

Research Article

# Depression among Indian Internet Addict Adolescents

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## I N F O

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## A B S T R A C T

**Introduction:** The revolution in technology has changed the entire environment. In this digital environment Internet is the basic action. Apart from the numerous advantages, Internet Addiction (IA) is emerging as a public health issue. The adolescents are at higher risk as their mental acumen is immature. At one point Internet addicts feel depressed. Adolescents with depression are at risk for increased recurrence of depression. Aims of the study is to find the prevalence of IA and to explore the relationship between IA and depression among Indian Adolescents.

**Research Methodology:** A cross sectional survey was conducted on randomly selected 450 adolescent students aged between 10-18 yrs of urban schools of Lucknow in the period of one year. Internet Addiction Test (IAT) was applied to find the Internet addiction and PHQ9-A (PHQ9 modified for adolescents) was used to find the depression.

**Result:** In 351 Internet users 33.61% (118) were not addicted, while 66.38% (233) students fall in category of addiction. Among Internet addicts, mild, moderate, moderately severe and severe depression was found in 56.22% (131), 16.73% (39), 14.16% (33) and 4.29% (10), respectively. Depression is a major contributor to the global burden of diseases worldwide and is ranked as the second leading cause of disability. Our study clearly shows an indirect correlation between IA and depression. Thus, this is the high time to educate the students at school level regarding the optimal use of Internet through talks, handbills or booklet which shall also guard the incidence of depression among adolescents.

**Keywords:** Adolescents, Internet Addiction, Depression

## Introduction

The revolution in technology has changed the entire environment. The Internet is not only a tool, but also a

social environment in which cognitive subjects exist and the use of the Internet is the basic action in the digital environment.<sup>1</sup> The Internet is no longer a luxury. It is a necessity for all. It is clear that the Internet is no longer

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the defining feature in the lives of children and teens. Thus, they have been labeled as “iGeneration” with the “i” representing both the types of mobile technologies being heralded by children and adolescents (iPhone, iPod, Wii, iTunes) plus the fact that these technologies are mostly “individualized” in the way they are used.<sup>2</sup>

Apart from the numerous advantages, literature reflects that the adolescents are at higher risk to develop Internet problematic behavior, a condition defined as Internet addiction (IA).<sup>3</sup> D Tang et al. and others also used the definitions such as Compulsive use of the Internet, problematic use of the web, and pathological use of the Internet.<sup>4</sup> IA is emerging as a public health issue. In 1998, Dr. Jonathan J. Kandell defined Internet addiction as “a psychological dependence on the Internet, regardless of the type of activity once logged on.”<sup>5</sup> Like other addictive behaviors, Internet addiction can be characterized by (i) overuse (ii) withdrawal and anger or depression when computers are unavailable; (iii) tolerance (more time to use to meet needs); and (iv) negative social impact.<sup>6</sup> There is even a proposal to include Internet addiction in the next revision of the Diagnostic and Statistical Manual of Mental Disorder.<sup>7</sup> Adolescence is a period in which the critical thinking is to be created at its composite form which places them in a high risk zone of IA. Adolescents with IA have a perception of less social support and greater difficulty in communication and in identifying and regulating emotions.<sup>8</sup> Internet addict adolescents are more stressed than normal adolescents.<sup>9</sup> According to the Cognitive-Phenomenological-Transactional theory, one factor is the mediation of the stress source and the stress reaction. This means that individuals’ coping style, time management tendencies, and other factors play an intermediary role, while social support plays a regulating role.<sup>10</sup> The situation in which adolescent is not able to cope with the stress and anxiety leads to many mental health problems like depression, loneliness, low self esteem and suicides. Loneliness is a big factor which compels the adolescents to use Internet excessively, to be friendly with virtual friends. At one point they feel more lonely and depressed.

According to the estimates of the World Health Organization, 322 million people, amounting to 4.4% of the world population, suffer from depression.<sup>11</sup> Adolescents with depression are at risk for increased recurring depression, psychosocial impairment, alcohol abuse, and antisocial behavior as they grow up. Some of them also have suicidal thoughts and even commit suicide.<sup>12</sup> Under the umbrella of these facts this study was designed to investigate the relationship between Internet addiction and depression among Indian adolescents.

### Aims and Objectives

- To find the prevalence of IA

- To explore the relationship between IA and depression among Indian Adolescents.

## Material and Methods

### Study Area

A cross-sectional survey method was used for data collection from the adolescents who are using mobile phones since last one year and presented in outdoor pediatric department at Saraswati medical college, Career institute of medical sciences during October 2018 to September 2019. The study was also conducted in two schools Career convent school and Career inter college at Lucknow district during study period. The convenient sampling technique was adopted for the present study. Sample size was 450.

### Eligibility Criteria

All adolescent (10 yrs-18 yrs of age) who were attending the pediatric outdoor dept. during that time period. Adolescents who were using mobile phones since last one year and adolescents of selected schools.

### Inclusion and Exclusion Criteria

The study includes:

- All adolescent who were attending the pediatric outdoor dept. during that time period.
- Adolescents who were using mobile phones since last one year.
- Adolescent Students of selected schools.
- Who were willing to take part in the study.
- Who were able to understand Hindi or English.

The study excludes:

- Adolescents who were not a resident of Lucknow dist.
- Adolescents who are not willing to participate in the study.

Internet Addiction Test (IAT), developed by Dr. Young was applied to find the Internet addiction.<sup>13</sup> The depression and its severity was marked by using PHQ9-A (PHQ9 modified for adolescents).<sup>14</sup>

Before starting study the study procedure and objectives has been explained to all the subjects. Verbal consent has been taken from all the participant and approval from ethical committees has been taken before starting the study.

### Statistical Analysis

Inferential statistical method was used for data analysis.

### Result

Total number of study subjects were 450 out of which 252 (54.00%) were males and remaining 198 (46.00%) were females Figure 1. The prevalence of Internet users was 78% (351) in a sample of 450 students aged 10 to 18 yrs. Internet users as per their sex and age is depicted in Figure 2.

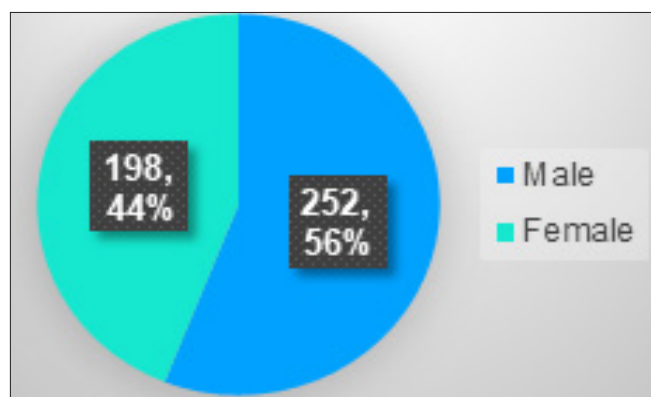


Figure 1. Population sex wise

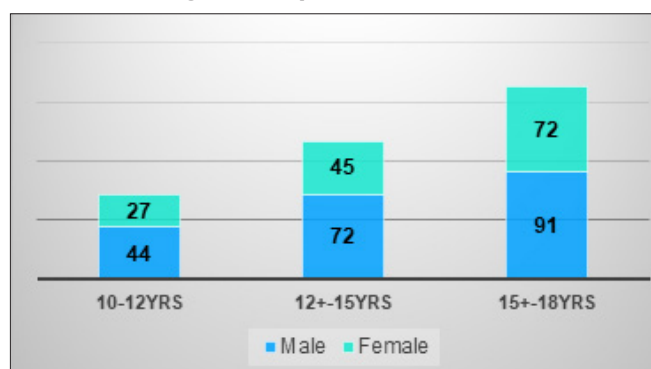


Figure 2. Internet users (age and sex) (n=351)

Among 351 Internet users, 33.61% (118) were not addicted, while 66.38% (233) students fall in category of addiction (Table 1).

Severity of Internet Addiction in different age groups is shown in Table 2.

Among the 351 Internet users, 34.18% (120) were not suffering with depression as their score was between 0-4, while 42.45% (149), 11.11% (39), 9.40% (33) and 2.84% (10) were suffering from mild (PHQ Score 5-9), moderate (PHQ Score 10-14), moderately severe (PHQ Score 15-19) and severe depression respectively (PHQ Score 20-27) (Table 3).

In the normal Internet users mild depression was found in 15.25% (18), while 84.74% (100) were not suffering from depression. In this group, no student suffered from moderate, moderately severe and severe depression (Table 4).

Internet addicts were 66.38% (233). The mild, moderate, moderately severe and severe depression was found 56.22% (131), 16.73% (39), 14.16% (33) and 4.29% (10) respectively among Internet addicts (Table 5).

Out of 233 addicts 213 (91.41%) were suffering from depression. Maximum depression (50.70%) was noted in 15+ -18 yr age group while 33.33% and 15.96% was found in age group of 12+-15 yr and 10-12 yr subsequently (Table 6).

Table 1. Magnitude of Internet Addiction (IA) (n=351)

S. No.	Age Group	Normal Internet Use	Internet Addiction
1.	10-12 yr.	31 (8.83%)	40 (11.39%)
2.	12+-15 yr.	39 (11.11%)	78 (22.22%)
3.	15+-18 yr.	48 (13.67%)	115 (32.76%)
	Total	118 (33.61%)	233 (66.38%)

Table 2. Severity of Internet Addiction (n=233)

S. No.	Age Group	Frequently used	Oftenly used	Always used
1.	10-12 yr.	20 (8.58%)	20 (8.58%)	Nil
2.	12+-15 yr.	43 (18.45%)	32 (13.73%)	3 (1.28%)
3.	15+-18 yr.	61 (26.18%)	50 (21.45%)	4 (1.71%)
	Total	124 (53.31%)	102 (43.77%)	7 (3.00%)

Table 3. Internet Users & PHQ Score (n=351)

S. No.	PHQ Score Age Group	0-4	5-9	10-14	15-19	20-27
1.	10-12 yr.	37 (10.54%)	24 (6.83%)	6 (1.70%)	3 (0.85%)	1 (0.28%)
2.	12+-15 yr.	37 (10.54%)	52 (14.81%)	11 (3.13%)	12 (3.41%)	3 (0.85%)
3.	15+-18 yr.	46 (13.10%)	73 (20.79%)	22 (6.26%)	18 (5.12%)	6 (1.70%)
	Total	120 (34.18%)	149 (42.45%)	39 (11.11%)	33 (9.40%)	10 (2.84%)

**Table 4. Normal Internet Users & PHQ-A Score (n= 118)**

S. No.	PHQ Score Age Gr	0-4	5-9	10-14	15-19	20-27
1.	10-12 yr.	31 (26.27%)	Nil	Nil	Nil	Nil
2.	12+-15 yr.	30 (8.54%)	7 (5.93%)	Nil	Nil	Nil
3.	15+-18 yr.	39 (33.05%)	11 (9.32%)	Nil	Nil	Nil
	Total	100 (84.74%)	18 (15.25%)	Nil	Nil	Nil

**Table 5. Internet addicts & PHQ Score (n=233)**

S. No.	PHQ Score Age Gr	0-4	5-9	10-14	15-19	20-27
1.	10-12 yr.	6 (2.57%)	24 (10.30%)	6 (2.57%)	3 (1.28%)	1 (0.42%)
2.	12+-15 yr	7 (3.00%)	45 (19.31%)	11 (4.72%)	12 (5.15%)	3 (1.28%)
3.	15+-18 yr.	7 (3.00%)	62 (26.60%)	22 (9.44%)	18 (7.72%)	6 (2.57%)
	Total	20 (8.58%)	131 (56.22%)	39 (16.73%)	33 (14.16%)	10 (4.29%)

**Table 6. Internet addicts & Depression PHQ Score 5-27 (n=213)**

S. No.	PHQ Score Age Gr	5-9	10-14	15-19	20-27	Total
1.	10-12 yr.	24 (10.30%)	6 (2.57%)	3 (1.28%)	1 (0.42%)	34 (15.96%)
2.	12+-15 yr.	45 (19.31%)	11 (4.72%)	12 (5.15%)	3 (1.28%)	71 (33.33%)
3.	15+-18 yr.	62 (26.60%)	22 (9.44%)	18 (7.72%)	6 (2.57%)	108 (50.70%)
	Total	131 (56.22%)	39 (16.73%)	33 (14.16%)	10 (4.29%)	

## Discussion

In the last few decades IA has become a global concern and it means that the over use of Internet to such extent that our everyday life collapses. IA is a compulsive, chronic, physiological or psychological need for a habit-forming substance, behavior, or activity having harmful physical, psychological, or social effects.<sup>15</sup> In our study the prevalence of Internet users was found 78% (351) which is lower than Europe (85.2%) but higher than Africa (36.1%), Australia (68.9%) and Middle East (64.5%).<sup>16,17</sup> prevalence of the Internet users depends upon the availability of device as well as working Internet connection, the developed/prosperous nation these facilities are very common and freely available for adolescents while in a developing country like ours these facilities are still under continuous improvements. That is the reasons of having less Internet users in present study. Out of 66.38% Internet addicts in present study, 53.31%, 43.77% and 3.00% were mild, moderate and severely Internet addicts respectively, When we compared this to Finnish teens who suffer 24% severely and 61% moderately Indian teens were not affected much with severe form of addiction.<sup>18</sup> Internet addiction is more common in Internet users who are dependent more and more for their virtual needs like online classes online parties use of dating sites and to fulfill daily needs like online shopping, which is still in the developing phase in India correlating less number of Internet addicts when compared. Our

data coincides with the Italian data.<sup>19</sup> Iranian teens are affected 74.1% moderately, 23.9% were highly, and 2% severely which also almost same as our study.<sup>20</sup> Depression is a major contributor to the global burden of diseases worldwide and is ranked as the second leading cause of disability<sup>21,22</sup> Numerous studies have found that there is a significant association between Internet addiction and such psychological morbidities as depression, stress, suicide intention, aggression and antisocial behaviors. These studies corroborate our findings of significant association between depression and Internet addiction.<sup>23,24,25</sup> It is not clear whether this addiction a cause or the result of various negative psychological factors.

Chang and Hung (2012) stated that the Internet is used by addicts as a means of avoiding and dealing with underlying psychological problems.<sup>26</sup> It has been established in neuroimaging studies that IA is associated with structural and functional changes in brain regions involved in executive attention, decision making, emotional processing, and cognitive control<sup>27</sup> Teens feel lonely when their relationships with others are not at the desired levels and this feeling of loneliness makes them feel unhappy. This angst state of mind works negatively in resolving their identity crisis and they become depressed. As we found that the maximum sufferers were in their late adolescence, when the pressure of their social and career recognition is at the highest and they may be slipped in the web of suicidal thoughts. If the

intervention is not made at this point to revert the equation, some may opt the fatal option. The end result of this process is dependent upon their mental acumen which more or less reflects the quality of nurturing of the teen. India opened its first Internet de-addiction center in 2014 at the National Institute of Mental Health and Neurosciences (NIMHANS), Bengaluru, as a Service for Healthy Use of Technology (SHUT) center. 28 Khanna et al recommends that yoga and meditation should be treated as a complementary therapy for medical therapy in the treatment of stress, anxiety, depression, and other psychiatric addictive disorders such as IA. 29

## Conclusion

As stated by the research studies including ours, the incidence of Internet addiction and depression is quite high in the present digital era. Thus, this is the high time to educate the students at school level regarding the optimal use of Internet through interactive talks, handbills or booklet which shall also guard the depression among adolescents. Time to time the screening for IA and depression can be done to segregate the students at risk. By providing them an appropriate therapy and counselling in time, future of these adolescents can be saved.

**Conflicts of Interest:** None

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## Appendix

### Sample Size

Sample size was 450 adolescent students.

Sample size calculation: As per the census of india 2011, the lucknow city had a population of 2,815,601. Population of Lucknow in 2017 was estimated to be 3.382 million. As per the UNICEF report 20% population of the country is adolescent so the estimated population of adolescent in Lucknow will be approximately 6.6764 lakhs at present

### Sample Size Calculation

The minimum sample size for present study is approximately calculated as 400.

Let N be the population size and the margin of error „e“ denotes the allowed probability of committing an error in selecting a sample representative of the population 27.

The sample size = n can be obtained by the formula. n = Sample Size, N = Population, e = Margin of error at 5% level i.e. 0.05

- $n = N/1 + (Ne)^2$
- $= 6,67,640/ 1+(6,67,640 \times (0.05)^2)$
- $= 6,67,640/ 1+(6,67,640 \times 0.0025)$
- $= 6,67,640/ 1+(1669.1)$
- $= 6,67,640/ (1670.1)$
- $= 399.78 = 400$  Approximately

So Size of the sample is approximately = 400

### Criteria For Sample Selection

#### Inclusion Criteria

The study includes:

- All adolescent who are attending the pediatric outdoor dept during that time period.
- Adolescent Students of selected schools.
- Who are willing to take part in the study.
- Who are able to understand Hindi or English.

#### Exclusion Criteria

The study excludes:

- Adolescents who were not a resident of Lucknow dist.
- Adolescents who are not willing to participate in the study .

### Sampling Techniques

The convenience sampling technique was adopted to select the sample for the present study.