ORIGINAL ARTICLE

INTERNET ADDICTION IN MEDICAL STUDENTS

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Background: Internet is a technology that was designed to facilitate research and official communication. According to Internet World Stats, there are 3.36 billion internet users in the world. The internet usage has increased by 832.5% in the world since 2005. In Pakistan there are 25 million active users using internet. It is a multi-dimensional behavioural disorder that manifest in various physical, psychological and social disorders and causes a number of functional and structural changes in brain with related various comorbidities. There is paucity of local researches on this topic but the access to internet and its use is enormous. This study was conducted to find the magnitude of internet addiction in medical students. **Methods:** It was a descriptive cross-sectional study carried out in Ayub Medical College, Abbottabad. One hundred & forty-eight students were selected in the survey using stratified random sampling. The data was collected using academic and school competence scale and internet addiction diagnostic criteria. **Results:** In this study, 11 (7.86%) fulfilled the criteria for internet addiction. Most of the students 93 (66.3%) used internet to visit social media applications. Majority of the students 10 (90.9%), showed tolerance as major non-essential symptom of internet addiction. Internet addicts showed significant p=0.01 below average academic performance when compared to non-addicts. Internet addiction showed a significant p=0.03 gender association with internet addiction more prevalent in females than males (12.5% Vs 2.9%). **Conclusion:** This study shows that excessive internet use leads to its addiction and is an entity of concern among medical students.

Keywords: Internet addiction; Behavioural disorders; Medical students; Social media.

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INTRODUCTION

Ten cardiopulmonary associated deaths in internet cafes, a murder on online gaming and significant morbidity among Korean adolescents has compelled the South Korean government to declare a new and emerging disorder to be the gravest issue of public health, that is internet addiction.[1]

The birth of internet with funding of US department of defense as Advanced Research Projects Agency Network (ARPNET) dates back to late 1960s. The invention of World Wide Web by Tim Berners Lee (1990) was a pivotal step in developing stupendous information source that we access today on daily basis.[2]

Internet is a technology that was basically designed to facilitate research and official communication[3] but with the passage of time, the use of internet has grown exponentially with ever changing scope of its use. There is no doubt that internet has revolutionized the word.

According to Internet World Stats, there are 3.36 billion active internet users in the world that forms 46.4% of the world population. The internet usage has increased by 832.5% in the world since 2005.[4] According to Internet Service Providers Association of Pakistan (ISPAK), there are 25 million internet users in Pakistan.[5] This enormous increase in use of internet with long daily online sessions has led to its addiction.[6]

The term of internet addiction was first coined by Dr. Ivan Goldberg in 1995 to describe "pathological and compulsive use of internet".[7] It is a multi-dimensional disorder that is explained as limitless utilization of certain online applications.[8] Defining internet addiction either as a mental disorder or as a behavioural syndrome is a controversial topic[9,10] but recently under Diagnostic and Statistical Manual (DSM-V) it has been characterized as diagnosable behavioural condition.[11,12]

There are various risk factors that expose users to addictive use of internet. It is used as a mood regulator to overcome low self-confidence, deficit identity and relationships.[13] Males are more addicted to internet[14-16]. Studies suggested that men are 7 times more vulnerable to have internet addiction than women.[17] Broken families and lack of parental oversight predisposes children and adolescent to internet addiction.[13] Decrease level of appreciation and encouragement by parents and teachers is another factor that leads to internet addiction by causing users to get refuge in online games, where they get immediate reward of their efforts.[18]

Internet Addiction leads to different physical, psychological and social disorders[19] and causes a number of functional and structural changes in brain with related various comorbidities.[20] Students are worst affected by the excessive use of internet. The overall prevalence of internet addiction is between 0.3% and 38%.[21,22] Studies have shown different prevalence rates of internet addiction among students of different countries and institutes with prevalence ranging between 1.8% and 34 %.[23–28]

Korea and China appear to be the most affected countries. After many crimes and deaths related to internet addiction, South Korean government regarded internet addiction disorder (IAD) as most important health problem.[1,25] To restrict this gigantic problem Government implemented "Internet Shut down" and "Cooling off" in 2011 and 2012 respectively to control midnight online gaming and amount of time killed by online gaming[29] Similarly recent laws in China restrict online gaming use to less than 3 hours[30].

There is paucity of local researches on this topic but the access to internet and its use seems to be enormous. This study was conducted to find the magnitude of internet addiction in medical students, so that appropriate measures can be taken by concerned to treat who are addicted and prevent addiction in those who are at risk.

MATERIAL AND METHODS

It was cross sectional survey carried out in Ayub Medical College, Abbottabad to determine prevalence of internet addiction in MBBS and BDS students of the institution. A sample of 148 size was estimated using the prevalence of internet addiction at 34%[28], precision 8% and 10% anticipated non-responders. These 148 students were selected using stratified random sampling.

Tool for data collection was a Questionnaire which comprised 3 parts. First part included demographic information. Second part included questions of academic and school competence scale[31] based on Likert scale. Each question carried 5 marks. Participants of survey received minimum of 1 and maximum of 5 marks from each question. Mean of marks was taken where 1=very poor, 2=below average, 3=average, 4=above average and 5=very good academic performance. Third part included questions on the symptoms of internet addiction based on Diagnostic criteria developed by Tao R *et al*[32] (pre-occupation, withdrawal symptoms, tolerance, lack of control, continued excessive use despite knowledge of negative effects, loss of interests excluding internet, and use of the internet to escape or relieve a dysphoric mood). The diagnostic accuracy rate of the criterion used is 99.26%, while the diagnostic sensitivity and specificity reached 89.66% and 100%, respectively.

Each participant was briefed in detail about the nature and purpose of the study. Confidentiality was assured and informed consent was taken. Data was analysed using SPSS version 21.

RESULTS

Out of 1270 total enrolled MBBS and BDS students of Ayub Medical College, 148 were selected for the survey. Response rate was 95% as 140 students agreed to participate and responded the questionnaire. In the surveyed students, 68 (48.6%) were males and 72 (51.4%) females. Out of total, 121 (86.4%) students belonged to MBBS while 19 (13.6%) belonged to BDS. Mean age of the students was 21.42±1.6 years. The mean duration of internet use was 4.76±0.8 years. The average daily time spent on the internet was 3.6 hours.

For getting access to internet 64 (45.71%) students use mobile, 11 (7.86%) students use laptop, 3 (2.14%) students use computer, while 59 (42.14%) used more than one devices to access internet.

Results showed that students most commonly 93 (66.3%) visit social media applications followed by 15 (10.71%) students visiting various information and news related websites. While 16 (11.43%) students had no specific priority and visited various applications randomly.

The diagnostic criteria for internet addiction used in this research employed 4 main requirements to be classified as internet addicts 1) Internet usage for duration of at least 3 months with minimum daily use of 6 hours 2) Symptom criteria comprising of 7 symptoms out of which first two (preoccupation and withdrawal) with at least any one of five others must be present 3) Presence of significant clinical impairment due to excessive internet use and 4) Those who fulfil this criterion should not have any psychiatric disorder. Out of 140 students, 11 (7.86%) fulfilled the criteria and were labelled as internet addicts while 129 (92.14%) were non-addicts.

As pre-occupation and withdrawal symptoms were essential for diagnosis of internet addiction, the frequency of non-essential symptoms varied among internet addicts. Tolerance was present in 10 (90.9%), unsuccessful attempts to control internet use in 6 (54.5%), continued excessive internet use despite knowledge of negative effects in 9 (81.5%), loss of interest excluding internet in 8 (72.7%) and internet use as a way to escape or relieve dysphoric mood in 8 (72.7%) internet addicts.

When assessing the academic performance none of the participants fell into category of very poor based on the diagnostic criteria. Of total 11 internet addicts, 3 (25.5%) were below average, 4

(36.4%) average, 4 (36.4%) above average and none were very good. While out of 129 non-addicts, 5 (3.9%) were below average, 61 (47.3%) average, 55 (42.6%) above average, and 8 (6.2%) were very good. Internet addicts showed significant p=0.01 below average academic performance when compared to non-addicts.

A significant association of internet addiction with gender was found. Out of 68 male participants, 2 (2.9%) were internet addicts while among 72 female participants 9 (12.5%) were internet addicts showing a significant gender association with internet addiction p=0.03. (Table-1)

As far as professional groups are concerned, all internet addicts 11(100%) belonged to MBBS group. None of the internet addicts had divorced parents, so no association of internet addiction was found with children of broken family or within socio economic groups.

Table-1: Association of internet addiction with academic performance, gender and socioeconomic status

Variable	Internet Addiction		*p*-value
	Yes	No	
Academic performance			
Below average	3 25.5%	5 3.9%	
Average	4 36.4%	61 47.3%	0.013
Above average	4 36.4%	55 42.6%	
Very good	0 0.0%	8 6.2%	
Gender			
Male	2 2.9%	66 97.1%	0.036
Female	9 12.5%	63 87.5%	

DISCUSSION

According to Internet World Stats[4], there are 3.36 billion internet users in the world that forms 46.4% of the world population. The internet usage has increased exponentially by 832.5% in the world since 2005. leading to introduction of term Internet addiction. It is a multi-dimensional and well-established behavioural disorder which has serious emotional and physical consequences.[19]

The overall prevalence of internet addiction in medical and dental students of Ayub Medical College was 7.9%. This result can be compared to results of Salehi et al of 7.3 % prevalence in medical students of Iran.[23] Another study in Iran by Ghamari *et al.*[33] showed prevalence of 10.8%. But various studies estimated higher prevalence as Liu X in China[26] and Chathoth V *et al*.[27] In India reported prevalence of 16.2% and 18.8% among medical students. Similarly, studies among university students of South Punjab and Lahore showed internet addiction prevalence of 28% [34] and 30%. [32]A few of studies estimated lower prevalence than this study such as 4.7% in high school students of Italy by Taranto *et al*.[35] The reasons for these variations in prevalence rates could be the heterogeneity of the subject population, difference in diagnostic methodology, the influence of confounding factors such as stress and psychological co morbidity and differences in social, cultural and technological factors such as the rate of global Internet access in a specific country, the use of the Internet in academic activities etc. However, one thing is evident from these results is that the higher the level of education, the higher the prevalence of internet addiction.

The most common purpose for internet use among students was to visit social media 66.3%. This finding is consistent with result of Chathoth *et al*.[27] who reported social networking to be most common purpose (97.8%). While Ghamari *et al*[33] reported opposite finding that research and scientific surveys were most important objective (48.4%) of using internet.

The survey showed that internet addiction was more prevalent in females than males (12.5% Vs 2.9%). This result was unexpected as most of previous studies indicated male predominance in internet addiction.[14–16] While Shek and Yu found that internet addiction was unrelated to gender.[19] In fact, Young has reported that males and females use the internet differently [36] and therefore, if the diagnostic tool mainly assesses the applications that are more frequently used by males, apparently there would be more males than females being diagnosed as internet addiction. Besides, there are views suggesting that gender difference in internet addiction may simply be due to the fact that more men than women use the internet worldwide. This may not be the case in Ayub Medical College. The results suggested that males were more commonly involved in physical activities. Generally, in our society, males have no restriction on their socializing activities by their parents. In contrast, girls prefer to engage in indoor activities either due to preference or cultural pressure and hence, use the internet more commonly especially for socializing.

This research revealed negative impact of internet addiction on academic performance of students. It was estimated that among internet addicts, 25.5% of students were below average, 36.4% average, 36.4% above average and none were very good according to academic and school competence scale. Using the same scale, Shek DT and Yu L illustrated similar results. Participants in their study who scored higher on academic performance, were less likely to be classified as

internet addicts.[19] Similarly Liu X *et al* demonstrated that prevalence of internet addiction in medical students of China with bad academic record was 24.1%, with below average record 27.1%, with average record 14%, with above average record 11.5% and with good record prevalence was 5.7%.[26] A study conducted in Korea showed that teenagers with relatively good grades had less tendency to suffer from Internet dependency impairment than those who had relatively bad grades.[37]

The study showed that there was no statistically significant association between socioeconomic status of the family and internet addiction behavior. Similarly, Shek DT and Yu L[19] and Sanders et al[38] also found that the effect of family economic status had no effect on internet misuse.

CONCLUSION

The study revealed that excessive internet use leads to its addiction especially among youth. The study identifies internet addiction as entity of concern among medical students. Most of the internet addicts use mobile phone for accessing internet and most commonly visit social media applications. The study estimates that internet addiction is more prevalent in females and it negatively affects academic performance.

Limitation: The sample size was small and hence, cannot be generalized to all medical students but this study gives an idea how prevalent the issue is among medical and dental students. This study only involved medical and dental students and the situation of internet addiction may be different in students of different academic backgrounds.

Recommendations: Further cross-sectional studies may be conducted to assess the situation if its changing and to find the impact of internet addiction on psychosocial health of the students.

AUTHORS' CONTRIBUTION

MZH: Concept, data analysis, literature review. ZZ, ZJ, ZA: Data collection and interpretation. ZA, WT: Drafting of manuscript and abstract.

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