Internet Addiction and Substance Use Disorders in Adolescent Students - A Cross Sectional Study

Sajeev Kumar PB[1], Niranjan Prasad[2], Zoheb Raj[3], Amal Abraham[4], Vinayak M[5], Akash Balu[6], Narayanankutty OK[7]

Abstract:

Behavioral addiction and substance use are on a rise among adolescents throughout the world and co-occurring psychiatric morbidities is an obstacle for treatment seeking and prognosis. The current study aims to find out the prevalence of substance use disorders, excessive internet use among adolescent school students and the factors responsible for it. Adolescents from various schools in a northern district from Kerala were recruited in the study and assessed using Young's Internet Addiction Test, CRAFFT substance use screening test and revised Kuppuswamy's Socio-economic Scale along with a semi-structured questionnaire assessing demographic profile of the individual. On evaluating 803 adolescents, 97 students (13.4%) were positive for IAT with 1.2% of total positives rated as severe, 32.9% rated as moderate positive while rest 65.9% were mild positive. Forty-two students use alcohol i.e. 5.2% of the students sampled. Fifteen students abuse marijuana or hashish while 12 students use other substances (sniffing glue, prescription drugs) Overall prevalence of substance use screened by CRAFFT questionnaire is 8.3%; 1.8% fulfilled criteria for substance dependence according to Diagnostic and Statistical Manual of Mental disorders- Fourth Edition (DSM IV) from total samples. A significant association between substance use disorders and excessive internet study is reported from the current study. Prevalence of substance use disorders and internet addiction is an emerging entity among adolescents and has serious repercussions on the developing brain. A long term effect of internet use on the brain is an area to be explored in the future.

Key words: Adolescents, Internet addiction, Substance abuse

Introduction:

Popularity of internet has soared through the years with people relying on it for communication, transferring data, jobs, entertainment and leisure. As availability and accessibility has also widened, the usage or 'hours logged in' have also risen.[1] Adolescents are currently the defining users of internet with their usage much higher than adults along with much of their social interactions using internet.[2] Earlier researches in 1990s showed internet use was detrimental although recent research is to the contrary.[3] Excessive internet use has been studied to be similar to excessive alcohol and substance use causing addiction and further set of criteria were developed to determine and evaluate internet addiction.[4,5]

Behavioural characteristics of adolescents with addiction have been studied in detail and a certain pattern specific to addictive behaviour elucidated. Certain personality and physiological traits such as impulsivity, risk taking and stress responsiveness has been linked to potential addiction.[6] Studies on molecular basis shows evidence of long-lived behavioural abnormalities in addiction due to long-term plasticity.[7] The need for diagnosing co-occurring disorders is hence deemed

necessary for better treatment and prognosis.

Ample research both in Western and Indian settings have helped identifying prevalence of substance use and addiction among adolescents and multiple contributing factors, while some were rather conclusive of their association.[8,9,10,11] On similar lines, some characteristics and psychiatric morbidities like depression, neurotic traits, male gender were found to be associated with internet addiction.[12,13,14] Various correlates for substance abuse and behaviour addiction are being explored.

Substance use and dependence have been found to co-occur with mental illnesses[15] and the risk of co-occurring disorders was high in adolescents as that of adults[16]. Attention deficit hyperactivity disorders and conduct disorders were much higher among adolescents presenting with substance use disorders.[17] Again there is a clear association between severity of substance use and the symptom profile of co-occurring mental illnesses.[18]

Surveys across United States and Europe gives a prevalence of 1.5% to 8.2% for internet addiction with varying questionnaires used for assessment with high prevalence of co-occurring depression, generalized anxiety disorder, social anxiety disorder and Attention Deficit Hyperactive Disorder.[19] Functional brain changes in the area of prefrontal cortex have been linked to addiction to internet.[20] Also a reduction in Dopamine D_2 in striatum including dorsal caudate and right putamen was associated with internet addiction.[21] Significant Dopamine Transporter (DAT) losses was observed in patients with Internet Use disorder.[22]

A significant association between problematic internet use and alcohol abuse was reported from a sample of 2114 which recruited high school students across Taiwan[23] and a screening of adolescents warranted and the proneness to problem behaviour attributed to neurobehavioral disinhibition.[24]

Adolescent problem behaviours have been frequently dichotomized into two empirically established syndromes reflecting internalizing disturbances (including depression, anxiety, withdrawal, and eating disorders) and externalizing disturbances (including aggression, oppositional disorders, delinquency, and school problems.[25] The current study aims to determine the prevalence of internet addiction and substance use among school going adolescents along with associated risk factors.

Materials & Methods:

Type of Study:

Analytical Cross sectional study using self rated questionnaires.

Study Setting:

Private, aided and government schools in Northern district in Kerala, India

Sample:

Students aged 16-19.

Selection Criteria:

Inclusion Criteria:
  a) School going adolescents aged 16-19
  b) Children who have assent / consented to the study.
Exclusion Criteria:
  a) Refusal of assent / consent
  b) Students already on treatment for seizure and psychiatric illness.

This was a cross sectional, single assessment study conducted in various schools of a district in Kerala. Participants were students of eleventh and twelfth standard. The selection of schools was done so as to include Government, Aided, Private schools, as well as C.B.S.E. and state syllabus so as to include samples from different strata of the society. A study team approached the Principal of concerned schools and handed over a detailed protocol of the study with informed consent. After explaining data

collection method and assurance of confidentiality, schools which agreed were included in the study.

Students were gathered in their respective class rooms in groups of 50-60, and a brief awareness session regarding internet addiction and substance use and abuse was given. Data was collected from June 1st 2014 to September 30th 2014. The study had approval of Ethical Review Committee (Kannur Medical College, Kannur, Kerala, India).

Assessment tools

1. Socio-demographic Proforma
2. Young's Internet Addiction Test(IAT)[4]
3. CRAFFT substance use screening test[26]
   a. Have you ever ridden in a CAR driven by someone (including yourself) who was "high" or had been using alcohol or drugs?
   b. Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?
   c. Do you ever use alcohol/drugs while you are by yourself, ALONE?
   d. Do you ever FORGET things you did while using alcohol or drugs?
   e. Does your family or FRIENDS ever tell you that you should cut down on your drinking or drug use?
   f. Have you gotten into TROUBLE while you were using alcohol or drugs?
4. Revised Kuppuswamy's socio-economic Status Scale[27]

After explaining the objective of the study, written informed consent was taken assuring anonymity and confidentiality. The students were administered an objectively structured proforma assessing the family type, locality, type of internet connection etc. followed by the Young's Internet Addiction Test(IAT),[4] a 20 numbered questionnaire assessing problem internet usage and CRAFFT substance use

screening test[26] which evaluates licit and illicit substance use and abuse in the past one year. Also used was the revised Kuppuswamy's socioeconomic status scale assessing the socioeconomic status.[28,29] The permission to use Young's IAT and the CRAFFT questionnaire were obtained from the respective authors.

Statistical analysis

Students were interviewed, examined and data thus collected was analyzed with the help of SPSS statistical software (version 21 for Windows; SPSS Inc, Chicago, IL). Prevalence was assessed with proportions; Chi-square test was used for comparison of proportions. Correlation was assessed with Spearman and Pearson's correlation. The difference was considered significant if $P < 0.05$.

Results:

Sample characteristics

The survey evaluated 803 adolescents aged 16 to 19 years. Mean age of sample assessed was 16.41+/-0.54 years; 50.4% of the samples were males. In this, 56.2% of the samples were in class 12th while 43.8% were in class 11th. 32.5% were from science stream, 16.3% from Humanities, 26.2% from Commerce and 25% from Computer science (**Table I**).

Of the total samples, 69% were from a rural background while 31% were from an urban background; 58.4 % were from nuclear families while the rest lived in joint families. A sample of 54.6% was from a school located in panchayat limits as opposed to 45.4% from a school located in municipality (**Figure I**).

Internet Use Characteristics

Internet access over phone was the preferred mode of internet access for 57.8% of the sample while 17.1% accessed broadband connection; meanwhile 13.9% had access to internet over both mobile phone and broadband; 10.6% of the

sample had no means of accessing internet. On assessing social networking, 38.7% of sample was using both WhatsApp and Facebook, and 38.3% using Facebook alone.

Table I: Sample Characteristics

Age	16.41+/-0.54	
Sex	Male	50.4%
	Female	49.6%
Class	11th standard	56.2%
	12th standard	43.8%
Stream	Science	32.5%
	Humanities	16.3%
	Commerce	26.2%
	Computer Science	25.0%

Figure I: Socioeconomic status of the Sample
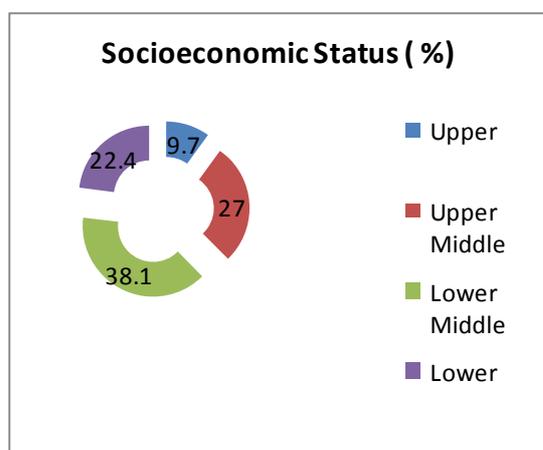
Internet Addiction

Of the total samples surveyed, 97 (13.4%) were positive for IAT, with 1.2% of total positives rated as severe, 32.9% rated as moderate positive while rest 65.9% was mild positive. [IAT ranges: NORMAL RANGE 0 – 30, MILD 31- 49, MODERATE 50 -79, SEVERE 80 – 100]. Males rated positive were significantly higher than females (Pearson's Chi Square Co-efficient is 31.59, $p<0.01$).

Substance Use and Dependence

Of the total samples, 42 students consumed alcohol i.e. 5.2% of the students sampled, 15 students abused marijuana or hashish while 12 students used other substances (sniffing glue, prescription drugs). Overall prevalence of substance use screened by CRAFFT questionnaire was 8.3%; 1.8% fulfilled criteria for substance dependence according to DSM IV[30] criteria from total samples.

Association between internet addiction and substance use

Significant positive association between Internet addiction and substance use was observed using Fisher's Exact Test (value=48.102) and Pearson's Chi Square Test (value=48.181) ($p < 0.05$).

Table II: Risk for substance use among adolescents with heavy internet use

Young's Internet Addiction Test (IAT)		Substance Use	
		Absent	**Present**
	No internet Addiction	603(96.80%)	20(3.20%)
	IAT positive	143(80.30%)	35(19.70%)

Odds Ratio = 7.379; Confidence Interval = 95%, Lower = 4.136, Upper = 13.165

Discussion:

Our study sample consisted of students aged 16-19 years from panchayats as well as municipalities. A previous prevalence study quoted 74.5% moderate users, with 24.8% possible addicts and 0.7% addicts in Mumbai[31] while our study shows 65.9%, 32.9% and 1.2% respectively. A percentage of 12.6 from schools located in panchayats were IAT positive while in schools in municipality, it was 15.9%. Corroborating with previous studies, internet addiction was much commoner among males than in females.[31,32,33] High prevalence of problematic internet use was recorded in rural areas in current study, while along with deficient social support, mental health morbidity and neurotic character traits was previously found associated with the disorder.[14]

The present study also reports a significant association between internet addiction and substance use and abuse in lines with a Taiwanese study which recruited high school students[23] while genetic linkage studies report impulsivity an important genetic risk factor for both type of addictions including behavioural addiction and substance addiction.[34]

Strengths and Limitations:

The study was conducted in a small demographic, but included samples from different strata based on urban and rural background, as well as types of schools. The sample selection was by convenient sampling. Anonymity of replies was explained and preserved. Only school going adolescents of age 16 to 19 years were included missing out on school dropouts in whom a higher prevalence of addictive behaviour is suspected. Another limitation of our study was that we could not assess or rule out other psychiatric co-morbidities in study samples.

Conclusion and Future Direction:

Prevalence of addictive behavior in adolescents is on the rise with internet addiction an emerging entity. The present study concludes the same and throws light on the associated risk factors. Effective screening and early detection is necessary to prevent further co-morbidities which has to address the problem behavior in school students. Existing legislation in India has kept a check on substance abuse among adolescents but the problem is still persisting[35]. The findings of the current study point towards an association between dependent internet use and addictive behaviour.

Various correlates for substance abuse and behaviour addiction are being explored. Functional brain changes in the area of prefrontal cortex have been linked to addiction to internet[20]. Newer neurobiological correlates are being explored which are responsible for early onset addictive beaviour. Multiple postulates which might contribute have been discovered enabling a better understanding and opens doorways into researches which would one day give us an all encompassing hypothesis.

With the recent emergence of internet addiction, the long term effects on brain with prolonged internet use remains a mystery. Identifying excessive internet usage and its effects on behaviour would enable us to intervene at the time of early warning signs and set limits.

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Authors details:

1- **Corresponding author:** Assistant Professor, Department of Psychiatry, Kannur Medical College, Anjarakandy, Kannur- 670612, Kerala, India; **E-mail:** snehithansaji@gmail.com

2- Professor & Head, Department of Psychiatry, Kannur Medical College, Anjarakandy, Kannur, Kerala

3, 4, 5, 6- Resident, Department of Psychiatry, Kannur Medical College, Anjarakandy, Kannur, Kerala

7- Professor, Department of Psychiatry, Kannur Medical College, Anjarakandy, Kannur, Kerala