

Internet Use, Internet Addiction and Quality of Sleep among Medical Undergraduates

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Abstract: With the development of online learning, communication and entertainment, the internet has become an indispensable tool for students. However, it can prove to be problematic owing to its dysfunctional use. The American Psychiatric Association has included Internet Gaming Disorder in the appendix of updated version of DSM-5. Internet Addiction (IA) has yet not been officially recognized as a disorder. This research was aimed to study the pattern of internet use and factors associated with it, to estimate the prevalence of internet addiction and to study the relationship between internet addiction and quality of sleep among medical undergraduates. Study was carried out on MBBS students studying in C. U. Shah medical college, Surendranagar in a single session after permission of Ethics Committee. Students were explained about the procedure, consent was taken and then they were subjected to self-administered socio-demographic data sheet, information regarding patterns of internet use, Young's Internet Addiction Test (IAT) and quality of sleep questionnaire. The data was analyzed by statistical methods using SPSS version 16. Study included 197 students, of which 102 were male. Mean age of the participant was 20. The prevalence of IA was found to be 19.2%. Male gender, hours of internet use per day, permanent login status, online friendships, online gaming, searching information online, and watching adult content were found to be significantly associated with IA. Internet use for online friendships was found to be a significant predictor of IA and searching information was found to be protective against IA on logistic regression. There was significant association between Internet Addiction and poor quality of sleep. With the rapidly increasing internet use among adults and adolescents, IA is soon likely to emerge as a global health issue. Characteristics of internet usage associated with IA needs to be considered while developing strategies for interventions.

Keywords: Internet Addiction, Medical undergraduates, Sleep.

INTRODUCTION

In recent years, the term "addiction" has been expanded beyond substance dependence to include non-substance dependence to include non-substance-related behaviors that cannot be curtailed and cause problems as well as social and occupational impairment. Proposed "behavioral" addictions have included such varied themes as exercise, shopping, gaming and forms of internet-enabled behavior such as online video gaming, socializing through social media and various forms of sexual behavior [1].

The Internet has become an integral part of life. The number of internet users in India crossed 205 million in October 2013 [2]. With the development of online learning, communication and entertainment, the internet has become an indispensable tool for students.

In the past decades, problem behaviors related to internet use has been given different terms such as "Internet Addiction Disorder", "pathological Internet use," "excessive Internet use," "Internet addiction," "problematic Internet use," "psychopathological Internet use," "Internet dependence," and "compulsive computer use," and different criteria have been proposed for the same.

The IAD (Internet Addiction Disorder) is a compulsive-impulsive spectrum disorder consists of a three subtypes: excessive gaming, sexual preoccupations, and e-mail/text messaging. All of the variants share the following four components: 1) Excessive use, often associated with a loss of sense of time or a neglect of basic drives 2) Withdrawal including feelings of anger, tension, and/or depression

when the computer is inaccessible 3) Tolerance, including the need for better computer equipment, more software, or more hours of use, and 4) Negative repercussions, including arguments, lying, poor achievement, social isolation, and fatigue [3].

The negative effects of IAD on physical and mental health have been a public health concern. IAD could lead to poor concentration and academic performance, headache, musculoskeletal pain, and fatigue [4], as well as psychiatric co-morbidities, such as mood and anxiety disorders [5], dysfunctional personality [6], attention-deficit hyperactivity disorder [7], impulsivity [8], and high levels of aggressiveness [9].

The American Psychiatric Association has included Internet Gaming Disorder in the appendix of updated version of DSM-5. Internet Addiction (IA) has yet not been officially recognized as a disorder. Over the past year, there has been a lively debate concerning the inclusion of gaming disorder (GD) in the draft of the 11th revision of the International Classification of Diseases (ICD-11) by the World Health Organization (WHO). A series of annual WHO expert meetings – in Tokyo (Japan), Seoul (South Korea), Hong Kong (China), and Istanbul (Turkey) – held since 2014 provided the rationale and justification for the recommendation to include GD in the section of disorders due to addictive behaviors in the ICD-11 Beta-Draft (WHO, 2018a)[10].

Identifying the epidemiological patterns of IAD and its associations with demographic and other variables may help to develop preventive and treatment strategies, and allocate appropriate health services to address the fast emerging problem of IAD.

This research was aimed to study the pattern of internet use and factors associated with it, to estimate the prevalence of internet addiction and to study the relationship between internet addiction and quality of sleep among medical undergraduates from medical college in Gujarat.

MATERIALS AND METHODS

Study was carried out in C. U. Shah medical college & hospital, Surendranagar. College students pursuing their graduation (MBBS), were recruited for the study. They were given self-administered survey forms which included socio-demographic data, information regarding patterns of internet use, Young's Internet Addiction Test (IAT) and quality of sleep questionnaire and filled up in a single session (30 minutes). Pattern of internet use included information such as owning personal device, duration of internet use per day, medium to access internet, login status, using internet for purposes such as online friendships, shopping, watching movies, watching news, instant messaging, online gaming, searching information and

watching adult content. IA test (IAT) was used to screen for IA. It is 20-item self-report questionnaire answered on five-point Likert type scale (0="Does not apply", 1="Rarely" to 5="Always"). Items on IAT measures in relation to internet use, compulsive behavior, academic difficulties, lack of competence at home, problems in interpersonal relations, and emotional problems. It has been validated for use in adult and adolescent populations and has good internal consistency as well as concurrent validity. The following cut-off points to the total YIAT score were applied: (1) normal internet use: scores 0–49 and (2) potential internet addiction: scores over 50 [11, 12]. Total IAT score of ≥ 50 were categorized as IA. This sleep-quality questionnaire - is 9-item self-report questionnaire answered on four-point scale (0 to 4) by circling the best accurate response for each question. Score < 19 indicates having some sleep problem.

Statistical analysis of the data was done by SPSS version 16 for Windows (Chicago, Illinois, USA). Frequencies with percentages were calculated for categorical variables and mean and standard deviation will be calculated for continuous variables. The data will be compared using chi-square (χ^2) test for categorical variables. Logistic regression was done to find protective and risk factors associated with IA. P value of < 0.05 was considered statistically significant.

Before starting data collection, approval from Institutional Ethics committee (IEC), was taken. Written Informed consent was taken from all participants. The students were assured that information revealed by them will be kept confidential and used for research purpose only.

RESULTS

In total, 220 MBBS students were surveyed. Only 197 participants completed the IAT and were included in the subsequent analysis. Out of 197, 102 (51.78%) were males. The mean age of participants was 20 years (standard deviation [SD] 1.04, range 18 to 23). The prevalence of IA was found to be 19.2% (38/197).

Participants who admitted to use internet for more than 4 h/day were 36.54%. Smartphone was owned by 100% and 63.45% kept a permanent log-in status. Participants reported using internet for online friendships (68.02%), instant messaging (57.86%), shopping (77.15%), online news (72.08%), online movies (78.17%), online games (58.88%), online music (82.74%), online blog (35.53%), online TV (77.5%), social networking sites (92.38%), file sharing (85.78%), watching pornographic content (48.22%) and for searching information (98.98%) [Table 1].

Male gender, owning a personal device, hours of internet use per day, use of internet for online friendships, watching movies, searching information online, instant messaging and watching pornographic

content were found to be significantly associated with IA on analysis[Table 2].

Internet use for online friendships and watching pornographic content was found to be a

significant predictor of IA and internet use for searching information and file sharing was found to be protective against IA on logistic regression [Table 3]. Poor quality of sleep was found to be significantly associated with IA [Table 4].

Table-1: Patterns of Internet use

Variables	N (%)
Male	102(51.77%)
Female	95(48.22%)
Log in status	
Permenant	125(63.45%)
Intermittent	72(36.54%)
Hours of usage	
>4 hours	72(36.54%)
<4 hours	125(63.45%)
Smartphone	197(100%)
Desktop	65(32.99%)
Laptop	106(53.80%)
Online friendships	134(68.02%)
Instant messaging	114(57.86%)
Online shopping	152(77.15%)
Online movies	154(78.17%)
Online news	142(72.08%)
Searching information	195(98.98%)
Online games	116(58.88%)
Online music	163(82.74%)
Online blog	70(35.53%)
Online TV	133(67.5%)
Social networking sites	182(92.38%)
File sharing	169(85.78%)
Pornographic content	95(48.22%)

DISCUSSION

IA includes symptoms such as preoccupation with the internet, withdrawal symptoms, tolerance, unsuccessful attempts to control internet use, and continued excessive internet use despite the negative consequences. Internet is used to escape or relieve a dysphoric mood, and to hide internet use, person may lie to family members, therapists, or others [13].

Researchers have reported that university students are considered the most vulnerable group in society to develop internet addiction [14, 15]. The prevalence of youth internet addiction reported by different researchers varies across different areas of the world [16]. It has been found that the occurrence rate of internet addiction among adolescents ranged from 1.98% to 35.8% in western and non-western countries [17-19].

Compared to adults, university students have less self-regulatory ability[20] and are more likely to use Internet excessively[21,22] which increases the risk of IAD in this population. University students have

been called “digital natives,” since they use Internet frequently. For example, the prevalence of IAD in a cohort of medical students was 30.1% [23], which is approximately five times higher than figures reported from the general population [24].

In a study done among the 242 MBBS students at Indore, 9.5% were severe internet addicts with IAT score between 80 and 100 and 18.6% were moderate addicts. Among them, 6.1% were males and 3.3% were females, with no significant association between IAT scores and gender [3].

Male gender, hours of internet use per day, use of internet for online friendships, shopping, watching movies, online gaming, searching information online and instant messaging were found to be significantly associated with IA. These associations are in agreement with similar findings from previous studies [25, 26]. Males are more susceptible to IA as they are primarily using internet for entertainment purposes such as gaming and watching sexually explicit material as compared to females [27].

Table-2: Internet Addiction (IA) and Internet use patterns

	Normal Internet usage, n (%)	Internet Addiction, n (%)	Chi-square value	P value
Gender				
Male	69(43.40%)	33(86.84%)	23.1857	<0.0001
Female	90(56.60%)	05(13.16%)		
Log in Status				
Intermittent	62(38.99%)	10(26.32%)	2.1257	0.148
Permenant	97(61.01%)	28(73.68%)		
Hours of usage				
<4 hours	112(70.44%)	13(34.22%)	17.3594	<0.0001
>4 hours	47(29.56%)	25(65.78%)		
Desktop				
No	107(67.30%)	25(65.78%)	0.0315	0.859
Yes	52(32.70%)	13(34.21%)		
Laptop				
No	71(44.65%)	20(52.63%)	0.7853	0.375
Yes	88(55.35%)	18(47.37%)		
Online friendships				
No	58(36.48%)	05(13.16%)	7.6676	0.0004
Yes	101(63.52%)	33(86.84%)		
Instant messaging				
No	76(47.80%)	07(18.42%)	10.8567	0.0018
Yes	83(52.20%)	31(81.58%)		
Online shopping				
No	39(24.53%)	06(15.79%)	1.3289	0.248
Yes	120(75.47%)	32(84.21%)		
Online movies				
No	40(25.16%)	03(7.89%)	5.3563	0.020
Yes	119(74.84%)	35(92.10%)		
Online news				
No	43(27.04%)	12(31.58%)	0.3134	0.575
Yes	116(72.96%)	26(68.42%)		
Searching information				
No	01(0.63%)	02(5.26%)	4.3922	0.036
Yes	158(99.37%)	36(94.74%)		
Online games				
No	70(40.03%)	11(28.95%)	2.8799	0.089
Yes	89(55.97%)	27(71.05%)		
Online music				
No	30(18.87%)	04(10.53%)	1.4944	0.221
Yes	129(81.13%)	34(89.47%)		
Online blog				
No	106(66.67%)	21(55.26%)	1.7411	0.187
Yes	53(33.33%)	17(44.74%)		
Online TV				
No	51(32.08%)	13(34.21%)	0.0637	0.800
Yes	108(67.92%)	25(65.99%)		
Social networking site				
No	14(8.81%)	01(2.63%)	1.6617	0.197
Yes	145(91.19%)	37(97.37%)		
File sharing				
No	24(15.09%)	04(10.53%)	0.5349	0.468
Yes	135(84.91%)	34(89.47%)		
Pornographic content				
No	95(59.75%)	07(18.42%)	20.9791	<0.0001
Yes	64(40.25%)	31(81.58%)		

Table-3: Internet Addiction and Internet use patterns - Logistic regression

Variables	Logistic Regression Internet addiction Adjusted OR(95% CI)
Gender	
Male	1.00(reference)
Female	3.735(0.755-18.488)
Log in Status	
Intermittent	1.00(reference)
Permenant	0.919(0.311-2.715)
Hours of usage	
<4 hours	1.00(reference)
>4 hours	3.200(1.260-8.126)
Desktop	
No	1.00(reference)
Yes	1.022(0.352-2.971)
Laptop	
No	1.00(reference)
Yes	0.458(0.159-1.314)
Online friendships	
No	1.00(reference)
Yes	2.121(0.579-7.763)
Instant messaging	
No	1.00(reference)
Yes	2.661(0.877-8.069)
Online shopping	
No	1.00(reference)
Yes	1.0270(0.278-3.798)
Online movies	
No	1.00(reference)
Yes	3.582(0.769-16.674)
Online news	
No	1.00(reference)
Yes	0.640(0.224-1.825)
Searching information	
No	1.00(reference)
Yes	0.677(0.045-10.211)
Online games	
No	1.00(reference)
Yes	0.783(0.244-2.509)
Online music	
No	1.00(reference)
Yes	2.321(0.550-9.785)
Online blog	
No	1.00(reference)
Yes	0.954(0.366-2.488)
Online TV	
No	1.00(reference)
Yes	0.804(0.286-2.256)
Social networking site	
No	1.00(reference)
Yes	0.958(0.065-14.167)
File sharing	
No	1.00(reference)
Yes	0.425(0.072-2.500)
Pornographic content	
No	1.00(reference)
Yes	2.384(0.489-11.634)

CI: Confidence interval; OR: Odds Ratio

Table-4: Internet addiction and Quality of sleep

Variable	Normal internet usage, n (%)	Internet Addiction, n (%)	Chi-square statistic	P value	Odds Ratio	95% CI
Quality of sleep						
Normal(Score >=19)	151	29	13.5336	0.0008	5.85	2.0872 to
Poor(Score<19)	08	09				

CI: Confidence Interval

Sites such as Facebook, Instagram, Snapchat and Twitter have become important platforms for chatting and developing online friendships. A study by Hong *et al.* reports that depressive character and Facebook usage significantly predict Facebook addiction which is a subset of IA [28].

Internet use for online friendships was found to be a significant predictor of IA. This is in keeping with the findings of previous studies [25]. Internet use for searching information is found to be protective against IA. A study conducted in Bengaluru by Krishnamurthy and Chetlapalli states that using internet less for coursework predicted IA [25]. This is keeping in with finding of our study.

The studies done by Ko CH *et al.* [29], Young KS *et al.* [30] have found that adolescents' addiction to the Internet has resulted in many negative consequences including academic failure, poor family relationships, impaired social functioning, emotional problems, and psychiatric problems. In a study carried out by Haque M *et al.* [31], among medical university students in Malaysia, it was found that over 50% of the students either frequently or occasionally declared that their academic and job performance was affected because of Internet use.

Heavy internet use was also reported to be associated to mood disorders[32], poor sleep quality[32,33], low self-esteem[34], impulsivity[35], suicide[36,37], lower levels of physical activity[33], and health problems (migraines, back pain, obesity)[38]. Further, in another study, addiction and overuse of Internet was found to lead to sleep deprivation, academic underachievement, failure to exercise and negative affective states (such as depression, angry, bored, guilty), and decreased ability to concentrate at work and education[39].

Besides these, a number of researchers have found Internet addiction to be associated with mental health problems [40, 41]. Students have poor mental health due to this addiction to the Internet [42, 43]. There are other consequences of inappropriate Internet use which could be harmful to their health. For example, misuse of Internet can lead to cybercrime, bullying, and solicitation [44].

Sleep problems are usually considered negative outcomes or complications of internet addiction [45], but reverse causation is also possible

since sleep problems predicted a longer time spent on social networking sites among young university students [46]. In a systematic review of the literature, addictive gaming was found to be associated to poorer sleep quality and problematic internet use was associated with subjective insomnia and poor sleep quality[47]. This is keeping in with finding of our study.

Internet addiction and other problematic internet use behaviors can have important influence on the sleep-wake program, leading to sleeplessness and other sleep disorders. Heavy internet use associated with insomnia, also increased time paid on the internet led to the important disturbance of sleep [48, 49]. One psychophysical mechanism that could help to clarify the negative influence of problematic internet use on sleeping habits can be that nighttime computer use causes a state of high arousal, therefore, interfering with the soothing procedures that are essential for sleep [50].

This was a cross-sectional study which limits the interpretation to factors associated with IA. There is a possibility of recall bias in the present study as the data was collected using self-reported questionnaires and scales.

CONCLUSION AND IMPLICATION

With the rapidly increasing internet use among adolescents and adults, IA is soon likely to emerge as a global health issue. Any college or school going person presenting to primary care physician with behavioral problems and poor academic report card with a history of internet use needs to be screened for IA. Universal diagnostic guidelines for IAD need to be developed. Characteristics of internet usage and factors found to be associated with IA needs to be considered while developing strategies for interventions. Cautious monitoring of hours and purpose of internet usage by parents and college authorities may help in controlled internet use. Policymakers may think of public health policy including "Healthy and Responsible Internet Use" in curriculum and in community awareness programmes.

Identifying and offering help to students with potential IA is important because this addiction often coexists with other psychological problems, and IA could be one visible tip of a complex iceberg.

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