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# A correlational study to assess the relationship between Internet Addiction and Depression among adolescents, Bangalore

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## Abstract

**Problem:** Adolescence is a fragile stage of development, due to which they are more vulnerable to unhealthy lifestyle behaviors. Internet is being widely penetrated; adolescents are having a higher chance to get addicted to the internet. Further, this study explores the relationship between internet addiction and depression amongadolescents.

**Methods:** The study was conducted between February and March 2020 among 250 adolescents studying in 8th to 10th grade from four selected schools located in Bangalore. A socio-demographic questionnaire, The Revised Chen Internet Addiction Scale (CIAS-R 2003) and Moods and Feelings Questionnaire: Short Version (SMFQ 1995) was used to assess the demographic profile, internet addiction and depression respectively.

**Findings:** The prevalence of internet addiction and depression was found to be 16.8% and 11.6% respectively. The result depicted a mild positive significant relationship ($r=0.337$, $p<0.001$) between internet addiction and depression. Internet addiction showed association with bodyweight and availability of own smart phone whereas depression showed an association with body weight, type of family, parents' marital status and the number of offline friends.

**Conclusions:** Based on the study result, the appropriate and effective actions need to be taken to educate adolescents and parents of healthy use of the internet.

**Keywords:** Adolescent, Depression, Internet addiction

## Introduction

According to the World Health Organization (WHO), an adolescent is any person who ages between 10 and 19 years. This period is considered as the transitional stage from childhood to adulthood (1). Adolescence period can be divided into early, middle, and late stage (2). Adolescence is a very crucial phase for mental well-being as they develop and maintain social and emotional habits which affect their health. These include performing regular exercise, following healthy sleeping patterns, developing effective coping,

problem-solving, and interpersonal skills as well and also learning to manage emotions. Various changes like; emotional, physical, and social, including poverty, abuse and violence, can put adolescents at risk of developing mental health problems(3). Many of the mental health problems which people confront during their adulthood begin to manifest in adolescence. For teens, it is developmentally appropriate to struggle with anxiety, depression or other forms of distress. Issues during adolescence such as; independence, self-identity, and tough choices related to school, sexuality, peers, drugs, alcohol and social life can be seen(4). Adolescents are also vulnerable and open-minded during this period and can become attracted to the Internet as a form of freedom which can lead to an addiction as time passes.

The number of Internet users' worldwide had increased from 360 million in December 2000 to 4208 million in June 2018. It shows that worldwide internet penetration rate was 55.1% in June 2018. In Asia, it had increased from 114 million to 2062 million in June 2018 which indicates that the internet penetration rate in Asia was 48.99%. It represents 49.01% of internet users are only in Asia. In case of India, there were about 462 million internet users in June 2018 as compared to 5 million in 2000, so the internet penetration in India is 34.1% of the population which represents 22.4% of internet users of Asia(5). Internet addiction is one of the newest forms of addiction which has been able to attract the attention of popular media and researchers recently. It has become one of the most crucial International mental health issues which require special attention (6). In India also, a rise in the use of the Internet has been seen by all age groups especially adolescents (7). Depression is one of the leading causes of illness and disability among adolescents across the globe. It has become a fourth leading cause among adolescents who are aged between 15and 19 years and fifteenth for those aged between 10 and 14 years. If the adolescents' mental health conditions are not addressed on time, it can result into conditions like; impairment of both physical and mental health, and also limit the opportunities to lead a fulfilling life as an adult (3). Emotional disorders during adolescence period can extremely affect areas like schoolwork and attendance. Along with depression and anxiety, adolescents can also experience extreme irritability, frustration and/orange. Symptoms can overlap across more than one emotional disorder accompanied by rapid and unexpected changes in mood and emotional outbursts. Social withdrawal can worsen isolation and loneliness among adolescents. And once the depression intensifies, it can lead to suicide. Globally, an estimated 10–20% of adolescents remain under diagnosed and undertreated who experience mental health conditions (3). In recent years, the increase internet use may one of the risk factors for depression among adolescents; hence this study is carried out to explore the relationship between the internet addiction and depression among adolescents in Bangalore, Karnataka, India.

**Materials and Methods**

**Type of study:** This cross-sectional study was conducted to assess the correlation between internet addiction and depression among adolescents.

Time and place of the study: The study was conducted in private English medium schools located in Bangalore, India between February and March 2020. Four schools were selected to conduct the study as per the convenience.

**Population and sample of the study:** The study population was composedof the students studying in 8th, 9th and 10th grades in the selected schools (n =



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250). The number of adolescents needed for this study was estimated at 250 with an estimated prevalence of 20% internet addiction among adolescents (8), 5% of absolute precision, and 95% of confidence level.

**Data collection tools:** In this study, a semi-structured questionnaire to collect the baseline information was prepared by the researcher. Revised Chen Internet Addiction Scale (CIAS-R 2003) and

**Moods and Feelings Questionnaire:** Short Version (SMFQ 1995) was used to assess the internet addiction and depression respectively.

**Questionnaire:** This questionnaire includes items to assess socio-demographic factors (age, gender, family income, leisure activities, etc.) and Internet usage pattern (mode and place of accessing the internet, average time spent on the internet in weekdays and during weekends/ holidays, availability of own smart phone, purpose and most liked activities to do on the internet).

Revised Chen Internet Addiction Scale (CIAS-R 2003)

It is used to assess internet addiction. It is a standardized self-administered scale composed of 26 items which can be rated on a 4 point Likert scale such as 1(Does not match my experience at all), 2 (Probably does not match my experience), 3 (Probably matches my experience) and 4 (Definitely matches my experience). This scale assesses five different domains of Internet related problems: compulsive use, withdrawal, tolerance, interpersonal and health consequences, and time management difficulties (9). Total score ranges from 26 – 104. The level of Internet addiction increases as the score in the scale increases. In a previous study, a cutoff score of 64 was found to have high diagnostic accuracy and specificity, 88% and 92.6% respectively (10). The internal reliability of the scale and subscales ranged from 0.79 to 0.93 in the original study(9).

**Moods and Feelings**

**Questionnaire:** Short Version (SMFQ 1995) It is used to assess depression among adolescents. It is a standardized selfreport instrument developed by Adrian Angold, et al. in 1995. It is composed of 13 items which are rated on a 3 point Likert scale such as; 0 (Not True), 1 (Sometimes) and 2 (true). It assesses depressive symptoms over the past two weeks. The score ranges from 0 – 26. Higher scores on the Moods and Feelings Questionnaire: Short version (SMFQ) suggests more severe depressive symptoms. In a previous study, the cut-off value was ≥12 with a sensitivity and specificity of 84.2% and 68.2% respectively. The internal reliability of the scale ranged from ($\alpha$= 0.88 to 0.89) in the previous study(11)(Adrian Angold, E. Jane Costello, 1995)

**Data collection:** After obtaining formal permission from the school authorities, the nature of the study was explained to the adolescents. The “Informed Consent Form” and “Assent Form” were handed over to the adolescents well in advance. The adolescents who brought the signed copy of both forms were included in the study. By consulting with the administrator in the selected schools, a particular date was fixed to carry out data collection. As per the predetermined time, the data were collected from the students in a separate classroom, only with study subjects. The average time taken to fill all three tools was 20 to 30 minutes.

**Ethical considerations:** The Institutional Review Board approved this study. Permission was taken from both student and their parents using assent and consent form to carry out the research. All the students who would participate in the study were clearly explained



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about the study and were told that it was their choice to participate in the study and also had the right to leave the study any time. The adolescents were also ensured that the information provided by them would be kept confidential and would not be disclosed to others.

**Data analysis and assessment:** IBM SPSS Statistics 20 program was used for data analysis. Descriptive statistical methods (Frequency and percentage distribution) were used to describe socio-demographic variables. The relationship between internet addiction and depression was analyzed using Karl Pearson correlation coefficient. Chi-square was used to find the association between study findings and selected sociodemographic variables. All the tests were carried out with a 0.05 level of significance.

**Limitations of the study:** The findings of this study are limited only to those adolescents who took part in the study. Also, the level of internet addiction and depression among adolescents is limited to the only structures present in the CIAS-R and SMFQ.

**Results**

Majority of the participants (97.2%) belonged to the age group 13 to 15 years. And 131 (52.6%) of participants were male. Majority of the participants (45.2%) were from 9th standard. (64.0%) were from the nuclear family. Nearly one fourth (27.6%) of them used a smart phone for leisure activities. Three fourth of the participants (74%) used the internet via a smart phone. A majority (80%) of them used the internet at home. Nearly three- fourth of the participants (74%) and most of the participants (92.4) used the internet for less than 120 minutes during weekdays and 0 to 6 hours during the weekend. More than half of the participants (59.2%) had their smart phone. Nearly half of them (45.6%) used the internet for entertainment followed by seeking Information (6.8%), academic purpose (3.6%) and communication (2.4%). Table 1 shows that out of 250 participants, 16.8% were addicted to the internet with the mean value of 51.07 and Standard Deviation of ± 14.654. It also observed that the prevalence of depression was 11.6% with mean of 7.04 and standard deviation of ±4.526. In terms of the relationship between internet addiction and depression, there was a statistical significant mild positive correlation between CIAS-R score and SMFQ score of the adolescents. ($r = 0.337$, $p < 0.01$) was present (Table 2). Table 3 shows that there was a statistically significant association between the adolescents' body weight ($\chi2 = 13.617$, $p = 0.001$), availability of their personal smart phone ($\chi2 = 5.582$, $p = 0.018$) and internet addiction. Whereas, depression showed an association with body weight ($\chi2 = 6.808$, $p = 0.033$), type of family ($\chi2 = 16.079$, $p = 0.0003$), parents' marital status ($\chi2 = 12.447$, $p = 0.006$) and the number of offline friends ($\chi2 = 7.835$, $p = 0.020$) (table 4).

**Discussions**

The present study result showed that there is a significant but mild degree of positive correlation ($r = 0.337$, $P < 0.001$) between internet addiction and depression among adolescents. Similar results were observed in Croatia that compulsive internet use was positively correlated ($r=0.415$, $P<0.01$) with depression among adolescents. (13) Another study conducted in Iran also showed similar findings showing positive correlation ($r=0.41$; $p < 0.001$) between internet addiction and depression. (14) Few more studies conducted in India and Jordan also revealed a positive correlation ($r=.809$, $p = <0.001$, $r=0.66$, $p<0.01$) between internet addiction and depression respectively. (15)(16) As per the findings of the various studies, a positive relationship exists between internet addiction and depression among adolescents i.e. adolescent with



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internet addiction might develop depression and vice versa.

The study findings showed that there is a significant statistical association between internet addiction and body weight (p = 0.005) and availability of own smart phone (p = 0.018) whereas for other variables like age, gender, residence, type of family, residence, parents' educational and occupational status, family income, number of online and offline friends were found to have no association with internetaddiction. The study finding was supported by a study conducted in Turkey showing a statistically significant relationship between the gravity of internet addiction and Obesity-Related Problems. (17) Other similar studies like; a longitudinal study conducted in Switzerland showed that the excessive use of the internet on weekends was associated with body weight. (18) And another study from Greece also revealed that heavier use of social networking sites was independently associated with a higher risk of overweight/obesity. (19) The association between internet addiction and owning smart phone was supported by the studies from Korea(20) and India(21) with their result showing that owning a smart phone is a significant risk factor for

Internet Addiction and more numbers of those using smart phones were addicted to the internet respectively. The study findings revealed that there is a significant statistical association between depression and body weight (p=0.033), family type (p=0.0003), parents' marital status (p= 0.006) and number of offline friends (p=0.020) whereas for other variables like age, gender, body weight, residence, parents' educational and occupational status, family income, number of online friends were found to have no association with depression. A similar study from Iran(22) showed a significant positive relationship between BMI and depression which supported the study findings. One more review study in Australia showed similar result showing a 70 increased risk of obesity in depressed adolescents compared with non depressed adolescents.

Similar results were observed in United States(23)and Iceland(24) that a child born into a large family and/or older parents was at risk for developing depression and also a family structure or parents' marital status has a significant effect on thedepressed mood of children. Another study in China(25) found that parental relationships with negative life events affected a child's symptoms of depression. One more study from Iran(26) showed that there was no evidence of an association between the parent's marital status, family size, the level of education and occupation of the parents with students' depression which contradicted in case of parents' marital status and family size while supported in case of parents' education and occupation. A study carried out in Finland (27)showed that social relationships among depressed adolescents can vary greatly with the number of existing relationships and the quality of the relationships which supported the current study findings to the association between the number of offline friends and depression.

**Conclusion**

In conclusion, a majority of adolescents were found to use the internet on a smart phone; they connected to the Internet for up to 12 hours per day. It was determined that the prevalence of internet addiction and depression was found to be 16.8% and 11.6% respectively. The depression was found to have a positive relationship with Internet addiction. Based on the results of this study, adolescents, their family members, school teachers must be made aware of the subject matter by conducting awareness programs and also to start intervention programs.



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Parents should be able to play a vital role by limiting the time of internet use by their children. The family should act carefully and rationally on these kinds of issues and become a role model for their children to adopt a healthy lifestyle. In the case of highrisk groups, appropriate intervention programs should be initiated. Internet addiction has become a public health issue for adolescents as it has been showing association with different forms of mental, behavioral, and physical problems. In future, to understand the nature, extent and causative factors of the relationship between internet addiction and depression, studies can be conducted using appropriate methodology on the larger sample. Also, a longitudinal study can be carried out to understand the development of internet addiction and depression and its effect on one another. Health professionals must know the negative impacts of excessive internet use on adolescents' mental health. The careful and regular observation of adolescents' internet use pattern and their moods and feelings will be very helpful in identifying those adolescents who are vulnerable to develop internet addiction and /or depression.

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**Legend Tables**

Table 1: Frequency and percentage of participant's with regard to Internet addiction and Depression n =250.

| variables | Frequency (f) | Percentage (%) |
|---|---|---|
| **Internet Addiction** | | |
| Not addicted | 208 | 83.2 |
| Addicted | 42 | 16.8 |
| **Depression** | | |
| Non depressed | 221 | 88.4 |
| Depressed | 29 | 11.6 |

Table 2: Correlation between Internet Addiction and Depression. n = 250

| variable | Correlation (r) | P value |
|---|---|---|
| **Internet addiction** | **.337 S*** | < 0.001 |
| **Depression** | | |

Table 3: Association between internet addiction and selected socio-demographic variables n = 250.

| Sl. No. | Socio-demographic variables | Internet addiction | | Chi-square ($\chi^2$) | p value |
|---|---|---|---|---|---|
| | | Non- addicted f (%) | Addicted f (%) | | |
| 1 | **Body weight** | | | | |
| | 28-44 | 126(60.6) | 16(38.1) | 13.617 | **0.001** |
| | 45-60 | 73(35.1) | 19(45.2) | | |
| | 61-75 | 9(4.32) | 7(16.7) | | |
| 2 | **Availability of own smart phone** | | | | |
| | Yes | 78(37.5) | 24(57.14) | 5.582 | **0.018** |
| | No | 130(62.5) | 18(42.86) | | |

Table no 4: Association between depression and socio-demographic variables n=250

| Sl. No | Socio-demographic variables | Depression | | Chi-square ($\chi^2$) | p value |
|---|---|---|---|---|---|
| | | Non depressed f (%) | Depressed f (%) | | |
| 1 | **Body weight (in kg)** | | | | |
| | 28-44 | 129(58.37) | 13(44.83) | 6.808 | **0.033** |
| | 45-60 | 81(36.65) | 11(37.93) | | |
| | 61-75 | 11(4.98) | 5(17.24) | | |
| 2 | **Type of family** | | | | |
| | Joint | 76(34.4) | 10(34.48) | 16.079[a] | **0.0003** |
| | Nuclear | 144(65.15) | 16(55.17) | | |
| | Extended | 1(0.45) | 3(10.35) | | |
| 3 | **Parent's marital status** | | | | |
| | Together | 212(95.9) | 26(89.66) | 12.447[b] | **0.006** |
| | Separated | 5(2.3) | 0 | | |
| | Divorced | 2(0.90) | 0 | | |
| | Widow | 2(0.90) | 3(10.34) | | |
| 4 | **Number of Offline friends** | | | | |
| | <35 | 177(80.1) | 19(65.5) | 7.835[c] | **0.020** |
| | 35-80 | 33(14.93) | 10(34.5) | | |
| | >80 | 11(4.97) | 0 | | |

a - 2 cells (33.3%) have expected count less than 5. The minimum expected count is .46. b - 6 cells (75.0%) have expected count less than 5. The minimum expected count is .23. c -2 cells (33.3%) have expected count less than 5. The minimum expected count is 1.28.



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