

**Depression among Adolescents: The Role of Internet Addiction and Sex**  
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**Abstract**

Excessive use of the internet among adolescents has been associated with many mental health problems including depression. The study investigated the depression of adolescents with high internet addiction and adolescents with low internet addiction as well as those of boys and girls. The study adopted a 2 (adolescents with high internet addiction versus adolescents with low internet addiction) x 2 (adolescent boys versus adolescent girls) factorial design. Two hundred and forty participants (124 adolescents with low internet addiction and 116 adolescents with high internet addiction) out of four hundred participants were purposively selected from different high schools and +2 colleges of Cuttack and Khurda districts of Odisha, India. The participants of all four groups (adolescent boys with high internet addiction, adolescent boys with low internet addiction, adolescent girls with high internet addiction and adolescent girls with low internet addiction) were compared with respect to their level of depression. The results indicated that adolescents with high internet addiction were more depressed than the adolescents with low internet addiction. Adolescent girls were found to be more depressed as compared to adolescent boys.

**Keywords:** depression, virtual adolescents, sex differences, internet addiction.

Internet plays a very important role in transforming the lives of adolescents' in the twenty-first century. Adolescents have become overly dependent on the internet which serves as a hindrance to their overall physical, academic, social, emotional and personal functioning ultimately resulting in addiction. Internet addiction is an online, compulsive behavior which hampers normal living conditions and causes severe stress on family, friends, loved ones and academic, financial and occupational environment (Chou & Hsiao, 2000; Griffiths, 2000; Whang et al, 2003; Widyanto & Griffiths, 2007; Young, 1998). It is a non-substance addiction and it is often referred to as Internet Addiction Disorder (IAD). This type of pathological internet use is considered for inclusion in DSM V and is often associated with depression. Young's (1996) criteria of internet addiction were based on the diagnostic standards of pathological gambling. The addicted person according to Young feels preoccupied with the internet and feels the need to use the internet with increasing amount of time in order to achieve satisfaction. They keep on making repeatedly unsuccessful efforts to control or cut back internet use and feel restless, moody, depressed, or irritable when attempting to cut down or stop internet use. They stay online longer than originally intended and risk the loss of a significant relationship, job, educational or career opportunity because of the internet. They lie to family members, therapists, or others to hide the extent of involvement with the internet and use the internet as a way of escaping from problems or relieving a dysphoric mood. Adolescents are often more habituated to virtual interactions rather than face-to-face communication since such virtual interactions enable them to strive for new opportunities and challenges. Adolescents often fail to identify the differences between the real world and virtual reality and as a result this type of

The internet acts as an escape from their day-to-day life and in turn increases the risks associated with addiction to the internet.

According to Beck (1970), depression is defined in terms of mood alteration, self-reproach and self-blame, regressive and self-punitive wishes (desire to escape, hide or die), vegetative changes (anorexia, insomnia and loss of libido) and changes in activity level (retardation or agitation). Multiple research evidences on internet addiction and depression have indicated that increased use of the internet leads to disturbances in the daily life of an adolescent and is associated with depression (Akin & Iskender, 2011; Bahrainian & Khazaei, 2014; Bernardi & Pallanti, 2009; Bhat & Kawa, 2015; Goel, et al., 2013; Jamwal et al., 2016; Kaur, 2015; Orsal et al., 2013; Sharma et al., 2016; Yadav et al., 2013; Yen et al., 2007). Low motivation, low self-esteem, need for confirmation from others and fear of rejection have been associated with internet addiction and depression (Yang et al., 2005). It has also been found that social isolation due to internet addiction may also lead to depression among adolescents (Tsai & Lin, 2003). Although many studies have been conducted with regard to internet addiction outside India, very few Indian studies have been carried out relating internet addiction to depression. This area needs more attention as internet addiction is more prevalent among Indian adolescents.

It has been found in many studies that involve children from preadolescence to young adulthood that girls have

an increase in the symptoms of depression after 13-14 years of age whereas, the depression level remains constant for boys. So, girls are found to be more depressed compared to boys. Multiple research evidences can be found in this regard (Galambos et al., 2004; Hankin, 2009; Nolen-Hoeksema & Girgus,

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al., 2016). A major concern in sex differences in depression may be that boys and girls do not really differ in the prevalence of depression but simply differ in their readiness to give an account of such feelings. Girls usually tend to show more symptoms of anxiety and somatic depression such as, tiredness, changes in appetite, and sleep disturbances whereas, there are no sex differences for anhedonia, depressed mood, and decrease in concentration. Due to secondary status in the society and sex role discrimination sometimes girls go through certain traumas, like sexual abuse, chronic strain, lack of respect, harassment, and constrained choices more often than boys and develop depression. There is also a sex difference in coping styles, self-concept, and biological responses to stressors.

### **Objective**

The objective of this study is to examine the influence of internet addiction and sex on adolescents' depression.

### **Method**

The objective of this study is to assess the effect of internet addiction and sex on the depression of adolescents. The study involves a 2 (adolescents with high internet addiction versus adolescents with low internet addiction) x 2 (adolescent boys versus adolescent girls) factorial design. Internet addiction and sex are the independent variables and depression is the dependent variable.

### **Sample**

Two hundred and forty participants (124 adolescents with low internet addiction and 116 adolescents with high internet addiction) out of four hundred participants were purposively selected from different high schools and +2 colleges of Cuttack and Khurda districts of Odisha, India. One hundred and sixty participants identified as moderate internet users were excluded from this study on the basis of their scores obtained from the scoring manual of the internet addiction test. Out of 124 adolescents with low internet addiction 64 were male and 60 were female participants. Out of 116 adolescents with high internet addiction 56 were male and 60 were female participants. Care was taken to sample groups equated with respect to education and age range. All the participants belonged to middle socio-economic group. They were administered the measure of internet addiction developed by Young (1996). The participants of all four groups (adolescent boys with high internet addiction, adolescent boys with low internet addiction, adolescent girls with high internet addiction and adolescent girls with low internet addiction) were compared with respect to their level of depression using the Beck's Depression Inventory.

### **Tools**

The study involves the Internet Addiction Test and the Beck's Depression Inventory for collecting data from adolescent students.

**Internet Addiction Test (IAT):** The Internet Addiction Test (IAT) was developed by Young in the

year 1996. It measures adolescents' involvement in computer and classifies addictive behavior in terms of mild, moderate and severe impairment. It covers the degree to which internet use affects the daily routine, social life, productivity, sleeping pattern and feelings of adolescents. The test consists of 20 statements containing six response options such as 'does not apply' (0), 'rarely' (1), 'occasionally' (2), 'frequently' (3), 'often' (4) and 'always' (5). Total scores are obtained by summing all the responses. The higher the score, the greater is the level of internet addiction. A score of 20-49 points indicates that the individual is an average online user having complete control over his or her usage, a score of 50-79 signifies frequent problems due to internet usage and a score of 80-100 indicates that the internet is causing significant problems. The test-retest reliability is .82 and the content validity is .88.

**Beck's Depression Inventory:** The Beck's Depression Inventory, (BDI) developed by Aron T. Beck and his colleagues in the year 1961, is one of the most widely used self-rating inventories for measuring the severity of depression. It consists of 21 multiple-choice statements. The BDI takes approximately 10 minutes to complete. Each statement has a set of four possible response options ranging from 0 to 3. The highest score would be 63. The lowest score would be 0. A score from 1-10 indicates that the ups and downs are normal, 11-16 indicates mild mood disturbance, 17-20 indicates borderline clinical depression, 21-30 indicates moderate depression, 31-40 indicates severe depression and above 40 indicates extreme depression. The inventory has high internal consistency with alpha coefficients of .86 and .81 for psychiatric and non-psychiatric populations respectively (Beck et al., 1988). The convergent validity for this inventory is 0.89.

### **Procedure**

Prior to official data collection permission was taken from the authorities of high schools and colleges. Out of 400 participants, 240 participants within the age bracket of 14 to 16 years were included in this study. One hundred and twenty four participants identified as low internet users and 116 participants identified as high internet users were included in this study on the basis of their scores obtained from the scoring manual of the internet addiction test. The investigator clearly stated that the participation was entirely voluntary and anonymous, could be withdrawn at any time and would in no way affect the participants. A good rapport was established between the investigator and the participants. Participants were given the measures of internet addiction and depression which were individually administered. Instructions regarding the measures were adequately explained and care was taken to ensure that they understood the questionnaires. The participants were instructed to respond to each item in the questionnaire freely and

frankly without any hesitation. A brief overview of the study was provided by the investigator. Strict confidentiality was ensured and the study was conducted in compliance with ethical principles.

### Results

The summary of the analysis of variance on the depression scores of the participants is presented in Table 1. The mean and standard deviations on the depression level of participants are presented in Table 2.

The effects of urban life such as loneliness, living in contemporary nuclear families, and early exposure to the internet lead to internet addiction and it is evident that excessive internet users report many psychological issues. They show many symptoms of withdrawal from significant interpersonal relationships which may ultimately result in depression. Goel et al., (2013) investigated the prevalence and relationship between internet addiction and depression in Indian adolescents and it

*Table 1: Analysis of Variance Performed on Depression Scores of Participants*

| Sources                                                     | df  | MS     | F      |
|-------------------------------------------------------------|-----|--------|--------|
| Status (High internet addiction vs. low internet addiction) | 1   | 203.13 | 22.22* |
| Sex                                                         | 1   | 530.83 | 58.08* |
| Status x Sex                                                | 1   | 1.82   | 0.20   |
| Error                                                       | 236 | 9.13   |        |

Note: \* $P < 0.01$

*Table 2: Mean Ratings on Depression Scores of Participants*

| Groups                                   | Boys  |      | Girls |      | Combined |
|------------------------------------------|-------|------|-------|------|----------|
|                                          | M     | SD   | M     | SD   | M        |
| Adolescents with high internet addiction | 17.96 | 2.86 | 21.11 | 3.48 | 19.59    |
| Adolescents with low internet addiction  | 16.29 | 2.67 | 19.10 | 3.02 | 17.65    |
| Combined                                 | 17.07 |      | 20.10 |      |          |

The analysis of variance (ANOVA) performed on depression scores of the participants shows significant effect for the level of internet addiction,  $F(1,236) = 22.22$ ,  $P < 0.01$  (see Table 1). As shown in Table 2, adolescents with high internet addiction demonstrated more depression compared to the adolescents with low internet addiction ( $M = 19.59$  and  $17.65$ , respectively). The result also showed significant effect for sex  $F(1,236) = 58.08$ ,  $p < 0.01$ . As depicted in Table 2, girls reported higher level of depression compared to boys ( $20.10$  and  $17.07$  respectively). It was evident from the above table that there was no significant interaction effect for internet addiction x sex,  $F(1,236) = 0.20$ , n.s. This shows that level of internet addiction and sex combined have no effect on the depression scores of the participants.

### Discussion

The present empirical investigation examines the role of internet addiction and sex on adolescents' depression. The above findings clearly show that adolescents with high internet addiction showed higher level of depression than adolescents with low internet addiction.

was found that excessive internet users had high scores on depression. Yadav et al., (2013) studied internet addiction and its correlates among high school students in Ahmedabad in India. In their study, internet addiction was indicated by the amount of time spent online and the use of various social networking sites. There were also many symptoms of anxiety and stress. Moreover, a strong positive correlation was also found between internet addiction and depression. Multiple research evidences have also been found in support of such a relationship (Bahrainian & Khazaei, 2014; Bhat & Kawa, 2015; Jamwal et al., 2016; Kaur, 2015; Orsal et al., 2013; Sharma et al., 2016).

The study also reveals that adolescent girls show higher level of depression than adolescent boys. This has also been corroborated by multiple research evidences (Maharaj et al., 2008; Sharma 2014; Sharma & Kirmani, 2013; Singhal et al., 2016). There can be many explanations for such a finding. It has been established by various research studies that genetic and personality factors influence the likelihood of a susceptibility to depression which is

more likely to develop in girls than boys (Goodyer et al., 1993; Jacobson & Rowe, 1999).

Having a ruminative response style increases the level of depression in girls. Girls get absorbed with the recall of negative events and focus more attention on the negative aspects of self (Broderick, 1998). Adolescent girls have a dysfunctional negative attitude and inferential style which promotes more rumination and the activation of negative contents. Many research studies associated with negative events in relation to sex have found that girls report more interpersonal negative events and boys report more negative academic school events (Larson & Ham, 1993; Rudolph & Hammen, 1999).

A vulnerability-stress model emphasizing on an interpersonal, affiliative need identified adolescent girls to be at a particular risk for interpersonal negative events (Cyranowski et al., 2000). Such a developmental pattern of sex difference in negative events has indicated that girls experience more negative events than boys after pubertal transition (Ge et al., 1994; Rudolph & Hammen, 1999). It has been found that tenth grade adolescent girls exhibited more negative attributional style than boys (Nolen-Hoeksema & Girgus, 1995).

Girls are also more anxious and suffer from more eating disorders than boys. Like western societies, in India also adolescent girls are influenced by the hard to achieve standards of beauty presented in the media. The cultural ideal of hard-to-achieve thinness builds a sense of discrepancy between the actual weight and the desired weight. This ultimately leads to dissatisfaction among adolescents. It decreases their self-esteem leading to depression. Girls consider appearances to be extremely important, and in turn become overly sensitive to the cultural requirements of so-called femininity (Streigel-Moore et al., 1986). This aspect of perceived physical attractiveness and body satisfaction is more predictive of depression among adolescent girls than boys (Cole et al., 1998). In sum, the findings highlight the need to study internet addiction in adolescence and it is also assumed that this study can help professionals in the field of education reduce the use of internet through counseling and life skill training to better understand the problems of internet addiction among adolescents.

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