

## Suicidal Ideation and Attempt among Alcohol use Disorder Patients Attending Addiction Clinic at Amanuel Mental Specialized Hospital, Addis Ababa, Ethiopia

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### Abstract

**Background:** Alcohol is one of commonly used psychoactive substances. Harmful use of alcohol results in a cluster of behavioral and physical symptoms known as Alcohol use disorder. WHO suggests that harmful use of alcohol to be an individual risk factor for suicidal behavior, accounting for 25-50% of all suicides linked to alcohol and other substance. Many studies were done on alcohol and suicidal ideation and attempt. Most of these studies suggest that alcohol have association with suicidal ideation and attempt. But there are studies with no association between alcohol use disorder and suicidal ideation and attempt.

**Objective:** To assess the prevalence of suicidal ideation and attempt among alcohol use disorder patients attending addiction clinic at Amanuel Mental Specialized Hospital (AMSH). It also determines the association of alcohol use disorder and suicidal ideation and attempt.

**Method:** This was a hospital based cross-sectional study, that include 120 patients of age above and equal 18 years. Data were collected by using ASSIST 3.1 (Alcohol, Smoking and Substance Involvement Screening Test), to assess alcohol use disorder, CSSRS (Colombia suicide severity rating scale) to assess suicidal ideation and attempt, and PHQ-9 (patient health questioners-9) to assess the depression and severity of depressive symptoms. Chi square and binary logistic regression was used to assess factor relation.

**Result:** The overall prevalence of suicide ideation and attempt among alcohol use disorder patients was 30.6% for the past month and 31.7% for past year of time of data collection. Suicide attempt was 14.9% and 13.3% respectively. Older age was associated significantly with suicidal ideation and attempt ( $X^2 = 6.128$ ,  $P = 0.047$ ). Alcohol use disorder had no association with suicidal ideation and attempt for both past month ( $OR = 0.827$ ; 95% CI 0.116, 5.914) ( $P = 0.850$ ) and the past year ( $OR = 1.360$ ; 95% CI 0.122, 15.165) ( $P = 0.803$ ) of data collection. Major depressive disorder was significantly associated with alcohol use disorder ( $P = 0.047$ ).

**Conclusion:** Suicide ideation and attempt was significantly associated with advancement of age among alcohol use disorder patients. Alcohol use disorder has no association with suicide ideation and attempt among the respondents. Alcohol use disorder and major depressive disorder was significantly associated with and could lead to suicidal ideation and attempt indirectly.

**Recommendation:** Further researches on alcohol use disorder, depression and suicide are necessary to assess the relationship each character.

### Abbreviations

**AMSH:** Amanuel Mental Specialized Hospital  
**ASSIST:** Alcohol, Smoking and Substance Involvement Screening Test  
**AUA:** Acute alcohol use  
**AUD:** Alcohol use disorder  
**AUDIT:** standard alcohol use disorder identification test  
**CSSRS:** Colombia suicide severity rating scale  
**DALYs:** Disability-adjusted life years

**DHS:** Demographic health survey  
**DSM:** Diagnostic and statistical manual  
**GSR:** Global status report  
**LMICs:** Low- and middle-income countries  
**PHQ-9:** Patient health questioner-9  
**SRIB:** Suicide-Related Ideation/ Behaviors  
**SPSS:** Statistical package for social sciences  
**SUD:** Substance use disorder  
**WHO:** World Health Organization

## Introduction

Alcohol is one of commonly used psychoactive substance used worldwide [1]. It is a potent drug that causes both acute and chronic changes in almost all neuro-chemical systems. Alcohol abuse can produce serious temporary psychological symptoms including depression, anxiety, and psychoses [2]. According to DSM-V, Alcohol use disorder (AUD) is defined by a cluster of behavioral and physical symptoms, which can include withdrawal, tolerance, and craving. It is also defined in DSM that Withdrawal is characterized by withdrawal symptoms that develop approximately 4-12 hours after the reduction of intake following prolonged, heavy alcohol ingestion. The DSM also defines Craving for alcohol is indicated by a strong desire to drink. Tolerance, as by either of the following: A need for markedly increased amounts of alcohol to achieve intoxication or desired effect, or a markedly diminished effect with continued use of the same amount of alcohol [1].

The 12-month prevalence of alcohol use disorder (AUD) is estimated to be 4.6% among 12 to 17 years old individuals, and 8.5% among adults age 18 years and older in the United States [1]. Alcohol consumption attributes to about 3.3 million deaths, or 5.9% of all global deaths, according to WHO-GSR 2014. A sex difference shows 7.6% of deaths among males and 4.0% of deaths among females. Alcohol also attributes to 139 million DALYs (disability-adjusted life years), or 5.1% of the global burden of disease and injury, of which self-harm accounts for 22% of the fraction [3].

In Ethiopia, WHO-GSR 2004 country profile report from a total population of 87 million, age >15 or more shows lifetime prevalence rate of alcohol dependence in Addis Ababa to be 0.5% (total), 1.0% (males) and < 0.1% (females) [4]. But local studies show the prevalence of substance use disorders (SUD) including hazardous drinking pattern is increasing [5].

About 200,000 deaths per year are linked directly to alcohol abuse. The common causes of death in persons with the alcohol related disorders are suicide, heart disease, cancer and hepatic disease. About 50 percent of all homicides and 25 percent of all suicides are associated with Alcohol use and related disorders. It leads all other substances in substance-related deaths [6].

In psychiatry suicide is known to be as a primary emergency. It is impossible to predict, but numerous clues can be seen. Suicide attempt, suicidal intent, suicidal ideation and suicide are used as terms comprising Suicidal Related Ideation and Behavior (SRIB). Also extending it term includes aborted self-harm, deliberate self-harm and lethality of suicidal behavior [5].

An estimated 804,000 suicide deaths occurred worldwide in 2012, calculated this brings one person to die every 40 seconds, with an annual global age-standardized suicide rate of 11.4 per 100 000 Population, when put in sex proportion it shows 15.0 for males and 8.0 for females. According to WHO suicides account for 50% of all violent deaths in men and 71% in women. Age of 70 years or over for both men and women show prevalence in almost all regions of the world. It is the second leading cause of death in 15–29 year-olds [6].

High income countries have somewhat higher age-standardized rate of suicide than in low- and middle-income countries (LMICs) (12.7 versus 11.2 per 100 000 population). But larger proportion

of the global population resides in LMICs; hence 75.5% of all global suicides occur in these countries. Problems in poor-quality mortality data has been used as a reason for under reporting and misclassification of suicide [6].

In Ethiopia WHO report of 2014 country profile suggests about 6852 number of suicides of all ages in 2012 (1781 female and 5071 male). This shows a 7.5 per 100,000 in 2012, a drop from 13.1 per 100,000 from the year 2000, showing a drop rate of -12.7 % [6]. The prevalence of suicidal ideation in Addis Ababa was 2.7% and lifetime prevalence of suicidal attempt was 0.9% [7].

WHO has identified individual risk factors as a to the likelihood of a person developing suicidal behaviors these risk factors consist of Previous suicide attempt, mental disorder, harmful use of alcohol and other substance, job or financial loss, hopelessness, chronic pain and illness, family history of suicide and genetic, biological factors [6].

All substance use disorders (SUDs) increase the risk of suicide. Alcohol and other substance use disorders are found in 25–50% of all suicides, and suicide risk is further increased if alcohol or substance use is co-morbid with other psychiatric disorders. Of all deaths from suicide, 22% can be attributed to the use of alcohol, which means that every fifth suicide would not occur if alcohol were not consumed in the population.

Despite large prevalence study of alcohol and other substances in Ethiopia, few are done on suicide related ideation/behaviors (SRIB) comparatively. To this day studies on alcohol and SRIB are not available in Ethiopia.

## Statement of the problem

Suicide remains one of major public health burden and primary Psychiatric emergency in the world, with 15<sup>th</sup> leading cause of death globally, which means one death every 40 minutes. It attributes to 22% of all suicide to alcohol use of all suicides [6].

Various studies show that Alcohol consumption is increasing from time to time. These studies show that It attributes to the global burden of disease and injury by 5.1%, as measured in DALYs [3]. They also show heavy drinking of alcohol as well as consumption of alcohol has been linked to suicide and violence [8].

Few populations based studies as well as clinic based studies have been done on substances and suicide. This means these studies appear substantial; their impact of substance misuse on suicide and related problems has not been well studied [5].

The direct association of alcohol use disorder, particularly acute alcohol use and suicide attempts are shown in various worldwide studies [9].

In our set up there is no study on the prevalence of suicide and co-morbid alcohol use disorders. What we hope findings from this study can provide important information on the substantiality of alcohol studies and review the incidence of suicide in special population group, in our case alcohol disorder patients. This will also add to further study on what needs to be done once we knew the extent of the problems.

## Objectives

### General objective

To assess the prevalence of suicidal ideation and attempt among alcohol use disorder patients attending addiction clinic at Amanuel Mental Specialized Hospital (AMSH).

### Specific objectives

To assess the prevalence of suicidal ideation and attempt among alcohol use disorder patients attending addiction clinic at Amanuel Mental Specialized Hospital (AMSH). To determine the severity of suicidal ideation and attempt among patients of alcohol use disorder. To assess the prevalence of major depressive disorder among alcohol use disorder patients. To determine the association of alcohol use disorder with suicidal ideation and attempt.

### Operational definition

**Suicide-** A fatal act that represents the persons wishes to die

**Suicidal ideation-** Thoughts of serving as an agent of one's own death

**Suicidal Intent-** Subjective expectation and desire for self-destructive act to end in death

**Suicide attempt/ Suicide behaviour-** Self injurious behaviour with a non-fatal outcome accompanied by explicit or implicit evidence that a person intends to die

**Alcohol use disorder-** A cluster of behavioral and physical symptoms, which can include withdrawal, tolerance, and craving.

**Major depressive disorder-** disorder of mood characterized by presence of sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function.

**Disability-adjusted life years (DALYs)-** Represent a time-based measure of overall burden of disease for a given population. DALYs are the sum of years of life lost due to premature mortality as well as years of life lost due to time lived in less than full health.

### Literature review

Several studies have been done on alcohol and suicide on prevalence, cause and effect as well as mode of suicidality.

A recent systematic review on global variation prevalence and incidence of MDD after screening electronic databases Medline, PsycINFO and EMBASE was done. They have identified 116 prevalence and four incidence studies. Their finding was global point prevalence after adjusting for methodological differences, was 4.7% (4.4–5.0 %) and pooled annual incidence was 3.0% (2.4–3.8 %) [10].

In a nationwide population study in Finland which includes a population size of 1397 of which they interviewed next-of-kin interviews was available for 1155 cases. They investigated victims with and without alcohol misuse among unselected completed suicides to explore the role of alcohol misuse in the suicidal process and final act. They studied in a total 1-year (1987–1988) population of suicides in the National Suicide Prevention Project in Finland, alcohol-misusing and -non-misusing victims were compared. Results showed 35% ( $n = 349$ ) of included victims were classified as alcohol mis-users and 65% ( $n = 648$ ) as non-mis-users. Depressive disorder not otherwise specified was more common among the misusers ( $P = 0.027$ ), They concluded that alcohol misuse was likely to have a

deteriorating influence on the life course of those who eventually succumb to suicide [11].

On other cohort study on the lifetime risk of suicide for affective disorder, alcoholism and schizophrenia, they used contemporary data and modern techniques consisting of 75 papers from year 1921 to 1975. Of these 27 of the papers were on mortality data for alcohol dependence. They used a selection method from meta-analysis which assessed suicide risk of mental disorders by identifying death from the risk by projecting it to curve fitting. Results showed that 7% for alcohol dependence has completed suicide, reaching a conclusion that only a slight variation over the life of cohort study. More or less the life time prevalence of alcohol dependence was similar throughout the disorder [12].

A review study (Cherpitel et.al) on association of acute alcohol use and suicidal behavior from literature published between 1991 and 2001, taken from MEDLINE, PsycINFO, National Institute on Alcohol Abuse and Alcoholism (NIAAA) and Alcohol and Alcohol Problems Science Database of 37 studies. They used data studied from age of 19 and above. Results showed the range of alcohol-positive cases to be found for both completed suicide and suicide attempts (10–69%) and (10–73%) respectively. The conclusion was there were substantially higher risk of suicide during or shortly after use of alcohol compared with alcohol-free periods. But with this wide range of result, it is difficult to conclude the relation between acute alcohol use and suicidal behaviors. The reasons were small samples and selection bias [13].

On other case control study done in Canterbury region of New Zealand, a 3-year study was done from (1991-1994) of 193 suicide descendants and 240 attempts. They compared them with 984 community controls. Age of 18 and over, were gathered by using psychological autopsy methodology. The results showed association of alcohol dependence and suicide. Attempters were 62 (25.8%) of 240, suicide descendants were 38 (19.7%) of 196 and controls were 46 (4.7%) of 948 populations. This study also concluded that low socioeconomic and education, as well as psychosis, co morbid drug use as a factor contributing to suicide attempt and completed suicide. Being a male is a strong indicator as completed suicide [14].

In another community-based sample of 1,237 adult Israeli lifetime drinkers assessed, by collecting data from 2007 to 2009. They selected only alcohol drinker on their study because non-drinkers would not be informative about alcohol use. The majority of participants in this study were male (77.9%). Major Depressive Disorder module of psychiatric research interview for substance and mental disorders 6.0 were used, which is validated in Israel. For alcohol use they used Alcohol use disorder and associated disability interview schedule. With this they have found that Suicide-related ideation and behaviors (SRIB) are associated with both alcohol disorders and major depressive disorder. Results shows, that lifetime SRIB to be 4.7%. Alcohol dependents had high prevalence of (9.0%) than among those without alcohol dependence (4.1%) [15].

A study done in USA, Comparison of 3190 Alcohol-Dependent Individuals with and Without Suicide Attempts were done using a semi structured interviews. Participants were involved in Collaborative Study on the Genetics of Alcoholism. The inclusion criteria of participants are fulfilling the DSM III of alcohol dependence. Of the Alcohol-dependent individuals 1233 (38.7%) were women, results

showed 522 (16.4%) reported histories of attempts. They are selected regardless of co morbid psychiatric illness or other substance use apart from alcohol use. Results showed the median age of first suicide attempt was 25.7 + 10.1 years. 39.5% of the attempt resulted in medical hospitalization, and 52.1% attempted suicide in the context of heavy drinking. Comparing result of the subjects with attempters, it showed range of 5.2% to 16.4% respectively [16]. The largest odds ratio in the logistic regressions in predicting suicide attempts for both male and female is independent depression OR=3.39 95%CI 2.58, 4.46 (P<0.001).

On another USA study done on Predictors of a Suicide Attempt One Year after Entry into Substance Use Disorder Treatment. This was a national survey using a sample of 8,807 of veterans seeking treatment for addiction. Patients presenting for treatment of substance use disorders (SUDs) were assessed by addiction screening index to participate for the study. They haven't used any exclusion criteria. Majority of the participants are male up to 96 %. Results show approximately 4% (314/8,807) of patients reported a suicide attempt within 30 days of their follow-up assessment [5].

A meta-analysis of acute use of alcohol and the risk of suicide attempt, collected from English-language literature on Medline, PsycINFO and Google Scholar consisting of case control and case cross over was searched for original articles and critical review on acute alcohol use and suicide attempt from period 1996–2015. The analysis included 7 studies. In all, seven studies provided odds ratio estimates for the likelihood of suicide attempt by acute alcohol use, compared with those who did not drink alcohol. The Prevalence of any acute alcohol use in those seven studies ranged from 26.5% to a high 44.4% (mean prevalence = 33%) and ORs ranged from a low 4.2 to a high 16.0. with this they concluded that acute alcohol use was associated with suicide attempt in particular with high dose [17].

A meta-analysis on Alcohol-Related Risk of Suicidal Ideation, Suicide Attempt, and Completed Suicide done in Iran after searching PubMed, Web of Science, and Scopus until February 2015 using (cohort, case-control, and cross-sectional) studies addressing the association between AUD and suicide. They included 31 studies out of 8548 retrieved studies by clearing duplications, irrelevant clarities and originality. They cleared heterogeneity by using Q-test. The results showed a significant association between alcohol use disorder and suicidal ideation, suicide attempt and a completed suicide [18].

An article published on predisposing and precipitating factors for suicide among alcoholics, review on model helpful for research. It suggests that there is a wealth of association between alcoholism and depression, also vice versa. The two disorders are comorbid frequently. High percentage of alcoholic suicides has shown MDD at the end of life >70% (Cheng), 45% (Conner et al,1999). The temporal association between alcoholism and depression and the interaction between suicide is unknown. Although most suggest alcoholism precede depression there are some counter results, vice versa. Through this line the additive or synergistic effect of alcohol and depression is also conflicting. In general, socio demographic, cultural, individuality, interpersonal dispute plays a role in predicting suicide in alcoholics [19].

A case control study done on suicide and mental illness among 75 men of age 18-35 who died by suicide was assessed. Psychological autopsy was taken by 2 psychiatrists and compared with a case

control design. They conclude that major depressive disorder, substance dependence and personality disorders were associated with suicide. However, they haven't found any association of alcohol abuse and suicide [20.]

On other review done in Finland by (Makela et al) to examine alcohol consumption and suicide mortality by age among Finnish men from 1990-1991, by controlling the confounding effect of unemployment, family integration and economic wellbeing. He studied an average of 250 cases of suicide decedents which was found from (Central Statistical Office of Finland, Causes of Death 1950-1991). Standardized regression coefficient shows no significant effect of alcohol on suicide overall age 15+  $r=0.26$ , 15-34  $r=0.3$ , 35-49  $r=0.33$ . Also the result didn't show no correlations for age >50 and women. He concluded that variables such as urbanization, secularization could be other confounding for suicide [21].

An east African study of systematic review and meta-analysis done on young people of age (15-24) to assess the extent of alcohol after data base search of Medline, EMBASE, Global Health, Afri-wide and psyc INFO of 2785 potentially relevant studies were taken. Only 56 were eligible for inclusion of prevalence of alcohol use. The reported median prevalence of alcohol use for ever-use was 52%, use in the last month 28%, and use in the last year 26%. Problem drinking as defined by AUDIT was 15%. High heterogeneity was seen between studies used in this analysis, with the highest prevalence of ever use of alcohol among university students up to 82% with range of (79–85%) and female sex workers 66% with range of (58–74%). However, this review and meta-analysis didn't show the association of suicide and alcohol [22].

Ethiopian based cross-sectional facility- and population-based study on Non-fatal suicidal behavior in rural Ethiopia: using Population-based (n = 1485) and facility-based (n = 1014) was done. They assessed suicide (items on suicide from the Composite International Diagnostic Interview), depressive symptoms (the Patient Health-9 Questionnaire) and alcohol use disorders (Alcohol Use Disorder Investigation Test; AUDIT). The overall 12-month prevalence of non-fatal suicidal behavior, consisting of suicidal ideation, plan and attempt, was 7.9 %. It was significantly higher in the facility (10.3 %; 95 % CI = 8.4, 12.1) than the community sample (6.3 %; 95 % CI = 5.0, 7.5). The 12-month prevalence of suicide attempt was 4.4 %, higher among the facility sample (5.4 %) compared with the community sample (3.8 %). Harmful use of alcohol and higher depression scores were associated significantly with increased non-fatal suicidal behaviors. Those with alcohol use disorder (AUDIT score of 16 with 95% CI) the odds ratio of “thought of committing suicide in the last 12 months” was OR=2.24, “Planned to commit suicide in the last 12 months” to OR= 2.77, Attempted suicide in the last 12 months OR= 2.72). Younger age (age <25 years) were also associated with all three forms of suicidal behavior [23].

On another recent Ethiopian community based cross sectional study done on hazardous alcohol use and associated factors in a rural Ethiopian district of 1500 adults, age 18 and above using the Fast Alcohol Screening Test (FAST) and validated adaptation of the Kessler 10 (psychological distress). They used multivariable logistic regression to assess factors associated with hazardous alcohol use. Results showed that the overall prevalence of hazardous alcohol use to be 21 %. Factors independently linked include severe psychological distress (adjusted OR = 2.96, 95 % CI = 1.49, 5.89) [24].

## Methods

### Study design

This was a prospective cross sectional hospital based study

Study period

Data were collected from June 2017- July 30/2017

### Study Setting

Amanuel Mental Specialized Hospital (AMSH) is the oldest and largest mental institution. Patients all over Ethiopia is referred to this institution for treatment. It gives an inpatient and outpatient service. It has specialized settings such as Addiction clinic and geriatric outpatient department where patients follow their treatment. It is also a center for research as it has a large diverse population from all over Ethiopia.

### Study population

Individual patients with alcohol use disorder following addiction clinic at Amanuel Mental Specialized Hospital, Addis Ababa, Ethiopia and fulfilling the inclusion criteria.

### Inclusion criteria

- DSM V criteria of Alcohol use disorder should be fulfilled
- Co morbid substance use disorder along with Alcohol use disorder

### Exclusion criteria

- Patients who are not willing to be enrolled in the data collection
- Patients having difficulty of language comprehension or hearing difficulty.
- Prior neurologic disability with behavioral /conduct disturbances, Dementia.

### Sample size determination

The required sample size will be determined using single population proportion

$$n = z^2 p(1-p) / d^2$$

$$n = 1.96^2 (1-0.037) 0.037 / 0.05^2$$

$$n = 55$$

Where n= the sample size Z= the score value at 95% CI (1.96)

d= Margin of error (5%) P=expected proportion in population

In this study, p=3.7% (as the overall prevalence of problem alcohol use among young people in Ethiopia (21). An average of 5 to 6 patents is seen per day at addiction clinic per day, giving us a total range of 100-120 participants per month. Data collection was for 2 months. Final sample size collected was

**Total n=120**

## Variables

### Independent variables

#### Socio demographic characteristics

Age	Sex
Marital status	Educational status
Religion	monthly income
Occupational status	

#### Alcohol related independent variables

Frequency of alcohol intake,	failure to do what is expected
strong desire or urge,	strong desire or urge, family
health social, legal, financial problem	tried to cut down use

## Dependent variables

### Depression related dependent variables

Little interest or pleasure in doing things	Poor appetite or eating too much
Feeling of down, depressed	Feeling bad about one self
Trouble of sleeping or oversleeping	Trouble of concentrating on things
Feeling of tired or having little energy	Moving or talking slow.

### Suicide related dependent variables

Wish to be dead	Suicidal Intent,
Suicidal thought	Suicidal Intent with specific plan
Suicide thought with method	Suicide behavior

### Data collection and procedure

Participants following treatment at addiction clinic in AMSH were approached for enrolment into the study after measured with the inclusion and exclusion criteria. A written informed consent was obtained once recruited. An interviewer based questionnaire was administered by the trained research data collector. Basic social demographic data, alcohol severity and depression were filled by data collectors with a validated questioner.

Alcohol use disorder patients were selected by using DSM-V criteria. Mild moderate and severe specifiers of the disorder were given to these patents, and are on appropriate treatment as per protocol of the hospital.

ASSIST 3.1 (Alcohol, Smoking and Substance Involvement Screening Test) was used to assess alcohol use disorder, CSSRS (Colombia suicide severity rating scale) to assess suicide ideation and attempt and PHQ-9 (patient health questioners-9) to assess the depression and severity of depressive symptoms. The questionnaires format was used in Amharic version to allow extraction of information from study population

### Ethical considerations

The study protocol was approved by the ethical review Committee of the Department of Psychiatry and the Ethical Review Committee at Amanuel Mental Specialized Hospital (AMSH). A written informed consent was obtained from all participants (patients or their caregivers).

### Data processing and analysis

After the collected data were checked for completeness, statistical analysis was done using SPSS/PC version 20.0 software. Descriptive proportions were calculated for baseline demographic data alcohol severity and Major depressive disorder. Descriptive analysis was also used to assess suicide severity. Chi square was used to assess basic socio-demographics and suicide severity. Alcohol severity was re categorized as low risk and high risk. Once re-categorized binary logistics regression to assess the relationship of suicidal ideation and attempt with alcohol use disorder.

## Results

### Characteristics of the participants

A total of 120 patients attending addiction clinic at Amanuel Mental Specialized Hospital were approached for the study. Of these 10

patents were assigned in a pilot study. The rest were participated on actual study. All of the participants was diagnosed with alcohol use disorder by DSM-V criteria and are on treatment.

Of the 120 participants, the sex distribution was 82% (99/120) for male and 17% (21/120) to be female. The age range was from 18 to 70 years, with The median age is 30 years. 64% are orthodox Christian in religion.36.4% had no financial income. Except 1 participant all had receive some sort formal education.

**Baseline socio-demographic profile of the study subjects are shown in Table 1**

Characteristics	Frequency N=120	Percentage
<b>Gender</b>		
Male	99	82%
Female	21	17%
<b>Age groups</b>		
18-30years	64	53.3%
31-40years	38	31.7%
>40 years	18	15.0%
Median year	30.00	
<b>Religion</b>		
Orthodox	77	63.6%
Muslim	35	28.9%
protestant	8	6.6%
<b>Marital status</b>		
Single	91	75.2%
Married	27	22.3%
divorced	2	1.7%
<b>Level of education</b>		
Illiterate	1	0.8%
Primary	19	15.7%
Secondary	55	45.5%
diploma	19	15.7%
degree	26	21.5%
<b>Occupational status</b>		
student	26	21.5%
manual labour	9	7.4%
office work	24	19.8%
driver	25	20.7%
teacher	10	8.3%
house wife	21	17.4%
none	5	4.1%

<b>Financial income</b>		
no income	44	36.4%
<3000	27	22.3%
>3000	49	40.5%

Only one participant had low risk alcohol use. The rest of the participants were had moderate to high risk of problems related to their alcohol use. From these 91.7% (111/120) of the respondents were high risk.

**Table 2: characteristics of the participants for alcohol use disorder**

Alcohol use disorder	Frequency	Percent
Lower risk	1	.8%
Moderate risk	6	5.0%
High risk	111	91.7%

Risk for alcohol is based on ASSIST scores. lower risk (0-10), Moderate risk (11-26), High score (27+).

Screening for depression with PHQ-9, 36.4% (44/120) patients has of the participants had no depression. The remaining 63.6% had major depressive disorder. Majority of the patents were having mild depression on the score of PHQ-9. There was no participant with severe depression.

**Table 3: characteristics of the participants for major depressive disorder**

Depression severity	Frequency	Percent
No depression	44	36.4
Mild depression	57	47.1
Moderate depression	18	14.9
Moderately severe	1	.8
Total	120	99.2

PHQ-9 for depression severity none (0-4), mild (5-9), moderate (10-14), moderately severe (15-19), severe (20-27)

**Description of suicide ideation and behaviour**

The relationship of the socio demographic variables (gender, age, marital status, and education level, monthly income and occupation) and suicidal ideation attempt was investigated with chi-square. Suicidal ideation and attempts are categorized as “past month” and “past year” from the data collection date. Age showed a relation with suicide ideation and attempt in the past year with (X<sup>2</sup> =6.128, P=0.047). It showed as age increase suicide ideation and attempt increase for the past year with 23.4% for Age 18-30, 23.7% age 31-40 and 38.9% for age >41. Gender, marital status, educational level income and occupation were not showing relation to suicide ideation and behavior

**Table 4: Prevalence of sociodemographic subgroups by suicide ideation and attempt (N=120)**

suicide ideation and attempts								
variable	No Prevalence %		Yes Prevalence %		X2		p-Value	
	Past month	Past year	Past year	Past year	Past month	Past year	Past month	Past year
<b>Gender</b>								
Male	75	80	24	19	.747	3.550	.416	.060
Female	14	13	31	8				
<b>Age groups</b>								
18-30 years	49	51	15	13	1.885	6.128	.390	.047
31-40 years	29	32	9	6				
>40 years	11	10	7	8				
<b>Marital status</b>								
Single	70	74	21	17	1.766	3.446	.414	.179
Married	18	18	9	9				
<b>Level of education</b>								
Primary	14	13			3.789	7.626	.437	.106
Secondary	40	42	15	13				
diploma	17	18	2	1				
degree	17	20	9	6				
<b>Occupational status</b>								
student	21	23	5	1	2.283	10.813	.319	.94
officework	16	20	8	4				
driver	21	20	5	5				
house wife	15	13	6	8				
<b>Financial income</b>								
no income	34	32	10	12	2.283	1.056	.319	.590
<3000 birr	17	21	10	6				
>3000 birr	38	40	11	9				

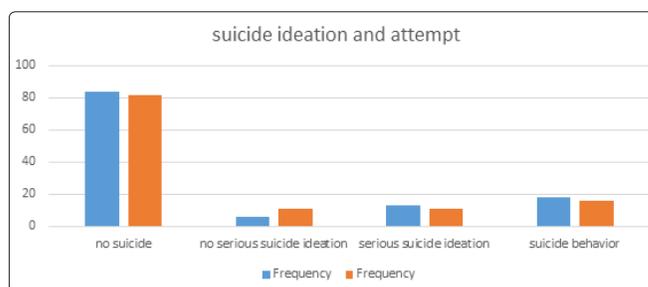
**Descriptive of suicide severity in the past month and past year**

Suicidal ideation and attempt in the past month of data collection time showed 69.4% (84/120) to be non-suicidal. Suicide ideation and attempt was 30.6%. Respondents with serious suicide ideation was 10.7% (13/120) and those with suicidal behavior was 14.9% (18/120).

Suicidal ideation and attempt in the past year of data collection time showed 68.3% (82/120) to have no suicide. This showed suicidal ideation and attempt of 31.7%. About 9.2% (3/120) of the respondents had serious suicide ideation and 13.3% (18/120) had suicidal behavior. About 96.5% of patients from past year remained with Suicidal ideation and attempt until past month of data collection. Table 5 shows descriptive of suicide ideation and attempt.

**Table 5: frequency of suicide ideation and attempt (N=120)**

suicide ideation and attempts				
severity	Frequency		Percent	
	Past month	Past year	Past month	Past year
No suicide	84	82	69.4%	68.3%
No serious suicide ideation	6	11	5%	9.2%
Serious suicide ideation	13	11	10.7%	9.2%
Suicide behavior	18	16	14.9%	13.3%



**Figure 1: frequency of suicide ideation and attempt (N=120)**

**Suicide ideation and attempt and alcohol use disorder**

Alcohol use disorder was re-categorized in to low and high risk based on ASSIST scores for statistical analysis purpose. Cut off value of less than 10 was used as low risk and above 10 as high risk Binary logistic regression was used to analyze the association between alcohol use disorder and suicide ideation and attempt. Results showed that there were no association between alcohol use disorder and suicide ideation and attempt for both in the past month (OR = 0.827; 95% CI 0.116, 5.914)(p = 0.850) and in the past year (OR = 1.360; 95% CI 0.122, 15.165) (p = 0.803) of the data collection time. The association was showed in table 6

**Table 6: Association between alcohol use disorder and suicidal ideation and attempt(N=120)**

Character	Suicidal ideation and attempt Odds Ratio (OR) (95 % Confidence Interval (CI)) (P value)	
	Past year	Past month
Low risk	Ref	Ref
High risk	(OR=1.360; 95% CI 0.122,15.165) (P=0.803)	(OR = 0.827; 95% CI 0.116, 5.914) (P = 0.850)

### Alcohol use disorder and major depressive disorder

Alcohol use disorder was categorized as low risk and high risk based on ASSIST scores. Cut off value of less than 10 was used as low risk and above 10 as high risk. Association of major depressive disorder with alcohol use disorder was done using Chi square. Our result showed a significant association of major depressive disorder with high risk alcohol use disorder patients with p value (P=0.047). Table 7 shows the results explained above.

**Table 7: Association between alcohol use disorder and major depressive disorder (N=120)**

Character	Major depressive disorder (MDD) n(%)		Statistics
	No MDD	MDD	
Low risk	Ref	3 (2.5%)	(X <sup>2</sup> =3.943, P=0.047)
High risk	Ref	16 (13.6)	

### Discussions

This study was intended to assess the prevalence of suicide ideation and attempt among alcohol use disorder patients. All participants had responded to our study. From 120 respondents 82% (99/120) were male and 17% (21/120) were female.

The results our study showed the prevalence of suicide ideation and attempt in majority homogeneous group of alcohol use disorder (high risk= 91.7% of total respondents) to be to be 31.7% in the past year and 30.6% in the past month of data collection. This indicate 96.56% of the participants with no marked difference in the proportion of suicidal ideation and attempt for both past year and past month with. The possible explanation could be the occurrence of sudden suicidal behavior without having any serious suicidal ideation, as seen in certain individuals with high level aggression and impulsivity which is common among some alcohol use disorder patients (Conner et al). Such individuals might be included in our study to respond only to suicidal attempt. The other possible explanation could be the fact that some patients remain in the persistent state of sociality because of mental illness such as major depressive disorder.

In our current study the prevalence of suicide ideation and attempt was 31.7% in the past year and 30.6% in the past month of data collection. This was higher than the life time prevalence of suicide attempts varied between 0.9 and 14.8 % in Ethiopia (Alem et.al, Kebede et.al).Also on another Ethiopian study showed non-fatal suicidal behavior in the facility sample 10.3 % compared with the community sample 6.3 % (Fekadu et al.) Stressful life events, legal problems, unemployment, financial difficulties, impulsivity, aggression, depression and other factors can precipitate suicidal ideation and attempt among alcohol use disorder (Conner et al.).

Thus the big gap in the ratio of our study can be explained by above factors. This was consistent with other study (Cherpit et al) showing increase in number of suicide ideation and or behavior in alcoholism for completed suicide 10–69% and suicide attempts 10–73%.

Age had significant correlation with suicidal ideation and attempt in the past year (X<sup>2</sup>=6.128, p=0.047).38.9% of suicide ideation and attempt was reported above age 41. This was comparable with other study (Preuss et al.) which showed association of suicidality with advancement of age. (X<sup>2</sup>=4.43, p<0.001). With this statistic we can predict alcohol use disorder directly or indirectly might contribute to suicidal ideation and attempt together with advancement of age. Another explanatory factor can be the presence of comorbid depression together with alcohol use disorder which is common in older population and its link to suicide ideation or attempt.

Other sociodemographic such as gender, unemployment and low education, didn't have significant correlation with suicidal ideation and attempt. On contrary other studies have shown association of suicidal ideation or behavior with these socio-demographic factors mostly of unemployment and financial problems among alcohol use disorder patients. (Pirkola et al.). This discrepancy could be explained by small sample size or difference in socio cultural factors of our study.

Our result didn't show any association of alcohol use disorder and suicidal ideation and attempt. The analysis indicated for the past month (OR = 0.827; 95% CI 0.116, 5.914) (P = 0.850) and for the past year (OR=1.360; 95% CI 0.122, 15.165) (P=0.803)of date of data collection. One similar literature (Makela et al.) found no association between the overall per capita alcohol consumption and suicide of age 50-69 (estimate -0.13, P=0.57) and above 70 (estimate -0.01 P=0.94) despite the increment in alcohol consumption. Also on another study (Lesage et al., 1994) has failed to show association between alcohol abuse and suicide among young men. This can be explained by either the absence of other predisposing and precipitating factors such as genetic, personality, stressful life events and cultural factors or study methodological quality such as small sample size. This was consolidated by the wide gap in the strength of association seen on most literatures between alcohol and suicide ideation (0.5-3.10) and for suicide attempt (1.65-10.50) (Darvish et al.).

Certain factors such as major depressive disorder, genetic, and environment as an example has some predisposing and precipitating effect on suicide among patents of alcohol use disorder (Conner. et.al). Our study showed significant association between alcohol use disorder and MDD (P=0.047) with 63.6% of the respondents having major depressive disorder. Similar results have been shown in other large studies such as (Cheng et al.) which showed 70% and (Conner et al.) which showed 45% of alcohol use disorder patients to have depression. Also (Pirkola et al.) showed depression were more common among the misusers (P = 0.027). Cur result showed higher ratio when compared to the global 12-month prevalence of major depressive disorder which is estimated 4.7% (Ferrari et al.). There is wealth of association between alcoholism and depression. Often both disorders are comorbid (Conner et al.). It is a known fact that major depressive disorder causes suicidal ideation and attempt. The direct association of alcohol use disorder to cause major depressive disorder can also explain possible indirect association of alcohol leading to suicidal ideation and attempt by causing depression.

## Conclusion

In this study we concluded that suicide ideation and attempt was significantly associated with advancement of age among alcohol use disorder patients. Other predisposing and precipitating factors may potentiate or add to suicide ideation and attempt among these population groups. Alcohol use disorder had no association with suicide ideation and attempt among the respondents. Study methodological factors or different population factors might contribute to our result not to show any association between alcohol use disorder and suicide ideation and attempt. Alcohol use disorder had significant association with major depressive disorder which can lead to cause suicide ideation and attempt indirectly [25,26].

## Recommendations

Based on the result we recommend the followings.

- Further researches on alcohol use disorder, depression and suicide are necessary to assess the relationship each character.

## Strength

- The study was done using all study population to maximize the representation
- Study tools were easily understandable and clear
- High response rate

## Limitations

Some of the limitation founded including: -

- Lower sample size was problematic to generalize the association of alcohol and suicide ideation and attempt.
- The study included predominant homogeneous high risk alcohol use disorder patients.
- Wide gap in prevalence of alcohol use among the general population was difficult to compare our results
- This made it highly selective so that it becomes difficult for analysis and a potential selective bias.
- The study had limitation in including acute alcohol use disorder and its association with suicide ideation and attempt.
- Other predisposing and precipitating factors which contribute to suicidal ideation and attempt such as aggression, stressful life events, other comorbid mental illness, genetic and socio-cultural factors were not assessed.

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## References

1. Diagnostic and Statistical Manual of Mental Disorders (2013) Fifth Edition. Arlington, VA, American Psychiatric Association 2013: 490-492
2. Schuckit MA (2009) Alcohol-related disorders. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009: 1268.
3. World Health Organization (2014a) Global Status Report on Alcohol and Health 2014. World Health Organization: Geneva, Switzerland.
4. World Health Organization (2014b) Global Status Report on Alcohol and Health 2014, country profiles. World Health Organization: Geneva, Switzerland.
5. Ilgen MA HA, Harris S, HR Moos, Quyen Q (2007) Tiet, Predictors of a Suicide Attempt One Year After Entry Into Substance Use Disorder Treatment, Alcohol ClinExp Res 31: 635-642.
6. Global epidemiology of suicide and suicide attempts (2014) Preventing suicide, a global imperative. World Health Organization: Geneva, Switzerland 2014: 20-39
7. Kebede D, Alem A (1999) Suicide attempts and ideation among adults in Addis Ababa, Ethiopia. ActaPsychiatricaScand 100: 35-39.
8. Macdonald S, Cherpitel CJ, Borges G, DeSouza A, Giesbrechet NA, et al. (2005) The criteria for causation of alcohol in violent injuries based on emergency room data from six countries. Addict. Behav 30: 103-113.
9. Hernandez-Avila CA, Krnazler HR (2011) Alcohol Use Disorders. In: Ruiz P, Strain EC, eds. The Substance Abuse Handbook, 2<sup>nd</sup> edn. Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins 2011: 36-47.
10. FerrariAJ, SomervilleAJ, BaxterAJ, NormanR, PattenSB (2013) Global variation in the prevalence and incidence of major depressive disorder :a systematic review of the epidemiological literature. Psychol. Med 43: 471-481.
11. Pirkola SP, Isometsä ET, Heikkinen ME, Henriksson MM, Lönnqvist JK (2000) Suicides of alcohol misusers and non-misusers in a nationwide psychological autopsy study. Alcohol & Alcoholism 35: 70-75.
12. Inskip HM, Harris EC, Barraclough B (1998) Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. Br J Psychiatry 172: 35-37.
13. Cherpitel CJ, Bond J, Guilherme LG, Borges G, Wilcox H.C (2004) Acute Alcohol Use and Suicidal Behavior: A Review of the Literature Addiction, AlcoholClinExp Res 28: 18-28.
14. Conner KR, Beautrais AL, Conwell Y (2003) Moderators of the relationship between alcohol dependence and suicide and medically serious suicide attempts: analyses of Canterbury Suicide Project Data. Alcohol ClinExp Res 27: 1156-1161.
15. Shoval G, Shmulewitz D, Wall MM, Aharonovich E, Spivak B, et al. (2014) Alcohol Dependence and Suicide-Related Ideation/ Behaviors in an Israeli Household Sample, With and Without Major Depression, Alcohol ClinExp Res38: 820-825.
16. Preuss UW, Schuckit MA, Smith TL, Danko GP, Buckman K, Bucholz (2002) Comparison of alcohol-dependent individuals with and without suicide attempts. Alcohol ClinExp Res 26: 471-477.
17. Borges G, Bagge C. L, Cherpitel C. J, Conner K R, Orozco R, et al. (2016) A meta-analysis of acute use of alcohol and the risk of suicide attempt. Psychological Medicine, Cambridge University Press 2016: 1-9.
18. Darvishi N, Farhadi M, Haghtalab T, Poorolajal J (2015) Alcohol-related risk of suicidal ideation, suicide attempt ,and completed suicide: a meta-analysis. PLOS ONE.
19. Conner KR, Duberstein PR (2004) Predisposing and

- 
- Precipitating Factors for Suicide Among Alcoholics: Empirical Review and Conceptual Integration. *alcoholism: clinical and experimental research* 28: 5.
20. Lesage AD, Boyer R, Grunberg F, Vanier C, Morissette R (1994) Suicide and mental disorders: a case-control study of young men. *Am J Psychiatry* 151: 1063-1068.
  21. Makela P (1996) Alcohol consumption and suicide mortality by age among Finnish men, 1950-1991. *Addiction* 91: 101-112.
  22. Francis JM, Grosskurth H, Chagalucha J, Kaipiga SH, Weiss HA (2014) Systematic review and meta-analysis: prevalence of alcohol use among young people in eastern Africa. *Tropical Medicine and International Health: John Wiley & Sons* 19: 476-488.
  23. Fekadu A, Medhin G, Selamu M, Shiferaw T, Hailemariam M, et al. (2016) Non-fatal suicidal behaviour in rural Ethiopia: a cross-sectional facility- and population-based study. *BMC Psychiatry* 16: 75.
  24. Teferra S, Medhin G, Selamu M, Bhana A, Hanlon C et al. (2016) Hazardous alcohol use and associated factors in a rural Ethiopian district: a cross-sectional community survey. *BMC Public Health* 16: 218.
  25. Fekadu A, Alem A, Hanlon C (2007) Alcohol and drug abuse in Ethiopia; past, present and future. *African journal of drug and alcohol studies* 6.
  26. Kebede D, Alem A (1999) The epidemiology of alcohol dependence and problem drinking in Addis Ababa, Ethiopia. *Acta Psychiatrica Scand* 100: 30-34.

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