There are various researches done worldwide to know the prevalence of internet addiction, factors influencing it and its impact on the lives of adolescent population.²⁻²² These studies show that the internet use is rising exponentially among adolescents and has a negative impact not only on their physical health but also the psychological wellbeing like decreased social interaction, increased incidence of depression, anxiety, feeling lonely, poor social adaptation and emotional skills, and lower level of self-esteem. Keeping this in mind this study is planned to estimate the use of internet among intermediate students (studying in 11th and 12th standard) in Hyderabad city and to understand its impact on physical health, psychological well-being, and the factors influencing internet use.

Objectives

To know the prevalence of internet addiction among students studying in 11th and 12th standard. To know the prevalence of depression, anxiety and stress among these students. To study the factors associated with internet addiction. To study the psychopathological effect of internet use.

METHODS

The study was done from 1st July to 10th September 2019 and it is an observational, multi-centric cross-sectional study. There are 431 institutes teaching 11th and 12th standard students in Hyderabad, out of which 20 were selected randomly using lucky draw method. Students studying in 11th and 12th standard using internet at least since past 1 year. 3000 students were included in the study.

Exclusion criteria

Students not willing to participate in the study.

Sampling technique

After obtaining permission from the principal, 150 students from every institute were selected using systematic random sampling. The purpose of the study was explained to the study participants and assurance about the confidentiality of the data was given. After obtaining oral informed consent, students were subjected to the study questionnaire.

Study tool and measurements

A pre-designed semi-structured questionnaire was used for data collection. It was a self-reported questionnaire.

Confidentiality of the data was maintained. It had three parts.

Part 1

It consists of general information about the student like socio-demographic characteristics, phone usage, sleep problems in past 30 days, behavioural problems, physical health in past 30 days, social life, life satisfaction, self-esteem and loneliness.

Health related behaviour

Scoring system was used to assess the health-related behaviour. It consisted of questions about time spent in physical exercise, meditation, hobby development, household chores, having meals on time, and substance abuse, on five-point Likert's responses scale (never to regularly). Minimum score being seven and maximum score being 35. Higher score indicates good health related behaviour.

Sleep problems

Sleep problems for the past 30 days was assessed using questions about difficulty in falling asleep, fragmented sleep and premature awakening, on a five-point Likert's responses scale (never, few times a month, few times a week, several times a week and every day). Minimum score being three and maximum score being 15. Low score indicates less sleep problem.

Behaviour problems

A set of questions are used to assess behaviour problems like violence or harm, on a five-point Likert's responses scale (same as sleep problem). Two additional questions were included which assessed the thought of suicide and any self-harm in past one year. 'Yes' response was given five points and 'no' response was given zero points. Minimum score being four and maximum score being 30. Low score indicates less behavioural problem.

Physical health problems in past 30 days

It consists of questions about physical health in past one month about headache, body pains, gastric upset, easy fatigue and feeling of positive health, with five-point Likert's responses scale (same as sleep problem). Minimum score being five and maximum score being 25. High score indicates more physical problems. As a part of physical health, BMI was also calculated and studied separately.

Social life

This is assessed using seven questions about relationships and social life, on a three-point Likert's responses scale (rarely, sometimes and regularly). Minimum score being

seven and maximum score being 21. Low score indicates poor social life.

Life satisfaction scale

Consists of five questions, to measure global cognitive judgments of one's life satisfaction on seven-point Likert's scale that ranges from seven-strongly agree to one-strongly disagree.¹⁹ Minimum score being five and maximum score being 35. High score indicates high life satisfaction.

Rosenberg self-esteem scale

Internal consistency-0.89 is a ten-item scale answered on a four-point Likert scale, from strongly agree to strongly disagree (three to zero).²⁰ Minimum score being zero and maximum score being 30. High score indicates high self-esteem.

Short-form UCLA loneliness scale (ULS-8)

Internal consistency - 0.84 contains the eight items employing a four-point Likert scale with values ranging from 'never' to 'always'.²¹ Minimum score being eight and maximum score being 32. High score indicates high loneliness.

Part 2

It consists of young's internet addiction scale (internal consistency $\alpha=0.93$) for assessing internet addiction.¹⁰ Altogether there are 20 items that include concepts such as loss of control, neglecting everyday life, behavioural and cognitive salience, negative consequences, mood modification, and deception. Each item is rated on a five-point Likert scale ranging from one is 'never' to five is 'always'. Item scores are added to create a final score, categorized as average users (20-49), mild addictive user experiencing occasional or frequent problems because of the Internet (50-79) and severe addictive user causing significant problems in life (score over 80).²²

Part 3

It is a DASS scale used to assess depression, anxiety and stress among students (Cronbach's α of 0.94, 0.88 and 0.93 for depression, anxiety and stress).²³ It consists of 42 questions and response ranging from '0' is 'did not apply to me at all' to '3' is 'applied to me very much or most part of the time'. The score is then entered on the score sheet which will then categories depression, anxiety and stress accordingly. The total time required to fill this form will be approximately 30-45 minutes.

Data analysis

Data analysis was done using SPSS software 20th version. Chi square test and correlation analysis were used to analyse the data. Result is summarised as follows.

RESULTS

Out of the total 3000 forms collected, 106 forms were incomplete, so were not included in the study. 2894 students had completely filled the forms and were analysed. Out of them, 1463 (50.6%) females and 1431 (49.4%) were males. Most of the study population (77.46%) was in the age group of 16-18 years, 3.7% were less than 16 years and 18.83% were more than 18 years. Majority of the students (1659, 57.3%) had normal BMI, 21.3% (616) were underweight, 20.5% (594) were overweight and 0.9% (25) were obese. Among the students, 31.7% (918) nuclear family whereas 68.3% (1976) had joint family. Among the students, 82.2% (2378) of their parents were living together, 10.8% (313) one or both parents had died and 7% (203) parents were separated/divorced. It is seen that, 59.5% (1721) of the students had siblings and 40.5% (1173) were single child. At the time of study, majority were living in hostel (2165, 74.8%), 557 (19.2%) were living with parents, 138 (4.8%) living alone and 34 (1.2%) were sharing room with friends (figure 3). In this study, 3.7% (106) were working to earn their livelihood. When enquired about the important events in the past one year, 485 (16.8%) had love failure, 485 (16.8%) suffered financial lose in family, 377 (13%) had death of one of the family member or near friend, 128 (4.42%) parental separation or divorce and 52 (1.8%) had exam failure. Among the students, 22 (0.8%) never participated in any extra-curricular activities, 263 (9.1%) participated rarely, 1452 (50.2%) sometimes, 745 (25.7%) frequently and 412 (14.2%) regularly.

It is seen that majority of the students (1549, 53.5%) were using phone from past 2-3 years, 25.1% were using since past 1 year and 21.4% were using from past 4 years or more. Most of the students (2513, 86.8%) had their personal mobile phones at around 16-18 years of age, 12.2% (354) of them had even before 16 years of age and 0.9% after 18 years of age.

Figure 1, shows the most relevant functional use of mobile phone. It shows that most of the students used mobile phones for social networking (88.53%), phone calls (83.90%), gaming (68.97%), listening to music (67.45%) and watching videos (60.82%).

Prevalence of internet addiction, depression, anxiety, and stress

It was observed that 44.1% (1275) of students were average online users and abnormal internet use was found in 55.9% (1619) students, among them 55.8% (1615) showed mild addiction causing occasional or frequent problems and 0.1% (4) showed severe addiction causing significant problem in life. Table 1 shows prevalence of depression, anxiety and stress. Among the students, 10.2% showed moderate depression and 2.2% showed severe depression. Mild anxiety was seen in 31.4%, moderate among 9.7% and severe anxiety in 0.03% of the

study subjects. Considering stress, mild form was seen among 31.2% and moderate among 4.3%. None of the students showed extreme depression, anxiety or stress.

Factors affecting internet use

To study the factors affecting the internet use we did a chi square test. As severe users are only 4 among the study individuals, mild users and severe user are combined as abnormal users. Table 2, shows the various variables and its effect on IAT score. It can be seen that gender difference in internet use is not statistically significant (p=0.391) though it is slightly more among males. It is also observed that a higher internet use is seen among those who have their own mobile phones before 16 years of age as compared to those who have it later than 18 years and this difference is statistically significant. Internet use is seen more among students living in nuclear family as compare to joint family, which is statistically significant (p<0.01). We can see that abnormal internet use is more among the students whose parents are staying together than compared to those students whose parents

are either divorced or separated or one or both died. The students who are having siblings are more abnormal users compared to the students who don't have siblings and the difference is statistically significant. The students who are sharing room with friends or living alone are significantly more abnormal users compared to the students who are living with family and in hostel. The students who are earning are comparatively more abnormal users than the non-earning students but it was not statistically significant. To study the effect of health-related behaviour, we did a correlation between health-related behaviour score and IAT score. As we can see in Figure 2 that a high score on health-related behaviour have a low score on IAT (negative correlation). We can say that those students who are more engaged in activities to improve their physical and mental health, spend less time on internet, these activities being physical exercise, meditation, yoga, having meals on time, spending time on hobby development, doing household chores and refraining from any addictive substance use like smoking or alcohol.

Table 1: Distribution of students according to DASS score.

Variable	Depression (D)	Anxiety (A)	Stress (S)
	N (%)	N (%)	N (%)
Normal	1547 (53.5)	1703 (58.8)	1869 (64.6)
Mild	986 (34.1)	909 (31.4)	902 (31.2)
Moderate	296 (10.2)	281 (9.7)	123 (4.3)
Severe	65 (2.2)	1 (0.03)	0
Extremely severe	0	0	0

Table 2: Factors affecting internet use among students.

Variables		Normal users (20-49)	Abnormal users (≥50)	(χ ² , p value)
		N (%)	N (%)	
Gender	Male (1431)	619 (43.3)	812 (56.7)	(0.736, 0.391)
	Female (1463)	656 (44.8)	807 (55.2)	
Age at which students had their own mobile (in years)	<16 (354)	128 (36.20)	226 (63.80)	(15.33, 0.000469)
	16-18 (2513)	1129 (44.90)	1384 (55.10)	
	>18 (27)	18 (66.70)	9 (33.30)	
Type of family	Nuclear (918)	335 (36.50)	583 (63.50)	(31.21, 0.0000)
	Joint (1976)	940 (47.60)	1036 (52.40)	
Parents marital status	Together (2378)	1019 (42.90)	1359 (57.10)	(8.94, 0.011)
	Separated/divorced (203)	95 (46.80)	108 (53.20)	
	One or both died (313)	161 (51.40)	152 (48.60)	
Sibling	Yes (1721)	713 (41.4)	1008 (58.6)	(11.89, 0.000564)
	No (1173)	562 (47.9)	611 (52.1)	
Living arrangement	Living with family (557)	189 (33.90)	368 (66.10)	(109.46, 0.0000)
	Hostel (2165)	1062 (49.10)	1103 (50.90)	
	Sharing room with friends (34)	2 (5.90)	32 (94.10)	
	Alone (138)	22 (15.90)	116 (84.10)	
Earning	Yes (106)	41 (38.70)	65 (61.30)	(1.29, 0.256)
	No (2788)	1234 (44.30)	1554 (55.70)	

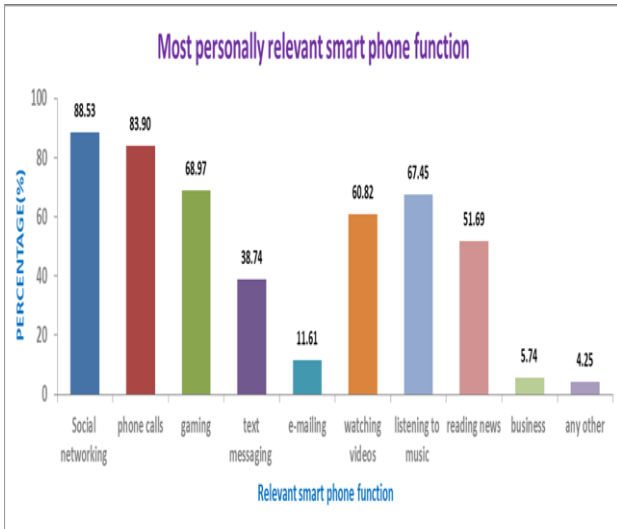


Figure 1: Most relevant smart phone use.

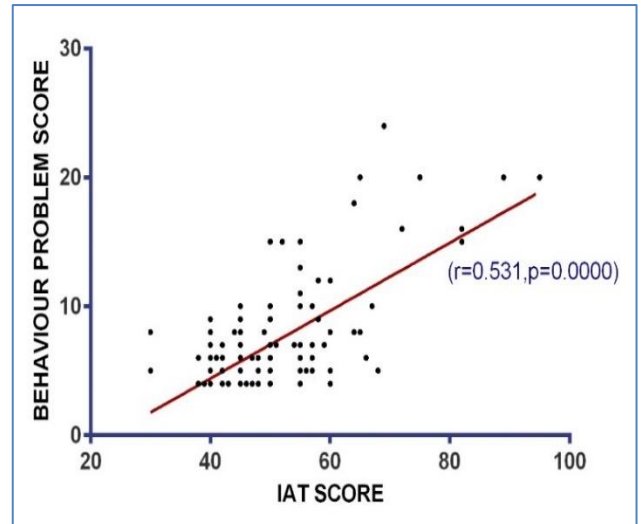


Figure 4: Effect of young's IAT score on behaviour problem score.

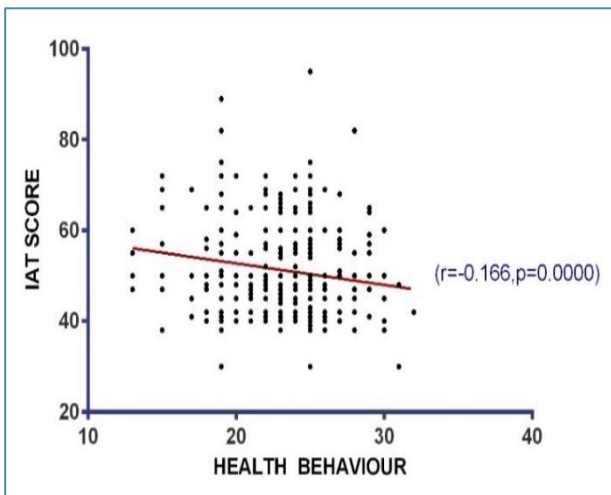


Figure 2: Effect of health-related behaviour on the IAT score.

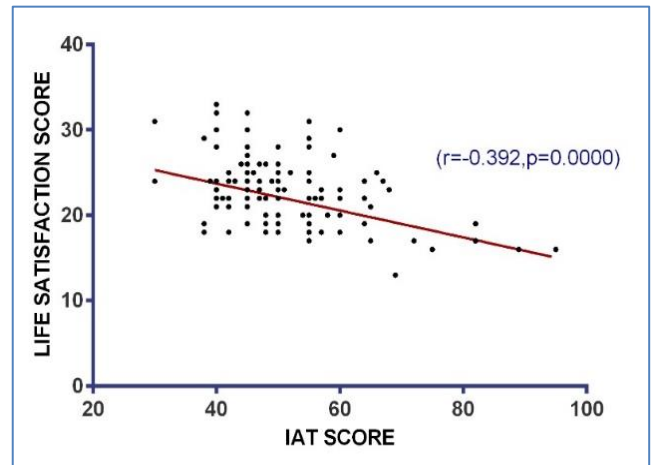


Figure 5: Effect of young's IAT score on life satisfaction scale.

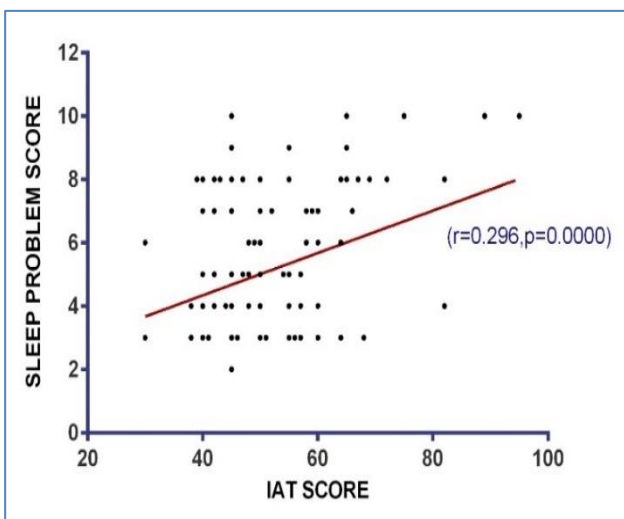


Figure 3: Effect of young's IAT score on sleep.

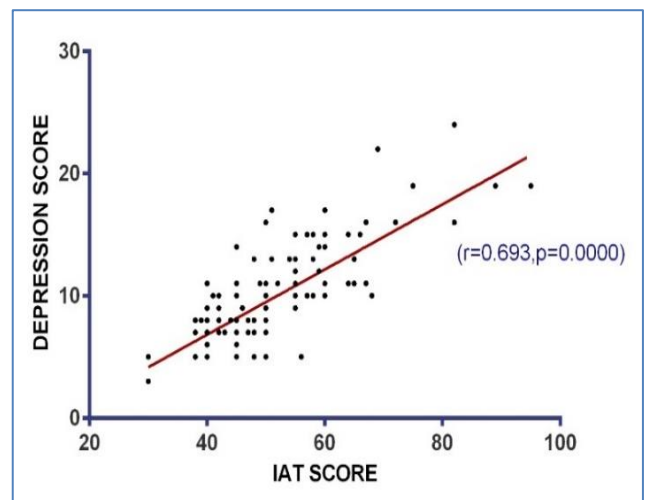


Figure 6: Effect of young's IAT score on the depression score.

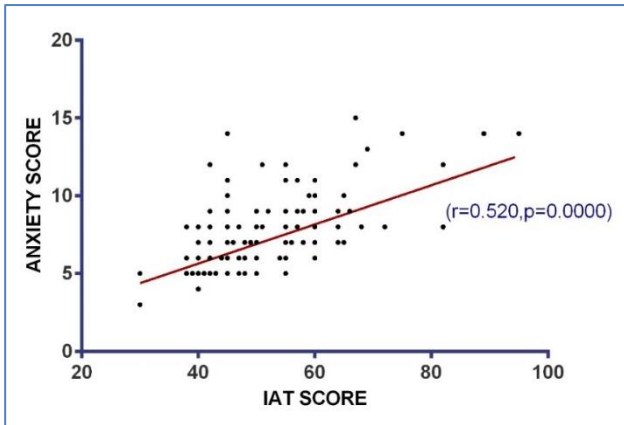


Figure 7: Effect of young's IAT score on the anxiety score.

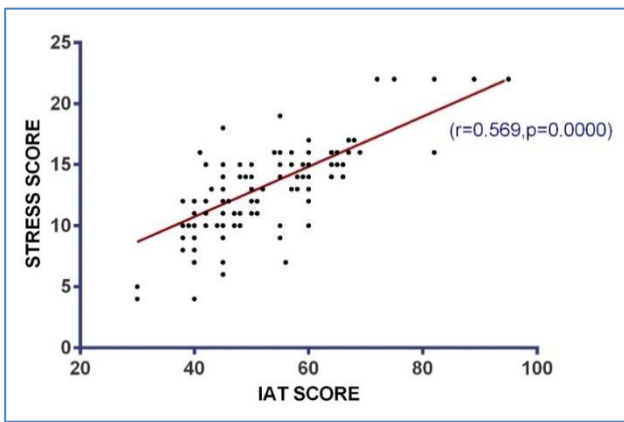


Figure 8: Effect of young's IAT score on the stress score.

Psychopathological effect of internet use

To study the psychopathological effect of internet use, correlation analysis was done by comparing the effect of the score on IAT with the different score on various scales used (Figures 3-8). Figure 3 shows that as the score on IAT increases the score of sleep problems also increases which is statistically significant. It indicates that those students having high internet use show sleep disturbances like difficulty in falling asleep, fragmented sleep or premature awakening. Behavioural problems like fights or quarrels, physical violence, self-harm, anger or damaging things around are seen more in those students who spend more time on mobile phones which is statistically significant (Figure 4). More problems related to physical health like headache, body pains, easy fatigue or tiredness, gastric upset, etc are experienced by those who have high score on IAT ($p=0.0000$). Students having high score on IAT have poor social life ($p=0.0000$) and are less satisfied with life (Figure 5). It was observed that students with low score on self-esteem scale had higher score on IAT ($p=0.0000$). That means that students having low self-esteem are more into internet use as compared to those with a relatively higher score on self-

esteem scale. A high internet use is also associated with feeling of loneliness ($p=0.0000$). Students spending more time on internet have a high score on depression (Figure 6), anxiety (Figure 7), and stress (Figure 8).

DISCUSSION

The present study shows that most of the students used mobile phones for social networking (88.53%), phone calls (83.90%), gaming (68.97%), listening to music (67.45%) and watching videos (60.82%). Phone calls have a higher percentage next to social networking as most of the students in the current study were staying in hostel. Similar results were seen in a study done by Xin in China, where common online activities were social networking (94.73%), school work (86.53%), entertainment (82.44%), internet gaming (73.42%) and shopping online (33.67%).² In the current study the prevalence of mild internet addictive behaviour causing occasional or frequent problems was found in 55.8% and severe addictive behaviour causing significant problem in life in 0.1% of students. In a study done by Xin, the overall prevalence of Internet Addiction was low (26.50%), compared to our study but severe addiction was 0.96% which is higher.² A prevalence of 25.1% of problematic internet use is found in a study done by Vries et al among adult psychiatric patients.³ Another study done by Goswami in central India, showed that 32.9% of students were having mild internet addiction, 16.3% moderate and 0.4% severe internet addiction.⁶ Krishnamurthy et al in the study done in Bangalore, identified 34% and 8% as students with mild and moderate Internet addiction respectively. Also found Internet addiction to be associated with male gender.⁷ North India shows a prevalence of 24.00% of moderate addiction and 06.33% severe addictions. Prevalence of severe addiction is found to be very high compared to our study.⁸ In a study done on Indian adolescents, it was found that 74.5% were moderate (average) users and 0.7% were found to be addicts.¹⁰ a study done among medical interns showed a higher prevalence of 31.54% of mild and 14.61% of moderate internet addiction.¹¹ From this discussion we can say that the problem of internet addiction is all over high.

In the current study the factors showing positive impact on internet use are nuclear family, living with friends or living alone, having siblings. Easy access to smart phones at younger age poses a risk of developing an addictive behaviour. The incidence of increase in usage of smart phones by the students at a younger age may be due to lack of parental control and awareness about the effects of internet addiction. Though internet use is seen more among males and earning students, it is not significant. A higher incidence of internet use is seen among those who live with friends or alone, which could be due to lack of parental control. Hostels following restrictions in relation to the phone usages could be a reason for a relatively low incidence of internet use. Also, those students who are engaged in activities to improve their physical and mental

health spend less time on internet. These activities being physical exercise, meditation, yoga, having meals on time, spending time on hobby development, doing household chores and refraining from any addictive substance use like smoking or alcohol. In a study done on Japanese by Vries et al, gender, education level, living alone or with others, and marital status do not seem to significantly affect internet addiction scores.³ Goswami et al in his study revealed that significant correlation was observed between level of internet addiction (IAT score) and male gender, medium of education, device used to access internet, purpose of usage and time of internet use. The major single cause of internet addiction observed was social networking.⁶ Nitin Anand and his colleagues conducted a program about the internet use patterns and its psychological distress on the engineering students and observed that most of the students engaged in excessive or addictive use of internet were staying in rented accommodations. Also indicated that the students who were engaging in >3 h of internet use per day in non-academic internet activities had higher levels of IA.¹² In 2016, Prabhakaran et al studied about the factors affecting internet use in Vadodara, India, observed that the prevalence rate was 8.7% out of which males were addicted the most, who owned their personal phones at young age.¹³ A recent case study was done on the medical students of southeas Iran by Gorgich and his colleagues and identified that male students are prone to internet addiction than the females. Mainly phone usage was increased during evening and night times for chatting, watching videos which shows similar affects to this study.¹⁴

In a study done among medical interns showed that males were more addicted than females, also availability of smart phone, 3G network and unlimited monthly packages had a significant association with addiction.¹¹ Similarly Krishnamurthy in Bangalore found internet addiction to be associated with male gender, continuous availability online, using the Internet less for course work or assignments, making new friendships online and getting into relationships online.¹⁵

While studying the psychopathological effect of internet use, we came to know that internet use has a great impact on the mental and social wellbeing of the students. Higher internet use is associated with higher sleep problems, behavioural issues and physical health problems. It also reduces social life, life satisfaction and self-esteem. Higher level of depression, anxiety and stress is found among those who are abnormal internet users. Similar results were shown by Vries et al among Japanese, where problematic internet users scored higher on all scales measuring psychiatric co-morbidities like depression, anxiety, ADHD, autism, OCD, impulsivity and abnormal sleep habits.³ Similar results were shown by Sharma et al in their study among college students in central India, that internet addiction was significantly negatively correlated to psychological wellbeing.¹⁶ In a review research done by Goswami et al, it is seen that internet use causes

disturbances in academic performance, social relationship, emotional wellbeing.¹⁷ Similar to our findings, it was found in a study done among Indian adolescents that those with excessive use internet had high scores on anxiety, depression, and anxiety depression.¹⁰ In a study done by Masih et al showed a negative implication such as sadness, feeling down, having a loss of interest in daily activities, distraction from normal exercises and other physical play as well as social interaction with friends. Adolescents who have high IAD, are more likely to suffer from emotional and mental stress, depression or social anxiety.¹⁸

CONCLUSION

It can be seen that higher internet use causes sleep problems, behavioural issues, physical health problems, depression, anxiety and stress. But it is also seen that there are factors which have a great influence on the internet use, which can be easily controlled or modified.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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