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Internet Addiction, Sleep Quality and Depression among Undergraduate Medical Students in Nepal

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ABSTRACT

Introduction: The virtual life of internet has taken away the real-life experiences. Prevalence of internet addiction, poor sleep quality and depression is increasing worldwide. Medical education is grooming in Nepal, but the evidence on, internet addiction, quality of sleep and depression in undergraduate medical students in Nepal is lacking.
Objective: To find out the prevalence of internet addiction, poor sleep quality and depression among undergraduate medical students and to measure the associations of poor sleep quality, internet addiction and depression with selected variables.
Methods: A descriptive cross sectional, questionnaire-based survey was carried out among 506 undergraduate medical students enrolled from first year to final year at two medical colleges in Lalitpur and Birgunj in Nepal. The data were collected using Young's 20-item Internet Addiction Test (IAT), Patient Health Questionnaire-9 (PHQ-9) and Pittsburgh Sleep Quality Index (PSQI). Both descriptive (frequency, percentage) and inferential statistics (Chi-square test) were used to analyze data in SPSS vs20.
Results: The proportion of participants meeting criteria for poor sleep quality was 42.29%, internet addiction was 39.33% and depression was 16.60%. There was significant association of poor sleep quality with age ($p<0.001$), tobacco use ($p<0.001$), sexually active behaviour ($p<0.001$) and academic performance ($p<0.001$). Similarly, there was significant association of internet addiction with age ($p<0.001$), sex ($p<0.001$), sexually active behaviour ($p<0.001$) and academic performance ($p<0.001$). Likewise findings also revealed that there was significant association of depression with age ($p=0.001$), sex ($p<0.001$), year of study ($p<0.001$), sexually active behaviour ($p=0.035$) and academic performance ($p=0.011$)
Conclusion: The study findings reveal a high prevalence of poor sleep quality, internet addiction and depression in undergraduate medical students from Nepal. Furthermore, the findings suggest that sleep quality, internet addiction and depressive symptoms are associated with age, sex, sexually active behavior, tobacco use, year of study and academic performance. So, to lower the burden of depressive symptoms, enhance the quality of sleep and reduce the addiction of internet among undergraduate students, educational institution can play a vital role by considering these associated factors.

Key Words: Depression, internet addiction, medical students, sleep quality, Nepal

INTRODUCTION

There has been increasing influence of internet in all aspects of society and the exponential rise of the global users indicates that it has become an integral part of the daily lives of people of modern era. [1] Due to overindulgence in internet, it can affect both physical and mental health of an individual including medical students. Studies have demonstrated that this overindulgence can occasionally be problematic, with some students conforming

to internet addiction. [2] Internet addiction (IA) is a kind of technology addiction and a behavioral addiction similar to a gambling habit and diverse addiction to the internet and addictions on the internet. [3] The internet provides a wealth of information in relation to diseases, therapeutic procedures, and pharmaceutical products, thus medical students are one of the vulnerable groups, considering that technology is incorporated into their education. [4] In a study, it was found that 58% of medical students preferred electronic resources and utilized a variety of websites for medical information. [5] Besides, with a significant proportion of medical students residing in hostels and leading independent lives, the predilection for internet dependence may be higher. [6] It was found that the overall prevalence of internet addiction among medical students was 18.5%, with moderate and severe addiction at 17.3% and 1.2% respectively. [7] In a study of undergraduate medical students in Turkey, 0.8% was determined as addicted internet users and 5.2% of high-risk internet users. [8] Internet penetration rate is gradually rising in Nepal, [9] and has reached to 54.34%. [10] Medical students have been found to have high vulnerability to depression. [11-17] A recent meta-analysis showed that depression affects approximately one third of medical students worldwide. [12]

Furthermore, a study conducted in a low-income country found that 55.8% of undergraduates to have poor sleep quality. [18] Internet addict students have higher chance of experiencing sleep problems. [19] Similarly, the students with sleep problems are more likely to develop depressive symptoms. [20] Students having at least one of the three conditions (poor sleep quality, internet addiction or depression) constituted 55.6% and those with all of the three conditions were 10.1% in Nepal. [21] Undergraduate medical students being vulnerable to depression, internet addiction and poor quality of sleep could affect their psychological health and which in turn may impair their behaviour, diminish their learning and affect in patient care. [22]

With paucity of researches in Nepal assessing these conditions among medical students, this study attempted to find out the prevalence of internet addiction, poor sleep quality and depression among undergraduate medical students in Birgunj and Lalitpur metropolitan city and also to measure the association of poor sleep quality, internet addiction and depression with selected variables.

MATERIALS AND METHODS

A descriptive cross-sectional design was adopted for the study. The study was carried out among undergraduate medical students enrolled from first year to final year at two medical colleges in Lalitpur and Birgunj who were available during the data collection period in the study sites. The minimum sample size was estimated using the formula, $n=z^2pq/l^2$. With prevalence 21.2%, [21] relative error 20%, and assumed non-response rate of 20%, the minimum sample size was 429. However, all the undergraduate medical students of both the colleges of the study were sought for data collection. Ethical approval was taken from Institutional Review Committee of National Medical College to conduct the study (Reference number: F-NMC/403/075/076). Written consent was taken from the study participants prior to administration of the questionnaire among them. Data were collected from 27th July 2019 to 3rd August 2019 by using semi-structured self-administered questionnaire which consisted of four parts, prepared after review of relevant literatures. The first part of the questionnaire was used to assess internet use, the second part was used to assess depressive symptoms, the third part to assess quality of sleep, and the fourth part was used to assess socio-demographic characteristics.

Information on age, sex, year of study, tobacco use, alcohol use, sexual activity, and academic performance in the latest exam was obtained from the students.

Students were grouped based on their use of tobacco and alcoholic beverages in past 30 days. Tobacco users were defined as those students who had consumed a tobacco product at least once (either smoking or chewing) and students who had consumed any alcoholic beverage at least once were referred to as alcohol users. Students' sexual activity was assessed as whether they were sexually active or not. Sexually active students were those who had reported to have had at least one event of penetrative sexual activity within the previous 30 days of data collection. Academic performance was assessed on the basis of self-evaluation of their performance in their latest exam they had taken and were categorized as satisfactory and unsatisfactory.

Internet addiction was assessed using Young's 20-item Internet Addiction Test (IAT). Score for individual item of IAT can range from 1 (rarely) to 5 (always). Composite score for IAT can range from 20 to 100 where a greater score is indicative of greater internet addiction. IAT score greater than or equal to 40, as suggested previously [23], was used to determine if the student met the criteria for internet addiction.

Depressive symptoms were assessed by nine-item scale, Patient Health Questionnaire-9 (PHQ-9). Score for each item of PHQ-9 ranges from 0 (not at all) to 3 (almost every day) based on the frequency of symptoms experienced. The total score ranges from 0 to 27, greater score reflecting more frequent and higher number of depressive symptoms. PHQ-9 score of greater than or equal to 10 [24], was used to determine if the student met criteria for depression.

Students' sleep quality was assessed using Pittsburgh Sleep Quality Index (PSQI). PSQI is a 19-item tool that evaluates sleep quality over a period of one month. PSQI score can range from 0 to 21, in which a greater score suggests poor sleep quality. We used PSQI global score greater than 5 [25], to determine if the student met criteria for poor sleep quality.

Overall, a total of 728 undergraduate medical students from first year to final year of two medical colleges in Lalitpur and Birgunj were available during the data collection period in the study site. One week time was given for them to return the filled questionnaire. Altogether 506 self-administered completed questionnaires were returned back within the allotted time period. So, the information of 506 study participants was included in the analysis of the data. The collected data were entered, cleaned and analyzed in SPSS (Statistical Package for Social Sciences) version20. Descriptive statistics including frequency and percentage was used to analyze the data and association of poor sleep quality, internet addiction, and depression with socio-demographic characteristics was assessed by using Chi-square test.

RESULTS

The age of participants ranged from 18 years to 27 years. Of the total 506 participants, 56.13% were female; 25.10% were enrolled in first year of their study; 15.61% were alcohol users, 24.51% were tobacco users, 11.46% were sexually active and 65.61% had satisfactory academic performance. (Table 1)

Table 1: Socio-demographic characteristics. (n=506)

Characteristics	Category	Frequency	Percentage
Age (in years)	< 20	116	22.92
	20 or more	390	77.08
Sex	Male	284	56.13
	Female	222	43.87
Year of Study	First	127	25.10
	Second	109	21.54
	Third	114	22.53
	Fourth	91	17.98
	Final	65	12.85
Alcohol user	Yes	79	15.61
	No	427	84.39
Tobacco user	Yes	124	24.51
	No	382	75.49
Sexually active	Yes	58	11.46
	No	448	88.54
Academic performance	Satisfactory	332	65.61
	Unsatisfactory	174	34.39

As presented in Table 2, the proportion of participants meeting criteria for poor sleep quality (PSQI > 5) were 42.29%, internet addiction (IAT ≥ 40) were 39.33%. Similarly, 16.60% of the

participants met criteria for depression (PHQ-9 ≥ 10).

Table 2: Prevalence of poor sleep quality, internet addiction and depression (n=506)

Outcome Measures	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Poor Sleep Quality	214	42.29	292	57.71
Internet Addiction	199	39.33	307	60.67
Depression	84	16.60	422	83.40

Data presented in Table 3, 4, and 5 showed that there was significant association of poor sleep quality with age (p<0.001), tobacco use (p<0.001), sexually active behaviour (p<0.001) and academic performance (p<0.001). Similarly, there was significant association of internet addiction with age (p<0.001), gender (p<0.001), sexually active behaviour (p<0.001) and academic performance (p<0.001). Likewise, findings also revealed that there was significant association of depression with age (p=0.001), sex (p<0.001), year of study (p<0.001), sexually active behaviour (p=0.035) and academic performance (p=0.011)

Table 3: Association of poor sleep quality with selected socio-demographic characteristics (n=506)

Characteristics	Category	Category Frequency	Poor Sleep Quality		p-value
			Yes Frequency (%)	No Frequency (%)	
Age (in years)	< 20	116	87 (75.00)	29 (25.00)	<0.001***
	20 or more	390	127 (32.56)	263 (67.44)	
Sex	Male	284	116 (40.85)	168 (59.15)	0.456
	Female	222	98 (44.14)	124 (55.86)	
Year of Study	First	127	58 (45.67)	69 (54.33)	0.702
	Second	109	49 (44.95)	60 (55.05)	
	Third	114	43 (37.72)	71 (62.28)	
	Fourth	91	36 (39.56)	55 (60.44)	
	Final	65	28 (43.08)	37 (56.92)	
Alcohol user	Yes	79	38 (48.10)	41 (51.90)	0.255
	No	427	176 (41.22)	251 (58.78)	
Tobacco user	Yes	124	59 (47.58)	65 (52.42)	<0.001***
	No	382	55 (14.40)	327 (85.60)	
Sexually active	Yes	58	44 (75.86)	14 (24.14)	<0.001***
	No	448	170 (37.95)	278 (62.05)	
Academic performance	Satisfactory	332	78 (23.49)	254 (76.51)	<0.001***
	Unsatisfactory	174	136 (78.16)	38 (21.84)	

** ** *** p-value significant at 0.05, 0.01, 0.001 level.*

Table 4: Association of internet addiction with selected socio-demographic characteristics (n=506)

Characteristics	Category	Category Frequency	Internet Addiction		p-value
			Yes Frequency (%)	No Frequency (%)	
Age (in years)	< 20	116	83 (71.55)	33 (28.45)	<0.001***
	20 or more	390	116 (29.74)	274 (70.26)	
Sex	Male	284	94 (33.10)	190 (66.90)	0.001**
	Female	222	105 (47.30)	117 (52.70)	
Year of Study	First	127	56 (44.09)	71 (55.91)	0.601
	Second	109	43 (39.45)	66 (60.55)	
	Third	114	39 (34.21)	75 (65.79)	
	Fourth	91	34 (37.36)	57 (62.64)	
	Final	65	27 (41.54)	38 (58.46)	
Alcohol user	Yes	79	34 (43.04)	45 (56.96)	0.462
	No	427	165 (38.64)	262 (61.36)	
Tobacco user	Yes	124	53 (42.74)	71 (57.26)	0.370
	No	382	146 (38.22)	236 (61.78)	
Sexually active	Yes	58	10 (17.24)	48 (82.76)	<0.001***
	No	448	189 (42.19)	259 (57.81)	
Academic performance	Satisfactory	332	65 (19.58)	267 (80.42)	<0.001***
	Unsatisfactory	174	134 (77.01)	40 (22.99)	

** ** *** p-value significant at 0.05, 0.01, 0.001 level.*

Table 5: Association of depression with selected socio-demographic characteristics (n=506)

Characteristics	Category	Category Frequency	Depression		p-value
			Yes Frequency (%)	No Frequency (%)	
Age (in years)	< 20	116	7 (6.03)	109 (93.97)	0.001**
	20 or more	390	77 (19.74)	313 (80.26)	
Sex	Male	284	16 (5.63)	268 (94.37)	<0.001***
	Female	222	68 (30.63)	154 (69.37)	
Year of Study	First	127	9 (7.09)	118 (92.91)	0.001**
	Second	109	21 (19.27)	88 (80.73)	
	Third	114	18 (15.79)	96 (84.21)	
	Fourth	91	16 (17.58)	75 (82.42)	
	Final	65	20 (30.77)	45 (69.23)	
Alcohol user	Yes	79	17 (21.52)	62 (78.48)	0.201
	No	427	67 (15.69)	360 (84.31)	
Tobacco user	Yes	124	25 (20.16)	99 (79.84)	0.22
	No	382	59 (15.45)	323 (84.55)	
Sexually active	Yes	58	4 (6.90)	54 (93.10)	0.035*
	No	448	80 (17.86)	368 (82.14)	
Academic performance	Satisfactory	332	45 (13.55)	287 (86.45)	0.011*
	Unsatisfactory	174	39 (22.41)	135 (77.59)	

** ** *** p-value significant at 0.05, 0.01, 0.001 level.*

DISCUSSION

Overall, it was observed that the proportion of participants meeting criteria for poor sleep quality was 42.29% and internet addiction was 39.33%. Similarly, 16.60% of the study participants met criteria for depression. The study findings are congruent to the findings conducted by Bhandari et al [21], which showed that the proportion of students meeting criteria for both poor sleep quality and internet addiction were 35.4% and 21.2% of the students met criteria for depression. Various studies have estimated the prevalence of internet addiction from 0.9% to 38% depending on the used criteria and the study population. [26,27] 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. However, one thing that is evident from these results is that the higher the level of education, the higher the prevalence of internet addiction. Similarly, regarding depression, the finding is comparable with the results of similar study done in Sweden (12.9%), [28] Manipal 20% [29] and Kathmandu 27.2% [30]

In this study it was found that there was significant association of poor sleep quality with age tobacco use, sexually active behaviour and academic performance. The study findings are in same line with the study [21], which revealed that higher age, sexual activeness and poor academic performance was significantly associated with poor sleep quality.

Similarly, the current study findings also revealed that there was significant association of internet addiction with age ($p<0.001$), sex ($p<0.001$), sexually active behaviour ($p<0.001$) and academic performance ($p<0.001$). The findings are consistent with other study [31] which suggests that there was significant association of internet addiction with sex and academic performance. The study findings are also in line with the study among undergraduates [21] which revealed that age, sexual activeness and poor academic performance was significantly associated with internet addiction.

Likewise, findings in this study also revealed that there was significant association of depression with age ($p=0.001$), sex ($p<0.001$), year of study ($p<0.001$), sexually active behaviour ($p=0.035$) and academic performance ($p=0.011$). The study findings are in consistent with the study [21] which revealed that higher age, sexual activeness and poor academic performance was significantly associated with depression. The finding is also supported by the study done by Sreeramareddy C, et al. [29] which revealed

that the prevalence rate was higher among clinical science students 15%, 18.9% and 24% in third, fourth and final year students respectively.

CONCLUSIONS

The study findings reveal a high prevalence of internet addiction, poor sleep quality and depression in undergraduate medical students from Nepal. Furthermore, the findings suggest that there is association between sleep quality, internet addiction and depressive symptoms with age, sex, sexually active behavior, tobacco use, year of study and academic performance. It suggests that medical students should be supported by student counselling units in the first year itself as they may be able to cope up with stress in the later years. So, to lower the burden of depressive symptoms among undergraduate medical students, medical colleges can play a vital role. For an instance, adjusting class hours and considering physiological need for sleep can be a good approach to overcome with these problems and avoid psychological health issues arising from these problems. Sensitizing students about negative effects of internet addiction and encouraging them to use it for productive purpose is utmost necessary. By identifying the symptoms of depression and addiction at an early stage hopefully the psychological morbidity among medical students can be prevented and the ones in morbid state can be approached to seek the professional help.

Conflict of Interest: None

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