ORIGINAL ARTICLE

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Internet Use and Addiction: A Cross-sectional Study to ascertain Internet Utilization Level for Academic & Non-Academic Purpose among Medical and University Students of Bangladesh

ABSTRACT

Objective: The Internet is an essential component for providing current and up to date information in education. Despite the significant advantages, abuse of internet results in Internet addiction (IA) disorder. The present study aims to determine the level of IA and internet behavior pattern among medical and university students in Bangladesh.

Methods: This cross-sectional study was carried out among 379 students in Bangladesh from one private medical college and one private university of Chittagong during the study period from 2017 to 2018. Analysis for throughput, "Young's IA test (IAT)'' was used. Data were analyzed using SPSS version 21. Cronbach's alpha coefficient, the independent t-test and one-way analysis of variance (ANOVA) were utilized and P<0.05 as significant.

Results: The mean± SD of "IAT" score was 47.97±13.61. Cronbach's alpha coefficient was 0.83. The majority (54.88%) of the participants was "mild user''. The majority (63.39%) of the medical students was "mild user,'' and the majority (61.60%) of the university students were "moderate user." Statistically, a significant difference was found between "IAT" score and "Duration of internet use" of the medical and university students (p = 0.00). A significant difference was observed between age, sex, and IA. The majority (86.61%) of medical students used the internet for social networking, and the majority (71.2%) of university students used the internet for education purpose. Maximum participants use "Smartphone" and "mobile 3G" and had an email address and a social network account.

Conclusions: Early detection of internet dependence could help to take appropriate steps to tackle the growing problem of IA.

Keywords: Internet Addiction, Bangladesh, University students, Smartphone, Mobile 3G

İnternet Kullanımı ve Bağımlılığı: Bangladeş'te Tıp ve Üniversite Öğrencileri Arasında Akademik ve Akademik Olmayan Amaçlı İnternet Kullanım Düzeyini Belirlemeye Yönelik Kesitsel Bir Çalışma

ÖZET

Amaç: İnternet, eğitimde güncel bilgiye erişim için önemli bir bileşendir. Önemli avantajları olmasına rağmen, İnternet'in kötüye kullanımı İnternet bağımlılığı (İB) ile sonuçlanmaktadır. Bu çalışma, Bangladeş'teki tıp ve üniversite öğrencileri arasındaki İB seviyesini ve bu kişilerin internetteki davranış kalıbını belirlemeyi amaçlamaktadır.

Gereç ve Yöntem: Bu kesitsel çalışma, 2017'den 2018'e kadar olan eğitim dönemi sırasında Bangladeş'te bulunan bir özel tıp fakültesi ile Chittagong'ta bulunan bir özel üniversiteden 379 öğrenci ile yapılmıştır. Girdi-çıktı analizi için Young İnternet Bağımlılığı Testi (İBT) kullanılmıştır. Veriler SPSS versiyon 21 kullanılarak analiz edilmiştir. Cronbach alfa katsayısı, bağımsız t testi ve tek yönlü varyans analizi (ANOVA) kullanılmış, P<0.05 anlamlı olarak kabul edilmiştir.

Bulgular: "İBT" skoru ortalaması±SD 47.97±13.61 olarak bulunmuştur. Cronbach alfa katsayısı 0.83'tür. Katılımcıların çoğu (%54.88) "hafif düzeyde kullanıcı" olarak bulunmuştur. Tıp öğrencilerinin çoğu (%63.39) "hafif düzeyde kullanıcı" ve üniversite öğrencilerinin çoğu (%61.60) "orta düzeyde kullanıcı" olarak belirlenmiştir. İstatistiksel olarak, tıp ve üniversite öğrencilerinin "İBT" skoru ile "İnternet kullanım süresi" arasında anlamlı bir farklılık bulunmuştur (p = 0.00). Yaş, cinsiyet ve İB arasında anlamlı bir farklılık gözlemlenmiştir. Tıp öğrencilerinin çoğu (%86.61) interneti sosyal medya için, üniversite öğrencilerinin çoğu (%71.2) interneti eğitim amaçlı kullandığını belirtmiştir. Tüm katılımcılar "Akıllı telefon" ve "mobil 3G" kullanmaktadır ve e-mail adresi ile sosyal medya hesabına sahiptir.

Sonuç: İnternet bağımlılığının erken tespit edilmesi, büyümekte olan İB sorununun üstesinden gelmek için gereken adımların atılmasına yardımcı olabilir.

Anahtar Kelimeler: İnternet Bağımlılığı, Bangladeş, Üniversite Öğrencileri, Akıllı Telefon, Mobil 3G

INTRODUCTION

Maintenance of high-quality knowledge is encouraged by education. This is done by motivating the students to become lifelong learners. For achieving such a goal, the key elements are the student's adequate skills in information seeking along with regular use of original scientific sources [1]. The Internet can be considered as an essential component of providing quality oriented current and up to date information in education [2]. The existence of the internet has made possible the instant access to information in an exciting way [3]. Millions of people use the internet for communication with each other as well as to get access to different resources [4]. The number of internet user in Asia has grown from 114 million in December 2000 to 1.07 billion in June 2012 which reflect about 27.5% of the population as a target of internet penetration [5]. It serves as a media for the delivery of educational materials and as an essential source of information for the students. The research ground of medical students cannot be fulfilled [6-11]. Students of the twenty-first century have the privilege to enjoy the prime facility of learning and research provided by the internet. Tools for the support and transmission of education for the students include e-book, e-journals, subject databases, academic and professional websites with numerous educational resources [12]. Local networks are linked through the internet and thus collaboration of institutions worldwide might be made possible easily, at the same time exchange of ideas and teaching materials can be done effectively [13]. Despite the significant advantages of being a rich educational information resource, it was reported that students use the internet predominantly for non-academic purposes like social media, email, and surfing [12]. Misuse of the internet in the form of excessive use of internet resulted in a series of problems notable IA disorder which drew the attention of many researchers all over the world [14-18]. In a study, Ghabili and Alizabeh reported that computer and internet were used largely for non-scientific purposes among Iranian medical students [19]. Lal et al. concluded that medical students of North Indian medical college were predominantly using the internet for email surfing, chatting, entertainment and education [20]. About 2/3rd of medical students in Lahore, Pakistan were reported to use the internet for both academic and professional activities [21]. IA was labeled by Walker MB as an obsessive & compulsive behavior based on its similarities to gambling addiction and compulsive shopping. All these disorders had a common property of having lack of chemical dependence [22]. Unfortunately, the emergence of IA has resulted due to excessive undisciplined use of such valuable communication, information and social interaction media [23-25]. Internet use among University students became explosive in nature. Multiple studies revealed that the risk of becoming internet addict was found more among the younger male population (18-24 years) and associated anxiety, depression, and anxiety depression [26-28].

Internet Uses Pattern among Medical and Non-Medical Students in Bangladesh and South Asian Countries: Previous research in eight public (4) and private (4) medical colleges among final year medical students reported that mainstream population had their own personal computer and internet access and utilized principally for non-academic purpose especial of social networking, online correspondence, reading the newspaper, etc. [29]. Another similar study conducted in private medical school in Bangladesh among medical students aged 20-22 years reported that the study participants use the internet every alternate but predominantly for online communication and social networking. The study participants opined that such uses of computer and internet squeezed their study and had negative in their academic performance although the web possesses great potential information to be a good prescriber [1]. One more study? in the study conducted among the students of Business Studies, Science and Arts of the University of Dhaka revealed that 90-100% students were a regular user of the Internet. Majority of them access the internet once a day to several times daily and for at least for one hour to over four hours. The reasons were described as academic, online communication, entertainment and online earning sources [30]. Another Bangladeshi study conducted in 11 medical schools among 591 medical students revealed that most of them were regular internet users for 4-6 hours daily through laptop and cell phone. The reasons were described were social networking like Facebook and academic purpose [31]. One Indian study revealed that undergraduates' medical students use internet chiefly for entertain but postgraduate and trainee doctors mainly for general information and research purpose [32]. Another Indian study also similarly reported that among medical students and postgraduates with increasing internet uses changes towards a more professional goal [20].

They are vulnerable group probably exists in Chittagong, Bangladesh. Subsequently raises a significant concern as these students spent huge time on the internet and lose their valuable time of study and health. Thus, the present study aims at determining the level of IA and assessing the internet behavior pattern for academic and non-academic purpose among the medical and university students in Bangladesh.

MATERIAL AND METHODS

This was a cross-sectional study, carried out in the Chattagram Maa-O-Shishu Hospital Medical College (CMOSHMC), and Premier University, Chittagong, Bangladesh during the study period of 2017-2018. The study group consisted of a convenient sample of 379 students in Bangladesh from one private

medical college and one private university of Chittagong, who were using the internet for last 6 months or more. Those students of CMOSHMC and mentioned private University voluntarily want to participate in this study were included. Obviously, participation was voluntary and anonymous. Generally, in Bangladesh, the medical and different subjects of University education start at the age of 18/19 years and finishes by 24/25 years. As medical education and non-medical university subjects need 5 years. Nevertheless, due to some unavoidable circumstance both of students and schools issues a few students get little older. Thereafter, this study divided the study participants into three groups: early years of study (18-21), the last part of the study (22-25) and unusual extra time (26-30) group.

A questionnaire, Internet Addiction Diagnostic Questionnaire [33-35], developed by the Center for Internet Addiction, USA (http://netaddiction.com/internet-addiction-test/) [35] was used to collect the data. Formal permission was obtained from the Center for Internet Addiction (Dr. Kimberly Young) to use this questionnaire for the present study. The Internet Addiction Diagnostic Questionnaire is a widely utilized screening instrument examining compulsive Internet use [36]. The questionnaire was distributed to the students during their regular classes and was given 30 minutes to complete it and to return it to the researcher. Information regarding age, gender, marital status, type of device for internet usage, type of internet connection, duration and purpose of internet use, email address and social networking were collected. For the screening of "Internet addiction," the most reliable instrument "Young's internet addiction test (IAT)'' was used. Its psychometric properties have been tested by Widyanto and McMorran [37-39]. "IAT" was composed of 20 questions. Each question had five options. The scoring of each option was as: "Rarely = 1", "Occasionally = 2", "Frequently = 3", "Often = 4" and "Always = 5". 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". "Mild user" was classified as "problematic internet user" and "moderate user" and "severe user" were classified as "internet addicts" [40-44].

Data were analyzed using SPSS 21 IBM, Armonk, NY, United States of America. Cronbach's alpha coefficient was measured to evaluate the reliability of the questionnaire. A reliability value of 0.70 and higher was satisfactory [45]. The independent t-test and was used to determine statistically significant differences between two separate groups. One-way analysis of variance (ANOVA) was used to analyze the difference between the mean scores of ages. $p<0.05$ was considered statistically significant.

RESULTS

Among 379 participants, 254 were from medical college and 125 from the university students. Table 1 showed the demographic characteristics of the participants. The mean age of the participants was 21.78±1.48 years. Maximum students were aged from 22 to 25 years. Most of the participants were female and unmarried. Cronbach's alpha coefficient was 0.83 which was in an acceptable range, thus indicated the reliability of the questionnaire).

Table 1. Demographic characteristics of the participants of "Internet addiction test."

Variable	Institute				Total	
	Medical		University			
	Number	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)
Age						
18-21	**129**	**50.8%**	35	28.0%	164	43.3
22-25	125	49.2%	**85**	**68.0%**	**210**	**55.4**
26-30	0	0.0%	5	4.0%	5	1.3
Gender						
Male	66	26.0%	**111**	**88.8%**	177	46.7
Female	**188**	**74.0%**	14	11.2%	**202**	**53.3**
Marital Status						
Married	3	1.2%	2	1.6%	5	1.3
Unmarried	**251**	**98.8%**	**123**	**98.4%**	**374**	**98.7**

Notes: n = 379. Bolded values are majority.

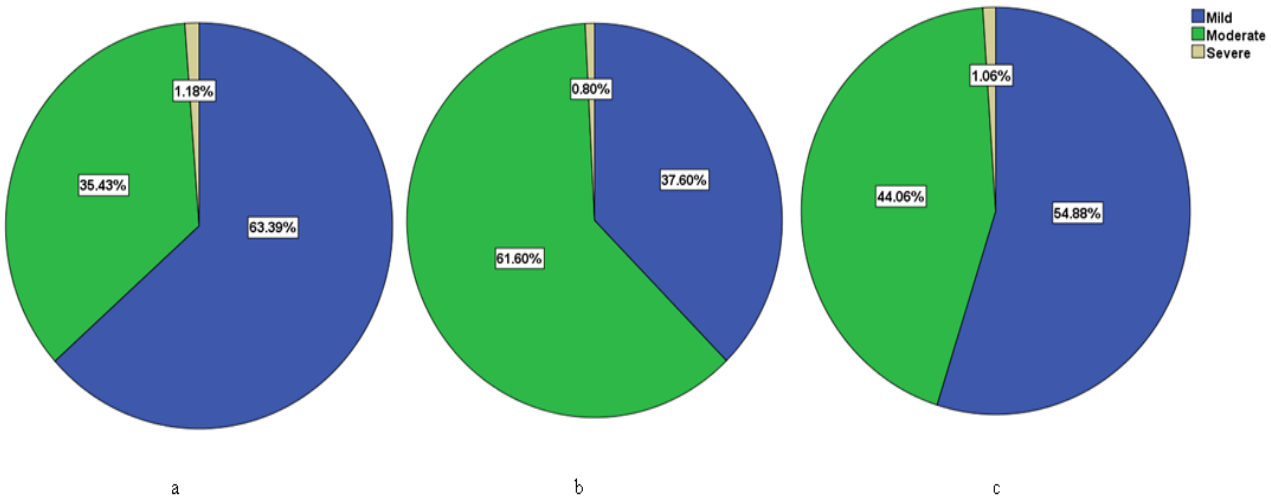

Figure 1. Pie diagram showing percentage frequencies of "Internet addiction" status of the participants a. Medical students (n=254) b. University students (n=125) c. Overall (n=379).

The mean ± SD of "IAT" score of the present study was 47.97±13.61 (Table 2). Figure 1c showed that majority of the participants was "mild user'' (54.88%) who was "problematic internet user." The prevalence of "severe user" was 1.06%. As shown in Table 2, the mean ± SD of "IAT" score of the medical and university students were 45.56±14.21 and 52.86±10.81 respectively which was statistically significant (p<0.0001). Figure 1a showed that majority (63.39%) of the medical students was "mild user''. Figure 1b showed that majority (61.60%) of the university students were "moderate user" who were classified as "internet addicts." The mean ± SD of "Duration of internet use" of the medical and university students were 176.85±122.59 and 267.84±159.12 respectively which was statistically significant (p<0.0001) (Table 2).

Table 2. Comparison of "IAT" score and "duration of internet use" between medical and university students

Variables	n	Range	Mean ± SD	Statistical Significance	
				t value	*P* value
IAT Score [1]					
Medical	254	20.00 - 91.00	45.56 ± 14.21	5.06	0.00
University	125	28.00 - 90.00	52.86 ± 10.81		
Overall	379	20.00 - 91.00	47.97 ± 13.61		
Duration of Internet Use (Minute) [1]					
Medical	254	15.00 – 600.00	176.85 ± 122.59	6.14	0.00
University	125	60.00 – 600.00	267.84 ± 159.12		
Overall	379	15.00 – 600.00	206.86 ± 142.13		

Notes: 1 Independent t-Test.

Table 3 showed that there was a significant difference between age, sex and "Internet addiction." No significant difference was observed between marital status and "Internet addiction." Table 4 showed the frequency of internet behavior of the participants. The purposes of internet use among medical students were social networking (86.61%), education (66.53%) and entertainment (61.81%). The university students used the internet for education (71.2%), social networking (60.8%) and entertainment (55.2%).

Table 3. Comparison between demographic characteristics and "IAT" score

Variables		n	Mean ± SD	Statistical Significance	
				t value	P/F value
Age [1]					
Medical	18 - 21	129	44.74 ± 13.06	0.86	0.35
	22 - 25	125	46.40 ± 15.32		
	26 - 30	0	-		
University	18 - 21	35	51.37 ± 11.64	0.48	0.61
	22 - 25	85	53.35 ± 10.55		
	26 - 30	5	54.80 ± 10.08		
Overall	18 - 21	164	46.16 ± 13.02	2.99	0.05 (S)
	22 - 25	210	49.21 ± 13.99		
	26 - 30	5	54.80 ± 10.08		
Gender [2]					
Medical	Male	66	51.59 ± 14.94	4.13	0.00 (S)
	Female	188	43.44 ± 13.35		
University	Male	111	52.83 ± 11.27	0.08	0.94
	Female	14	53.07 ± 6.31		
Overall	Male	177	52.37 ± 12.73	6.18	0.00 (S)
	Female	202	44.11 ± 13.21		

Notes: n = 379, S = Significant. 1 The one-way analysis of variance (ANOVA), 2 Independent t-Test.

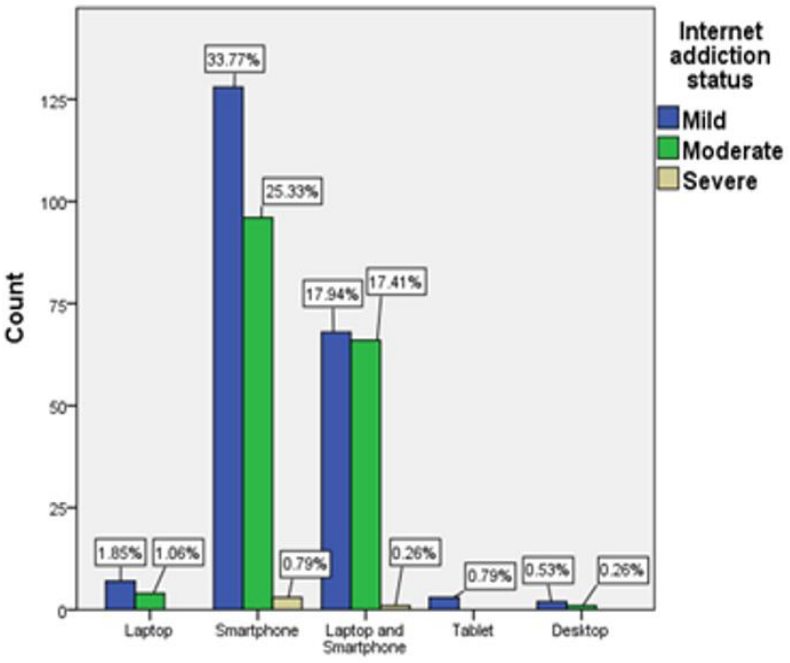

Figure 2. Bar diagram showing frequencies of "Type of device for internet usage" of the participants (n=379)

Table 4: Frequency of internet usage behavior of the participants

Purpose for Internet Use [1]	**Medical (n = 254)**	**University (n = 125)**	**Overall (n = 379)**
		Number (%)	
Social networking	**220 (86.61%)**	**76 (60.8%)**	**296 (78.10%)**
Education	**169 (66.53%)**	**89 (71.2%)**	**258 (68.07%)**
Entertainment (online game, YouTube)	**157 (61.81%)**	**69 (55.2%)**	**226 (59.63%)**
E-mail communication	54 (21.25%)	34 (27.2%)	88 (23.21%)
Research	23 (9.05%)	33 (26.4%)	56 (14.78%)
Net meeting	14 (5.51%)	7 (5.6%)	21 (5.54%)
Others (Online shopping, ride hiring)	4 (1.57%)	4 (3.2%)	8 (2.11%)

Notes: n = 379. Bolded values are the majority. 1 Independent t-Test.

Figure 2 showed that 59.89% of the participants use "Smartphone" and 35.61% use both "Laptop and Smartphone." Figure 3 showed that 63.06% of the participants use "mobile 3G" and 29.29% use "WiFi" for internet connection. Figure 4 and 5 showed that 96.04% and 98.95% of the participants had an email address and social network account respectively.

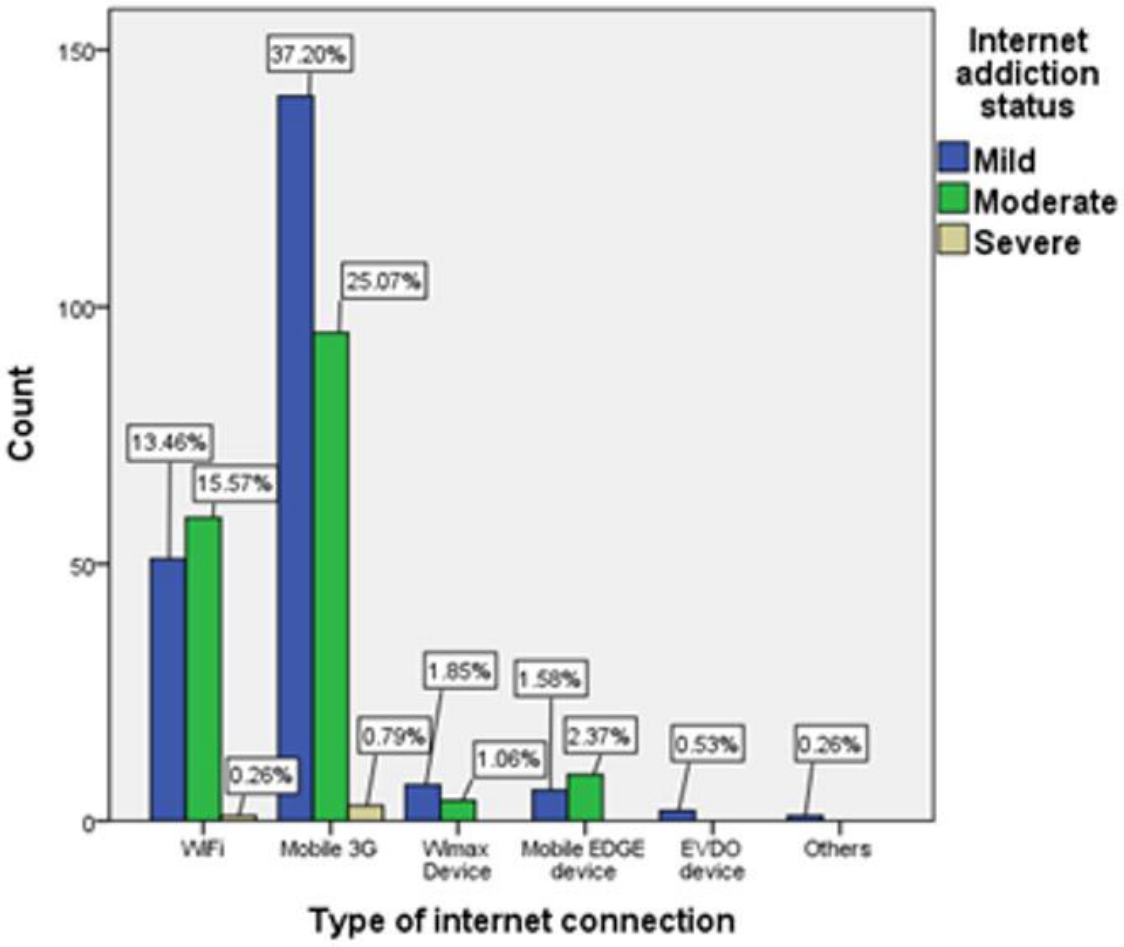

Figure 3. Bar diagram showing frequencies of "Type of internet connection" of the participants (n=379)

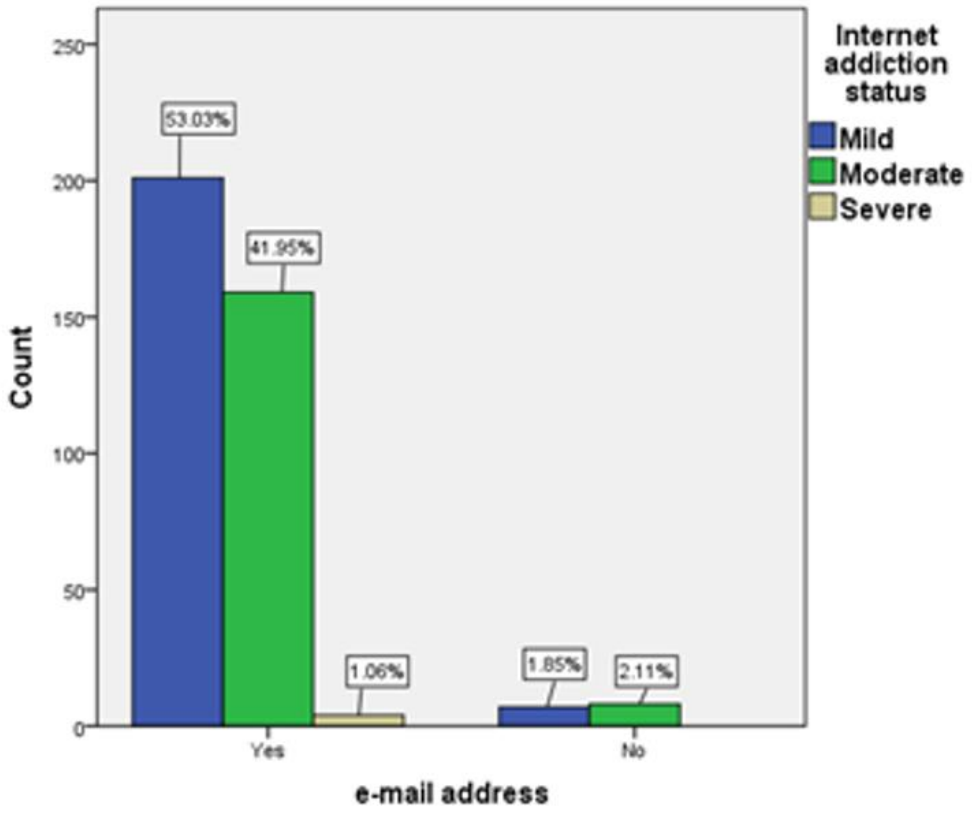

Figure 4. Bar diagram showing frequencies of the participants having an e-mail address (n=379)

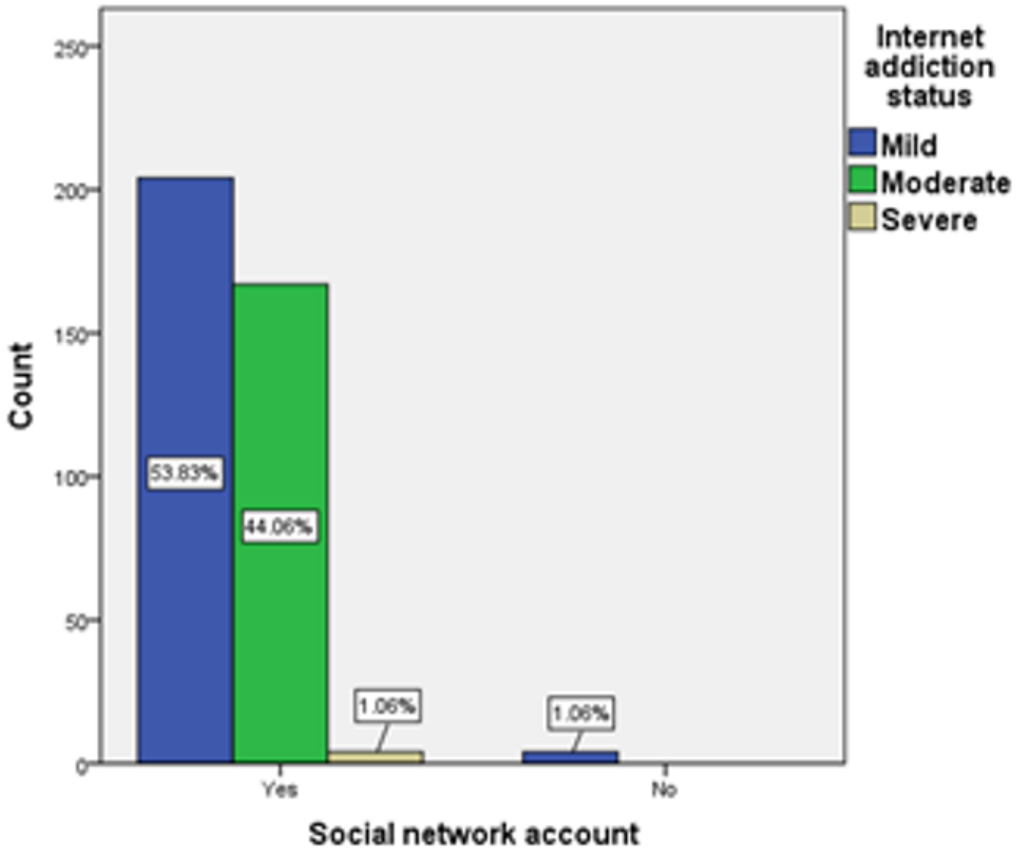

Figure 5. Bar diagram showing frequencies of the participants having a social network account (n=379)

DISCUSSION

The present study was designed to determine the prevalence of IA among the medical and university studentsin Bangladesh. Among 379 participants, 254 were from medical college and 125 from the university. Maximum students were aged from 22 to 25 years (55.4%) and were female (53.3%) (Table 1). In a study, Mazaheri and Najarkolaei reported that the Cronbach's alpha coefficient of the Persian version of "Young's internet addiction test (IAT)'' was 0.89 [43]. Cronbach's alpha coefficient of the present study was 0.83 which is in an acceptable range and thus indicates the reliability of "Young's internet addiction test (IAT)''.

It is found that in the present study, 44.06% are "moderate user" and 1.06% is "severe user." Thus, it indicates that 45.12% are "internet addicts" which is much higher than in previous studies (39.6% in Iran, 20% in India, 5.5% in Greek, and 28.1% in India) [40, 41, 44, 46]. On the other hand, it was lower than Malaysian study (81%) [47]. It is also observed that maximum participants (59.89%) use the internet in "Smartphone" device and 63.06% of the participants use "mobile 3G" for internet connection [Figure 2 and 3]. Thus, it depicts that the use of "Smartphone" and "mobile 3G" are associated with the development of "Internet addicts." This is a warning sign regarding the health and wealth issue of young generation in Bangladesh. IA leads to disturbance in personal and family life. Those who are suffering from IA spend more time and money in virtual life which will diminish their quality in establishing and maintaining a social life. It will also hamper the academic performance of the students which may create an occupational problem in later life [48, 49].

This study also indicated that the prevalence of IA was more among male students in comparison to female students and this should not be stated here, please delete it. This must be in the results section not in discussion. Because it contains statistical value. (Table 3). Ataee et al. also reported that the prevalence of IA was more among undergraduate male medical students of Iran [40]. Although Setty et al. and Tsimtsiou et al. reported that gender was not associated with IA [44, 46]. No significant difference was observed between marital status and internet addiction in this study. A similar finding was also reported by Tsimtsiou et al. [46]. Although Ataee et al. reported that the prevalence of IA was more among male and single students of Iran [40]. Recent Chinese study also reported that boys, the relationship between parents, and school environment were statistically significantly associated with IA [50]. Several research studies reported that young males, singles, familial relationship, and low self-esteem associated with depression, hostility and emotional instability were significantly related with IA [40, 48, 50, 51] and such association often designated as risk factors for this new misery of human life. Thereafter, recommended more research has been advocated to explore the root cause, and educational intervention is necessary for remedial and safeguard young population [40].

In a study, Tsimtsiou et al. reported that the use of social networking like Facebook or Twitter and online games for entertainment purpose increases the IA significantly among Greek medical students [46]. Berner et al. similarly reported that the use of Facebook is closely associated with IA among Chilean medical students [52]. Chathoth et al. also reported that social networking, entertainment, e-mail communication, and education were the common purpose of internet use among undergraduate medical students in Mangalore [42]. In the present study, it is observed that 78.10% of participants use internet for social networking and 59.63% use internet for entertainment like playing games, watching movies or songs in YouTube (Table 4). 68.07% of participants of the present study use the internet for education purpose (Table 4). Tsimtsiou et al. reported that the use of e-mail for communication purpose might be protective as it leads to less chance of development of IA [46]. In this study, although 96.04% of participants had an e-mail address, only 23.21% of participants use e-mail for communication purpose (Figure 4 and Table 4).

This sentence also should be stated in results section not here. In discussion you just interpret your results. You should interpret what does this mean. A statistically significant difference was also found regarding "Duration of internet use" of the medical and university students (Table 2). It is observed that university students spend more time on the internet. It is also found that majority (61.60%) of the university students were "moderate user," whereas the majority (63.39%) of the medical students were "mild user'' (Figure 1a and 1b). The purposes of internet use among university students were education (71.2%), social networking (60.8%) and entertainment (55.2%), and among medical students were social networking (86.61%), education (66.53%) and entertainment (61.81%). The prevalence of IA was more among male medical students than female. It is not necessary. but the non-significant difference was found among university students (Table 3).

The current study participants were principally mild to moderate internet users were quite similar with multiple Indian studies [53, 54]. These study participants mainly use the internet for entertainment, internet gaming, social networking, online communication, and academic reasons which were also like earlier overseas studies [55-58].

Finally, "the increased digital age has propelled us into the Internet age, and Internet addiction has become a true" public health issue [59]. Consequently, multiple studies discuss the issue of treatment IA [59-62]. In the Republic of Korea and the People's Republic of China have identified IA as their primary issue offending as substantial public health

delinquent. These countries adopted continued research, educational, and treatment strategies to combat such addiction [61]. In the USA both out and in-patient service has been developed to fight against this addiction [63, 64]. Another study revealed that treatment intervention with reality therapy successfully recovered several such internet addict patients. Reality therapy has been identified as the principal addiction salvage instrument. It helps people to inspire to select to regain their lives by obligating to modification of their own behavior. It comprises sittings to show patients that addiction is a choice and to give them drill in time management; it also familiarizes other arrangements to the problematic behavior [65, 66].

Furthermore, the current population of Bangladesh is 166,938,146 [67] with the median age in Bangladesh is 26.0 years. Another study revealed that in Bangladesh around 30% of the total population is a young adult (10-24 years) [68]. Moreover, Bangladesh Telecommunication Regulatory Commission reported that the total number of Internet Subscribers had reached 80.829 million [69]. One Indian study revealed that 0.7% population were considered as Internet addicts [27]. If it is supposed that the same figure was applicable to Bangladesh, then the number of addicts could reach around 0.56 million people could be internet addicts in Bangladesh. Thereafter it is definite that Bangladesh needs more research to explore the actual number and need to build intervention program remedial and rehabilitation from these modern internet gadgets.

Limitation of the Study: This was a cross-sectional study with its' inherent restriction. Therefore, a conclusion of the causal-effect relationship between variables cannot be made, while the generalization of results to study population is not possible because of the small sample size and convenient sampling. The study participants were from the same city. Hence, it is recommended that further study using a cohort study and/or random sampling should be carried out to get more conclusive results.

CONCLUSION

The present study revealed that the prevalence of IA among study participants was at a moderate level among medical and university students of Bangladesh. The reasons for internet use were social networking, online communication, entertainment, and academic purpose. Early detection of internet dependence and treatment intervention program could help to save medical and university students from a growing severe threat – IA disorder. Appropriate educational intervention should be installed to tackle the growing problem of IA as like other countries. Additionally, necessary counseling and awareness program should be promoted to all schools to prevent such addiction and to prevent loss of academic time and health. In this regard, more longitudinal prospective research is necessary to identify the depth of the problem. Thereafter, a proper guideline should be developed for medical and non-medical students about using the internet will help them to build the knowledge tremendously. Thus a better professional career could be achieved.

DECLARATION

Contributorship: All authors contributed equally.

Funding: This study obtained no financial support.

Competing interests: The authors report no conflicts of interest in this work.

Ethics statement: The study was approved by the Institutional Review Board for ethical approval of Chattagram Maa-O-Shishu Hospital Medical College (CMOSHMC), Agrabad, Chittagong 4100, Bangladesh. A brief description was given to the students regarding the nature and purpose of the study. Anonymity was ensured and confirmed to those study respondents. Students were encouraged to participate in this study voluntarily.

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REFERENCES

1- Chowdhury NS, Chowdhury NN, Rabbi F, Tabassum R, Ishrat S. Computer literacy and attitudes towards e-learning among Bangladeshi Medical Students. Updat Dent Coll J 2013; 3(1): 3-6.
2- Noor-Ul-Amin S. An Effective use of ICT for Education and Learning by Drawing on Worldwide Knowledge, Research, and Experience: ICT as a Change Agent for Education. A Literature Review. Scholarly J Educ 2013; 2 (4): 38-45.
3- Kastin S, Wexler J. Bioinformatics: searching the net. Semin Nucl Med 1998; 28(2): 177-87.
4- Sharma R, Verma U, Sawhney V, Arora S, Kapoor V. Trend of Internet use among medical students. JK Sci 2006; 8(2): 101-02.
5- Internet users in the world: distribution by world regions – 2012, q2. Internet World Stats: Usage and population statistics. Available at http://www.internetworldstats.com/stats.html [Accessed August 18, 2018]
6- Jones RB, Navin LM, Barrie J, Hillan E, Kinane D. Computer literacy among medical, nursing, dental and veterinary undergraduates. Med Educ 1991; 25 (3): 191-195.
7- Mansor I. Computer skills among medical students: a survey at the King Abdul Aziz University, Jeddah. J Ayub Med Coll 2002; 14(3): 13-15.

8- 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): 30-35.
9- Virtanen JI, Nieminen P. Information and communication technology among undergraduate and dental students in Finland. Eur J Dent Edu 2002; 6(4): 147-152.
10- Odusanya OO, Bamgbala OA. Computing and information technology skills of final year medical and dental students at the College of Medicine, University of Lagos, Nigeria. Niger Post Grad Med J 2002; 9(4): 189-93.
11- Atack L, Rankin J. A descriptive study of registered nurses experiences with web-based learning. J Adv Nurs. 2002; 40(4): 315-19.
12- Anyaoku EN, Obianuju E, Nwafor-Orizu, Oguaka CN. Internet information seeking and use by medical students of Nnamdi Azikiwe University, Nigeria. Int J of Library and Inform Sci 2015; 7(8): 148-54.
13- World Federation for Medical Education. Guidelines for using computers in medical education. Med Educ 1998; 32(2): 205-208.
14- Kraut R, Kiesler S, Bonka B, Cummings J, Helgeson V, Crawford A. Internet paradox revisited. Journal of Social Issue 2002; 58 (1): 49-74.
15- Cui L, Zhao X, Wu M, Xu A. A research on the effects of Internet addiction on adolescents' social development. Psychol Sci 2006; 29 (1): 34-36.
16- Pratarelli ME, Browne BL, Johnson K. The bits and bytes of computer/Internet addiction: a factor analytic approach. Behav Res Methods Instrum Comput 1999; 31(2): 305-14.
17- Pratarelli ME, Browne BL. Confirmatory factor analysis of Internet use and addiction. Cyberpsychol Behav 2002; 5(1): 53-64.
18- Kandell JJ. Internet addiction on campus: the vulnerability of college students. CyberPsychology & Behav 1998; 1(1): 11-17.
19- Ghabili K, Alizabeh M. Computer and Internet use among Iranian medical students. Med Educ 2008; 42 (1): 113-15.
20- Lal P, Malhotra R, Ahuja C, Ingle CG. Internet use among medical students and residents of a medical college of North India. Indian J Common Med 2006; 31(4): 293-94.
21- Jadoon NA, Zahid MF, Mansoorulhaq H, Ullah S, Jadoon BA, Raza A, Hussain M, Yaqoob R, Shahzad MA. Evaluation of internet access and utilization by medical students in Lahore, Pakistan. BMC Med Inform Decis Making 2011; 11: 37.
22- Shaffer HJ. Strange bedfellows: a critical view of pathological gambling and addiction. Addiction 1999; 94 (10): 1445-48.
23- Griffiths M, Wood RT. Risk factors in adolescence: The case of gambling, video game playing, and the internet. J Gambl Stud 2000; 16 (2-3): 199-25.
24- Young KS, Case CJ. Internet abuse in the workplace: New trends in risk management. Cyberpsychol Behav. 2004; 7 (1): 105-111.
25- Liu T, Potenza MN. Problematic internet use: Clinical implications. CNS Spectr 2007; 12 (6): 453-66.
26- Soule LC, Shell LW, Kleen BA. Exploring internet addiction: demographic characteristics and stereotypes of heavy internet users. J Comp Inform Sys 2002; 44 (1): 64-73.
27- Goel D, Subramanyam A, Kamath R. A study on the prevalence of internet addiction and its association with psychopathology in Indian adolescents. Indian J Psychiatry 2013; 55 (2): 140-143.
28- Sharma A, Sharma R. Internet addiction and psychological well-being among college students: A cross-sectional study from Central India. J Family Med Prim Care. 2018; 7 (1): 147-151.
29- Shaheen MM, Nahar S, Talukder MHK, Tasnim S. Computer and internet use by the undergraduate medical students of Bangladesh. South-East Asian J Med Educ. 2016; 10 (2): 46-54.
30- Hossain MA, Rahman MH. Comparative Study of Internet Usage Among University Students: A Study of the University of Dhaka, Bangladesh. Eur Sci J 2017; 13 (34): 134-150
31- Ahmad MM, Gupta RD. Pattern of Computer and Internet Use among Medical Students in Bangladesh. New Indian J Surg 2012; 3 (3): 135.
32- Unnikrishnan B, Kulshrestha V, Saraf A, Agrahari AC, Prakash S, Samantaray L, Parida A. Pattern of computer and internet use among medical students in Coastal South India. South East Asian J Med Educ 2008; 2 (2): 18-25.
33- Young KS [webpage on the Internet]. Internet addiction: symptoms, evaluation, and treatment. innovations in clinical practice. In Vande Creek L, Jackson T, editors. Innovations in Clinical Practice: A Source Book (Vol. 17; pp. 19–31). Sarasota, FL: Professional Resource Press; 1999:1–17. Available from: http://treatmentcenters.com/downloads/internet-addiction.pdf. [Accessed August 18, 2018] 2016.
34- Young KS. Internet addiction: The emergence of a new clinical disorder. Cyberpsychol Behav 2009;1(3):237–244.
35- Net Addiction [webpage on the Internet]. The Center for Internet Addiction. Internet Addiction Test (IAT). Available from: http://netaddiction.com/internet-addiction-test/. [Accessed August 18, 2018]
36- 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: 190-220

37- Widyanto L, McMurran M. The psychometric properties of the internet addiction test. Cyberpsychol Behav 2004; 7 (4): 443-50.
38- Young KS. Caught in the Net: How to recognize the signs of internet addiction and a winning strategy for recovery. New York, NY: John Willey & Sons, Inc; 1998. p196.
39- Chang MK, Law SPM. Factor structure for Young's Internet Addiction Test: A confirmatory study. Comput Human Behav 2008; 24 (6): 2597-2619.
40- Ataee M, Jouybari TA, Emdadi SH, Hatamzadeh N, Mahboubi M, Aghaei A. Prevalence of Internet Addiction and Its Associated Factors in Hamadan University of Medical College Students. Life Sci J 2014; 11 (4s): 214-217.
41- 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. National J Community Med 2014; 5(1): 93-95.
42- Chathoth VM, Kodavanji B, Arunkumar N, Pai SR. Internet behavior pattern in undergraduate medical students in Mangalore. Int J Innov Res Sci Eng Tech 2013; 2(6): 2133-2136.
43- 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): 101-05.
44- Setty SKC, K SR, Usha LVR. A Cross-Sectional Study of Internet Addiction in Undergraduate Medical Students. IOSR J Dent Med Sci. 2015; 14(12): 108-11.
45- George D, Mallery P. SPSS for Windows Step by Step: A Simple Guide and Reference, 11.0 Update, Allyn & Bacon, Boston, Mass, USA, 4th edition, 2003.
46- Tsimtsiou Z, Haidich AB, Spachos D, Kokkali S, Bamidis P, Dardavesis T, Arvanitidou M. Internet Addiction in Greek Medical Students: An Online Survey. Acad Psychiatry 2015; 39 (3):300-304.
47- Haque M, Rahman NA, Majumder MA, Haque SZ, Kamal ZM, Islam Z, Haque AE, Rahman NI, Alattraqchi AG. Internet use and addiction among medical students of Universiti Sultan Zainal Abidin, Malaysia. Psychol Res Behav Manag 2016; 9: 297-307.
48- Wallace P. Internet addiction disorder and youth: There are growing concerns about compulsive online activity and that this could impede students' performance and social lives. EMBO Rep. 2014;15(1):12-16.
49- Soleymani MR, Garivani A, Zare-Farashbandi F. The effect of the internet addiction on the information-seeking behavior of the postgraduate students. Mater Sociomed. 2016;28(3):191-195.
50- Xin M, Xing J, Pengfei W, Houru L, Mengcheng W, Hong Z. Online activities, prevalence of Internet addiction and risk factors related to family and school among adolescents in China. Addict Behav Rep. 2017; 7: 14-18.
51- Üneri ÖŞ, Tanıdır C. Evaluation of internet addiction in a group of high school students: a cross-sectional study. Düşünen Adam. 2011; 24(4): 265-272.
52- Berner JE, Santander J, Contreras AM and Gómez T. Description of internet addiction among Chilean medical students: a cross-sectional study. Acad Psychiatry 2014; 38(1):11-14.
53- Bagdey P, Adikane H, Narlawar U, Dhage D, Surwase K, Kaware A. A cross-sectional study of prevalence of internet addiction and its association with mental health among college going students in Nagpur city. Int J Community Med Public Health 2018; 5 (4): 1658-1665.
54- Chaudhari B, Menon P, Saldanha D, Tewari A, Bhattacharya L. Internet addiction and its determinants among medical students. Ind Psychiatry J 2015;24(2):158-162.
55- Kuss DJ, Griffiths MD. Online Social Networking and Addiction—A Review of the Psychological Literature. Int J Environ Res Public Health 2011;8(9):3528-3552.
56- Guedes E, Sancassiani F, Carta MG, Campos C, Machado S, King AL, Nardi AE. Internet Addiction and Excessive Social Networks Use: What About Facebook? Clin Pract Epidemiol Mental Health 2016; 12: 43-48.
57- Wegmann E, Ostendorf S, Brand M. Is it beneficial to use Internet-communication for escaping from boredom? Boredom proneness interacts with cue-induced craving and avoidance expectancies in explaining symptoms of Internet-communication disorder. PLoS One 2018; 13 (4): e0195742.
58- Yousuf R, Bakar SMA, Haque M, Islam MN, Salam A. Medical Professional and Usage of Social Media. Bang J Med Sci 2017; 16 (4): 606-609.
59- Gregory C. Signs, symptoms, diagnosis, and treatments for those who may be addicted to the Web on their PC or smartphone. Internet Addiction Disorder. Psycom, Vertical Health LLC. 2018 Available at https://www.psycom.net/iadcriteria.html [Accessed on November 4, 2018]
60- Petersen KU, Weymann N, Schelb Y, Thiel R, Thomasius R. Pathological Internet use - epidemiology, diagnostics, co-occurring disorders, and treatment. Fortschritte Der Neurologie Psychiatrie. 2009; 77 (5): 263-271.
61- Peukert P, Sieslack S, Barth G, Batra A. Internet- and computer game addiction: Phenomenology, comorbidity, etiology, diagnostics and therapeutic implications for the addictives and their relatives. Psychiatrische Praxis. 2010; 37 (5): 219-224.
62- Widyanto L, Griffiths MD. 'Internet addiction': a critical review. Int J Ment Health Addict. 2006; 4(1): 31-51.
63- Block JJ. Issues for DSM-V: Internet addiction. Am J Psychiat. 2008; 165 (3): 306-307.
64- Pies R. Should DSM-V designate "Internet addiction" a mental disorder? Psychiatry. 2009; 6(2): 31-37.

65- Kim JU. A reality therapy group counseling program as an Internet addiction recovery method for college students in Korea. Int J Real Ther. 2007 ;26 (2):3-9.
66- Kim JU. The effect of a R/T group counseling program on the Internet addiction level and self-esteem of Internet addiction university students. Int J Real Ther. 2008; 27 (2): 4-12.
67- Bangladesh Population (Live). 2018. Available at http://www.worldometers.info/world-population/bangladesh-population/ [Accessed on November 4, 2018]
68- Staff Correspondent. Rise of youth. The Daily Star. 2014. Available at https://www.thedailystar.net/rise-of-youth-51048 [Accessed on November 4, 2018]
69- Bangladesh Telecommunication Regulatory Commission. Internet Subscribers in Bangladesh January 2018. 2018. Available at http://www.btrc.gov.bd/content/internet-subscribers-bangladesh-january-2018 [Accessed November 4, 2018]