

# Alcohol Drinking Habits and Its Leading Factors of Undergraduate Students: Using Cross-Sectional Study Design

Solomon Abebaw Andargie\*, Assaye Belay Gelaw

Department of Statistics, Mizan-Tepi University, Tepi, Ethiopia

## Email address:

[solabew@gmail.com](mailto:solabew@gmail.com) (S. A. Andargie), [abstat23@gmail.com](mailto:abstat23@gmail.com) (A. B. Gelaw)

\*Corresponding author

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**Abstract:** 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. The sample of 77 students were 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. Out of 77 sampled students, forty-two (54.55%) of students have alcohol drinking habit and thirty-five (45.45%) of students have not alcohol drinking habit. The chi-square test showed that gender of an individual ( $p\text{-value}=0.039<0.05$ ), departments ( $p\text{-value}=0.009<0.05$ ) and initiation ( $p\text{-value}=0.009<0.05$ ) were significantly associated with alcohol drinking habit of students in Mizan-Tepi University, in case of Tepi Campus, Ethiopia 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 and the study concluded that alcohol-drinking habit of students is high.

**Keywords:** Alcohol Drinking Habit, Logistic Regression, Odds Ratio

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## 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 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]. Another study was conducted in 2007 for era districted North West Ethiopia indicates 70.67% alcohol use and 50.6% chat chewing most students to this substance mainly 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 Grambling 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 or started teaching-learning activities in the 2007 Gregorian calendar as a University in Ethiopia. The establishment of the University is alone with government policy and expanding quality higher education and ensuring its equitable distribution across the country.

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, 2019 in the Gregorian calendar in Mizan Tepi University, Tepi Campus, Ethiopia. Stratified Random Sampling was used. The sample size is calculated with the help of the formula [14].

$$n = \frac{n_o}{1 + \frac{n_o}{N}}, \text{ Where } n_o = (Z_{\alpha/2})^2 \frac{pq}{d^2} \quad (1)$$

$$Z_{\alpha/2} = Z_{0.025} = 1.96 \text{ at } \alpha = 0.05, \text{ where}$$

$\alpha$  is level of significance

$$d = \text{Marginal error} = 0.1$$

$P = 0.5$  is taken (maximum variation among students on alcohol drnking habit).

$$Q = \text{Proportion of failure, } 1 - P = 0.5$$

$$n_o = (1.96)^2 \frac{0.5 * 0.5}{(0.1)^2} = 96, \text{ and then } \frac{n_o}{N} = \frac{96}{400} = 0.24 > 0.05.$$

$$\text{So it needs adjustment, } n = \frac{n_o}{1 + \frac{n_o}{N}}, n = \frac{96}{1 + 96/400} = 77$$

and the Proportion sample allocation:  $n_i = n * N_i / N, i = 1, 2, 3, 4, 5, 6, 7$ .

Table 1. Proportion of Sample Allocation.

Sample Stratum	Department	Population stratum	$n_i = \frac{n * N_i}{N}$
$n_1$	Biology	$N_1=74$	13
$n_2$	Chemistry	$N_2=78$	15
$n_3$	Mathematics	$N_3=26$	6
$n_4$	Physics	$N_4=28$	6
$n_5$	Sport science	$N_5=41$	8
$n_6$	Statistics	$N_6=69$	13
$n_7$	Geology	$N_7=84$	16

Table 1: Showed 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.

Dependent variable: status Alcohol Drinking habit:  
 $Y = \begin{cases} 1, \text{ took any alcohol} \\ 0, \text{ other wise} \end{cases}$

Independent variables: Age, sex of student, religion of student, previous resident, and type of drink alcohol, father education, mother education, initiation, average monthly income, and Departments.

### 2.1. Chi-Square Test of Independence

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

$$\text{Test statistics } \chi^2 = \frac{\sum (O_{ij} - E_{ij})^2}{E_{ij}} \quad (2)$$

$\chi^2$  Critical value:  $\chi^2_{\alpha} (c - 1) (r - 1)$ ,  $O_{ij}$  is observed frequency, is expected frequency, is number of columns and is number of rows [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:

$$\ln \left( \frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots \dots \beta_k X_{ki} \quad (3)$$

$$P_i / 1 - P_i = \exp (\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots \dots \beta_k X_{ki}) \quad (4)$$

where:  $P_i$  is the probability of success,  $1 - P_i$  is The Probability of failure,  $\beta_0$  is constant term,  $\beta$  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.

$$P(x_i) = \frac{e^{X_i' \beta}}{1 + e^{X_i' \beta}} \quad (5)$$

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  $\beta$  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 seventy-seven sampled students, forty-two (54.5%) of the students have alcohol drinking habits and thirty-five (45.5%) of the students did not have alcohol drinking habit.

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

Drinking habit	Number of student (n=77)	Percent
Alcohol drinking habit	42	54.5
Did not alcohol drinking	35	45.5
Total	77	100.00

Table 2 showed the cross-tab and chi-square test of independence and interpreted some variables: Among 77 sampled students, twenty (26.0) students whose religion is orthodox. From this, eight (10.4) students have alcohol drinking habit, and twelve (15.6) students have no alcohol drinking habit; twenty (26.0) of Muslim of the students, ten (13.0) student have alcohol drinking habit and ten (13.0) student have no alcohol drinking habit; among twelve (15.6) of Protestant student, nine (11.7) have alcohol drinking habit and three (3.9) students have no alcohol drinking habit; among thirteen (16.9) of Catholic students, seven (9.1) students have alcohol drinking habit and six (7.8) students have no alcohol drinking habit; and among twelve (15.6) students whose religion are others among mentioned above, eight (10.4) students have alcohol drinking habit four (5.2) students have no alcohol drinking habit.

Among all sampled thirty-two (41.6) female students, thirty (16.9) students have alcohol drinking habit while nineteen (24.7) students have no alcohol drinking habit; among forty-five (58.4) male students, twenty-nine (37.7) student have alcohol drinking habit while sixteen (20.7) students have no alcohol drinking habit. Likewise, among seventy-seven sampled students thirty-two (41.6) of students whose previous place of residence were urban, fourteen (18.2) have alcohol drinking habit and eighteen (23.4) students have no alcohol drinking habit; among forty-five (58.4) of students who came comes from rural, twenty-eight (36.4) students have alcohol drinking habit, and seventeen (22.0) student have no alcohol drinking habit.

**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	18 (23.4)	23 (29.8)	41 (53.2)	1.915	0.384
	23-25	6 (7.8)	3 (3.9)	9 (11.7)		
	>25	11 (14.3)	16 (20.8)	27 (35.1)		
Religion	Orthodox	12 (15.6)	8 (10.4)	20 (26.0)	4.621	0.329
	Muslim	10 (13.0)	10 (13.0)	20 (26.0)		
	Protestant	3 (3.9)	9 (11.7)	12 (15.6)		
	Catholic	6 (7.8)	7 (9.1)	13 (16.9)		
	Other	4 (5.2)	8 (10.4)	12 (15.6)		
Sex	Female	19 (24.7)	13 (16.9)	32 (41.6)	4.820	0.039
	Male	16 (20.7)	29 (37.7)	45 (58.4)		
Resident	Urban	18 (23.4)	14 (18.2)	32 (41.6)	2.574	0.109
	Rural	17 (22.0)	28 (36.4)	45 (58.4)		
Income	<500	14 (18.2)	23 (29.9)	37 (48.1)	1.667	0.197
	500-1000	21 (27.2)	19 (24.7)	40 (51.9)		
	Friends	4 (5.2)	19 (24.7)	23 (29.9)		
Initiation	Environment	12 (15.6)	11 (14.3)	23 (29.9)	11.602	0.009
	Family case	8 (10.4)	7 (9.1)	15 (19.5)		
	Other	11 (14.3)	5 (6.5)	16 (20.8)		

Variables	Categories	drinking habit of alcohol		Total (%)	Chi square	P value
		No (%)	Yes (%)			
Department	Biology	7 (9.1)	6 (7.8)	13 (16.9)	17.021	0.009
	Statistics	9 (11.7)	4 (5.2)	13 (16.9)		
	math's	3 (3.9)	3 (3.9)	6 (7.8)		
	Chemistry	9 (11.7)	6 (7.8)	15 (19.5)		
	Sport	0 (0.0)	8 (10.4)	8 (10.4)		
	Physics	4 (5.2)	2 (2.6)	6 (7.8)		
Mother Education	Geology	3 (3.9)	13 (16.9)	16 (20.8)	1.704	0.636
	Illiteracy	19 (24.7)	17 (22.1)	36 (46.8)		
	Primary	4 (5.2)	6 (7.8)	10 (13.0)		
	Secondary	10 (13.0)	17 (22.1)	27 (35.1)		
Father Education	Above	2 (2.6)	2 (2.6)	4 (5.2)	3.800	0.284
	Illiteracy	8 (10.4)	13 (16.9)	21 (27.3)		
	Primary	12 (15.6)	10 (13.0)	22 (28.6)		
	Secondary	15 (19.5)	16 (20.8)	31 (40.3)		
Types of Alcohol	Above	0 (0.0)	3 (3.9)	3 (3.9)	8.188	0.085
	Tela	6 (7.8)	11 (14.3)	17 (22.1)		
	Tej	12 (15.6)	20 (26.0)	32 (41.6)		
	Areke	6 (7.8)	3 (3.9)	9 (11.7)		
	Bear	2 (2.6)	5 (6.5)	7 (9.1)		
	Other	9 (11.7)	3 (3.9)	12 (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.

Based on Table 4, p-value (0.859) is greater than the  $\alpha$ -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.

Table 4. Hosmer and Lemeshow Test.

Chi-square	Df	Sig.
3.980	8	0.859

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

The fitted model is  $\log \text{it} (\pi) = 21.605 - 9.574_{\text{statistics}} - 12.8_{\text{Mathematics}} - 9.36_{\text{sport science}} + 4.452_{500-1000 \text{ birr}} + 6.945_{\text{Teji}} + 8.007_{\text{areki}} + 8.319_{\text{environmental factor}}$

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 (500-1000) is 85.788 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 4101.357 times more likely to affect the alcohol drinking habit of undergraduate students as compared initiation of friends when all other variables remain constant.

## 4. Discussion

The finding revealed that the prevalence of alcohol drinking habit among students in the university is 54.5 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%. And a similar study reported in the Ethiopian Demographic and Health Survey, the prevalence of alcohol drinking status is 35% [16]. It 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]. The prevalence of alcohol abusers in secondary school students (54%) in Kisumu Town, East Kenya is highly related to the current study [19]. 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, started drinking alcohol, and 20% reported binge drinking [22], the study done among Axum University where about 608 (80.4%) of the respondents were aware of problems or complications that could arise from alcohol [23], the 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 findings showed that the prevalence of alcohol drinking habit is more prevalent as compared to the study done in Pakistan, Mary land, USA report, and Addis Ababa University; however, it is less prevalent than the study done in US national survey and Axum University.

From this finds, 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 consistently supported by the study done in [25] which is surprising that 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 on 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 V. [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 abstention maybe for only alcohol that is purchased as well as community perception of genders. This finding is similar across the study done by Benegal V. [27].

From all sampled students, 54.2% 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 impact, 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 finds 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 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 (chi-square) 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 the level of significance. Thus, it is 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.

## 6. Recommendations

Since the prevalence of alcohol-drinking habits of undergraduate students is high, the management office should give more emphasis on the issue. Further analyses will be considered also covering large community of the institution to identify the problem in depth.

## List of Abbreviations

ARH: Alcohol-Related Harm  
MTU: Mizan-Tepi University  
OR: Odd Ratio

## Ethics of Approval and Consent to Participate

The study and the questionnaires were checked by department examiners as a committee before collecting the data. The survey data were collected from respondents from those who were volunteer to give information.

## Consent for Publication

Not applicable since there is no protective individuals in the participants.

## Competing Interests

The authors declare that they have no competing interests.

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