



ALCOHOL DRINKING HABITS AND ITS LEADING FACTORS OF UNDERGRADUATE STUDENTS USING CROSS-SECTIONAL STUDY DESIGN

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Alcohol-related leading factors are prevalent, and the important public health problem. Alcohol has represented the issue of the global burden of disease. Alcohol consumption requires a consideration of the amount of alcohol consumed and drinking habits. Thus, the primary objective of this study was to determine the leading factor of the alcohol drinking habits of undergraduate students at Mizan-Tepi University, Ethiopia.

Methods: The sample of 116 students interviewed and selected by using a stratified random sampling technique. The data were collected by using self-structured questionnaires. The Binary logistic regression model was correctly fitted the data and the Hosmer-Lemeshow test was used to test the goodness of fit of the model. SPSS statistical software version 20 was used to analyze the data and a cross-tab table was used to summarize the descriptive statistics and chi-square test of independence.

Result: Out of one hundred sixteen sampled students, sixty-two (53.4%) of students have alcohol drinking habit and fifty-four (46.6%) of students have not alcohol drinking habit. The chi-square test showed that gender of an individual (p -value=0.039), departments (p -value=0.009) and initiation (p -value=0.009) were significantly associated with alcohol drinking habit of students in Mizan-Tepi University at 5 % level of significance. The odds ratio of the mathematics department is 0.0076 times less likely to have alcohol-drinking habits as compared to biology department when all other variables are remaining constant. The study shows that alcohol-drinking habit of students is high.

Keywords: Alcohol drinking habit; logistic regression; odds ratio; chi-square test.

LIST OF ABBREVIATIONS

ARH : Alcohol-Related Harm

MTU : Mizan-Tepi University

OR : Odd Ratio

1. INTRODUCTION

The university years do not only involve personal growth and intellectual development. They are also a period in which many students consume large

quantities of alcohol and experience several associated adverse effects [1]. Alcohol use and associated alcohol-related harm (ARH) are among the most prevalent and important public health problems

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plaguing this generation [2]. Alcohol is a chemical substance that affects the process of mind or body. People begin taking alcohol for various reasons such as to feel good to better and to find out what it is like and to fit the consumption of a small amount of alcohol leads to a sense of wellbeing and relaxation [3].

Available research indicates that approximately 80% of college students drink and that half of college student drinkers engage in heavy episodic drinking. Furthermore, the institutions they attend expend valuable resources to deal with institutional and personal consequences of their behavior [4]. College presidents and research scientists were put together to ensure that the product will at the same time contribute to the scientific basis for addressing college drinking and will be relevant to the practical challenges faced by college administrators. The task force was charged with integrating available scientific research with experiences reported by administrators, service providers and students [5].

Both alcohol consumption and consumed alcoholic beverage types and socio-demographic relationships are aimed to be revealed. Significant differences were found in socio-demographic relationships with alcohol consumption and alcoholic beverages in India [6]. The study aimed to determine the factors associated with parents' belief in the appropriateness of giving alcohol to minors. The parents of Western Australia study surveyed their alcohol use habits and their behaviors, beliefs and attitudes, and their children's alcohol consumption and demographic characteristics [7].

Drinking on college campuses may seem to be entrenched and impervious to intervention; however, it is potentially modifiable with carefully targeted approaches endorsed by all stakeholders including students [8]. A rate of alcohol use among college/university students is growing, for example, alcohol use among students of the university Sao Paulo Brazil between 1996 and 2001 showed an increase from 88.6% to 92% it also continues to be the most prevalent problem among college student in the United States [9]. About 40.5% did something that caused them to regret while someone they know criticized 32.3% local surveys among university students in South Africa showed the presence of higher level of risky drinking than in the national survey. In the year 1998, the pattern of use of alcohol chat and cigarette among 479 medical and Para was studied [10]. A study conducted in 2017 for era districted North West Ethiopia indicates 70.67% alcohol use and 50.6% chat chewing most students to this substance manly for a family relative reason and

peer perjure. Another study was conducted fawn indicated that students with digressive symptoms where more like to report alcohol consumption [11].

Alcohol causes the deterioration of the central nervures system with actual brain shrinkage in the male the part of the central nervure system controlling libido may be permanently destroyed. Many alcohols have limited food intake and suffer frame vitamin B group deficiency in pregnancy heavy drinking can result in cottontail damage to the feats known as fetal alcohol syndrome [12]. Alcohol is artificially recognized to be a teratogen, besides economic impacts. The cumulative effect of alcohol consumption has the potential to influence human behavior alcohol lowers self-esteem. This can result in destructive worthless feelings. Individual that drink is at risk of conflicts with family, friends, and co-work. Alcoholic drinking is expensive and can run away a large part of the family budget. Gambling and problem gambling were also significantly associated with Bing drinking alcohol abuse and heavy or problem drinking [13].

2. METHODS

The study was conducted at Mizan-Tepi University, Tepi Campus. It is located 612 km southwest of National capital, Addis Ababa and about 852 kilometers from the regional capital Hawassa. Mizan-Tepi University (MTU), Tepi campus was established for teaching-learning activities in the 2007 GC as a University in Ethiopia.

2.1 Study Design

Cross-sectional study design was carried out. The target population for this study would be conducted on all undergraduate Natural and Computational Sciences students, 2020 in the Gregorian calendar in Mizan Tepi University, Tepi Campus, Ethiopia. Stratified Random Sampling was used. The sample size calculated with the help of the formula [14].

$$n = \frac{n_o}{1 + \frac{n_o}{N}}$$

Where $n_o = (Z_{\alpha/2})^2 \frac{pq}{d^2}$
 $Z_{\alpha/2} = Z_{0.025} = 1.96$, at $\alpha = 0.05$, where α is level of significance
 $d =$ Marginal error = 0.08
 $P = 0.5$ is taken (maximum variation among students on alcohol drnking \square abit).
 $Q =$ Proportion of failure, $1 - P = 0.5$

Table 1. Proportion of Sample Allocation

Sample Stratum	Department	Population stratum	$n_i = \frac{n \cdot N_i}{N}$
n_1	Biology	$N_1=88$	20
n_2	Chemistry	$N_2=92$	21
n_3	Mathematics	$N_3=40$	10
n_4	Physics	$N_4=42$	10
n_5	Sport science	$N_5=55$	13
n_6	Statistics	$N_6=83$	19
n_7	Geology	$N_7=100$	23

$$n_o = (1.96)^2 \frac{0.5 * 0.5}{(0.08)^2} = 150,$$

$$\text{and then } \frac{n_o}{N} = \frac{150}{500} = 0.3 > 0.05.$$

So it needs adjustment , $n = \frac{n_o}{1 + \frac{n_o}{N}}$, $n = \frac{150}{1 + 150/500} = 116$

Table 1: Shows that the proportional sample allocation for each department since the number of students for each department is different. Administered questionnaires with the interview were used to collect the data.

A chi-square test is used to test the association between independent variables and alcohol drinking habits of students [15].

2.2 Binary Logistic Regression Model

It is a procedure for finding the mathematical function that is best describes the relationship between the dependent and one or more independent variables. Model formulation:

$$\ln \left(\frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots \dots \dots \beta_k X_{ki} \tag{1}$$

$$P_i / 1 - P_i = \exp (\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots \dots \dots \beta_k X_{ki}) \tag{2}$$

where: P_i is the probability of success; $1 - P_i$ is the probability of failure , β_0 is constant term, β regression coefficients, and X_i are independent variables.

2.3 Parameter Estimation for Logistic Regression

To estimate the parameters of logistic regression model, maximum likelihood estimation methods are mostly used. In this study, the maximum likelihood estimation technique would be applied to estimate the

parameters of the model. Consider the logistic regression function.

$$P(x_i) = \frac{e^{X_i' \beta}}{1 + e^{X_i' \beta}} \tag{3}$$

since observe values of Y say, Y_i 's ($i=1, 2 \dots n$) are independently distributed as Bernoulli, the maximum likelihood function of Y is given by:

$$L(\beta / y) = \prod_{i=1}^n P(y_i | X_i')$$

$$= \prod_{i=1}^n \left[\frac{e^{X_i' \beta}}{1 + e^{X_i' \beta}} \right]^{y_i} \left[\frac{1}{1 + e^{X_i' \beta}} \right]^{(1-y_i)}$$

The objective of ML estimation is to get an estimator $\hat{\beta} = (\hat{\beta}_0, \hat{\beta}_1, \hat{\beta}_2, \dots, \hat{\beta}_k)$ of β which maximizes the likelihood function expressed in equation (4). Since the likelihood equation is non- linear in the parameters [1]

3. RESULTS

The data were presented in Table 2 below showed that, among sampled students, sixty-two (53.4%) of the students have alcohol drinking habits and fifty-four (46.6%) of the students did not have alcohol drinking habit.

Table 3 shows the cross-tab and chi-square test of independence of students for their alcohol drinking habits. Among all sampled fifty (41.6%) female students, twenty-two (16.9%) of students have alcohol drinking habit while twenty-eight (24.7%) of students have no alcohol drinking habit; among sixty-six (58.4%) male students, forty-one (37.7%) of student have alcohol drinking habit while sixteen (20.7) students have no alcohol drinking habit. Likewise, among one hundred sixteen sampled students fifty

(41.6%) of students whose previous place of residence were urban, twenty-three (18.2%) have alcohol drinking habit and twenty-seven (23.4%) of students have no alcohol drinking habit; among sixty-six (58.4%) of students who comes from rural, forty (36.4) students have alcohol drinking habit, and twenty-six (22.0%) student have no alcohol drinking habit.

Table 2. Prevalence of Alcohol Drinking Habit of Students (summary of outcome variable)

Drinking habit	Number of student(n=116)	Percent
Alcohol drinking habit	62	53.4
Did not alcohol drinking	54	46.6
Total	116	100.00

Table 3. Summary of socio-demographic factors and chi-square test of independence

Variables	Categories	Drinking habit of alcohol		Total (%)	Chi square	P value
		No (%)	Yes (%)			
Age	20-22	24(23.4)	29(29.8)	53(53.2)	1.915	0.384
	23-25	12(7.8)	9(3.9)	21(11.7)		
	>25	17(14.3)	25(20.8)	42(35.1)		
Religion	Orthodox	14(15.6)	12(10.4)	26(26.0)	4.621	0.329
	Muslim	14(13.0)	14(13.0)	28(26.0)		
	Protestant	7(3.9)	13(11.7)	20(15.6)		
	Catholic	10(7.8)	11(9.1)	21(16.9)		
	Other	9(5.2)	12(10.4)	21(15.6)		
Sex	Female	28(24.7)	22(16.9)	50(41.6)	4.820	0.039
	Male	25(20.7)	41(37.7)	66(58.4)		
Resident	Urban	27(23.4)	23(18.2)	50(41.6)	2.574	0.109
	Rural	26(22.0)	40(36.4)	66(58.4)		
Income	<500	23(18.2)	32(29.9)	55(48.1)	1.667	0.197
	500-1000	31(27.2)	30(24.7)	61(51.9)		
Initiation	Friends	9(5.2)	23(24.7)	32(29.9)	11.602	0.009
	Environment	17(15.6)	16(14.3)	33(29.9)		
	Family case	13(10.4)	12(9.1)	25(19.5)		
	Other	16(14.3)	10(6.5)	26(20.8)		
Department	Biology	10(9.1)	8(7.8)	18(16.9)	17.021	0.009
	Statistics	12(11.7)	7(5.2)	19(16.9)		
	math's	6(3.9)	6(3.9)	12(7.8)		
	Chemistry	12(11.7)	8(7.8)	20(19.5)		
	Sport	0(0.0)	10(7.4)	10(7.4)		
	Physics	7(6.2)	5(4.6)	15(10.8)		
	Geology	6(3.9)	16(16.9)	22(20.8)		
	Other	6(3.9)	16(16.9)	22(20.8)		
Mother Education	Illiteracy	23(24.7)	22(22.1)	45(46.8)	1.704	0.636
	Primary	9(5.2)	11(7.8)	20(13.0)		
	Secondary	15(13.0)	22(22.1)	37(35.1)		
	Above	7(2.6)	7(2.6)	14(5.2)		
Father Education	Illiteracy	14(10.4)	19(16.9)	33(27.3)	3.800	0.284
	Primary	18(15.6)	16(13.0)	34(28.6)		
	Secondary	22(19.5)	23(20.8)	45(40.3)		
	Above	0(0.0)	4(3.9)	4(3.9)		
Types of Alcohol	Tela	10(7.8)	15(14.3)	25(22.1)	8.188	0.085
	Tej	16(15.6)	24(26.0)	40(41.6)		
	Areke	10(7.8)	6(3.9)	16(11.7)		
	Bear	6(2.6)	9(6.5)	15(9.1)		
	Other	13(11.7)	7(3.9)	20(15.6)		

It is clearly seen in Table 3, sex of individual (p-value <0.05), departments (p-value<0.05) and initiation (p-value<0.05) are significantly associated with alcohol drinking habit.

Table 4. Hosmer and Lemeshow test

Chi-square	Df	Sig.
3.980	8	0.859

Based on Table 4, p-value (0.859) is greater than the α -value then do not reject the Hosmer and Lemeshow from the above output indicating there is sufficient evidence for the model is fitting the data adequately.

The fitted model is log *it* (π)

$$\begin{aligned}
 &= 21.605 - 9.574_{statistics} \\
 &- 12.8_{Mat\mathbb{m}atics} \\
 &- 9.36_{sport\ science} \\
 &+ 4.452_{500-1000\ birr} + 6.945_{Teji} \\
 &+ 8.007_{areki} \\
 &+ 8.319_{environmental\ factor})
 \end{aligned}$$

The log odd type of alcohol is 6.945 indicates a direct positive relationship between alcohol drinking habits of students and types of alcohol. The odds ratio Teji is 1030.3 times more likely to affect alcohol-drinking habit of undergraduate students as compared to Tela when all other variables remain constant.

The log odds of income is 4.452 indicates that a direct relationship between alcohol drinking habit of

undergraduate students and income status. The odds ratio (OR) of income between (500-1000) is 35.788 times more likely to affect the alcohol drinking habit of undergraduate students compared to those their income is <500 when all other variables remain constant. The odds ratio of initiation of alcohol drinking habit is 14.357 times more likely to affect the alcohol drinking habit of undergraduate students as compared initiation of friends when all other variables remain constant.

4. DISCUSSIONS

The finding revealed that the prevalence of alcohol drinking habit among students in the university is 53.4 and it is too much high as compared to the study done on high school students in Ethiopia, Dire Dawa showed that the current alcohol drinking habit is 34.5% and 19.6%. In addition, a similar study reported in the Ethiopian Demographic and Health Survey, the prevalence of alcohol drinking status is 35 % [16]. This indicated that the issue needs intervention and a special controlling management system in the university or study area is mandatory.

The current study also a high prevalence of alcohol drinking as compared to the study done among secondary school students in Ambo Town and its prevalence of alcohol drinking is 35.4% [17] and it is a challenge that needs quick response due to the alarming rate of involvement young students [18]. [19], the prevalence of alcohol abusers in secondary school students (54%) in Kisumu Town, East Kenya

Table 5. Parameter estimates of binary logistic regression model `

Variables	Estimates (Sd.error)	df	Wald test
Departments		6	5.689
Statistics	-9.574(4.753)*	1	4.058
Mathematics	-12.880(5.931)*	1	4.717
Chemistry	-7.265(6.383)	1	1.295
Sport science	-9.360(4.604)*	1	4.133
Physics	21.387(9862.093)	1	.000
Geology	-7.857(4.130)	1	3.619
500-1000 birr	4.452(2.157)*	1	4.261
Types of alcohol		4	6.285
Teji	6.945(3.096)*	1	5.034
Areki	8.007(3.988)*	1	4.031
Bear	8.164(5.146)	1	2.517
Others	8.676(4.437)	1	3.823
Initiation concerns		3	7.257
Environment factor	8.319(3.233)*	1	6.621
Family case	3.774(2.424)	1	2.423
Other factors	-3.140(2.677)	1	1.376
Constant	21.605(18418.425)	1	.000

is highly related to the current study. Up to 35% of the alcohol, abusers in Pakistan reported their parents are also abusing drugs [20], according to the US national survey; 78% of adolescents used alcohol. Out of these, 47% reported regularly drinking alcohol [21], one study conducted at large scale in Maryland, USA, reported that 28% of adolescents exposed to movies depicting alcohol use or involved in alcohol-related marketing activities [22]. The study done in Axum University where about 608 (80.4%) of the respondents were aware of problems or complications that could arise from alcohol [23], also study was done among Addis Ababa University, Medical students which are the prevalence of alcohol drinking in the last 12 months was 7% [24]. Thus, the finding showed that the prevalence of alcohol drinking habit is more prevalent as compared to the study done in Pakistan, Maryland, USA report, and Addis Ababa University; however, it is less prevalent than the study done in US national survey and Axum University.

From this finding, the proportion of alcohol consumption by urban was lower as relative to the rural respondents since eighteen percent of respondents have used alcohol while thirty-six percent of rural respondents have used. This implies that rural respondents are two times consuming alcohol as compared to urban respondents. This study is consistent with the study done in South-East Asia New Delhi, India [25], which is surprising those rural respondents (1.8%) which large proportion of urban women alcohol users (0.5%) thus seem quite disproportionate to the actual problem, which is commonly observed in urban areas. The relatively low proportion maybe because the sampled urban area is a conservative middle-class locality.

Consumption of alcohol, conducted in Mizan Tepi University, estimate the prevalence of alcohol use as thirty-seven percent of males and sixteen percent of all females. The current study supported that the research done by Benegal et al [26], which estimated the prevalence of alcohol use as thirty percent of all adult males in the state and about one percent of all adult females. If one considers the fact that in many communities consumption of locally used alcohol is a tradition and a way of life, the reported abstinence maybe for only alcohol that is purchased as well as community perception of genders. This finding is similar across the study done on National experiences in India [27].

From all sampled students, 53.4 % of respondents have used alcohol at Mizan-Tepi University, in the case of College of Natural and Computational Science undergraduate students and which indicates that college students drink and that half of college student

drinkers engage in heavy episodic drinking. Students who engage in excessive drinking influence, not just themselves rather than fellow students experience second-hand consequences ranging from disrupted study and sleep to physical and sexual assault. Furthermore, the institutions they attend expend valuable resources to deal with institutional and personal consequences of their behavior [28].

In this finding the study found that the difference in gender had a $p < 0.05$ (p-value is 0.039) hence, meaning that gender deference does have any significant value with reference of alcohol abuse among the students and the age of the student did not have any significant association with the drinking of alcohol. Thus, the current study contradicts with the study with the study done in alcohol abuse among Egerton University Students in Njoro-Kenya [29].

Traditional drinks such as Araki, Teji, Tela and beer were commonly used by students those who came different residence. The aforementioned drinks, Teji, Tela and Areki are traditionally prepared and substitute the modern drink types like Wuski, Woine, Beer, and extra were produced by factories at large. However, the student drinking habit increased on traditional drinks and the current study is comparatively consistent with WHO reports [30]. The association between frequency of drinking and ARH is presented in Table 3. Crude analysis, showed strong significant and positive associations between more frequent drinkers of the sex of individuals [31].

5. CONCLUSION

The study used to assess the leading factors to alcoholism among undergraduate students in the College of Natural and Computational Science at Mizan-Tepi University. The findings showed that the majority of college students have an alcohol drinking habit. This may indicate that there is an impact of students on the learning and teaching process at the University. It may have social, economic and political impacts at the country level. In the chi-square test, there is no significant association between alcohol drinking habits of undergraduate students with age, religion, place of the previous residence, income per month get from family, types of alcohol, father education level, and mother education level at 5% level of significance. Thus, it concluded that there is an association to explore the leading factors to alcoholism among undergraduate students with sex individuals, departments and drinking initiation at a 5% level of significance. In the binary logistic regression analysis, income per month get from family, types of drinking alcohol and initiation are the major influential factor that affects alcohol-

drinking habit of undergraduates' students in the University.

ETHICAL APPROVAL AND CONSENT

The study and the questionnaires were checked by department examiners as a committee before collecting the data. The survey data were collected from respondents those who were volunteer to give information. Respondents' written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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