ORIGINAL ARTICLE

Prevalence & determinants of Internet Addiction among Indian adolescents

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Abstract

Background: Astonishing growth in the internet's popularity with improvements in its availability and affordability has led to internet overuse and addiction. School students who have social, peer or behavioural problems are more susceptible to internet addiction. **Objectives**: To determine the prevalence of internet addiction in the school-going adolescents of Aligarh and to measure the association of internet addiction with the socio-demographics of the study participants. **Material & Methods**: This cross-sectional study was conducted in the schools of Aligarh. 1020 participants were selected through a multi-stage sampling technique proportional to the number of students in each class. Data Collection was done using a questionnaire that included Young's 20-item Internet Addiction Test (IAT). **Results**: About 35.6% of the students had internet addiction. Males (40.6%) were significantly (p=0.001) more addicted to the internet than females (30.6%). On bivariate analysis, a higher age group (17-19 years) (OR= 2.152, 95% CI- 1.267- 3.655), male gender (OR= 3.510, 95% CI- 2.187 − 5.634) and internet access at home (OR= 2.663, 95% CI- 1.496 – 4.740) were found to have a significantly higher odds' for internet addiction. **Conclusions**: Internet addiction is widely prevalent among school going adolescents and needs attention.

Keywords

Introduction

The fascinating world of internet originated in the 1960's, when the United States used it for military purposes for the first time (1). Today, in terms of internet usage, India ranks second with 354 million internet users, ahead of many other countries including the United States (280.7 Million) (2). Internet has profoundly changed the way we work, communicate and live, but it may also lead to addiction. Internet addiction is a growing problem and is known by different terms such as pathological internet use (3), Problematic internet use (4), compulsive internet use (5) and Internet Overuse (6). Among the different age groups, school students who struggle to cope up with academic performance or have peer and behavioural concerns are more susceptible to internet addiction.

The overall global prevalence of internet addiction as 6% (7), while it is 0.7% (8) to 18.88% (9) in India. There is a paucity of large sample studies on internet addiction and its determinants from India, a country with huge adolescent population.

Aims & Objectives

1. To determine the prevalence of internet addiction in the school-going adolescents of Aligarh
2. To measure the association of internet addiction with the socio-demographics of the study participants.

Material & Methods

This cross-sectional study was conducted among the English medium schools in Aligarh district, Uttar Pradesh. The study duration was from July 2014 to June 2015. After obtaining ethics approval from the multidisciplinary Institutional Ethics Committee, Jawaharlal Nehru Medical College, AMU, Aligarh; a multistage sampling technique was done for selecting the target study participants. A total of 12 English medium schools were randomly chosen for the study, out of which 8 gave consent. Students enrolled in class 9th to 12th were included in the study. A prior consent was taken from the school authorities, parents of the students, and the students themselves. To emphasize the importance of the research, the investigator explained the purpose of the study and confidentiality of the survey. Students who were absent on the day of data collection were excluded. After calculating the respective sample sizes to be drawn from each of the selected schools and classes by Probability Proportion to Size (PPS), systematic random sampling was done to draw the desired sample from each class. The summarized plan of the study is shown in Figure1.The same investigator was present throughout the survey period in the class and in case of doubt, they were clarified and made to complete the questionnaire in his presence. All the students were assured that the information collected would be treated confidentially.

Sample size: Sample size of the study was calculated by using the formula, n = $z^2p(1-p)/d^2$ x DEFF (design effect). The prevalence assumed was 11.8% (10), and, n was the sample size, z was the 95% confidence interval, p stood for prevalence, d for allowable error and DEFF for design effect which was taken as 2. Thus, the sample size was estimated to be 1020.

Study instruments: The study instrument was a questionnaire with two parts:

Part-1: Socio-demographic profile and pattern of internet use:

Data regarding socio-demographic profile of the students, purpose of using the internet, time of access, money spent per month, place of access, average duration of access per day during weekdays and weekend was collected using self-administered pro-forma.

Part-2: Young's Internet Addiction Test (IAT):

The severity of self-reported compulsive use of the internet was measured using Young's IAT, a 20-item 5-point Likert scale. The scores ranges from 0-100. The psychometric property of the IAT was established by a six factor model consisting of Salience, Excess use, Neglecting work, Anticipation, Lack of self-control and Neglecting social life (11). The reliability for the six subscales was found to be, Cronbach's alpha = 0.54 to 0.82 and validity of all six factors significantly correlated with each other. The IAT showed a very good internal consistency in a study conducted in India (10) with Cronbach's alpha = 0.93

Definitions:

Internet users: An internet user was defined as "someone aged 2 years and above who went online in the past 30 days". The definition was based on the International Telecommunication Union (ITU) definition as quoted by Internet World Stats (2014) (12).

Internet Addiction by Young's IAT: The severity of impairment was based on the final score obtained by summation of the individual scores and classified as internet addicted with score 50-100 and not addicted with scores 0-49 (10).

Statistical Analysis: Data entry and analysis was done using SPSS software version 20. Descriptive statistics were used to describe the data:- frequencies and percentages for categorical variables and mean values with standard deviations for continuous variables. Chi-square test was used for analyzing categorical variables. P-value < 0.05 was considered as significant. Logistic regression analysis was used to find the significant predictors of internet addiction by using the backward stepwise technique.

Results

The study sampled a total of 1020 participants, out of which, 57 had no internet exposure yet. Thus, the

percentage of internet users in the study population was 94.4%. 963 students further completed the questionnaires. The mean age of the study population was 15.71 ± 1.19 years. 72.7% of the study population belonged to the age group 14-16 years whereas 27.3% of them were in 17-19 years age group. Among them, the proportion of males and females were almost similar with 483 (50.2%) males and 480 (49.8%) females. 472 (49%) students studied in the 9th-10th standard and 491 (51%) in the 11th-12th standard. The maternal and paternal education was graduation and above- 46.3 % in mothers and 66.9% in fathers. Most of the study participants had more than two siblings (64.8%). Majority of the study population were having computer at home (75.9%) and had access to internet facility (79.3%). Among the study population 75.1% had an average monthly expenditure of more than 500 Rupees (Table 1).

The mean IAT score of study participants was 43.21 ± 15.71 and almost follows the normal distribution curve as shown by the histogram in the figure 2. The skewness was 0.026 and kurtosis was -0.149. The overall prevalence of internet addiction was found to be 35.6% with the mean IAT score of 59.71 ± 8.263. (Table 2)

The prevalence of internet addiction was significantly associated with increasing age with 44.9% among 17-19 years age group as compared to 14-16 years age group (32.1%). Internet addiction was more in male participants (40.6%) than the female participants (30.6%). About 38.7% of the study participants were in class group 11th-12th, 36.4% had more than 2 siblings and 36.9% with average monthly expenditure of more than 500 INR. However, the only significant statistical association with internet addiction was class group. The internet addiction was not significantly associated with either fathers' or mothers' educational status. The study had many participants with computer facility (75.9%) and internet access (79.3%), however statistical significance was found only with internet access. (Table 3)

Further, the correlates of internet addiction were tested by logistic regression using the backward method. On bivariate analysis, a higher age group (17-19 years), male gender and internet access at home were found to have a significantly higher odds' for internet addiction (Table 4).

Discussion

The main objective of this study was to find the prevalence of internet addiction, and it was found to be 35.6% among internet users. A wide range of prevalence has been reported in different studies, ranging from 0.2 % to 36.7 %. The prevalence was 0.2% in Chinese adolescents (13) and 36.7% in Italian adolescents (14). Though, both used same IAT scale, the difference in prevalence was due to criteria used for classifying internet addiction. Our study used the criteria similar to the Italian study and found a similar prevalence as well.

Prevalence rates ranging from 8% to 22.8% reported in many studies were mainly because of the difference in criteria used and the population settings in terms of age and place (9,10,15,16,17,18). This shows that a standard criteria has to be established for estimating the addiction due to internet usage among adolescents. Furthermore, standardized research on internet addiction in wake of tremendous growth in internet usage through smartphones has to be intensified.

These variations in the prevalence rates of internet addiction may be due to difference in diagnostic instruments/criteria and population settings in-terms of age and place. The current study uses the Young's IAT to estimate the prevalence of internet addiction, which showed a very good internal consistency in a study conducted in India (10) with Cronbach's alpha of 0.93.

The present study shows significant association between internet addiction and male gender. Similar findings have been reported in studies conducted in Asian and European countries (8,10,15,19,20,21).

Some studies have also reported insignificant associations with gender (22). Interestingly, a study conducted among the university female students in Ilam, Iran, report a higher internet addiction among females (23).

A higher age was also found to be significantly associated with higher rates of internet addiction. Many earlier studies (10,15,21,23) are in consonance with this finding. However, few studies (24,25) had reported an inverse relationship between internet addiction and age.

Respondents who were studying in class 11th and 12th (38.7%) were more likely to develop internet addiction than the lower class students, similar to other studies (24). No significant association was seen between participant's parent's education and

internet addiction prevalence. This finding is consistent with studies from Iran (23,25). Similar to other study (19), students with access to internet facility at home was significantly associated with internet addiction. However, this was not the finding with computer access in general, in our study.

Conclusion

The study findings suggest that Aligarh, with its proposal for becoming smart city in India, is facing this newer lifestyle issue with internet addiction prevalence rate of 35.6%. This prevalence is worrisome, as Aligarh is a second tier city in India and prevalence of internet addiction could be more adverse in the metropolitan cities of India, as they are a part of the lifestyle which is being imported from the so called developed countries (26). Internet addiction, as an emerging lifestyle problem has caught attention of the health care providers, and, internet de-addiction centres are already established in many cities of India (27).

Recommendation

Further research for evidence based intervention should be done to curb this menace before it becomes a bigger public health problem.

Limitation of the study

Owing to the cross-sectional study design, the study is unable to decipher the direction of associations or long-term outcomes of internet addiction. Also, individual perceptions could not be explored, as we have used self-administered questionnaires due to operational reasons. Moreover, generalizability could be an issue as only English medium schools were included.

Authors Contribution

All the authors made a substantial contributions to the conception and design of the study and interpretation of the data, drafting the article or revising it critically for important intellectual content and final approval of the version to be published. Data collection and analysis was done by the corresponding author.

Acknowledgement

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Abbreviations: AMU:Aligarh Muslim University; IA:Internet Addiction; IAT:Internet Addiction Test; PPS:Probability Proportionate to Size; SD:Standard Deviation; DSM: Diagnostic and Statistical Manual of Mental Disorders; DEFF:Design Effect; CI:Confidence Interval; AOR:Adjusted Odds Ratio

Tables

TABLE 1 THE DISTRIBUTION OF SOCIO-DEMOGRAPHIC VARIABLES (N=963)

Variables	n (%)	95% CI
Age group(Years)		
14-16	700 (72.7)	69.89 – 75.51
17-19	263 (27.3)	24.49 – 30.11
Sex		
Male	483 (50.2)	47.04 – 53.36
Female	480 (49.8)	46.64 – 52.96
Class group		
9th -10th	472 (49)	45.84 – 52.16
11th- 12th	491 (51)	47.84 – 54.16
Fathers education group		
Illiterate	19 (2)	1.12 – 2.88
Primary	29 (3)	1.92 – 4.08
High school	109 (11.3)	9.3 – 13.3
Higher secondary	162 (16.8)	14.44 – 19.16
Graduate and above	644 (66.9)	63.93 – 69.87
Mothers education group		

Illiterate	52 (5.4)	3.97 – 6.83
Primary	83 (8.6)	6.83 – 10.37
High school	197 (20.5)	17.95 – 23.05
Higher secondary	185 (19.2)	16.71 – 21.69
Graduate and above	446 (46.3)	43.15 – 49.45
Avg. monthly expenditure		
<500	240 (24.9)	22.17 – 27.63
500 and above	723 (75.1)	72.37 – 77.83
Number of siblings group		
1-2	339 (35.2)	32.18 – 38.22
>2	624 (64.8)	61.78 – 67.82
Computer at home		
Yes	731(75.9)	73.2 – 78.6
No	232(24.1)	21.4 – 26.8
Internet access at home		
Yes	764(79.3)	76.74 – 81.86
No	199(20.7)	18.14 – 23.26

TABLE 2 INTERNET ADDICTION CLASSIFICATION AND ITS TEST SCORE

Internet addiction group	Mean ± SD	n (%)
Internet addiction present	59.71 ± 8.26	343 (35.6)
Internet addiction absent	34.07 ± 10.57	620 (64.4)
Total	43.21 ±15.71	963 (100)

TABLE 3 ASSOCIATION OF SOCIO-DEMOGRAPHIC CHARACTERISTICS WITH INTERNET ADDICTION

Variables	IA present n (%)	IA absent n (%)	Test χ^2	P-value
Age group				
14-16	225 (32.1)	475 (67.9)	13.497	<0.001
17-19	118 (44.9)	145 (55.1)		
Sex				
Male	196 (40.6)	287 (59.4)	10.404	0.001
Female	147 (30.6)	333 (69.4)		
Class group				
9th - 10th	153 (32.4)	319 (67.6)	4.141	0.042
11th - 12th	190 (38.7)	301 (61.3)		
Fathers education group				
Illiterate	7 (36.8)	12 (63.2)	1.244	0.871
primary	10 (34.5)	19 (65.5)		
High school	44 (40.4)	65 (59.6)		
Higher secondary	57 (35.2)	105 (64.8)		
Graduate and above	225 (34.9)	419 (65.1)		
Mothers education group				
Illiterate	14 (26.9)	38 (73.1)	3.135	0.536
primary	32 (38.6)	51 (61.4)		
High school	67 (34)	130 (66)		
Higher secondary	72 (38.9)	113 (61.1)		
Graduate and above	158 (35.4)	288 (64.6)		
Number of siblings group				

1-2	116 (34.2)	223 (65.8)	0.447	0.504	
>2	227 (36.4)	397 (63.6)			
Computer at home					
Yes	265 (36.3)	466 (63.7)	0.532	0.466	
No	78 (33.6)	154 (66.4)			
Internet at home					
Yes	284 (37.2)	480 (62.8)	3.898	0.048	
No	59 (29.6)	140 (70.4)			
Average monthly expenditure group					
0-500	76 (31.7)	164(68.3)	2.176	0.140	
>500	267 (36.9)	456 (63.1)			

TABLE 4 BIVARIATE ANALYSIS FOR PREDICTORS OF INTERNET ADDICTION

Variables	df	Adjusted odds ratio*	95% CI
Age Group in years			
14-16	1	1	1.267 – 3.655
17-19		2.152	
Sex			
Male	1	3.510	2.187 – 5.634
Female		1	
Internet access at home			
Yes	1	2.663	1.496 – 4.740
No		1	

*R^2= 0.60

Figures

FIGURE 1 PLAN OF THE STUDY

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┌─────────────────────────────────┐
│ Random Selection of schools to be│
│            studied               │
└─────────────────────────────────┘
              ↓
┌─────────────────────────────────┐
│ Details of 9th-12th standard     │
│ students in each school          │
└─────────────────────────────────┘
              ↓
┌─────────────────────────────────┐
│   PPS sampling from each school  │
└─────────────────────────────────┘
              ↓
┌─────────────────────────────────┐
│ Selection of students from       │
│ respective classes in each school│
│ by PPS sampling                  │
└─────────────────────────────────┘
              ↓
┌─────────────────────────────────┐
│ Every 5th (sampling interval)    │
│ student from each class was      │
│ selected for the study using     │
│ Systematic Random Sampling       │
│ technique                        │
└─────────────────────────────────┘
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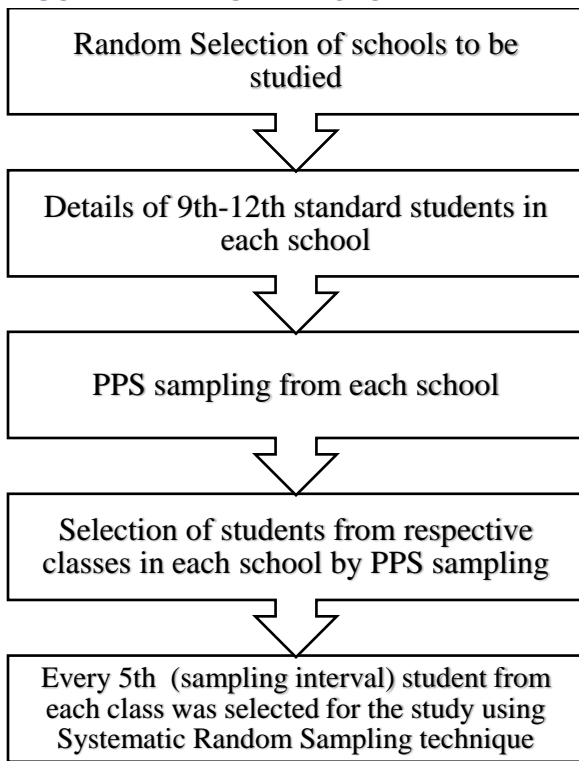
FIGURE 2 HISTOGRAM SHOWING THE DISTRIBUTION OF INTERNET ADDICTION SCORE