SHORT ARTICLE

Prevalence and Health related effects of Internet Addiction on Medical students in a Tertiary care center

Garima Kaur[1], Sarama saha[2], Anindya Das[3], Manisha Naithani[4]

[1]Non-Acad junior Resident, Department of Emergency Medicine, All India Institute of Medical Science Rishikesh; [2]Associate Professor, Department of Biochemistry, All India Institute of Medical Science Rishikesh,[3]Associate Professor, Department of Psychiatry, All India Institute of Medical Science Rishikesh; [4]Additional Professor, Department of Biochemistry, All India Institute of Medical Science Rishikesh.

Corresponding Author

Dr Manisha Naithani, Additional Professor, Department of Biochemistry, All India Institute of Medical Science Rishikesh
E Mail ID naithanimanisha@gmail.com

Citation

Kaur G, Saha S, Das A, Naithani M. Prevalence and Health related effects of Internet Addiction on Medical students in a Tertiary care center. Indian J Comm Health. 2020;32(1):145-150.

Source of Funding: Nil **Conflict of Interest:** None declared

Article Cycle

Received: 10/10/2019; **Revision:** 18/02/2020; **Accepted:** 27/02/2020; **Published:** 31/03/2020

Abstract

Background: Internet usage has increased exponentially in recent years. This growing use of internet has become worrisome as to whether to consider this excessive use as an addiction and if it negatively impacts one's physical, mental and social health **Aim**: To investigate the prevalence of internet addiction and its association with health related factors in Medical students. **Methods and Materials**: A cross-sectional study was conducted with a sample size of 250. The students were asked to self-administer a semi-structured proforma regarding internet usage, Young's IAT and Duke's Health Profile. Young's IAT was used to measure the addition level. Duke's Health Profile was used to assess the physical, mental and social status. **Result**: 250 students participated in the study, 62% male and 38% female. 86% were found to be average online user and 1.2% had scores of category of Internet addiction. There was a significantly positive association between monthly expenditure and Young Score Grade. Those falling in category of Internet Addiction had low physical, mental and general health score and high Anxiety and Depression Score. **Conclusion**: From this study it can be concluded that internet addiction may have negative impact on physical, mental and social well-being of Medical students.

Keywords

Students; Medical; Depression; Behavior; Addictive; Anxiety Disorders; Internet; Diagnostic and Statistical Manual of Mental Disorders; Social Media; Procrastination

Introduction

Internet is a necessity providing innumerable services and its usage has exponentially increased worldwide. In India there were 5.5 million internet users in 2000 as compared to 560 million users in June 2019 (1,2)

Dr. Ivan Goldberg proposed the term "Internet Addiction" in 1995 for pathological compulsive internet use (3) and considered that any behaviour which meets the "6 core components of addiction, i.e., salience, mood modification, tolerance, withdrawal, conflict, and relapse" can be deemed as an addiction (4). Dr. Kimberly Young inferred excessive use of internet was most akin to pathological gambling, a disorder of impulse control in DSM IV(5).

Internet addiction can manifest as personal, familial, academic, financial, and occupational problems just like substance abuse. Young adults are more vulnerable to develop dependence on the Internet because of their developmental and psychological attributes, restricted parental supervision; availability of time; limitless access to internet; convenience and to complete assignments (6).

In countries like China and South Korea Internet addiction is identified as a significant threat to public health and support education, research and treatment. Many studies focusing this problem have been conducted in South India but not in North India, especially in the region of Uttarakhand.

Aims & Objectives

- To assess prevalence of internet use
- To assess its deleterious effects in form of addiction and other associated problems in Medical and Nursing students
- To bridge the gap in understanding the health related effects of internet addiction.

Material & Methods

Study Type- This is an observational cross-sectional study.

Study Area- This study was conducted at a Tertiary care hospital

Study Duration- The study last for 1 week of duration in the month of February 2017

Inclusion Criteria-

1) Undergraduate MBBS and Nursing students of AIIMS Rishikesh aged between 17-24
2) Those who gave consent to participate in the study

Exclusion Criteria-

1) Interns
2) Students of other undergraduate courses
3) Students who were unwilling to participate in the study

Strategy for collection-

Forms consisting of semi-structured proforma, Young's Internet Addiction Test, Duke's Health Profile and consent form were distributed in the class of students and 15 minutes were given to students to fill the forms.

Working Definition-

Internet addiction is defined as any online-related, compulsive behavior which interferes with normal living and causes severe stress on family, friends, loved ones, and one's work environment.

Tools-

Following tools were used in the study:

1. Semi-structured proforma- the proforma included demographic details (Name, Age, Sex), purpose of using internet (Education, Entertainment, Social Networking, Business Transactions, Online Shopping), Monthly Expenditure, Place of Access (Home, Cyber-cafe, College), Internet Accessed most during (Morning, Afternoon, Evening, Night)
2. The Internet Addiction Test (IAT; Young, 1998)- The severity of self-reported compulsive use of the internet was measured by the Internet Addiction Test which includes 20 item 5-point Likert scale. The responses for 20 items are added to calculate Total Internet addiction score which ranges from 0-100. It is the only available test whose psychometric properties have been tested by Widyanto and McMurran (7).

   Modified Young's criteria has been used for Internet Addiction Test in this study:

   0-49: average users with complete control of their internet use

   50-79: over-users with frequent problems caused by their internet use

   80-100: internet addicts with significant problems caused by their internet use.
3. The Duke Health Profile is a 17 item generic questionnaire with which quantitative adult self reported functional health status can be calculated during a one-week time period. It can easily be filled by the individual respondent or any another person. The administration time is less than five minutes. It is necessary to answer each question. It includes 11 scales. Six scales (i.e., physical health, mental health, social health, general health, perceived health, self-esteem) measure function such that higher the score, better is the functional status. While five scales (i.e., anxiety, depression, anxiety-depression, pain disability) measure dysfunction in which high scores represent greater dysfunction.

Ethical Approval- Ethical approval was taken from Institutional Ethical Committee of All India Institute of Medical Sciences, Rishikesh before the commencement of the study.

Consent- During the course of the study written and informed consent was taken from the participating students.

Statistical Analysis:

The data was analyzed using Statistical Package for the Social Science software, version 20.0 (SPSS 20). The data did not follow the normal distribution, therefore, non-parametric tests were used to analyse and correlate it. Data are expressed as median (Range).

Kruskal Wallis test was used to compare different health scores based on Young's Score Grade (8). Spearman's correlation was carried to investigate the association among all parameters.

P value <0.05 has been considered as significant.

Results

Characteristics of total participants have been presented in (Table 1).

Out of 250 participants enrolled in this study, 155(62%) were male and 95(38%) were female students. The average age of total participants was 20. The average Young's score, Physical, Mental, Social, General Health Score, Self Esteem Score, Anxiety and Depression Score of all participants was 31, 80,70,70,73.33 70, 33.33 and 30 respectively (Table 1)

Comparison of different health scores among groups based on Young's score grades had been mentioned in (Table 2). These findings had been depicted in (Figure 1).

The participants were divided into categories based on Young's Score Grade(YSG):

Average online user (YSG: 0-49) = 86%; this group was labeled as young score group 1(YS1)

Possible addict (YSG: 50-79) = 12.8%; this group was labeled as young score group 2(YS2)

Addict (YSG: 80-100) = 1.2%; this group was labeled as young score group 3 (YS3)

Male participants were found to be more likely to be addicted to internet as compared to female participants ($p < 0.001$).

The Dukes health index was used to assess the variation in health profile of participants and its relation to the degree of addiction. Addicts had significantly low score in Physical (p= 0.006), Social(p=0.027) and General Health Score(p=0.002) while Average users scored high in Physical Health Score, Social Health Score, Mental Health Score. Addicts were found to have significant low sense of Self-Esteem(p=0.005) whereas the average users had high self esteem. Addicts scored high in Anxiety(p=0.013) and Depression Score(p=0.28). These findings have been depicted in (Figure 1).

Addicts had significantly higher average duration of use of internet per day as compare to average users (p value < 0.0001) (Table 2).

Correlation of different parameters with Young's score grades had been presented in (Table 3)

There is significant negative association between Young's score grades and Physical (ρ=-0.194, p=0.002), Mental (ρ=-0.131, p=0.038), Social (ρ=-0.170,p=0.007), General Health Score(ρ=-0.217,p=0.001) and Self-Esteem Score(ρ=-0.196,p=0.002) while positive association with Anxiety(ρ=0.170,p=0.007) and Depression (ρ=0.152,p=0.016)(Table 3).

Moreover, Monthly expenditure (ρ=0.140, p=0.027) and Average duration of internet usage(ρ=0.324,p<0.0001) had highly significant positive correlation with Young Score Grade.(Table 3).

In addition to this, Young Score Grade had strong negative correlation with usage of internet for Education Purpose (ρ=-0.289, p=0.0001). On the other hand, there was a positive association between internet use as entertainment (ρ=0.045) and Social Networking purpose(ρ=0.047) and Young Score Grade which indicates that addicts were more likely to use internet for Entertainment and Social Networking Purposes. (Table 3).

Furthermore, with respect to place of internet access significant negative correlation was found between internet usage at home (ρ=-0.179,p=0.004)and YSG while positive association was observed between college and YSG (ρ=0.109).(Table 3).

Finally, regarding the time of internet usage, YSG has more positive association with use of internet at night (ρ=0.119) as compared to morning (ρ=0.097) and afternoon(ρ=0.042) while negative correlation with evening (ρ=-0.032).(Table 3).

Discussion

Various studies have been conducted to assess the factors associated with internet addiction and its prevalence in adolescents and young adults. However, very few studies have been conducted in Medical students who are the future predictor of the health status of the population of that country. This study is conducted to further extend our understanding regarding the nature of internet use and its effect on physical, mental and social health aspects.

The prevalence of internet addiction in our study was found to be only 1.2%. On the other hand, the global prevalence estimate of 6.0% of internet addiction was documented by Cecilia Cheng and Angel Yee-lam Li (9). This discrepancy could be due to the fact Indian students come from various socioeconomic background. Also the study population belonged to Medical community, therefore requiring long study hours, leaving less time for internet usage. The vast difference in prevalence from our study could also be attributed by the varying criteria taken into consideration to assess the level of internet addiction since Young's Score 70-100 was defined as Internet Addiction in those studies (10) while 80-100 Young's Score Grade was implemented in present study (6).

In our study the male students were found to be more addicted to internet as compared to female students which corroborates the findings of previous study that have been conducted by Dufour M et al. (11) Male preponderance can be explained by increased male indulgence in online activities such as gaming, pornography, and gambling which can lead to pathological internet use.(12)

Present study showed that addicts mostly used internet for entertainment and social networking purposes. This also agrees with previous studies which show that binge watching television series and online gaming are common practices among youth of these days (13).

Young Score Grade had negative correlation with use of internet for Academic Purposes indicates that the internet addicts could be using internet for other purposes such as gaming, entertainment or pornography. Just like other addictions an internet addiction could hinder rational thinking and divert attention to pleasurable tasks and reduce attention to academics (14).

Addicts were found to have low sense of self esteem. Internet via social networking sites and blogging portals allows creation of false personas to seek validation from others. Having low self esteem and low self confidence in their true self, they find it easier to have online friendships and relationships (15). In contrast, average user have normal self-esteem, which enabled them to have friendships in the real world. The peer pressure and need to prove one-self unique, cool and popular increases stress in already stressful lives and drives addicted internet users to find solace in procrastination by distracting themselves through excessive use.

Now-a-days internet can be accessed easily to vent out pent up thoughts and sadness. This could be a reason for high Anxiety and Depression scores found in addicts. On the other hand, witnessing better life of others as displayed on social media exacerbates depression. However, it is difficult to comment from this study that

whether depression and anxiety are cause or effect of internet addiction. A study done by Santos VA had shown an indirect improvement in internet addiction level following effective treatment anxiety disorder (16).

The finding that addicts were less likely to use the internet at home may be explained by the fact that most addicts, in addition to having low self esteem, use internet to fight the loneliness which they don't feel when surrounded by loved ones at home. Other studies also agree. As college shows positive association with YSG, this may imply that while on campus students use internet. excessively may be because of lack of parental supervision.

Having low levels of Physical, Social and Mental scores in addicts could be explained by the fact that the addicts spend more time using internet leading to sedentary lifestyle. Average users secured high General Health Scores and perceived themselves to be healthy probably because of not spending most of their time using internet. Positive association between monthly expenditure and young score grade indicates that addicts had high monthly expenditure as they would spend on expensive internet packages to avail the service. Addicts were found to be more likely to use internet during night. This could be due to insomnia. Whether, insomnia is cause or effect of internet addiction is not clearly delineated (17).

Conclusion

Internet use has now become an important part of life. This study was done to assess the prevalence of internet addiction and to study its health related effects on Medical students. Prevalence of internet addiction was found to be 1.2%. Students with high level of internet addiction were found to use internet more for recreational purposes, during the night and, long usage hours leading to high monthly expenses. Addicts had low physical, mental and general health. They were also found to have higher tendency to have anxiety, depression and low sense of Self-Esteem. Even though the prevalence is low in our study, it can be inferred that excessive use of internet can negatively impact the physical, mental and social health of a Medical student. Therefore, there is a need for evaluation regarding effects of Internet use and to formulate the guidelines for early detection and prevention of development of internet addiction and related complications among Medical students who are the future doctors of the country.

Recommendation

1. Excessive use of internet can negatively impact the physical, mental and social health of a Medical student.
2. Need to formulate the guidelines for early detection and prevention of development of internet addiction and related complications

Limitation of the study

Since this was an observational and cross-sectional study, the cause and effect relationship between internet use and the health status could not be ascertained. For this reason, some prospective cohort study should be conducted on a large sample size

Relevance of the study

This study presents the prevalence of internet addiction at 1.2 % in representative population of Medical and Nursing students as the students studying are from various parts of India and also correlate the physical, mental and social effects of different levels of addiction. Similar studies have not been done in North India, especially in the region of Uttarakhand.

Authors Contribution

GK: contributed in design, definition of literature search, Data acquisition and manuscript preparation. SS: contributed in definition of intellectual content, data analysis, statistical analysis, manuscript editing and manuscript review AD: contributed in concepts, design and definition of intellectual content. MN: contributed in overall design, definition of intellectual content, Data acquisition, manuscript editing and manuscript review.

Acknowledgement

We would like to express our gratitude to all the students who participated in this study.

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Tables

TABLE 1 CHARACTERISTICS OF TOTAL STUDY PARTICIPANTS

Health Scores	Study Population
N(M/F)	250(155/95)
Age	20(2)
Young's Score	31(20)
Physical Health Score	80 (30)
Mental Health Score	70 (30)
Social Health Score	70 (30)
General Health Score	73.33 (23.33)
Perceived Health Score	50 (50)
Self Esteem Score	70 (20)
Anxiety Score	33.33 ()
Depression Score	30 (13.5 - 46.5)
Anxiety Depression Score	28.57 (14.28 – 42.85)
Pain Score	50(25 - 75)
Disability Score	0 (0 - 0)

TABLE 2 COMPARISON OF DIFFERENT HEALTH SCORES AMONG GROUPS BASED ON YOUNG'S SCORE GRADES.

Health Scores	Young score group1	Young score group 2	Young score group 3	p-value
N	215 (86%)	32(12.8%)	3 (1.2%)	
Physical Health Score	80 (70 - 90)	70 (60 - 80)	60 (50 - 70)	0.006
Mental Health Score	70 (60 - 90)	60 (60 – 77.5)	50 (40 - 70)	*0.073*
Social Health Score	70 (60 - 80)	55 (42.5 - 70)	60 (50 - 70)	0.027
General Health Score	73.33 (60 – 83.33)	63.33 (54.17 - 75)	56.67 (46.67 - 70)	0.002
Perceived Health Score	50 (50 - 100)	50 (50 - 100)	50 (0 - 50)	0.110
Self Esteem Score	70 (60 - 80)	60 (50 - 70)	50 (50 - 60)	0.005
Anxiety Score	33.33 (24.99 – 49.99)	33.33 (33.33 – 56.25)	83.33 (33.33 – 99.99)	0.013
Depression Score	30 (10 - 40)	35 (22.5 - 50)	60 (30 - 80)	0.028
Anxiety Depression Score	28.57 (14.28 – 42.86)	35.72 (21.43 – 48.22)	71.43 (21.43 – 85.72)	0.032
Pain Score	0 (0 - 50)	50 (0 - 50)	50 (0 - 50)	0.246
Disability Score	0 (0 - 0)	0 (0 – 37.5)	0 (0 - 0)	0.240
Average duration of internet usage	2 (1 - 3)	4 (3 - 5)	4 (4 - 6)	<0.0001
Kruskal Wallis test. p-value < 0.05 is considered clinically significant				

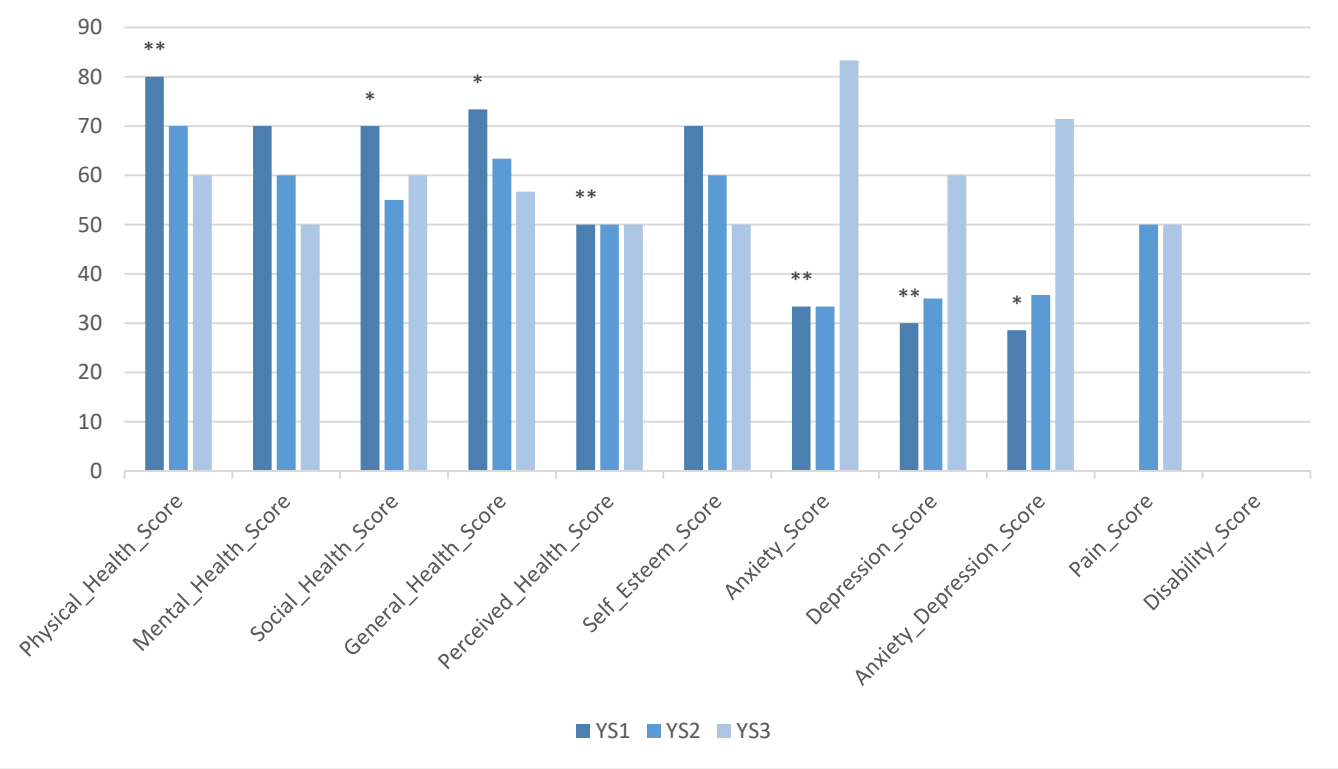
TABLE 3 CORRELATION OF DIFFERENT PARAMETERS WITH YOUNG'S SCORE GRADES.

Parameters	Spearman's correlation coefficient (ρ)	p-value
Physical Health Score	-0.194	0.002
Mental Health Score	-0.131	0.038

Social Health Score		-0.170	0.007
Physical Plus Mental Plus Social Health Score		-0.217	0.001
General Health Score		-0.217	0.001
Perceived Health Score		-0.095	0.136
Self Esteem Score		-0.196	0.002
Anxiety Score		0.170	0.007
Depression Score		0.152	0.016
Anxiety Depression Score		0.155	0.014
Pain Score		0.106	*0.095*
Disability Score		0.076	0.229
Monthly expenditure		0.140	0.027
Average duration of internet usage		0.324	<0.0001
Purpose of internet usage	Education	-0.289	<0.0001
	Entertainment	0.045	0.480
	Social networking	0.047	0.456
	Business	-0.059	0.349
	Transaction	-0.074	0.242
Place of internet access	Home	-0.179	0.004
	College	0.109	0.086
	Cyber Café	0.092	0.147
Internet accessed most during	Morning	0.097	0.127
	Afternoon	0.042	0.508
	Evening	-0.032	0.610
	Night	0.119	0.059
Spearman's correlation. p-value < 0.05 is considered clinically significant.			

Figures

FIGURE 1 COMPARISON OF HEALTH SCORES AMONG GROUPS BASED ON YOUNG'S SCORE GRADES



YS1= Young score group 1, YS2= young score group2, YS3= young score group 3;*P value <0.05 -Significant; **P value <0.001