Original Article

Assessment of Internet Addiction in Different Phases of Undergraduate Medical Student in Eastern Medical College, Cumilla, Bangladesh

Islam MZ[1], Rahman NMW[2], Rayhan N[3], Saibal AA[4], Datta A[5], Sultana T[6], Foysal AA[7], Nahid KA[8], Khandaker M[9], Sultana R[10]

Abstract:

Background: *Explosive growth of the internet worldwide as well as in Bangladesh unlocks the massive opportunity for the medical students & professionals to become lifelong learner by keeping themselves always updated by the huge knowledge & information of medical science. But this potential progression of Internet throughout the world also brings a new but great threat named Internet addiction (IA) among the young students of college and University, including medical students. So, the aim of the present study was to assess the internet use and addiction among the undergraduate medical students of different phases (years) of Eastern Medical College, Cumilla, Bangladesh.* ***Methods:*** *Total two hundred and eighty students of four phases (five years) are included in this cross-sectional study. A questionnaire named 'Internet Addiction Diagnostic Questionnaire' developed by the Center for Internet Addiction, USA, was used in this study. Data were analyzed by Statistical Package for the Social Sciences (SPSS) software.* ***Results:*** *By the total Internet Addiction Test (IAT) score, 70 (25%) students are normal internet user whereas rest of the students have mild (187, 67%) to moderate (23, 8%) internet addiction. The mean IAT scores were 33.30±10.57 and 26.52±13.14 for male and female participants, respectively and both genders were suffering from mild (male 45% & female 55%) to moderate (male 57% & female 43%) Internet addiction. Smartphones were used by majority of the students (82%) to access the internet and their main purpose of using internet were social networking, educational & entertainment.* ***Conclusion:*** *This study unfolds that Internet addiction has become a major problem in medical students of Bangladesh which may create severe disturbance in their personal, familial, academic and professional life. So, development of a proper internet usage guideline and also an appropriate management guideline for Internet addiction will help tremendously the young students as well as medical students to use the internet to build their knowledge simultaneously avoiding the risk of Internet addiction.*

Key words: Internet, Addiction, Undergraduate Medical Students, Smartphones, Bangladesh

Received: March 05, 2018; **Accepted:** June 30, 2018

Introduction:

In the current decade there is an explosive growth of internet usage worldwide[1]. Bangladesh, the newly recognized developing country, also experiencing this explosion[2]. According to the Bangladesh Telecommunication Regulatory Commission (BTRC) internet subscribers in Bangladesh currently has reached 87.8 Million[3]. So, use of internet has now become an indispensable part of human life including information exchange, social interaction, communication, education, research, health seeking, banking, business, shopping, administration, entertainment and many more[4]. This information technology and easy availability of telecommunication devices (like smartphones, tabs, netbooks, etc.) has revolutionized the medical education and practice also[5]. Due to the advanced development of network construction, digital library (e-book, e-journals, subject databases, teaching materials, assessment tools and other educational resources) and wireless internet facility now freely available in colleges and Universities[6]. To become a lifelong learner, medical students can use these opportunities in medical colleges to keep updated with the exponential growth of information and knowledge in the field of medicine[4,6].

[1] Dr. Md. Zakirul Islam, Associate Professor, Department of Pharmacology & Therapeutics, Eastern Medical College, Cumilla, Bangladesh.
[2] Dr. NM Wahidur Rahman, Associate Professor, Department of Microbiology, Eastern Medical College, Cumilla, Bangladesh.
[3] Dr. Nasim Rayhan, Associate Professor, Department of Pathology, Eastern Medical College, Cumilla, Bangladesh.
[4] Dr. Md. Arif Akbar Saibal, Associate Professor, Dept. of Internal Medicine, Eastern Medical College & Hospital, Cumilla, Bangladesh.
[5] Dr. Ankur Datta, Senior Lecturer, Department of Community Medicine, Eastern Medical College, Cumilla, Bangladesh.
[6] Dr. Taslima Sultana, Assistant Professor, Department of Pharmacology & Therapeutics, Eastern Medical College, Cumilla, Bangladesh.
[7] Dr. Abdullah Al Foysal, Assistant Professor, Department of Anatomy, Eastern Medical College, Cumilla, Bangladesh.
[8] Dr. Khondakar Alwan Nahid, Assistant Professor, Department of Biochemistry, Eastern Medical College, Cumilla, Bangladesh.
[9] Dr. Mahmuda Khandaker, Assistant Professor, Department of Microbiology, Eastern Medical College, Cumilla, Bangladesh.
[10] Dr. Rehana Sultana, Associate Professor, Department of Community Medicine, Eastern Medical College, Cumilla, Bangladesh.
Address of Correspondence: Dr. Md. Zakirul Islam, Associate Professor, Department of Pharmacology & Therapeutics, Eastern Medical College, Cumilla, Bangladesh. Mobile: +8801818317715, Email: zakirulislamcom7@gmail.com

But this enormously grown internet now has emerged as two-edged sword, on one side beneficial in searching, acquiring, updating, sharing knowledge & information; on the other side may lead to habituation, addiction and adverse academic, mental, physical and social effects[4,7]. Many studies reported that college and university students including medical students spend a major portion of their time in accessing the internet for both academic and extracurricular purposes[8,9,10]. Therefore, researchers consider this excess internet usage or misuse of some internet function as a new kind of mental illness called 'pathological Internet use (PIU)'[11].

PIU can lead to many unwanted effects such as depression, anxiety, hostility, interpersonal sensitivity, psychoticism, psychosomatic symptoms, lack of physical energy, sleep deprivation, poor dietary habits, impaired function at work, impaired academic performance, physiological dysfunction, weakened immunity, emotional symptoms, behavioral symptoms, and social adaptation & relationship problems[4,12].

The term 'Addiction' has generally been related with substance abuse like nicotine, alcohol, or drugs[13]. However, symptoms of pathological compulsive internet use is now considered as addictive behavior with mental health implications and termed as 'Internet Addiction' (IA)[14]. IA is defined as "a psychological dependence on the internet, regardless of the activity once logged on" and also described as "excessive or poorly controlled preoccupations, urges, or behaviors regarding computer use and internet access that lead to impairment or distress"[15]. IA is now documented as a psychiatric ailment with precise diagnostic and management principles[16].

Thus, present study aims to assess the internet use and addiction among the undergraduate medical students of different phases (years) of Eastern Medical College, Cumilla, Bangladesh and compare the level of Internet addiction among different phases (years) of study and between genders; and also to assess the various purposes of Internet use among the students.

Materials & Methods:

This cross-sectional study was carried out among the undergraduate medical (MBBS) students in the Eastern Medical College (EMC), Cumilla, Bangladesh of Phase 1-4 (Year 1-5) during the academic year of 2017-2018. A total number of 280 students were included in the study by simple random sampling technique. The study was carried out after approval from the Ethical Review Committee of EMC. Only students who gave informed consent and who have been using internet for at least 6 months or more prior to the study were included in the study. Participants in the study were assured that the information given by them would be anonymous and confidential to avoid reporting bias. A brief description was also given to the students regarding the nature and purpose of the study before data collection.

The data were collected using a questionnaire named 'Internet Addiction Diagnostic Questionnaire' developed by the Center for Internet Addiction, USA (http://netaddiction.com/internet-addiction-test/)[17]. The IA Diagnostic Questionnaire is a self-administered semi-structured questionnaire developed by Dr. Kimberly Young consisting of information about demographic data, information about internet usage, and internet addiction test scale which is widely used screening and internet addiction level measuring instrument worldwide for the compulsive internet users[18].

The validity and reliability of Young's internet addiction test (IAT) scale has been tested in many studies[18,19]. Its reliability in South Asian population and college & University students has also been established[20]. IAT contains twenty questions related to internet usage. Each question had five options and the scoring of each option on Likert scale as rarely = 1, occasionally = 2, frequently = 3, often = 4 and always = 5. After all the questions were answered, the numbers for each response were added to obtain a final score. The higher the score, the greater the level of addiction and creation of problems resulting from such internet usage. The range of the total score would be 20 to 100. Based on that, subjects were classified as: <20 = 'normal user', 20-49 = 'mild user' who has control over usage, 50-79 = 'moderate user' who experienced occasional or frequent problems due to over usage and 80-100 = 'severe user' who experienced significant problem due to over usage[21].

The data were compiled and statistical analysis was carried out by using Statistical Package for the Social Sciences (SPSS) version 23 (IBM Corporation, Armonk, NY, USA). Independent sample t-test and One-way analysis of variance (ANOVA) was used to determine the statistical significance of mean differences between & among the groups.

Results:

Among the 280 students 88 (31.5%) from phase-1 (year-1 & year-2), 67 (23.9%) from phase-2 (year-3), 72 (25.7%) from phase-3 (year-4) and 53 (18.9%) from phase-4 (year-5). Sociodemographic characteristics of the participants were presented in the Table-I. The mean±SD of age of the participants was 21.54±1.35 years. Majority of the students were aged from 22 to 25. Among the participants 117

(41.8%) and 163 (58.2%) were male and female, respectively and most of them were unmarried.

Table-I: Sociodemographic characteristics of the participants (n=280)

Variables		Frequency (%)
Age (years) (mean±SD)		21.54±1.35
Gender	Male	117 (41.8%)
	Female	163 (58.2%)
Marital status	Married	4 (1.4%)
	Unmarried	276 (98.6%)
Phase (year) of study	Phase-1 (year-1 & 2)	88 (31.55%)
	Phase-2 (year-3)	67 (23.9%)
	Phase-3 (year-4)	72 (25.7%)
	Phase-4 (year-5)	53 (18.9%)

According to the total IAT score, 70 (25%) students of the total 280 students are normal internet user whereas rest of the students have mild (187, 67%) to moderate (23, 8%) internet addiction [Figure 1]. The mean±SD of total IAT score for the male participants was 33.30±10.57 and for the female participants was 26.52±13.14 and there was a significant difference (p <0.001) between male and female participants [Table II]. Both genders were suffering from mild (male 45% & female 55%) to moderate (male 57% & female 43%) IA and none of them was found having severe IA. Mild IA was found more in female whereas moderate IA was found more in male [Figure 2].

Table-II: Comparison of total scores of internet addiction test between sociodemographic characteristics of the participants (n=280)

Variables		Mean±SD	p value
Gender	Male	33.30±10.57	<0.001* (t=4.613)
	Female	26.52±13.14	
Marital status	Married	28.25±0.95	0.860 (t=0.176)
	Unmarried	29.37±12.66	
Phase (year) of study	Phase-1 (year-1 & 2)	26.19±12.78	0.002* (F=5.182)
	Phase-2 (year-3)	32.07±10.94	
	Phase-3 (year-4)	27.81±12.47	
	Phase-4 (year-5)	33.25±12.79	

Independent sample t test was done between male & female and married & unmarried students. One way ANOVA was done among the phases (years) of study. * the mean difference is significant at the 0.05 level.

Also, the mean±SD of total IAT scores were 28.25±0.95 and 29.37±12.66 for married and single participants, respectively and no significant difference (p >0.05) was found between these two groups [Table II]. Consequently, on average both married and single participants were suffering from mild to moderate IA.

Significant statistical differences (p=0.002) were observed among the total IAT score of the students of four phases [Table II]. Post hoc analysis of comparison of the total scores of IAT between the different phases (years) of study using Bonferroni test showed that there was a statistically significant difference present between phase 1 & phase 2 (p=0.021) and phase 1 & phase 4 (p=0.007) [Table III]. Highest to lowest categorization by total scores of IAT of mild IA were phase 1>phase 3>phase 2>phase 4 and of moderate IA were phase 2>phase 4>phase 1=phase 3 [Figure 1].

Table-III: Post hoc analysis of comparison of total scores of internet addiction test between the phase (year) of study using Bonferroni test (n=280)

Groups	p value
Phase 1 Versus	
Phase 2	0.021*
Phase 3	1.000
Phase 4	0.007*
Phase 2 Versus	
Phase 1	0.021*
Phase 3	0.251
Phase 4	1.000
Phase 3 Versus	
Phase 1	1.000
Phase 2	0.251
Phase 4	0.091
Phase 4 Versus	
Phase 1	0.007*
Phase 2	1.000
Phase 3	0.091

* the mean difference is significant at the 0.05 level

Figure 3 showed the major purposes of internet use among the medical students of different phases (years) of the study which were social networking (30%), educational (25%), entertainment (22%), email communication (17%), net meeting (4%) and others (2%). Majority of the study participants use smartphones (230, 82%) and few of them use laptop & desktop computer (28, 10%) and other devices (22, 8%) for accessing the internet [Figure 4].

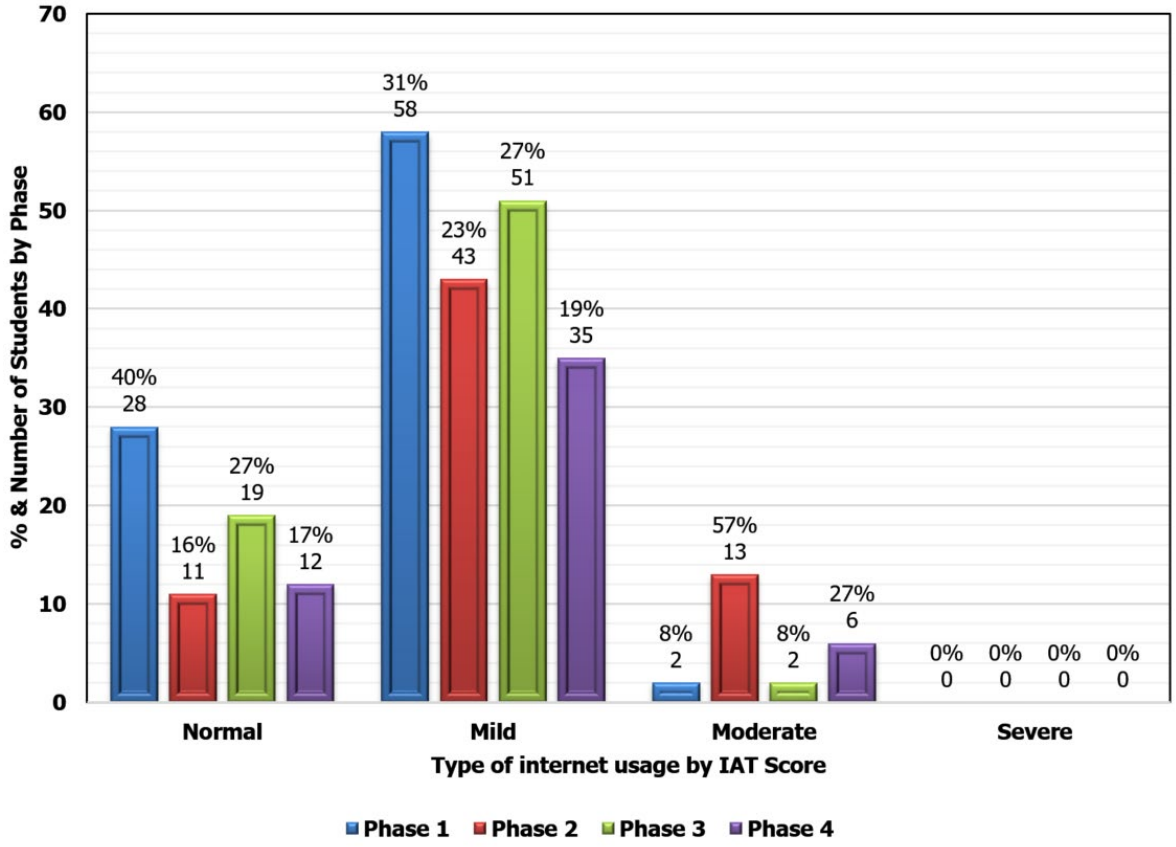

Figure-1: Distribution of severity scale of internet addiction in different phases (n=280)

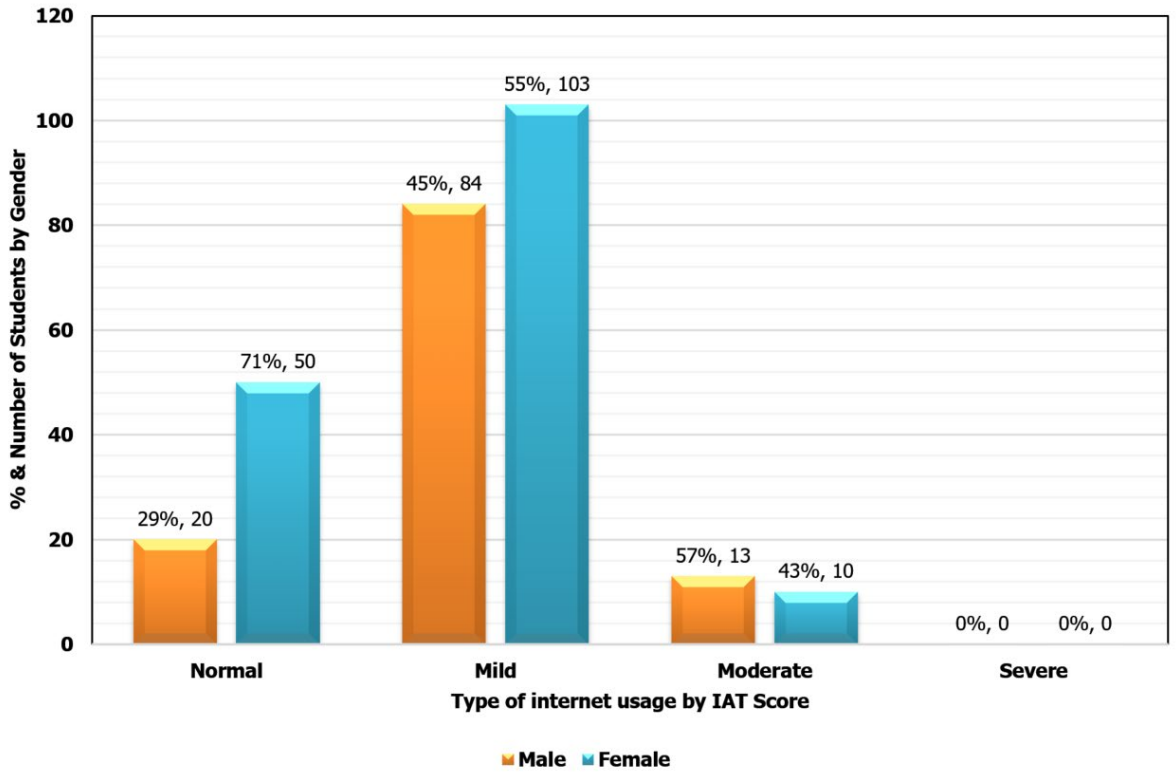

Figure-2: Distribution of severity scale of internet addiction according to gender (n=280)

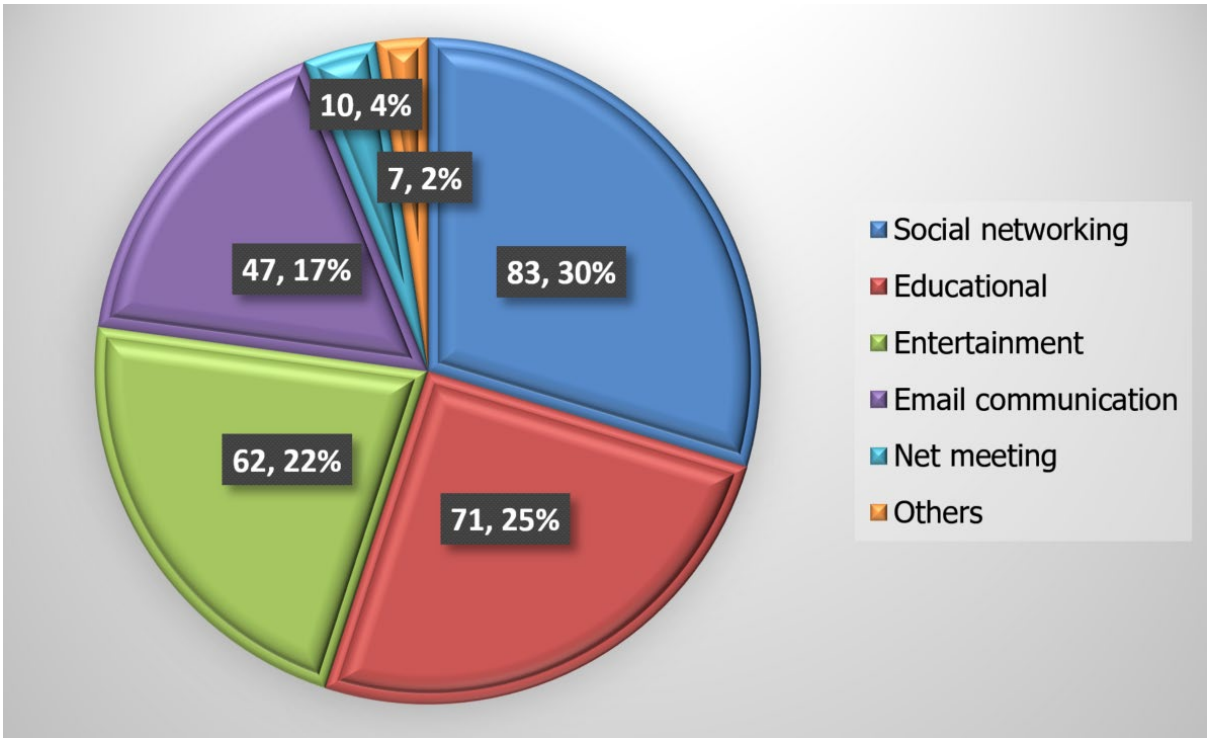

Figure-3: Major purposes of internet use among the participants (n=280)

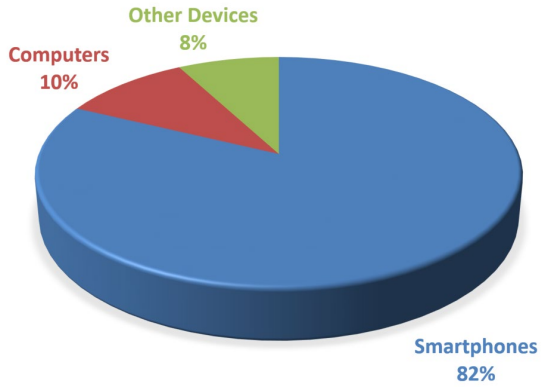

Figure-4: Types & percentages of devices for internet usage by the participants

Discussion:

Maintenance of high-quality of knowledge can be achieved by lifelong learning especially with the aid of internet[22]. But IA especially in the young population including medical students has become a progressively more dominant public health issue and also an important research concerns from different scientific fields including psychology, psychiatry, and neuroscience[23]. Average age (mean±SD = 21.54±1.35, age range 22-25 years) of the students of this study was also similar to other studies conducted in the medical schools[22,23,24,25].

In the present study only 70 (25%) students are normal internet user by the total IAT score. However, majority of the students (210, 75%) spent online more than they intended to and according to the total IAT score they have mild (187, 67%) to moderate (23, 8%) IA. No students with severe IA found in this study and the reason of which probably the tremendous pressure of medical study[22]. Mild IA was found more in Phase 1 & Phase 3 students than in Phase 2 and Phase 4 students. Again moderate IA was found more in Phase 2 & Phase 4 students than in Phase 1 and Phase 3 students [Figure 1]. These findings of the current study have similarity with the findings of various studies done in different countries[26,27,28,29,30].

Male and female students (both unmarried & married) of all phases (years) are suffering from mild to moderate IA, but mild IA was found more in female whereas moderate IA was found more in male [Figure 2]. Similar gender and marital status variation of IA was demonstrated in many studies from other countries[31,32,33,34].

Several studies reported that internet was largely used for non-scientific & non-academic purposes by the medical students like social networking, entertainment, email communication, chatting & others despite of educational, professional & research purposes[35,36]. Reasons of the internet use by the medical students of present study are also similar to the previous studies[36]. Smartphones are the main device to access the internet rather than computer and other devices[32,37,38]. Present study also reveals the same picture regarding device usage for internet access.

IA was expressed as an obsessive compulsive behavior based on its similarities to gambling addiction & compulsive shopping and all these disorders had a common property of having lack of the addictive drugs dependence[4,12,39,40]. Easy availability and excessive undisciplined use of online communication, information and social interaction media were identified by the researchers as the principal causes of IA and the risk of becoming internet addict was more in younger internet user than older ones[41]. Internet addicts spend more time & money in virtual life which detached them from establishing & maintaining a quality social life[12]. IA hamper the academic performance of the medical students which may destroy their professional life later[42]. So, IA became an emerging risk for health & wealth of the young learners including medical student in different countries of the world as well as in Bangladesh because it may create severe disturbance in their personal, familial and professional life.

Conclusion and Recommendation:

The present study unfolds that IA has become a major problem in medical students which have substantial risk of developing grave psychological, emotional, and physical complications. To save the young learners including medical students from IA, early detection and proper management of this great threat is very much necessary. Development and application of a proper internet usage guideline and also an appropriate management guideline for IA will help tremendously the young students as well as medical students to use the internet to build their knowledge simultaneously avoiding the risk of IA.

Acknowledgment:

The Authors are grateful to all the medical students of Eastern Medical College, Cumilla who participated in this study and also for their help during data collection by properly answering the IA Diagnostic Questionnaire. The authors are also obliged to Dr Kimberly S Young, an internationally known expert on IA, from the Center for Internet Addiction, for the IA Diagnostic Questionnaire for this study.

Conflict of interest:

The authors report no conflicts of interest in this study.

References:

1. Jelenchick LA, Becker T, Moreno MA. Assessing the psychometric properties of the Internet Addiction Test (IAT) in US college students. Psychiatry Res. 2012; 196 (2-3): 296-301.

2. Chowdhury NS, Chowdhury NN, Rabbi F, Tabassum R, Ishrat S. Computer literacy and attitudes towards e-learning among Bangladeshi medical students. Update Dent Coll J. 2013; 3 (1): 3-6.

3. Bangladesh Telecommunication Regulatory Commission (BTRC). Internet Subscribers in Bangladesh June, 2018. Available at: http://www.btrc.gov.bd/content/internet-subscribers-bangladesh-june-2018 [Accessed on June 28, 2018]

4. Haque M, Rahman NA, Majumder MA, Haque SZ, Kamal ZM, Islam Z, *et al*. Internet use and addiction among medical students of Universiti Sultan Zainal Abidin, Malaysia. Psychol Res Behav Manag. 2016; 9: 297-307.

5. Sulania A, Sachdeva S, Dwivedi N. Risk of internet addiction among undergraduate medical, nursing, and lab technology students of a health institution from Delhi, India. Digit Med. 2015; 1 (2): 72-8.

6. Sumit SA, Deepti DA, Kalpana KM, Nandkeshav RA, Prakash RB. Pattern of internet use among medical students: a cross sectional study. Asian J Sci Tech. 2015; 6 (4): 1285-8.

7. Prakash S. Internet addiction among junior doctors: a cross-sectional study. Indian J Psychol Med. 2017; 39 (4): 422–5.

8. Jones RB, Navin LM, Barrie J, Hillan E, Kinane D. Computer literacy among medical, nursing, dental and veterinary undergraduates. Med Educ. 1991; 25 (3): 191-5.

9. Chaudhari B, Menon P, Saldanha D, Tewari A, Bhattacharya L. Internet addiction and its determinants among medical students. Ind Psychiatry J. 2015; 24 (2): 158–62.

10. Mattheos N, Nattestad A, Schittek M, Attstrom R. Computer literacy and attitudes among students in 16 European dental schools: current aspects, regional differences, and future trends. Eur J Dent Edu. 2002; 6 (1): 30-5.

11. Durkee T, Carli V, Floderus B, Wasserman C, Sarchiapone M, Apter A, *et al*. Pathological internet use and risk-behaviors among European adolescents. Int J Environ Res Public Health. 2016; 13 (3): pii E294.

12. Moreno MA, Jelenchick L, Cox E, Young H, Christakis DA. Problematic internet use among US youth: a systematic review. Arch Pediatr Adolesc Med. 2011; 165 (9): 797-805.

13. Virtanen JI, Nieminen P. Information and communication technology among undergraduate and dental students in Finland. Eur J Dent Edu. 2002; 6 (4): 147-52.

14. Basu S, Garg S, Singh MM, Kohli C. Addiction-like behavior associated with mobile phone usage among medical students in Delhi. Indian J Psychol Med. 2018; 40 (5): 446–51.

15. Pratarelli ME, Browne BL. Confirmatory factor analysis of internet use and addiction. Cyberpsychol Behav. 2002; 5 (1): 53-64.

16. Kraut R, Kiesler S, Bonka B, Cummings J, Helgeson V, Crawford A. Internet paradox revisited. J Soc Issues. 2002; 58 (1): 49-74.

17. Net Addiction. The Center for Internet Addiction. Internet Addiction Test (IAT). Available at: http://netaddiction.com/ internet-addiction-test/. [Accessed on January 5, 2018]

18. Young KS. Internet addiction: The emergence of a new clinical disorder. Cyberpsychol Behav. 1998; 1 (3): 237–44.

19. Laconi S, Rodgers RF, Chabrol H. The measurement of internet addiction: A critical review of existing scales and their psychometric properties. Comput Human Behav. 2014; 41 (1): 190–220.

20. Nayak RD. Internet addiction a comparative study between undergraduate students of India and Malaysia. Int J Indian Psychol. 2015; 2 (4): 116–20.

21. Young KS. Internet addiction: symptoms, evaluation, and treatment. Innovations in clinical practice. In: Vande Creek L, Jackson T, Eds. Innovations in Clinical Practice: A Source Book, volume 17. Sarasota, FL: Professional Resource Press; 1999. p 19–31. Available at: http: //treatmentcenters.com/ downloads/ internet-addiction.pdf [Accessed on January 8, 2018].

22. Haque ATME, Sugathan S, Ali O, Islam MZ, Haque M. Use of electronic devices by the medical students of UniKL-RCMP, Malaysia, and its influence on academic performances. Natl J Physiol Pharm Pharmacol. 2016; 6 (1): 38–45.

23. Siraj HH, Salam A, Hasan NAB, Jin TH, Roslan RB, Othman MNB. Internet usage and academic performance: a study in a Malaysian public university. Int Med J. 2015; 22 (2): 83–6.

24. Cash H, Rae CD, Steel AH, Winkler A. Internet addiction: a brief summary of research and practice. Curr Psychiatry Rev. 2012; 8 (4): 292–8.

25. Lal P, Malhotra R, Ahuja C, Ingle CG. Internet use among medical students and residents of a medical college of North India. Indian J Community Med. 2006; 31 (4): 293-94.

26. Ajuwon GA. Computer and internet use by first year clinical and nursing students in a Nigerian teaching hospital. BMC Med Inform Decis Mak. 2003; 3 (1): 10.

27. Teong KV, Ang MC. Internet use and addiction among students in Malaysian public Universities in East Malaysia: some empirical evidence. J Manage Res. 2016; 8 (2): 31–47.

28. Chou C, Hsiao MC. Internet addiction, usage, gratifications, and pleasure experience - the Taiwan college students' case. Comput Educ. 2000; 35 (1): 65-80.

29. Jadoon NA, Zahid MF, Mansoorulhaq H, Ullah S, Jadoon BA, Raza A, *et al*. Evaluation of internet access and utilization by medical students in Lahore, Pakistan. BMC Med Inform Decis Mak. 2011; 11 (1): 37.

30. Malviya A, Dixit S, Shukla H, Mishra A, Jain A, Tripathi A. A study to evaluate internet addiction disorder among students of a medical college and associated hospital of central India. Natl J Community Med. 2014; 5 (1): 93-5.

31. Mazaheri MA, Najarkolaei FR. Cell phone and internet addiction among students in Isfahan University of medical sciences. J Health Policy Sustain Health. 2014; 1 (3): 101-5.

32. Marahatta SB, Adhikari B, Aryal N, Regmi R. Internet addiction and associated factors among health sciences students in Nepal. J Community Med Health Educ. 2015; 5 (4): 362.

33. Jahanian R, Seifury Z. The impact of internet addiction on students' mental health in technical and vocational colleges in alborz province. Middle-East J Sci Res. 2013; 14 (11): 1533–8.

34. Fortson BL, Scotti JR, Chen YC, Malone J, Del Ben KS. Internet use, abuse, and dependence among students at a southeastern regional University. J Am Coll Health. 2007; 56 (2): 137–44.

35. Saied SM, Elsabagh HM, El-Afandy AM. Internet and facebook addiction among Egyptian and Malaysian medical students: a comparative study, Tanta University, Egypt. Int J Community Med Public Health. 2016; 3 (5): 1288–97.

36. Tushar B, Swapnali K, Pooja B. Computer and internet use among undergraduate medical students. Int J Contemporary Med Res. 2016; 3 (5): 1317–21.

37. Ayatollahi A, Ayatollahi J, Ayatollahi F, Ayatollahi R, Shahcheraghi SH. Computer and internet use among undergraduate medical students in Iran. Pak J Med Sci. 2014; 30 (5): 1054–8.

38. Anyaoku EN, Obianuju E, Nwafor-Orizu, Oguaka CN. Internet information seeking and use by medical students of Nnamdi Azikiwe University, Nigeria. Int J Lib Inf Sci. 2015; 7 (8): 148-54.

39. Karacic S, Oreskovic S. Internet addiction through the phase of adolescence: A questionnaire study. JMIR Ment Health. 2017; 4 (2): e11.

40. Ghabili K, Alizabeh M. Computer and internet use among Iranian medical students. Med Educ. 2008; 42 (1): 113-5.

41. Tsimtsiou Z, Haidich AB, Spachos D, Kokkali S, Bamidis P, Dardavesis T, *et al.* Internet addiction in Greek medical students: an online survey. Acad Psychiatry. 2015; 39 (3): 300–4.

42. Young KS, Case CJ. Internet abuse in the workplace: new trends in risk management. Cyberpsychol Behav. 2004; 7 (1): 105-11.

Citation of this article:
Islam MZ, Rahman NMW, Rayhan N, Saibal AA, Datta A, Sultana T, Foysal AA, Nahid KA, Khandaker M, Sultana R. Assessment of Internet Addiction in Different Phases of Undergraduate Medical Student in Eastern Medical College, Cumilla, Bangladesh. Eastern Med Coll J. 2018; 3 (2): 7-14.