Lack of Correlation between Depression and Alcohol use Disorder among College Students in Ethiopia

Mohammedamin Hajure[1]*, Zakir Abdu[1], Mustefa Mohammedhussein[1], Aman Dule[1] and Mandaras Tariku[2]

[1]*Department of Psychiatry, Mettu University, Ethiopia*

[2]*Department of Midwifery, Mettu University, Ethiopia*

Abstract

Background: Prior studies had consistently shown that harmful alcohol use and depression were a common phenomenon among college students and affects them in various ways.

Aim: The study assessed correlation between depression and alcohol consumption and probable predictors of alcohol consumption.

Method: A cross sectional study was conducted in Mettu polytechnic college with a sample of 310 students. Alcohol consumption was measured using the alcohol use disorder identification test. Multivariable logistic regressions and Chi-square test was used to examine relationships between the variables. Pearson correlation was used to observe the correlation of two variables. All tests were two-tailed and p-value <0.05 was considered statistically significant.

Result: Twenty nine percent of college students, (36.2%) male and (20.7%) female suffered from clinically significant alcohol use disorder. Study showed no significant difference between level of depression and alcohol consumption (r (310) =0.015, p=0.793). After controlling for the potential confounders, age ≤ 23 year and poor social support were found to be independent predictors of alcohol use disorder in the final regression model.

Conclusion: Study showed lack of association between depression and alcohol use disorder. However, a substantial proportion of college students were found to drink alcohol at hazardous levels. This finding indicated the need for prompt attention to develop effective intervention strategies which may include prevention policies and educational intervention for college students, their parents and other stakeholders.

Keywords: Alcohol consumption; Depression; College students

Abbreviations

AUDIT: Alcohol Use Disorder Identification Test; BDI-II: Beck Depression Inventory-II; ETB: Ethiopian Birr; SPSS: Statistical Package for Social Science; UK: United Kingdom; US: United States; WHO: World Health Organization

Introduction

College is huge transition for most young people, and issues such as moving away from family member, residing with other person, and reduced family or adult supervision are common phenomena. These changes are often related with increased risks of developing depression, alcohol consumption, and other mental health problems among college students [1,2]. Such transition may become difficult, particularly in the context of developing countries where the living and educational qualities in the college are poor. Previous studies revealed an upsurge both in rates of depression and alcohol use during college period [3,4].

The most commonly used substance among college students is alcohol leading cannabis and tobacco [5]. A recent study conducted among college student in USA indicated that about one in five college students meet the diagnostic criteria for Alcohol Use Disorder (AUD), of which 12.5% and 7.8% met criteria for alcohol dependence and abuse respectively [6].

A number of research demonstrated that harmful and hazardous alcohol consumption contributes to depression [7]. Depression among college students has been linked with academic pressure and disturbed sleep patterns [8], binge drinking [9], and frequency of drunkenness [10],

problematic alcohol use [11], and higher daily alcohol use [12]. It seems that undesirable consequences rather than alcohol use parse, are commonly related with negative effects such as increased worry, tension and melancholy, social phobia, and negative triads [13,14].

Research findings have shown that gender [15], year of study [16], age range from 17 to 20 years, culture of alcohol advertising [17], missing class [18,19] impaired academic achievement [20], risky sexual behavior [19], violence, and socio-economic status [19] have been associated with college drinking.

The findings of harmful use of alcohol were found to be higher in developed countries, estimated to range from 20% in Ireland [21], 34% in Australia [22], and from 2.2% to 14.8% in UK [23] to 37% in New Zealand [24]. However the higher uses of alcohol among young people were also reported from developing countries, including study in Zambia (47%), South Africa (88%) and Tanzania (18%) [25].

There were inconsistent finding from previous studies regarding the linkage between alcohol college drinking and depression with some recent studies indicating lack of association between alcohol use and depressive symptoms [26-29], while other studies have shown association between depressive symptoms and alcohol use, particularly with binge drinking [1,2].

In view of the association between alcohol use and depression among college students, study conducted in Nigeria reported a prevalence rate of major depressive disorder 17.2% and 23.8% among alcohol abuser and alcohol dependent respectively [30].

Previously conducted studies in Ethiopia showed that alcohol was the most commonly used substance by college and university student surpassing khat and tobacco [31-33]. Previous studies have documented a 21.6% to 50% proportion of alcohol use among college students in Ethiopia; however, no studies have examined the correlation between alcohol use and depression.

Given the gaps mentioned in the existing literature, the current study conducted with the purpose of investigating the possible correlation between depression and alcohol use disorder and identifying factors associated with alcohol use disorder among college students in Mettu, Ethiopia.

Materials and Methods

Study design, area and period

A Facility based cross sectional study was carried out in Mettu polytechnic college from June 10th to 30th, 2019. Mettu, Ilu Abba Bor Zone city is situated 600 km far in southwest direction from Addis Ababa, the capital city of Ethiopia.

Study population and Sampling procedure

All students in Mettu polytechnic college were included in the sampling frame and students available during the data collection period were participated in the study. The sample size was determined by using single population proportion formula,

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

Considering the prevalence of alcohol consumption (48.2%) among college students in Ethiopia from prior study [34], confidence level of 95%, marginal error of 5%, and using correction formula and adding 10% non-response rate the final calculated sample size was (n=310).

Systematic random sampling was used to select the study participant. Sampling interval was determined by dividing the total study population (N=1383) to the total sample size (n=310) which was three. A lottery method was used to select the first respondent and the subsequent respondents were chosen every three regular interval.

Data collection procedure and Instrument

Data was collected through self-administered technique. The questionnaire was translated to local language Afaan Oromo and Amharic and then translated back to English by an independent person to check for its consistency.

The instrument consisted of questionnaire to assess Socio-demographic variables, risky sexual behavior, depression, social support and substance use. Alcohol Use Disorder Identification Test (AUDIT) 10 items was used to assess harmful alcohol drinking. The questionnaire uses an overall score to classify drinking levels into four risk levels: Low risk (0-7), risky or hazardous (8-15), harmful (16-19) and high risk (20 and above). The AUDIT score of <8 considered as low risk levels of consumption and ≥ 8 as hazardous levels of alcohol consumption [35]. Cronbach alpha for the AUDIT in this sample was α=0.89.

Depressive symptoms were assessed using the Beck depression Inventory-II [36], which scored on a 4-point Likert scale (0 to 3) and the scores were range from 0 to 63. The scores of BDI-II categorized into levels indicating the severity as follows: Minimally depressed (0-9), mildly depressed (10-19), moderately depressed (20-28) and severely depressed (29 or above). In this study score ≥ 9 on the BDI-II was used to classify those who are risky for depression. The instrument has shown strong internal consistency and constructs validity in previous study [36]. Cronbach alpha for the BDI-II in the current sample was α=0.90. Social support was assessed by OSLO-3 item social support scale [37].

Operational definition

Risky sexual behaviors: When participants reported "YES" to one of the subsequent risky sexual behaviors questionnaires i.e. inconsistent condom use, multiples sexual partners or having sexual intercourse after alcohol drinking.

Social support: Assessed by Oslo 3-item social support scale and categorized as poor (3-8), moderate (9-11) and strong social support (12-14) [37].

Data processing and analysis

Data were checked for completeness, coded, entered to Epi-Data version 3.1 and analyzed by SPSS version 20. The dependent variable was a dichotomous score of low risk drinking and hazardous drinking. Chi-square was used to test the association between explanatory variables and binary score AUDIT. Multivariable logistic regressions were used to determine variables with significant association, and the strength of association was determined using Odds ratio with 95% CI. All analyses were two-tailed and p-value <0.05 was considered significant. Pearson correlation was used to show association between level of depression and alcohol use disorder.

Ethical consideration

The study was carried out after ethical clearance waived from the ethical review committee of college of health sciences, Mettu University. Approval letter was obtained from the head department of psychiatry and permission was obtained from Mettu polytechnic

college administration. Respondents were told about the objectives of the study and requested to participate. Participation was entirely voluntary and written informed consent was obtained from all participants. Confidentiality was kept and all related queries were responded.

Results

Demographic characteristics of study participants

A total of 310 students were participated in this study, of whom 160 (51.6%) were males. Nearly half (n=156, 50.3%) of the students were in the level three followed by the level four study (n=78, 25.2%). More than half of the participants (n=169, 54.5%) were aged 24 year and above and lived in urban area (55.8% n=173). The reported family monthly income was less than 4,567 Ethiopian birr for most of students (Table 1).

Association of alcohol consumption with demographic, clinical and other substance use

The prevalence of hazardous alcohol consumption (score ≥ 8 on AUDIT) was 28.7%, with 36.2% of male and 20.7% of female reported to have a hazardous alcohol intake. Family monthly income, gender, year of study, and age of respondents were shown to have significant association with hazardous levels of alcohol consumption. Khat and tobacco use, risky sexual behavior, social support, family history of chronic physical illness were shown to have significant association with hazardous levels of alcohol consumption (Table 2, 3).

Alcohol consumption and depression

This study examines the association between alcohol use measured through alcohol use disorder identification test and depression, and whether this association differs in terms of different variable i.e. age, gender and level of the study. The finding shows a significantly higher proportion of alcohol consumption among participants with higher rate of depressive symptoms. Furthermore, about 54% and 37% of the participants reported minimal to moderate level and severe level of depression respectively.

Pearson's correlation revealed no significant correlation between depression and alcohol use disorder (r (310) =0.015, p=0.793) (Table 4). After controlling for the confounders, age less than ≤ 23 year, male sex, first year of study, presence of risky sexual behavior and poor social support were shown to have association with hazardous alcohol consumption in the multivariable logistic regression (Table 5).

Discussion

College is a huge transition for most young people, often accompanied by exposure to alcohol drinking and great deal of emotional disturbance such as depression. The current study aims to advance a body of research that target to assess correlation between hazardous alcohol use and depression among the college student. Previous studies conducted in different setting [38-40] showed significant association between depression and alcohol use disorder. In contrast to this, the present study found lack of association between depression and alcohol use disorder, which was also supported by the finding from some previous studies [41]. This might be related to the cultural norms or values of the surrounding communities that may not promote the use alcohol in terms of coping mechanism or resilience to stress or other emotional problems. Despite this, there was a higher prevalence of alcohol use disorders reported among the participants with higher depressive symptoms.

Table 1: Demographic characteristics of study participants (N=310).

Study variables	Response	Frequency (N)	Percentage (%)
Age	≤ 23	141	45.5
	≥ 24	169	54.5
Gender	Male	160	51.6
	Female	150	48.4
Marital status	Married	47	15,2
	Single	263	84.8
Religion	Protestant	130	41.9
	Muslim	89	28.7
	Orthodox	84	27.1
	Other**	7	2.3
Residence	Rural	137	44.2
	Urban	173	55.8
Family monthly income (ETB) ***	<4567.74¶	164	52.9
	>4567.74	146	47.1
Pocket money (ETB)	<629.34¶¶	211	68.1
	>629.34	99	31.9
Year of study	Year I	17	5.5
	Year II	59	19
	Year III	156	50.3
	Year IV	78	25.2
Competency status in the previous semester	Competent	264	85.2
	Not competent	46	14.8

**Catholic, wakefata, ***Current currency 1$=28.98 ETB, ¶Mean of family income per month, ¶¶Mean of pocket money per month

Table 2: Alcohol consumption according to the socio-demographic characteristics of study participant (N=310).

Variables		Alcohol consumption N (%)		X²	p-value*
		Hazardous (n=89)	Low risk (n=221)		
Age	≤ 23	26 (18.4%)	115 (81.6%)	13.32	0
	≥ 24	63 (37.3%)	106 (62.7%)		
Gender	Male	58 (36.2%)	102 (63.8%)	9.186	0.002
	Female	31 (20.7%)	119 (79.3%)		
Marital status	Married	12 (25.5%	35 (74.5%)	0.273	0.601
	Single	77 (29.3%)	186 (70.7%)		
Residence	Rural	49 (28.3%)	124 (71.7%)	0.028	0.866
	Urban	40 (29.2%)	97 (70.7%)		
Family monthly income (ETB) ***	<4567.74¶	55 (33.5%)	109 (66.5%)	3.964	0.046
	>4567.74	34 (23.3%)	112 (76.7%)		
Pocket money (ETB)	<629.34¶¶	58 (27.5%)	153 (72.5%)	0.482	0.488
	>629.34	31 (31.3%)	68 (68.7%)		
Year of study	Year I	3 (17.6)	14 (82.4%)	8.459	0.037
	Year II	25 (42.4%)	34 (57.6%)		
	Year III	37 (23.7%)	119 (76.3%)		
	Year IV	24 (30.8%)	54 (69.2%)		
Competency status in the previous semester	Competent	80 (30.3%)	184 (69.7%)	2.207	0.137
	Not competent	9 (19.6%)	37 (80.4%)		

**Catholic, wakefata, ***Current currency 1$=28.98ETB, ¶Mean of family income per month, ¶¶Mean of pocket money per month, *Chi-square test

Table 3: Alcohol consumption according to the clinical and substance use (other than alcohol) characteristics of study participants (N=310).

Study variables		Alcohol consumption N (%)		X²	P value*
		Low risk (n=221)	Hazardous(n=89)		
Khat use	Yes	45 (57.7)	33 (42.3)	9.416	<0.01
	No	176 (75.9)	56 (24.1)		
Tobacco use	Yes	18 (40.0)	27 (60.0)	25.18	<0.001
	No	203 (76.6)	62 (23.4)		
Risky sexual behavior	Yes	71 (61.2)	46 (38.8)	10.33	<0.01
	No	150 (77.3)	43 (22.7)		
Social support	Good	132 (78.6)	36 (21.4)	9.5	<0.01
	Poor	89 (62.7)	53 (37.3)		
Family history of chronic physical illness	Yes	24 (88.9)	3 (11.1)		
	No	197 (69.6)	86 (30.4)	0.12	0.034
Family history of mental illness	Yes	30 (65.2)	16 (34.8)	0.056	0.324
	No	191 (72.3)	73 (27.7)		

*Chi-square test

The current study showed that 28.7% of the respondents used alcohol hazardously with male 2.8 times more likely to drink alcohol hazardously than female. This was in line with study conducted in Australia [39] United States [15], UK [41], South Africa, Tanzania and Zambia [25] where males have reported drinking alcohol hazardously than females. This might be related Tomen's report of more coping motives compared to women [42].

Finding from previous studies shows a relationship between hazardous use of alcohol and level or year of study [16,43]. This was in agreement with the results of the current study, which showed that higher odds of hazardous alcohol consumption among first year students. This could be related to the fact that, first year college was

a critical time for beginning substance use or for increasing the dose of usage.

Another factor shown to have association with hazardous alcohol use among college student was age. Current studies showed that students aged ≤ 23 year were 2.44 times more likely to use alcohol hazardously compared to those aged ≥ 24 year. This was in agreement with the results of other study were younger students between 17 and 20 years was found to consume alcohol hazardously than their counterparts [17,44,45]. The reason might be described in relation to the experience where young adults more likely to drink alcohol to cope with stress compared to older adults [46].

Furthermore, students with poor social support were 1.2 times

Table 4: Correlation of Beck depression inventory & AUDIT scale (N=310).

		Beck depression score	AUDIT score
Beck depression score	Pearson correlation	1	0.015*
	Sig. (2-tailed)		0.729
	N		310
AUDIT score	Pearson correlation	0.015*	1
	Sig. (2-tailed)	0.729	
	N	310	

*Correlation was non-significant at 0.729, AUDIT: Alcohol use disorder identification test

Table 5: Multivariable analysis of factors associated with hazardous alcohol consumption among college students (N=310).

Study variable	Alcohol consumption		AOR (95% CI)	P-value ‡
	Low risk N (%)	Hazardous use N (%)		
Age				
≤ 23 years	115 (81.6)	26 (18.4)	1	0.04*
≥ 24 years	106 (62.7)	63 (37.3)	1.92 (1.03, 3.57)	
Sex				
Male	108 (65.1)	58 (34.9)	2.76 (1.52, 5.03)	0.001**
Female	113 (78.5)	31 (21.5)	1	
Year of study				
Year I	14 (84.2)	3 (17.6)	3.26 (1.19, 8.85)	0.021*
Year II	34 (57.6)	25 (42.4)	2.03 (0.87,4.76)	0.102
Year III	119 (76.3)	37 (23.7)	1.02 (0.51,2.05)	0.948
Year IV	54 (69.2)	24 (30.8)	1	
Risky sexual behavior				
Yes	71 (60.7)	46 (39.3)	1.77 (1.00-3.12)	
No	150 (77.7)	43 (22.3)	1	0.05*
Social support				
Poor	89 (62.7)	53 (37.3)	1.93 (1.09-3.38)	0.022**
Good	132 (78.6)	36 (21.4)	1	

AOR: Adjusted Odds Ratio, CI: Confidence Interval, *p <0.05, **p < 0.01, 1: Reference group
‡ Adjusted for age, risky sexual behavior, social support, gender, year of study, family history of illness, khat use, tobacco use and family monthly income

more likely to use alcohol compared to those with good social support which was in line with the report of the earlier study [44]. One possible explanation for this finding is that college drinkers are more likely to consume for social enhancement in response to lack of socialization [47].

The current study demonstrated association of risky sexual behavior and hazardous level of alcohol use which was supported by previous research findings [48]. This was in line with the report that showed students who drink alcohol are more likely to involve in risky sexual behavior which may lead to HIV infection [49].

Limitations

The nature of the cross-sectional study could not explore the cause-effect association among variables. The possibility of recall bias might exist because of the retrospective nature of some of the study variables. Furthermore the study was not assessed the effects of other co-occurring psychiatric illness like anxiety or stress which might overrate or underrate the observed associations.

Conclusion

The study showed lack of association between depression and alcohol use disorder. However, a substantial proportion of college students were found to drink alcohol at hazardous levels. Age ≤ 23 year and poor social support were found to be independent predictors of alcohol use disorder in the final regression model. This finding indicated the need for prompt attention to develop effective intervention strategies which may include policies and educational intervention for college students, their parents and other stakeholders.

Acknowledgement

Authors are thankful for Mettu University College of health sciences, psychiatry department, Mettu polytechnic college, and study participants and data collectors.

Ethical Consideration

The study was carried out after ethical clearance waived from the ethical review committee of college of health sciences, Mettu University. Approval letter was obtained from the head department of psychiatry and permission letter was obtained from Mettu technical vocational education training college dean office. Respondents were told about the objectives of the study and requested to participate. Participation was entirely voluntary and written informed consent was obtained from all participants. Confidentiality was kept and all related queries were responded.

References

1. Murphy JG, Hoyme CK, Colby SM, Borsari B. Alcohol consumption, alcohol-related problems and quality of life among college students. J Coll Stud Dev. 2006;47(1):110-21.

2. Hingson R, Heeren T, Winter M, Wechsler H. Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18-24: Changes from 1998 to 2001. Ann Rev Public Health. 2005;26:259-79.

3. Geisner IM, Mallett K, Kilmer JR. An examination of depressive symptoms and drinking patterns in first year college students. Issues Ment Health Nurs. 2012;33(5):280-7.

4. Mackenzie S, Wiegel JR, Mundt M, Brown D, Saewyc E, Heiligenstein E, et al. Depression and suicide ideation among students accessing campus healthcare. Am J Orthopsychiatry. 2011;81(1):101-7.

5. Patrick ME, Schulenberg JE. Prevalence and predictors of adolescent alcohol use and binge drinking in the United States. Alcohol Res. 2013;35(2):193-200.

6. Slutske WS. Alcohol use disorders among US college students and their non-college-attending peers. Arch Gen Psychiatry. 2005;62(3):321-7.

7. Boden JM, Fergusson DM. Alcohol and depression. Addiction. 2011;106(5):906-14.

8. Said D, Kypri K, Bowman J. Risk factors for mental disorder among university students in Australia: Findings from a web-based cross-sectional survey. Soc Psychiatry Psychiatr Epidemiol. 2013;48(6):935-44.

9. Marmorstein NR, Iacono WG, Malone SM. Longitudinal associations between depression and substance dependence from adolescence through early adulthood. Drug Alcohol Depend. 2010;107(2-3):154-60.

10. Hoel S, Eriksen BM, Breidablik HJ, Meland E. Adolescent alcohol use, psychological health, and social integration. Scand J Public Health. 2004;32(5):361-7.

11. Dvorak RD, Lamis DA, Malone PS. Alcohol use, depressive symptoms, and impulsivity as risk factors for suicide proneness among college students. J Affect Disord. 2013;149(1-3):326-34.

12. Pedrelli P, Nyer M, Yeung A, Zulauf C, Wilens T. College students: Mental health problems and treatment considerations. Acad Psychiatry. 2015;39(5):503-11.

13. Lewis BA, O'Neill HK. Alcohol expectancies and social deficits relating to problem drinking among college students. Addict Behav. 2000;25(2):295-9.

14. Kassel JD, Jackson SI, Unrod M. Generalized expectancies for negative mood regulation and problem drinking among college students. J Stud Alcohol. 2000;61(2):332-40.

15. Abbey A, Buck PO, Zawacki T, Saenz C. Alcohol's effects on perceptions of a potential date rape. J Stud Alcohol. 2003;64(5):669-77.

16. Prendergast ML. Substance use and abuse among college students: A review of recent literature. J Am Coll Health. 1994;43(3):99-113.

17. Mphele SBM, Gralewski C, Balogun S. Stress and alcohol use among college students: A case of molepolole college students. IOSR J Humanit Soc Sci. 2013;8(3):1-6.

18. Brandão YST, Correia DS, de Farias MSJA, Antunes TMT, da Silva LA. The prevalence of alcohol consumption among the students newly enrolled at a public university. J Pharm Bioallied Sci. 2011;3(3):345-9.

19. Newbury-Birch D, White M, Kamali F. Factors influencing alcohol and illicit drug use amongst medical students. Drug Alcohol Depend. 2000;59(2):125-30.

20. Cai S. Acculturation and alcohol drinking behavior among Chinese international university students in the Midwest. Public access theses and dissertations from the college of education and human sciences. University of Nebraska; 2015.

21. Davoren MP, Demant J, Shiely F, Perry IJ. Alcohol consumption among university students in Ireland and the United Kingdom from 2002 to 2014: A systematic review. BMC Public Health. 2016;16:173.

22. Hallett J, Howat PM, Maycock BR, McManus A, Kypri K, Dhaliwal SS. Undergraduate student drinking and related harms at an Australian university: Web-based survey of a large random sample. BMC Public Health. 2012;12:37.

23. Heather N, Partington S, Partington E, Longstaff F, Allsop S, Jankowski M, et al. Alcohol use disorders and hazardous drinking among undergraduates at English Universities. Alcohol Alcohol. 2011;46(3):270-7.

24. Kypri K, Paschall MJ, Langley J, Baxter J, Cashell-Smith M, Bourdeau B. Drinking and alcohol-related harm among New Zealand university students: findings from a national web-based survey. Alcohol Clin Exp Res. 2009;33(2):307-14.

25. MWANSA A. Nkowane, Lee Rocha-Silva, Shekhar Saxena, Joseph Mbatia Pnagw-S. Psychoactive substance use among young people: Findings of a multi-center study in three African countries. Federal Legal Publications. 2004;329-56.

26. Valentiner DP, Mounts NS, Deacon BJ. Panic attacks, depression and anxiety symptoms, and substance use behaviors during late adolescence. J Anxiety Disord. 2004;18(5):573-85.

27. Monahan CJ, Bracken-Minor KL, McCausland CM, McDevitt-Murphy ME, Murphy JG. Health-related quality of life among heavy-drinking college students. Am J Health Behav. 2012;36(3):289-99.

28. McDevitt-Murphy ME, Fields JA, Monahan CJ, Bracken KL. Drinking motives among heavy-drinking veterans with and without posttraumatic stress disorder. Addict Res Theory. 2015;23(2):148-55.

29. Kenney SR, Lac A, Labrie JW, Hummer JF, Pham A. Mental health, sleep quality, drinking motives, and alcohol-related consequences: A path-analytic model. J Stud Alcohol Drugs. 2013;74(6):841-51.

30. Adewuya AO. Prevalence of major depressive disorder in Nigerian college students with alcohol-related problems. Gen Hosp Psychiatry. 2006;28(2):169-73.

31. Aklog T, Tiruneh G, Tsegay G. Markos Poly Technique College in Debre. Glob J Med Res. 2013;13(4).

32. Teferra S. Substance use among university students in Ethiopia: A systematic review and meta-analysis. Ethiop J Heal Dev. 2018;32(4):265-77.

33. Birega MG, Addis B, Agmasu M, Tadele M. Descriptive study on magnitude of substance abuse among students of Aman poly technique college students, bench Maji zone south west Ethiopia. J Addict Res Ther. 2017;8(3):320.

34. Yismaw S, Kebede H. Prevalence and associated factors of alcohol consumption among college students in Gondar town, Northwest Ethiopia. Sci J Public Heal. 2015;3(4):453-9.

35. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption--II. Addiction. 1993;88(6):791-804.

36. Toledano-Toledano F, Contreras-Valdez JA. Validity and reliability of the Beck Depression Inventory II (BDI-II) in family caregivers of children with chronic diseases. PLoS One. 2018;13(11):e0206917.

37. Dalgard OS, Dowrick C, Lehtinen V, Vazquez-Barquero JL, Casey P, Wilkinson G, et al. Negative life events, social support and gender difference in depression: A multinational community survey with data from the ODIN study. Soc Psychiatry Psychiatr Epidemiol. 2006;41(6):444-51.

38. Grant BF, Harford TC. Comorbidity between DSM-IV alcohol use

disorders and major depression: Results of a national survey. Drug Alcohol Depend. 1995;39(3):197-206.

39. Ross HE. DSM-III-R alcohol abuse and dependence and psychiatric comorbidity in Ontario: Results from the mental health supplement to the Ontario health survey. Drug Alcohol Depend. 1995;39(2):111-28.

40. Kessler RC, Crum RM, Warner LA, Nelson CB, Schulenberg J, Anthony JC. Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the national comorbidity survey. Arch Gen Psychiatry. 1997;54(4):313-21.

41. Geisner IM, Larimer ME, Neighbors C. The relationship among alcohol use, related problems, and symptoms of psychological distress: gender as a moderator in a college sample. Addict Behav. 2004;29(5):843-8.

42. Park CL, Levenson MR. Drinking to cope among college students: Prevalence, problems and coping processes. J Stud Alcohol. 2002;63(4):486-97.

43. Turrisi R, Mallett KA, Mastroleo NR, Larimer ME. Heavy drinking in college students: Who is at risk and what is being done about it? J Gen Psychol. 2006;133(4):401-20.

44. Abbey A, Smith MJ, Scott RO. The relationship between reasons for drinking alcohol and alcohol consumption: An interactional approach. Addict Behav. 1993;18(6):659-70.

45. Sutherland I, Shepherd JP. Social dimensions of adolescent substance use. Addiction. 2001;96(3):445-58.

46. Lowry R, Kann L, Collins JL, Kolbe LJ. The effect of socioeconomic status on chronic disease risk behaviors among US adolescents. JAMA. 1996;276(10):792-7.

47. Neighbors C, Larimer ME, Lewis MA. Targeting misperceptions of descriptive drinking norms: Efficacy of a computer-delivered personalized normative feedback intervention. J Consult Clin Psychol. 2004;72(3):434-47.

48. Cooper ML. Alcohol use and risky sexual behavior among college students and youth: Evaluating the evidence. J Stud Alcohol Suppl. 2002;(14):101-17.

49. Weinhardt LS, Carey MP. Does alcohol lead to sexual risk behavior? Findings from event-level research. Annu Rev Sex Res. 2000;11:125-57.