

Alcohol use and its associated factors during pregnancy in Ethiopia: a population-based survey

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Abstract

Background: Alcohol use during pregnancy is a modifiable health behavior that causes a range of health problems in infants, including impaired growth, stillbirth, and fetal alcohol spectrum disorder. However, there is lack of comprehensive information on alcohol use and associated factors during pregnancy using a population-based dataset in Ethiopia. Therefore, this study aimed to assess the prevalence of alcohol use during pregnancy and associated factors using a national, population-based survey.

Methods: The study utilized data from the 2011 and 2016 Ethiopian Demographic and Health Survey, a cross-sectional survey conducted on a nationally representative sample. The survey employed a multistage cluster sampling method to generate representative national and sub-national health and health related indicators. A total of 2,341 pregnant women were included in the analysis. Factors associated with alcohol use were identified using multivariable logistic regression model. Adjusted odds ratios (AOR) with 95% confidence interval (CI) were computed to quantify the degree of association between independent variables and alcohol use.

Results: In Ethiopia, the prevalence of alcohol use among pregnant women was 30.2% (95% CI: 28.4%-32.2%). The study identified that being employed (AOR: 2.07; 95%CI: 1.55-2.77), ever attempted termination of pregnancy (AOR: 2.21; 95% CI: 1.60-3.05), having two (AOR: 2.56; 95% CI: 1.76-3.72), or three (AOR: 2.98; 95% CI: 1.40-6.35) sexual partners in lifetime and chat chewing (AOR: 8.91; 95% CI: 4.61-17.23) had increased the odds of alcohol use during pregnancy.

Conclusion: In this study, the prevalence of alcohol use during pregnancy among Ethiopian mothers was high. Working status, ever used something to terminate the pregnancy, more than one lifetime partner, and chat chewing were factors associated with alcohol use during pregnancy. Thus, prevention interventions and strategies can draw on the identified modifiable health behaviors.

Introduction

Alcohol intake for women who are planning pregnancy in the near future, who are pregnant, and who are breastfeeding is discouraged [1, 2]. There is no safe amount or type of alcohol drinking during pregnancy [3], though complications increase with increased intake [4–6].

Alcohol consumption during pregnancy and the peri-conception period is associated with fetal alcohol spectrum disorders (FASD), and a host of other obstetric complications [4, 6, 7]. FASD is a grave, yet preventable, complication of maternal alcohol consumption. It encompasses malformations, neurodevelopmental delay, poor growth, and future behavioral impact to the newborns. Neurocognitive and behavioral problems resulting from prenatal alcohol exposure (PAE) are life-long [8]. A mother's current alcohol intake is associated with histories of abortion, psychological disorders, and a prior history of alcohol intake [9, 10].

Prenatal alcohol exposure is associated with poor obstetric performance, which includes but is not limited to: miscarriage, stillbirth, preterm labor, premature rupture of membrane and low birth weight [5, 11]. PAE has also been known to be associated with placental abnormalities [12].

Despite its known consequences, alcohol consumption is a common practice during pregnancy throughout the world. The amount of consumption might vary from mild or moderate, to heavy or binge drinking (defined as having 5 or more drinks per occasion) [4, 13]. The magnitude of consumption is variable across the world and across sociocultural differences. Studies show that in the United States of America 22.8% of pregnant women drank alcohol during pregnancy [14], in Australia 82% [15], and in Sweden 6% [16]. The prevalence of alcohol consumption during pregnancy in east Africa ranged from 3.4–20.5% [17].

In Ethiopia, a few facility-based studies show that alcohol is consumed at variable rates across the country (8.1–16.1%) [9, 18]. However, there is lack of comprehensive information on alcohol consumption and associated factors using a population-based dataset at the national level. Therefore, this study aimed to assess the prevalence of women who consumed alcohol during pregnancy and associated factors using two surveys data (2011 and 2016) Ethiopian Demographic and Health survey (EDHS).

Methods

Study setting and design

Ethiopia is a sub-Saharan African country, found in East Africa. Administratively, the country is divided into nine regional states and two city administrations. Each regional state is sub-divided into zones, weredas (districts), and kebeles, the smallest administrative units.

This analysis utilized cross-sectional data from the 2011 and 2016 EDHS. The two surveys followed a rigorous methodology to generate a representative national and sub-national (regional) sample to measure a range of health indicators. The 2011 and 2016 EDHS samples were selected using two-stage stratified cluster sampling using the enumeration areas (EAs) of the 2007 Ethiopian population and housing census as the primary sampling unit and households as the secondary sampling unit. In the first stage, EAs were selected with probability proportional to EAs size from the complete list of 84,915 EAs created for the 2007 PHC sampling frame. In the second stage of selection, a fixed number of households per cluster were selected with an equal probability of systematic selection from the newly created household listing. All women age 15–49 who were either permanent residents of the selected households or visitors who stayed in the household the night before the survey were eligible to be interviewed. A total of 32,198 women (16,515 from 2011 and 15,683 from 2016 EDHSs) in the reproductive age group (15–49 years) were interviewed. The detailed methodologies of the two surveys can be found elsewhere [1, 19]. For this study, 2,399 pregnant women (1,277 from 2011 and 1,122 from 2016) were included in the analysis.

Data extraction

The EDHS datasets, which are publicly available to all registered users, were requested and downloaded from the Demographic and Health Survey (DHS) Program website (https://www.dhsprogram.com/data/dataset_admin). After reviewing and understanding the details of the EDHS data structure and dataset types, we selected the recommended dataset type for pregnant women. Data on alcohol use, and potential independent variables were extracted.

Measurements

The outcome variable (alcohol drinking) in DHS was measured from women as having at least one drink of any alcoholic beverage in the past 30 days. The explanatory variables include place of residence, household head, age, education, employment status, household wealth status, antenatal care visits, gestational age, number of children, chat chewing, visited health facility in past 12 months, visited by health worker in past 12 months, lifetime sexual partners, current pregnancy, and ever used anything to terminate the pregnancy.

Data analysis

The data analysis was done using STATA version 16.0. Sample weighting was considered during analysis since the EDHS data was derived from a complex survey. Descriptive statistics were used to describe data. Bivariable and multivariable logistic regression analysis was done to identify the predictors of alcohol drinking. Variables having a p-value less than 0.25 in the bivariable logistic regression analysis were candidate variables for the multivariable logistic regression model. The degree of association between explanatory variables and outcome variables was quantified using adjusted odds ratio (AOR) with 95% confidence interval (CI).

Ethical considerations

Data of the 2011 and 2016 EDHS were obtained after getting permission from DHS measures. The DHS data were collected in line with national and international ethical guidelines. Further information on the survey protocol can be found the 2010 and 2016 EDHS country report [1, 20].

Results

Socio-demographic characteristics

A total of 2,340 (1,205 from the 2011 EDHS and 1,135 from the 2016 EDHS) pregnant women were included in the analysis. Rural residents comprised 86.7% of the pregnant women. One third of the pregnant women's ages were in the age range of 25–29 years. About 57% of pregnant women didn't have formal education, and 50% of them were not working at the time of data collection. The majority, 86.7%, of head of households were male. Almost a quarter of pregnant women (23.5%) had the poorest wealth status and 70% of pregnant women had no antenatal care visit for the index pregnancy (Table 1).

Table 1
 Pregnant women socio-demographic and reproductive characteristics, 2011 and 2016 EDHS, Ethiopia (weighted count = 2,341).

Variables	Number (%)
Place of residence	
Urban	311 (13.3)
Rural	2030 (86.7)
Women age in Years	
15–19	225(9.6)
20–24	565 (24.1)
25–29	701 (30.0)
30–34	465(19.9)
35–39	267(11.4)
>=40	117 (5.0)
Women education	
No education	1344 (57.4)
Primary	805(34.4)
Secondary and above	192 (8.2)
Women employment status	
Currently employed	1175 (50.2)
Currently not employed	1166(49.8)
Head of household	
Male	2022 (86.4)
Female	319 (13.6)
Antenatal care visit	
No visit	1643 (70.2)
1–3 visit	373 (16.0)
> 4 visits	325 (13.8)
Household wealth status	
Poorest	551 (23.5)

Variables	Number (%)
Poorer	523 (22.4)
Middle	442 (18.9)
Richer	434 (18.5)
Richest	391 (16.7)
Survey years	
2011	1205 (51.5)
2016	1135(48.5)

Practice of alcohol consumption

The national level prevalence of alcohol use was found to be 30.2% (95% CI: 28.4–32.2) at the national level and the analysis did not show a significant difference between rural (29.7%; 95% CI: 27.8–31.7%) and urban (34%; 95% CI: 28.8–39.6) pregnant women residents.

Obstetric, substance and psychosocial related factors

More than a third of pregnant women (34.8%) were in their first trimester of pregnancy, and 38% were in their third trimester. Three hundred thirty-three, 14.2%, of pregnant women chewed khat at least once in the last 30 days. The majority, 80.7%, of pregnant women had one lifetime partner. In the 12 months prior to the interview, 44% did not visit a health facility, and 75% were not visited by health extension worker. A quarter of the pregnant women had five or more children. The current pregnancy was not wanted for 9.4% of pregnant women, and 40% of pregnant women had attempted to terminate the pregnancy (Table 2).

Table 2
 Obstetric, substance and psychosocial related factors among pregnant women in Ethiopia, 2011 and 2016 EDHS, Ethiopia (n = 2,340).

Variables	Number (%)
Gestational age	
First trimesters	814 (34.8)
Second trimesters	635 (27.1)
Third trimesters	891 (38.1)
Khat chewing	
Yes	333 (14.2)
No	2007 (85.8)
Life time sexual partner	
One partner	1888 (80.7)
Two Partners	369 (15.8)
Three partners	83 (3.5)
Visited health facility in the past 12 months	
Yes	1309 (55.9)
No	1031 (44.1)
Visited by HEW in the past 12 months	
Yes	580 (24.8)
No	1760 (75.2)
No. of children	
No child yet	430 (18.4)
Has one child	393 (16.8)
Has two children	330(14.1)
Has three children	281(12.0)
Has four children	296 (12.7)
Has five and more	610 (26.0)
Current pregnancy (n = 2332)	
HEW = Health Extension Worker	

Variables	Number (%)
Not wanted	219 (9.4)
Wanted later	499 (21.4)
Wanted	1613 (68.9)
Ever attempted to terminate the pregnancy	
Yes	946 (40.4)
No	1395 (59.6)
HEW = Health Extension Worker	

Factors Associated With Alcohol Use

Employment status, ever attempted to terminate the pregnancy, number of lifetime sexual partners, and khat chewing were significant factors associated with alcohol use. Women who were employed were two times more likely to drink alcohol (AOR: 2.07 (1.55–2.77)) compared to those who were not employed. Further, prior attempts to terminate the pregnancy were significantly associated with (AOR: 2.21 (1.60–3.05)) alcohol use. Having more than one lifetime sexual partner also increased the odds of alcohol use. Those who had two partners were 2.5 times more likely to use alcohol compared to those who had one (AOR: 2.56 (1.76–3.72)). Likewise, those who had 3 lifetime sexual partners had 3 times higher odds of alcohol use (AOR: 2.98 (1.40–6.35)) compared to those who had one partner. Being a khat user also increased the odds of alcohol use (AOR 8.91(4.61–17.23)) compared to non-khat chewers (Table 3).

Table 3

Factors associated with alcohol consumption among pregnant women in Ethiopia, 2011 and 2016 EDHS, Ethiopia

Characteristics	Alcohol use		COR (95%CI)	AOR (95%CI)
	Yes	No		
Place of residence				
Urban	106	205	1.23 (0.83–1.83)	0.64 (0.35–1.16)
Rural	602	1428	1.00	1.00
Women's age				
15–19 years	71	154	1.00	
20–24 years	160	405	0.86 (0.53–1.39)	
25–29 years	203	498	0.88(0.55–1.40)	
30–34 years	152	313	1.05(0.66–1.68)	
35–39 years	82	185	0.96(0.56–1.63)	
40–49 years	39	79	1.06(0.54–2.09)	
Women education				
No formal education	437	907	0.90 (0.55–1.47)	
Primary	203	602	0.63(0.38–1.04)	
Secondary & above	67	125	1.00	
Women employment status				
Employed	452	723	2.24(1.71–2.94)**	2.07(1.55–2.77)**
Not employed	255	911	1.00	1.00
Head of household				
Male	615	1407	1.00	
Female	92	227	0.93(0.65–1.32)	
Household wealth status				
Poorest	171	380	1.00	0.91(0.50–1.67)
Poorer	155	368	0.93(0.62–1.39)	0.77(0.41–1.45)
Middle	120	322	0.82(0.55–1.24)	0.68(0.38–1.24)
Richer	117	317	0.81(0.52–1.26)	0.54(0.30–0.97)

Characteristics	Alcohol use		COR (95%CI)	AOR (95%CI)
	Yes	No		
Richest	144	247	1.28(0.83–1.98)	1.00
Gestational age				
First trimesters	224	591	1.00	1.00
Second trimesters	191	443	1.14 (0.81–1.59)	1.24(0.84–1.81)
Third trimesters	292	599	1.28(0.94–1.75)	1.26(0.91–1.73)
Antenatal care visit				
No visit	529	1115	1.25 (0.85–1.85)	1.49(1.00-2.22)
1–3 visit	89	284	0.83 (0.53–1.30)	0.98(0.61–1.57)
4 & above visit	89	236	1.00	1.00
Visited health facility in the past 12 months				
Yes	364	945	0.77(0.59–1.01)	
No	344	687	1.00	
Visited field health worker in the past 12 months				
Yes	192	388	0.84 (0.61–1.16)	0.77(0.57–1.05)
No	515	1245	1.00	
Ever attempted to terminate the pregnancy				
Yes	381	565	2.22(1.68–2.95)**	2.21(1.60–3.05)**
No	326	1069	1.00	1.00
Life time sexual partner				
One partner	492	1396	1.00	1.00
Two Partners	171	198	2.48 (1.70–3.61)**	2.56(1.76–3.72)**
Three partners	44	39	3.39(1.72–6.68)**	2.98(1.40–6.35)*
Khat chewing				
Yes	23	310	6.79(3.69–12.5)**	8.91(4.61–17.23)**

Characteristics	Alcohol use		COR (95%CI)	AOR (95%CI)
	Yes	No		
No	684	1323	1.00	

Discussion

It has long been known that alcohol use during pregnancy has detrimental effects on women and infants; however, the practice remains common. Besides fetal alcohol syndrome, abortion-related maternal deaths and various fetal complications are also caused by alcohol consumption during pregnancy [21].

According to the study, in Ethiopia, almost a third of pregnant women have consumed alcohol during pregnancy, signaling a significant problem in the country. The study also demonstrated that there is no significant difference between rural and urban women, among different educational levels, and along the age spectrum. Other factors found to be associated with the alcohol use are lifetime number of partners, having tried to terminate the pregnancy, working status, and chat chewing.

In previous local studies, the prevalence of alcohol use during pregnancy varied from 4.3–45% [10, 18], which is consistent with the national survey. However, the prevalence is higher compared to a recent meta-analysis in sub-Saharan Africa [20.8% (95% CI: 18.2, 23.5)] [22], the World Health Organization Africa region (18.5%) [23], Korea (16.4%) [24], the United States (11.5%) [25], and global estimated prevalence (9.8%) [26]. On the other hand, this finding is lower than studies done in Australia (64%) [27] and Russia (60%) [28]. One possible explanation for this variation could be a variation in socio-demographic and economic status, cultural practices, and health policies. There could also be differences in measurement tools for alcohol drinkers. Under reporting due to social desirability bias, recall bias, religious beliefs, and geographic variations were also mentioned as limitations in previous studies that could affect the accuracy of measurements of prevalence of alcohol drinking during pregnancy [29, 30].

Findings of a systematic review showed that alcohol consumption during pregnancy was associated with socioeconomic factors, like source of income, employment status, and knowledge of harmful effects of alcohol; and behavioral factors, like prior alcohol consumption, partner's alcohol use, peer pressure to use alcohol, and smoking [22]. Other studies show that women's alcohol drinking has been increasing due to having their own income, socialization with friends, peer pressure, and lack of adequate information about the adverse health effect of alcohol [31–35]. Women who are working have their own money to spend on alcohol, while their counterparts who are not working do not. In the current study, women who were employed had increased odds of alcohol use during pregnancy, which is consistent with the previous research [35].

The literature has shown that alcohol consumption is significantly associated with abortion-related maternal deaths. Alcohol consumption may lead to increased risk of induced abortion and consequently, death due to unsafe abortion [21]. The current study revealed that prior attempt to terminate the pregnancy was significantly associated with alcohol use during pregnancy, which is consistent with

previous studies [36, 37]. Unplanned pregnancies are at high risk for exposure for different teratogens; alcohol, radiation and drugs. Women who have attempted to terminate the pregnancy might have an unplanned pregnancy or unstable family situation. The social and psychological impacts of unplanned pregnancy may influence the initiation of alcohol or other substance use to relieve or mask stress [38]. Being a khat user also increased the odds of alcohol use during pregnancy in this study, likely following a similar mechanism.

In this study, having more than one lifetime sexual partner increased the odds of alcohol use during pregnancy. Multiple lifetime sexual partners expose women to different people with different behaviors. Having a partner who drinks may lead a pregnant woman to drink as well. Alternatively, being a drinker may have been a cause or outcome of prior unsuccessful relationships. The literature also reveals that the association between alcohol use and number of sexual partners is stronger for women than men [39].

Conclusion

This study merged two large nationally representative datasets to examine alcohol consumption among Ethiopian women during pregnancy. Previous studies have not examined this topic using nationally representative data. The study also has limitations, namely possible under reporting of alcohol use due to social desirability and recall biases that could affect the accuracy of prevalence measurement of alcohol consumption. Another limitation of the study is that the survey did not look at types of alcohol consumed and frequency of alcohol use during pregnancy. If a woman has one glass of beer early in the pregnancy, it does not have the same implications as a woman who drinks liquor regularly. The study that looks more closely at the mechanisms between alcohol use and abortion would be interesting.

List Of Abbreviations

AOR: Adjusted odds Ratio; CI: Confidence Interval; DHS: Demographic and Health Survey; EAs: Enumeration Areas; EDHS: Ethiopian Demographic and Health Survey; FASD: Fetal Alcohol Spectrum Disorders; PAE: Prenatal Alcohol Exposure

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the ethical standards of the Helsinki Declaration of the World Medical Association 1964. Data of the 2011 and 2016 EDHS were obtained after getting permission from DHS measures. The DHS data were collected in line with national and international ethical guidelines. Further information on the survey protocol can be found the 2010 and 2016 EDHS country report

Consent for publication

Not applicable

Availability of data and materials

The data is available at DHS Measures. Anybody can access the data after requesting the data owners of DHS Measures

Competing interests

The authors declare that they have no competing interest

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Authors' contributions

NA conceived the study, assisted the data analysis and interpretation, drafted the manuscript and critically reviewed the manuscript. MA conceived the study, conducted the data analysis and interpretation, and critically reviewed the manuscript. DN assisted the data analysis, critically reviewed the manuscript. KK critically reviewed the manuscript and did final editing. All of the authors read and approved the final version of the manuscript.

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