

Internet Addiction and its Associated Factors Among Dilla University Undergraduate Students, Dilla, Ethiopia, 2019: A Cross-Sectional Study

Nebiyu Mengistu (✉ nebiyumen@gmail.com)

Dilla University

Desalegn Tarekegn

Dilla University

Wondwosen Molla

Dilla University

Seid Shumye

Dilla University

Research

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Abstract

Background: Internet addiction is characterized by excessive or poorly controlled preoccupation, urges or behavior regarding computer use and internet access that lead to impairment or distress. Globally, it has been found that the occurrence rate of internet addiction among university students ranges from 0.8% to 47.7%. Despite, there are multiple challenges that related with internet addiction which remains under-recognized and largely ignored by stakeholders and also not well known especially in low income countries including Ethiopia. Therefore, this study was conducted aimed to assess the magnitude of the internet addiction and its associated factors among undergraduate students.

Methods: Institutional based cross-sectional study was employed from May 1st to June 1st 2019. Multi-stage sampling technique was used to get a total of 846 undergraduate Students. Data was collected by using self-administered structured questionnaires of Young's Internet Addiction Test. The collected data was coded and entered into EPIDATA 3.1 and analyzed by using SPSS version 22, Bivariate and multivariate logistic regression analysis was conducted to identify factors associated with internet addiction and statistically significant was considered at P-value <0.05.

Results: A total of 846 study participants, giving a response rate were 761 (90%) and the prevalence of internet addiction was 19.4%. Multiple logistic regression model revealed that being male [AOR=1.69, 95% CI: (1.80, 6.41)], probable depression [AOR =3.61, 95% CI (2.40, 5.43)] and khat or caffeinated drinks [AOR=1.86, 95%CI: (1.21, 2.87)] were significantly associated with internet addiction.

Conclusion: This study revealed that a high prevalence of internet addiction among Dilla university students and there were various factors associated with increased prevalence of problematic internet use. Therefore, students need to be educated about safe, valuable, and healthy practice of internet use and better to counsel on substance use and its consequences and also psychiatric evaluation (referring for mental health services) to overcome the anticipated increase in internet addiction

Background

Internet is growing worldwide for information and is a user-friendly communication medium that is cost effective and fast useful tool in education(1). Internet technology has changed our daily lives dramatically. Adolescents and young adults in particular may be attracted by and preoccupied with various online activities(2). However, internet is a double edged sword; its appropriate use can undoubtedly facilitate the academic process like a magic wand whereas inappropriate use can wreak havoc(3).

Internet addiction is defined as "inability to stop internet overuse, tendency to perceive offline time as meaningless, excessive irritation and aggression during deprivation" and can be also described as internet dependence, pathological internet use or compulsive internet(4, 5). It is a new and attractive subject considered as a behavior-based addiction in recent years(6). And it is becoming a serious problem across the world, especially for adolescents. Scholars have also warned that internet addiction

could bring substantial loss of productivity in schools and companies. On the basis of the existing literature it was hypothesized that internet addiction would have negative impact on academic performance of the university students (7–9).

Globally, it has been found that the occurrence rate of internet addiction among university students ranges from 0.8–47.7% (8–18). Most study findings have shown that excessive use of internet adversely affects one's physical health, family life, and academic performance. Academic problems caused by internet addiction include decline in study habits, significant drop in grades, missing classes, increased risk of being placed on academic probation, and poor integration in extracurricular activities (18–21).

Heavy internet use has many associations with depression, (22) poor sleep quality, mood changes, and poor health outcomes such as obesity and low self-esteem(23).

Studies in different countries have generated widely different estimates. A study in Italy, for example, found very low prevalence (0.8%)(8) while prevalence rates as high as 18% have been reported in the UK(10).

According to a survey conducted in Asian countries like Japan, Hong kong, Pakistan and India revealed that 21.6%, 26.7%, 16.7% and 18.88% respectively. The highest internet addiction risk profile is that of a male, under the age of 21, with low self-esteem who lives away from home, making him more vulnerable to the problems and also depression and anxiety(13), (17), (24) (25).

Another cross-sectional survey was conducted on internet addiction among medical students of Sohag University in Egypt revealed that the prevalence of IA was 47.7%. Being male, internet access on mobile phones, easy internet access at home, using internet for browsing social media and e-mail, and bad relation with the family were the most important predictors of IA(18).

Despite there are significant health problems and high prevalence of internet addiction among undergraduate students, as of the investigator knowledge, the magnitude of the internet addiction and its associated factors among undergraduate students are not well studied in Ethiopia as well as in the current study area.

Beside that the current study addressed key correlated factors that could be managed by stakeholders to provide information on students need to be educated about safe, valuable, and healthy practice of internet use and control of psychological problems among students.

Therefore, this study will have aimed to asses' magnitude of internet addiction and is associated factors among undergraduate university students.

Methods

Study design, period, setting, and population

An institutional-based cross-sectional study was conducted in Dilla University from May 1st 2019 to June 1 2019, located in south of the capital city of Ethiopia and far by 360 Km. One of the newer universities that was founded in 1996 G.C was named as Teachers and Health Science College in Ethiopia. However, since 2007 G.C, it is providing higher level of education in many disciplines, which has been clustered into three campuses and six colleges. Currently, it has 47 undergraduate and 17 postgraduate departments, at BA/ BSc, Bed, MA/MSc level with regular, extension, and summer courses, and it has about 30108 students. The study population was randomly selected undergraduate students of Dilla University.

Sample size determination

The minimum number of samples required for this study is determined by using Single population proportion formula considering the following assumptions:

$$n = \frac{(Z\alpha/2)^2 p (1-p)}{d^2}$$

Where

n = minimum sample size required for the study

Z= standard normal distribution (Z=1.96) with confidence interval of 95% and $\alpha=0.05$

P= the prevalence of internet addiction is not known in our country; hence, P= 50 % (0.5) was used.

d= Absolute precision or tolerable margin of error (d) =5%=0.05

$$n_i = \frac{(Z\alpha/2)^2 p (1-p)}{d^2} = \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)^2} = 384$$

Then adding 10% ($384 \times 0.1 = 38.4 \approx 39$) of non-respondent the total sample size for this study is $384+39=423$. And finally, by using the design effect the above sample size is multiplied by finally by using the design effect the above sample size is multiplied by 2 = 846. We used a multistage cluster sampling procedure to select sample of undergraduate students. Initially, two colleges (College of medicine and health sciences, and College of business and economics), and one school (school of law) were selected. In the second stage, the selected college is stratified based on the departments. There are thirteen (13) departments on the selected college. All thus departments with their years of student was included in this study and also design effect was used. The final sample size was allocated proportionally for each department based on the number of their students. Finally, simple random sampling technique was used to select participants by using their ID number as a sampling frame.

Data collection tools and procedures

Data was collected by using self-administered structured questionnaire. The self-administered structured questionnaire consists of the 88 items with closed ended questions. The questionnaire is divided into seven (7) sections; Socio-demographic characteristics (has 9 items), Internet addiction test (20 items), Self-esteem factors (10 items), Depression and anxiety (14 items), Social support scale (3 items), Peer Influence (29 items) and Current substance use (3 items).

Data on the components of internet addiction was collected by using Young's internet addiction test (IAT). This scale has been widely used for screening and measuring the level of internet addiction worldwide and YIAT showed that it is more reliable in University students. The Generally Cronbach α in the present study was 0.89. Each item of the YIAT 20 is rated on a scale from rarely to always. Using a five-point Likert scale, the responses were assigned a numeric value or score where 'rarely' was scored one point and 'always' was scored five points. These items include questions about compulsive behavior related to the use of internet, presence of problems in academic performance, bad home environment, relationship problems with family or friends, and suffering from emotional problems. After answering all the questions, scores of each response are added to obtain a final score ranging between 20 and 100. The higher the score, the greater the level of addiction. There is no gold standard for distinguishing between IA and non-IA. According to the IAT manual, users are given four labels based on the total score, normal user (score ≤ 20), mild user (score between 20 and 49), moderate user (score between 50 and 69), and severe or excessive user (score ≥ 80)(26). Since the moderate users are often unable to control their internet use, we considered both moderate and excessive use of internet (IAT total score ≥ 50) as IA and also based on the IA test manual, we considered that those who scored between 0 and 49 were normal users of internet. This opinion of internet addiction classification is fairly supported by the existing literature (18, 27, 28).

Rosenberg Self-esteem scale was used to assess self-esteem. It was measured with 10-item scale that measures global self-worth by measuring both positive and negative feelings about the self. The scale is believed to be uni-dimensional. All items are answered using a 4-point Likert scale format ranging from strongly agree to strongly disagree(29).

Peer pressure was measured by PPQ-R which is a 29-item self-report scale that assesses peer influences in everyday life situations. It is a 5-point Likert scale with 1 (strongly disagree) to 5 (strongly agree). The scale consists of five subscales and high score on each subscale indicates higher peer pressure in that form(30).

Hamilton Anxiety Rating Scale (HARS)-was one of the first rating scales developed to measure the severity of anxiety symptoms, and is still widely used today in both clinical and research settings. The scale consists of 14 items. Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to moderate severity and 25–30 moderate to severe(31).

Hamilton Depression Rating Scale (HDRS) - is the most widely used clinician-administered depression assessment scale. The original version contains 17 items (HDRS17) pertaining to symptoms of depression experienced over the past week. For the HDRS17, a score of 0–7 is generally accepted to be

within the normal range (or in clinical remission), while a score of 20 or higher (indicating at least moderate severity) is usually required for entry into a clinical trial(32).

Social support was measured using Oslo 3 items social support scale (OSS-3) which is poor social support- a score of "3-8" ,intermediate social support- a score of "9-11" ,strong social support- a score of "12-14" (33).

Data quality control issues

Training was given to the data collectors and supervisors on the data collection tool and sampling techniques. Supervision was held regularly during the data collection period both by the researcher, co-investigators and supervisors to check on a daily basis for completeness and consistency. In addition, pre-test of the study was carried out in 5 % (43) of total undergraduate students at outside of the study area (Hawassa University), which is closer to the study area.

Analysis

Following accomplishment of data collection activities, the questionnaires was entered in to EpiData version 3.1, (where QES, REC and Check files created), to ensure a double data entry system and then, was exported to SPSS version 22, to accomplish further data exploration procedures; along with the required statistical data analysis methods. Descriptive statistic (mean, median, frequency, and percentage) was used to summarize data and the result was reported using frequencies, percentages, charts, and tables. Bivariate and multivariate logistic regression analysis was conducted to identify factors associated with internet addiction and statistically significant was considered at P-value <0.05.

Results

Socio demographic characteristics of respondents

A total of 846 study participants, giving a response rate was 761 (90%). The mean age of the respondents was 20.74 years with SD (± 1.79). The proportion of male to female participants was (59.8–40.2%).

More than half of the student's 500 (65.7%) were Orthodox by religion and most of the respondents were single 661(86.9%) regarding to marital status (Table 1).

Table 1

Socio demographic characteristics of Dilla university undergraduate students, Dilla, Ethiopia, 2020.

Variables	Category	Frequency(761)	Percentage (90%)
Age	15–19	223	29.1
	20–24	503	66.1
	≥ 25	35	4.6
Sex	Male	455	59.8
	Female	306	40.2
Religion	Orthodox	500	65.7
	Muslim	127	16.7
	Protestant	124	16.3
	Others *	10	1.3
Marital status	Single	661	86.9
	In relationship	60	7.9
	Married	20	2.6
	Others * **	10	1.3
Ethnicity	Oromo	261	34.3
	Amhara	355	46.6
	Tigre	35	4.6
	Wolaita	19	2.5
	Others	91	12.0
Living arrangement	with family	516	67.8
	alone	172	22.6
	Others****	73	9.6
Residence	Rural	542	71.2
	Urban	219	28.8

N.B.

* Catholic, Wakifeta ** Separated, Divorced, widowed *** Daily laborer, **** With relatives, Adopted

Variables	Category	Frequency(761)	Percentage (90%)
Academic year	First year	212	27.9
	Second year	193	25.3
	Third year	138	18.1
	Fourth year	114	15.1
	Fifth year	69	9.0
	Sixth year	35	4.6
Financial support	From family	672	88.3
	From relatives	65	8.5
	Others	24	3.2
N.B.			
* Catholic, Wakifeta ** Separated, Divorced, widowed *** Daily laborer, **** With relatives, Adopted			

Characteristics of common mode of internet access and experience

Regarding to mode of internet access and its experience, 438(57.5%) and 453 (59.5%) more than half of the students uses their mobile internet of the participants and had internet use experience ≥ 1 month respectively (Table 2).

Table 2
Characteristics of common mode of internet access and experience of Dilla university undergraduate students, Dilla, Ethiopia, 2020.

Internet-use experience (in months)	Never	10	1.3
	0 to 6	127	16.7
	6 to 12	171	22.5
	≥ 12	453	59.5
Internet-use per day (in hours)	≤ 5 hours	286	37.5
	≥ 5 hours	475	62.4
Common mode of Internet access	Wi-Fi	222	29.1
	Broadband	101	13.2
	Mobile internet	438	57.5

Psycho-social characteristics of the participants

According to psycho-social characteristics, 178(23.4%) were depressed, 213(28.0%) of the participants had probable anxiety disorder symptoms and 307(40.3%) had poor social support. Among 306 female student's, 62 (34.8%) and of 455 males 116(65.2 %) had depression (Table 3).

Table 3
Psycho-social characteristics of Dilla university undergraduate students, Dilla, Ethiopia, 2020.

Probable depression	No	583	76.6
	Yes	178	23.4
Probable Anxiety	No	548	72.0
	Yes	213	28.0
Social support	Poor	58	7.5
	Moderate	397	52.2
	Strong	307	40.3

Behavioral characteristics of respondents

The current use of substances among 761 study participants was 490(64.4%). Among those substance users, majority 202(26.5%) use alcohol followed by 158(20.8%) khat and caffeinated drinks (Fig. 1).

Internet addiction and its associated factors among undergraduate students

The magnitude of internet addiction among undergraduate students of Dilla University was found to be 19.4%. Multivariable logistic regression revealed male sex, probable depression and current use of khat or caffeinated drinks were found to be statistically significant with internet addiction.

The odds of developing problematic internet use was more than three times higher among depressed respondents as compared to non-depressed (76.6% vs. 23.4%) [AOR = 3.61, 95% CI (2.40, 5.43)].

Prevalence of problematic internet use was found to be 1.69 times higher in male's undergraduate students than females [AOR = 1.69, 95% CI: (1.80, 6.41)].

Regarding to the respondent's substance use those who taking khat or caffeinated drinks currently had 1.86 times more likely to develop internet addiction as compared to those who didn't use these substances [AOR = 1.86,95%CI: (1.21,2.87)].(Table 4)

Table 4: Factors associated with internet addiction among undergraduate students (Bivariate and multivariate analysis) (n=761), Dilla, Ethiopia, 2020.

Variables	Categories	Internet addiction		COR(95%CI)	AOR(95%CI)
		Problematic	Normal		
Age	15-19	38	185	0.44(0.20,0.99)	0.53(0.22,1.25)
	20-24	99	404	0.53(0.25,1.12)	0.66(0.29,1.48)
	≥ 25	11	24	1.00	1.00
Sex	Male	105	315	1.83(1.24,2.70)	1.69(1.12,2.56) *
	Female	43	263	1.00	1.00
Probable depression	No	77	506	1.00	1.00
	Yes	71	107	4.36(2.97,6.40)	3.61(2.40, 5.43)**
Probable anxiety	No	97	451	1.00	1.00
	Yes	51	162	0.68(0.46,1.01)	0.86(0.56,1.31)
Social support	Poor	67	240	2.73(1.04,7.13)	1.96(0.72,5.35)
	Moderate	76	321	2.32(0.89,6.02)	1.83(0.68,4.94)
	Strong	5	49	1.00	1.00
Self-esteem	Low-self esteem	82	337	0.98(0.68,1.41)	1.23(0.83,1.82)
	High-self esteem	276	66	1.00	1.00
Current use of khat or caffeinated drinks	No	98	505	1.00	1.00
	Yes	50	108	2.38(1.60,3.55)	1.86(1.21,2.87) *

N.B. 1.00 references

*p-value less than 0.05

**p-value less than 0.015

P of Hosmer and lemeshow test =0.37, chi square=8.59, df=8.

Discussion

In this study, 761 undergraduate students were surveyed to ascertain the prevalence of internet addiction and associated factors among Dilla university undergraduate students. The current study revealed that the prevalence of problematic internet use was 19.4% with 95% CI (16.6, 22.5). This study was in line with studies conducted in India (Mangore), Pakistan, Japan and United Kingdom among university undergraduate students which were 18.8% 16.7%, 21.6% 18%, and respectively (13, 14, 17, 34). This consistency may be due to sharing of the same study population and used the same tool (IAT) to assess internet addiction.

The finding of this study was higher than the study done in Italy 0.8%(35), Iran `7.3%(36) and Spain 6.08%(37). This might be due to sociocultural difference of the study population, variation in sample size, which is lower than current study difference of age of the study participants.

However the finding of current study was lower than studies done in Egypt (47.7%)(18), Saud Arabia (31.7%)(15), Hong Kong (26.7%)(12), Nepal(42%)(16) and Greek(32.2%) (38). This variation may be due to the design used in USA study which was longitudinal. An others differences are socioeconomic variation related to participants that is easy internet access at home and on mobile phones, sample size of the study (n = 2,200) in Greek.

In this study, prevalence of problematic internet addiction was found to be 1.69 times higher in males than females [AOR = 1.69, 95% CI: (1.80, 6.41)].

This result is supported by study carried out in Egypt(18) and Iran(39). The possible justification for this strong association could be due to the fact that males are more prone to higher web familiarity of males and their preference for online games and pornographic sites place them at higher risk(40). And also another possible explanation is that men receive less parental supervision and they use the internet for entertainment purposes more than women.

On the other hand, the present finding disagree with study done in France(41). The discrepancy might be due to socio-cultural difference and variation of the age of study participants in addition to that variation on sample size (higher frequency of male which is 73.5%) also considered.

In this study, the odds of developing problematic internet use was more than three times higher among depressed respondents as compared to non-depressed (76.6% vs. 23.4%) [AOR = 3.61, 95% CI (2.40, 5.43)].

This finding is in agreement with studies done in Iran(37), India(42) and Turkey (43). The possible reason for this may be that, individuals suffering from depression can have the predisposition to have an Internet addiction; depressed mood can impair the coping with stress, and may make subjects escape the negative experience through entering into internet. So, students who have depressive symptoms usually seek internet for socializing with distant friends and short term relief which makes them addicted to internet (20, 44, 45).

Among substance users, current use of khat or caffeinated drinks was significantly associated with internet addiction which is 1.86 times more likely to develop internet addiction as compared to those who didn't use these substances [AOR = 1.86,95%CI: (1.21,2.87)]. This finding is agree with study conducted in Iran(46) and Greek university students(47). This may be explained by due to the fact that the biological effect of the substances on the brain that khat or caffeinated drinks are a central nervous system stimulant that has the ability to enhance alertness and concentration, boost mood, motivation to work, and the craving or compulsive effect of the substances which is also associated with symptoms of problematic internet use. So, many people might be easily motivated or urged to use internet(48).

Limitation

This study does not show any cause effect relationship because of cross sectional nature of the study design and there are also chances for social desirability bias wherein students in order to impress the

investigator may not have reported exact values for internet use.

Conclusion

This study revealed that a high prevalence of internet addiction among Dilla University undergraduate students compared with the general population. In this study being male, probable depression, and current use of tobacco and khat or caffeinated drinks were significantly associated with problematic internet use. The findings suggest that it's better to educate and focus on identified such high risk groups in order to give a special emphasis, provide psychological counseling and furthermore, students need to be educated about safe, valuable, and healthy practice of internet use and better to counsel on substance use and its consequences to overcome the anticipated increase in internet addiction.

Abbreviations

CI

Confidence Interval

CMD

Common Mental Disorders

E (DHS)

Ethiopia (Demographic Health Survey)

ETB

Ethiopian Birr

EpiData

Epidemiological Data

HADS

Hospital based Anxiety and Depression Scale

IAT

Internet Addiction Test

LAMIC

Low- and middle-income countries

MOSH

Minster of Science and Higher education

SD

Standard Deviation

SRS

Simple Random Sampling

SPSS

Statistical Package for Social Science

SSA

Sub-Saharan Africa

Declarations

Ethics approval and consent to participation

Ethics approval was obtained from Institutional Review Board (IRB) of Dilla University College of Health Sciences and medicine. After the purpose and objectives of the study have been informed, oral and written consent was obtained from each study participants, before the start of the data collection. To maintain the anonymity and confidentiality of information, similar data collection procedure was in place.

- **Consent to publication:** N/A

- **Availability of data and materials.**

All data generated or analyzed during this study are included in this published article. The data sets of the current study is available from [Nebiyu Mengistu, email: nebiyumen@gmail.com; Mobile: +251931333504, Dilla university, Dilla] upon reasonable request

- **Competing interests**

The authors declare that they have no competing interests.

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Authors' contributions

Nebiyu Mengistu (nebiyumen@gmail.com) organized the original investigation; coordinated the collection of data; analysis, writing report and drafted the manuscript and revision of the Manuscript. Seid Shumye (Seidshumye22@gmail.com), Wondwosen Molla (wondwosenm955@gmail.com) and Desalegn tarekegn (desalegnntt@gmail.com) equally contributed to the design of the study, performed the statistical analyses contributed to the statistical analyses.

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References

1. Castrén J, Huttunen T, Kunttu K. Users and non-users of web-based health advice service among Finnish university students—chronic conditions and self-reported health status (a cross-sectional study). *BMC Med Inf Decis Mak*. 2008;8(1):8.
2. Monahan KD. Influence of technology on adolescent development and spiritual formation. 2009.
3. Gray NJ. Health Information on the Internet—A Double-Edged Sword? *J Adolesc Health*. 2008;42(5):432–3.
4. Young KS. Internet addiction: A new clinical phenomenon and its consequences. *American behavioral scientist*. 2004;48(4):402–15.
5. Widyanto L, Griffiths M. 'Internet addiction': a critical review. *International Journal of mental health Addiction*. 2006;4(1):31–51.
6. Vizehfar F. Assessment of the internet addiction between Iranian net users. 2005.
7. Bhise AT. internet addiction and its effect on children of marathi medium schools a case study. 2016.
8. Poli R, Agrimi E. Internet addiction disorder: prevalence in an Italian student population. *Nord J Psychiatry*. 2012;66(1):55–9.
9. Fernández-Villa T, Ojeda JA, Gómez AA, CARRAL J, Delgado-Rodríguez CANCELAM. M, et al. Problematic Internet Use in University Students: associated factors and differences of gender. *Adicciones*. 2015;27(4).
10. Niemz K, Griffiths M, Banyard P. Prevalence of pathological Internet use among university students and correlations with self-esteem, the General Health Questionnaire (GHQ), and disinhibition. *Cyberpsychology behavior*. 2005;8(6):562–70.
11. Sherer K. College life on-line: Healthy and unhealthy Internet use. *Journal of College Student Development*. 1997.
12. Yu L, Shek DTL. Internet addiction in Hong Kong adolescents: a three-year longitudinal study. *J Pediatr Adolesc Gynecol*. 2013;26(3):10-S7.
13. Tateno M, Teo AR, Shiraishi M, Tayama M, Kawanishi C, Kato TA. Prevalence rate of Internet addiction among Japanese college students: Two cross-sectional studies and reconsideration of cut-off points of Young's Internet Addiction Test in Japan. *Psychiatry Clin Neurosci*. 2018;72(9):723–30.
14. Khan MA, Alvi AA, Shabbir F, Rajput TA. Effect of Internet addiction on academic performance of medical students. *J Islam Int Med Coll*. 2016;11:48–51.
15. Khayat MA, Qari MH, Almutairi BS, Shuaib Bh, Rambo MZ, Alrogi MJ, et al. Sleep Quality and Internet Addiction Level among University Students. *The Egyptian Journal of Hospital Medicine*. 2018;73(7):7042–7.

16. Marahatta S, 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):6–10.
17. Chathoth V, Kodavanji B, Arunkumar N, Pai SR. Internet behaviour pattern in undergraduate medical students in Mangalore. *International Journal of Innovative Research in Science Engineering Technology*. 2013;2(6):2133–6.
18. Ali R, Mohammed N, Aly H. Internet addiction among medical students of Sohag University, Egypt. *Journal of Egyptian Public Health Association*. 2017;92(2):86–95.
19. Ruiz Mafé C, Sanz Blas S. Explaining Internet dependency: An exploratory study of future purchase intention of Spanish Internet users. *Internet research*. 2006;16(4):380–97.
20. Akin A, Iskender M. Internet addiction and depression, anxiety and stress. *International online journal of educational sciences*. 2011;3(1):138–48.
21. Association AP. *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*[Internet]. American Psychiatric Pub; 2013.
22. Lai C, Mak K, Watanabe H, Jeong J, Kim D, Bahar N, et al. The mediating role of Internet addiction in depression, social anxiety, and psychosocial well-being among adolescents in six Asian countries: a structural equation modelling approach. *Public Health*. 2015;129(9):1224–36.
23. Kim JH, Lau C, Cheuk K-K, Kan P, Hui HL, Griffiths SM. Brief report: Predictors of heavy Internet use and associations with health-promoting and health risk behaviors among Hong Kong university students. *Journal of adolescence*. 2010;33(1):215–20.
24. Khan MAAA, Shabbir F, Rajput TA. Effect of internet addiction on academic performance of medical students. *J Islam Int Med Col*. 2016;11:48–51.
25. Yu LSD. Internet addiction in Hong Kong adolescents: a three-year longitudinal study. *J Pediatr Adolesc Gynecol*. 2013;26(3 Suppl):10 – S17.
26. K. Y. Internet addiction test (IAT).. Stoelting;, editor2016 Dec 1.
27. Al-Gamal E, Alzayyat A, Ahmad MM. Prevalence of Internet Addiction and Its Association With Psychological Distress and Coping Strategies Among University Students in Jordan. *Perspectives in psychiatric care*. 2016;52(1):49–61.
28. Ghamari F, Mohammadbeigi A, Mohammadsalehi N, Hashiani AA. Internet addiction and modeling its risk factors in medical students. *Iran Indian journal of psychological medicine*. 2011;33(2):158–62.
29. M. R. Society and the adolescent self-image. press; Pu, editor2015 Dec 8.
30. Saini S. Peer Pressure Questionnaire-Revised2016/09/02.
31. Thompson E. Hamilton rating scale for anxiety (HAM-A). *Occup Med*. 2015;65(7):601.
32. Obeid S, Hallit CAE, Haddad C, Hany Z, Hallit S. Validation of the Hamilton Depression Rating Scale (HDRS) and sociodemographic factors associated with Lebanese depressed patients. *L'encephale*. 2018;44(5):397–402.

33. Dalgard O. Social support-Consequences for individual and society. EUPHIX, EUphact Bilthoven: RIVM,< <http://www.euphix.org> > EUphact\Determinants of health\Environment\Social support. 2009;16.
34. Picon F, Karam R, Breda V, Restano A, Silveira A, Spritzer D. Precisamos falar sobre tecnologia: caracterizando clinicamente os subtipos de dependência de tecnologia. *Revista brasileira de psicoterapia*. 2015;17(2):44–60.
35. Ferreira LTK, Ceolim MF. Sleep quality in HIV-positive outpatients. *Revista da Escola de Enfermagem da USP*. 2012;46(4):892–9.
36. Dabaghzadeh F, Khalili H, Ghaeli P, Alimadadi A. Sleep quality and its correlates in HIV positive patients who are candidates for initiation of antiretroviral therapy. *Iranian journal of psychiatry*. 2013;8(4):160.
37. Huang X, Li H, Meyers K, Xia W, Meng Z, Li C, et al. Burden of sleep disturbances and associated risk factors: A cross-sectional survey among HIV-infected persons on antiretroviral therapy across China. *Scientific reports*. 2017;7(1):3657.
38. Phillips KD, Moneyham L, Murdaugh C, Boyd MR, Tavakoli A, Jackson K, et al. Sleep disturbance and depression as barriers to adherence. *Clin Nurs Res*. 2005;14(3):273–93.
39. Oshinaike O, Akinbami A, Ojelabi O, Dada A, Dosunmu A, John Olabode S. Quality of sleep in an HIV population on antiretroviral therapy at an urban tertiary centre in Lagos, Nigeria. *Neurology research international*. 2014;2014.
40. Tsai HF, Cheng SH, Yeh TL, Shih C-C, Chen KC, Yang YC, et al. The risk factors of Internet addiction—a survey of university freshmen. *Psychiatry research*. 2009;167(3):294–9.
41. Khan HU, Hammami H. Measuring internet addiction in Europe-based knowledge societies: a case study of France. *International Journal of Business Information Systems*. 2019;32(2):199–218.
42. Kumar S, Kumar A, Badiyani B, Singh SK, Gupta A, Ismail MB. Relationship of internet addiction with depression and academic performance in Indian dental students. *Clujul Medical*. 2018;91(3):300.
43. Rodríguez-Estrada E, Iglesias-Chiesa M, Fresán-Orellana A, Reyes-Terán G. Factors associated with poor sleep quality among HIV-positive individuals in Mexico City. *Salud Mental*. 2018;41(3):123–9.
44. Nie NH, Hillygus DS, Erbring L. Internet use, interpersonal relations, and sociability. *The Internet in everyday life*. 2002:215 – 43.
45. Kraut R, Kiesler S, Boneva B, Cummings J, Helgeson V, Crawford A. Internet paradox revisited. *Journal of social issues*. 2002;58(1):49–74.
46. 46.
47. Allavena C, Guimard T, Billaud E, De la Tullaye S, Reliquet V, Pineau S, et al. Prevalence and risk factors of sleep disturbance in a large HIV-infected adult population. *AIDS Behav*. 2016;20(2):339–44.
48. Favrod-Coune T, Broers B. The health effect of psychostimulants: a literature review. *Pharmaceuticals*. 2010;3(7):2333–61.

Figures

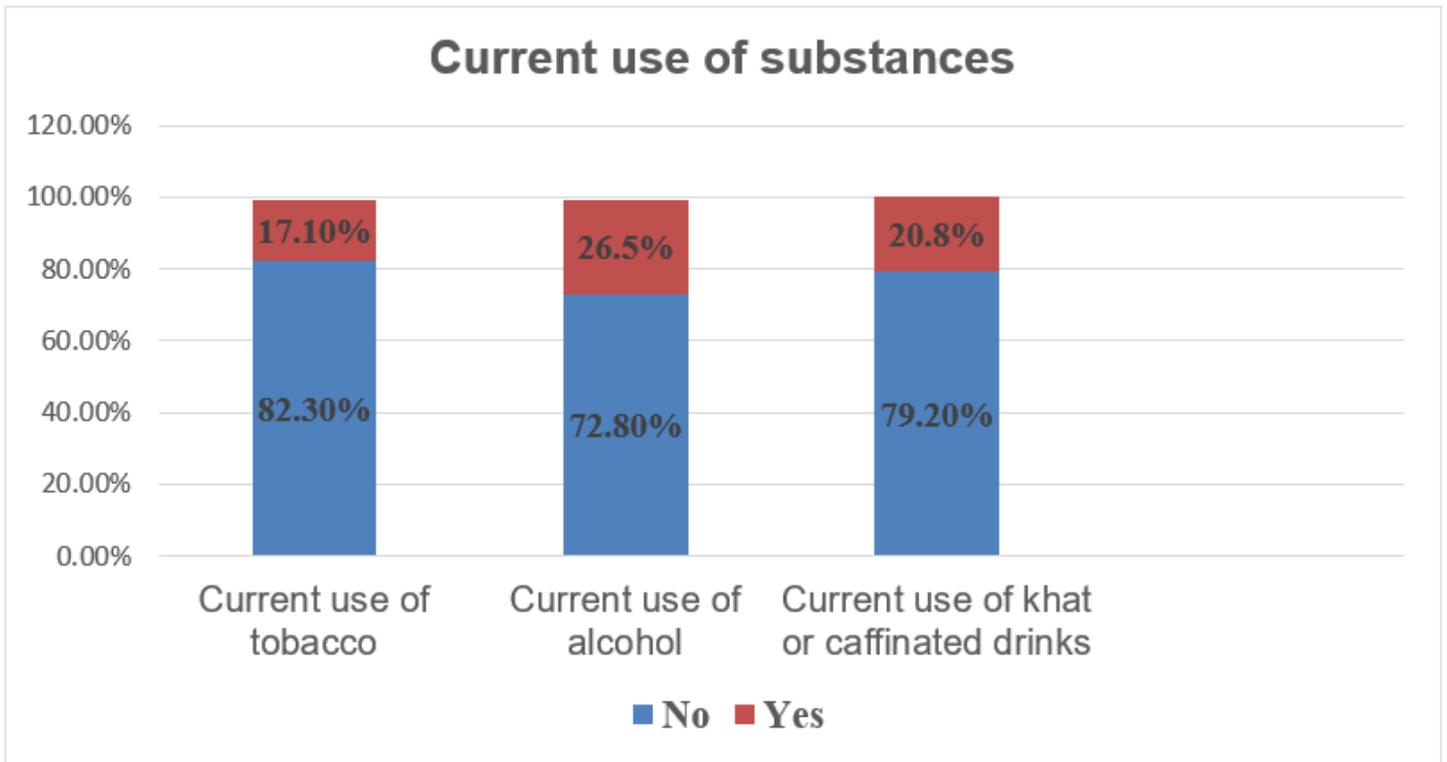


Figure 1

Current use of substances among Dilla university undergraduate students, Dilla, Ethiopia, 2020.(n=761)