

Prevalence and associated factors of alcohol intake in the first trimester of pregnancy in Dabat district, northwest Ethiopia

Abebaw Addis Gelagay¹ · Abebaw Gebeyehu Worku¹ · Debrework Tesgera Bashah² · Nigusie Birhan Tebeje² · Mignote HailuGebrie² · Hedija Yenus Yeshita¹ · Endeshaw Adimasu Cherkose³ · Ayenew Molla Lakew⁴ · Berihun Assefa Dachew⁴ · Amare Tariku⁵ · Birhanu Abera Ayana⁶ · Gashaw Andargie Bikes⁷ · Aysheshim Kassahun Belew⁵

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Abstract

Background Now a day, the consumption of alcohol among pregnant women is increasing from time to time, and it has become one of the increasingly serious public health and socio-economic problems. In addition, cause miscarriages, stillbirths, and a range of physical, behavioural, and intellectual disabilities for the baby that can last a lifetime. There is also limited evidence. Therefore, the objective of this study was to prevalence and associated factors of alcohol intake in the first trimester of pregnancy in Dabat district, northwest Ethiopia.

Methods A community-based cross-sectional survey was conducted to determine the magnitude of alcohol intake within the first three months of pregnancy at the Dabat Demographic and Health Survey Site. A census of pregnant women in Dabat demographic and health survey sites was employed. A total of 579 pregnant women were found and participated in this study. The Data were entered and analyzed using EPI INFO and STATA version 14, respectively. Multivariable logistic regression analysis was used to determine factors related to alcohol intake during the first trimester of pregnancy. The adjusted odds ratio (AOR) with 95% confidence interval was used to show the strength of the association, and P value < 0.05 was used to confirm the significance of the association.

Results The prevalence of alcohol intake in the first trimester of pregnancy was 58% (95%CI (54.1, 61.8)). Rural residence (AOR = 6.83, 95% CI, 2.55, 18.32), being married (AOR = 2.37, 95% CI: 1.14, 4), being a housewife occupation (AOR = 2.24, 95% CI, 1.54, 3.26) and having a history of stillbirth ((AOR = 1.99, 95% CI: 1.2, 4.14) were significantly associated with alcohol intake in the first trimester.

Conclusions The prevalence of alcohol consumption in the first trimester of pregnancy was high in the study area. Pregnant women's sociodemographic characteristics and history of stillbirth are associated with alcohol consumption. Therefore, increasing maternal awareness of the negative effects of alcohol consumption among mothers living in rural

✉ Aysheshim Kassahun Belew, aysheshim121@gmail.com; Abebaw Addis Gelagay, ababaw.addis@gmail.com; Abebaw Gebeyehu Worku, abebawgebeyehu@yahoo.com; Debrework Tesgera Bashah, debre2012@gmail.com; Nigusie Birhan Tebeje, nigusiebirhan@gmail.com; Mignote HailuGebrie, elatman.hailu86@gmail.com; Hedija Yenus Yeshita, kedijayenus@gmail.com; Endeshaw Adimasu Cherkose, endeshaw_99@yahoo.com; Ayenew Molla Lakew, mayenew15@gmail.com; Berihun Assefa Dachew, berihunassefa21@gmail.com; Amare Tariku, amaretariku15@yahoo.com; Birhanu Abera Ayana, birhanua31@gmail.com; Gashaw Andargie Bikes, gashawab@gmail.com |

¹Department of Reproductive Health, Institute of Public Health, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia. ²School of Nursing, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia. ³School of Midwifery, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia. ⁴Department of Epidemiology and Biostatistics, Institute of Public Health, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia. ⁵Department of Human Nutrition, Institute of Public Health, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia. ⁶Department of Obstetrics and Gynaecology, School of Medicine, University of Gondar, Gondar, Ethiopia. ⁷Department of Health System and Policy, Institute of Public Health, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia.



areas is important to modify higher rates of alcohol intake in the first trimester. Mothers with a history of stillbirth should pay attention.

Keywords Alcohol intake · First trimester · Pregnant women · Dabat · Ethiopia

Abbreviations

AOR	Adjusted Odds Ratio
CI	Confidence Interval
COR	Crud Odds Ratio
CSA	Central Statistics Agency
EDHS	Ethiopian Demographic and Health Survey
FAS	Fetal Alcohol Syndrome
IRB	Institutional review board
MNCH	Maternal, newborn, and child health

1 Introduction

Alcohol, a toxic and addictive drug found in beer, wine, and spirits, can cause serious and lasting changes in the brain [1]. It has a poor effect on food intake, restricts the supply of essential nutrients, and inhibits the breakdown of nutrients into usable molecules by reducing the secretion of pancreatic digestive enzymes, thereby affecting energy supply and structural maintenance [2]. In addition, alcohol destroys the digestion, storage, utilization, and excretion of nutrients, thereby destroying the nutritional process, thereby destroying the absorption of nutrients through damaging the cells of the stomach and intestinal walls, and preventing certain nutrients from entering the blood [3, 4]. Consequently, it may lead to more absorption problems. For example, folate deficiency can alter the cells lining the small intestine, impairing the absorption of water and nutrients, including glucose, sodium, and other folates, especially in pregnant women) [5].

Alcohol intake during pregnancy has a negative effect on mother and fetus [6], including Fetal Alcohol Syndrome (FAS), as a result, globally about 119, 000 children born every year women who consume alcohol during pregnancy will deliver a child with FAS [7, 8]. In addition, there are potential adverse health consequences, including spontaneous abortion, stillbirth, intrauterine growth retardation, low birth weight, premature delivery, and birth defects [9], it causes developmental delay, facial deformities, central nervous system impairment [10], fetal mortality [11], and low birth rate [12]. Moreover, increasing energy intake by 20–50% during chronic alcohol consumption may mobilize fetal vitamin concentrations in the liver, thereby increasing vitamin A levels, leading to fetal organ deficiency [13].

Smoking cessation is recommended, but globally, 1 in 10 women drink alcohol during pregnancy, and 20% of them are heavy drinkers, which equates to four or more drinks at a time [7, 8]. The current trend in alcohol intake has increased from 9.2% in 2011 to 11.3% in 2018 [14], with the highest percentage in Europe, from 20.9% to 28.5% [15]. In Africa, the number of pregnant women who drink alcohol ranges from 19.5% to 59% [15–17]. Given that 39.8% of pregnant women in Ethiopia drink alcohol [14].

Previous studies affirmed that low education status [6, 14, 15], having primary education [14], being a housewife [14], making local brews as a source of income [6], not having had complications in previous pregnancies [6], making local brews as a source of income [6], not having had complications in previous pregnancies [6], unplanned pregnancy [14], having relatives who use alcohol [6, 15], pregnancy alcohol use [15], and poor social support [14, 15] are positive factors for pregnant women's drinking.

Despite so little evidence indicating that the consumption of alcohol during pregnancy has taken into account the negative effects, but there is no study on the effect of alcohol during her first trimester of pregnancy to inform policy makers and program designers in Ethiopia. However, alcohol use among pregnant women as well as screening of alcohol use and provision of intervention for pregnant women has not got concern despite the rise of consumption of alcohol and its impact on the ground for all socio demographics from time to time in Ethiopia. Therefore, this study aimed to show the prevalence and associated factors of alcohol consumption during the first trimester of pregnancy among pregnant women in the Dabat district of northwestern Ethiopia.

2 Methods

2.1 Study area, population, and design

A Community based cross-sectional survey was conducted to determine the prevalence of alcohol intake during the first trimester of pregnancy and identify its determinants in Dabat demographic and health research sites. The centre is among the six healths and Demographic Surveillance Systems in Ethiopia. According to the Central Statistics Agency (CSA) report of Ethiopia, the district has an estimated population of 145,458 people in 27 rural and 3 urban Kebeles (the smallest administrative units in the country). The research centre includes 13 Kebeles (9 rural and 4 urban) representing each agro-ecological zone of the district, and there are 5 health centres and 29 health posts in the district. The study population included women of reproductive age (15–49 years) who were pregnant identified by house-to-house survey.

2.2 Sample size and sampling technique

A single population proportion formula was used to estimate the sample size. Assumptions considered in the sample size calculation were 34% prevalence of alcohol intake among pregnant women in Bahir Dar City [16], 95% confidence level, 10% non-response rate, and 4% degree of precision. Finally, a sample size of 593 was obtained. However, since the study was nested in the Dabat Demographic and Health Surveillance (DHS) data and this baseline survey was the base for the Maternal and Neonatal and Child Health (MNCH) surveillance, a census of pregnant and postpartum women was done. Hence, a total of 579 pregnant mothers were found in urban and rural Kebeles of Dabat Demographic and health survey sites and participated.

2.3 Data collection tools and procedures

The questionnaire was written in English from relevant literature and translated into Amharic, the local language of the region, and then translated back to English for consistency and analysis. The tool consists of two parts, closed and open, to address research goals, including socio-demographic information, antenatal care service utilization history, and alcohol intake. Supervisors and investigators were recruited from the research centre, and five-day training was conducted on the research objectives, and they were briefly introduced to the contents and procedures of the questionnaire before fieldwork. Participants' informed consent was obtained verbally and each woman was interviewed alone.

2.4 Operational definition

The alcohol intake measurement is defined as the participants who report their alcohol intake during first trimester of pregnancy. If a pregnant woman reported as consuming alcohol during first trimester of pregnancy from Tella, Teje, Areqe, Beer, Wine, and Distilled sprites during her last /current pregnancy was classified as alcohol consumer.

2.5 Data management and analysis

All questionnaires were checked for consistency and completeness. Data were entered and analyzed using EPI INFO and STATA version 14, respectively. Variables such as age and education level are collected openly and classified during the analysis process. Descriptive statistics such as frequency and proportions were calculated. A multivariable logistic regression analysis was employed to identify the factors associated with alcohol intake. Adjusted Odds Ratio (AOR) with 95% confidence interval was used to show the strength and direction of the association, while a P-value < 0.05 was used to declare the significance of association.

3 Results

3.1 Socio-demographic characteristics of the respondents

A total of 579 pregnant mothers participated in this study. The average age of the study participants was 31.57 years and the standard deviation was + 7.05. Nearly half of the 274 participants (47.3%) are between 30–39 years old. The majority of women are Orthodox (97.1%) and rural residents (92.2%). Slightly more than half (54.6%) of the study participants were housewives. Almost all 526 (90.8%) of the pregnant mothers were married (Table 1).

3.2 Reproductive Health and behavioural characteristics of the study participants

Study participants have ever had an abortion, 45 (7.8%) and are stillborn (7.6%). About one-fifth of women are primiparous, accounting for 107 (18.5%). Two thirds, 398(68.7%) of the participants were unplanned pregnancy. Amongst the women who gave birth, 84.1% had delivered their children at home. Of nearly half of the mothers, 269 (46.5%) did not participate in the current pregnancy test of ANC. Only 99 (17.1%) pregnant mothers were screened for HIV. Of the one-third of pregnant women, 205 (35.4%) showed signs of danger (Table 2).

3.3 Alcohol intake prevalence

In the study area, more than half of the pregnant women (336 (58.0%, 95% CI: 54.1, 61.8)) drank alcohol in the first trimester of pregnancy.

3.4 Factors associated with alcohol intake during the first trimester of pregnancy

Multivariate binary logistic regression analysis showed that in the first trimester of pregnancy, when the p-value was less than 0.05, the variables of residence, occupation, and marital status were statistically related to drinking.

Table 1 Socio-demographic characteristics of pregnant women among women in Dabat Demographic and Health survey sites, 2017

Variable	Category	Frequency (Percentage)
Age of the mother in years	18–24	111 (19.2)
	25–30	130 (22.5)
	30–39	274 (47.3)
	> = 40	64 (11.1)
Religion	Orthodox Christian	562 (97.1)
	Muslim	17 (2.9)
Residence	Urban	45 (7.8)
	Rural	534 (92.2)
Marital Status	Married	526 (90.8)
	Unmarried	53 (9.2)
Educational Status	Unable to read and write	414 (71.5)
	Able to read and write	28 (4.8)
	Primary(1–8)	77 (13.3)
	Secondary and above	60 (10.4)
Occupation	Farmer	226 (39)
	House wife	316 (54.6)
	Merchant	18 (3.1)
	Others*	19 (3.3)

*Government employee, Daily labourer

Table 2 Reproductive health and behavioural of pregnant women among women in Dabat Demographic and Health survey sites, 2017

Variable	Category	Frequency (Percentage)
Numbers of pregnancy	1–3	214 (37)
	4–6	252 (43.5)
	7–11	113 (19.5)
Number of Children	No	11 (1.9)
	1–2	204 (45.2)
	3–5	261 (45.1)
	6–10	103 (17.8)
Abortion age less than 7 months	No	534 (92.2)
	Yes	45 (7.8)
Types of Abortion(n = 45)	Spontaneous	38 (84.4)
	Induced	7 (15.6)
ANC visit for the last child	No	264 (45.6)
	Yes	315 (54.4)
Danger sign during last child	No	557 (96.2)
	Yes	22 (3.8)
Place of Delivery last child(n = 568)	Home	487 (84.1)
	Health post	13 (2.2)
	Health centre/hospital	70 (12.1)
PNC for last child(n = 568)	No	520 (90.2)
	Yes	48 (8.3)
Types of pregnancy	Planned	398 (68.7)
	Unplanned	181 (31.3)
Types of unwanted pregnancy	Mistimed	148 (81.8)
	Unwanted	33 (18.2)
ANC visit for current pregnancy	No	269 (46.5)
	Yes	310 (53.5)
No. of ANC visit(n = 310)	1	97 (31.3)
	2	103 (33.2)
	3	70 (22.6)
	4 and above	40 (12.9)
Danger sign	No	374 (64.6)
	Yes	205 (35.4)
Partner HIV test	No	510 (88.1)
	Yes	69 (11.9)
Iron/folic tablet intake(n = 310)	No	65 (21)
	Yes	245 (79)
Alcohol Intake	No	76 (13.1)
	Yes	503 (86.9)

Respondents living in rural areas were 6.8 times more likely to drink alcohol in the first three months than respondents living in urban [AOR = 6.83, 95% CI, 2.55, 18.32].

Compared with women working on the farm, pregnant women who are housewives are 2.24 times more likely to drink alcohol in the first trimester of pregnancy [AOR = 2.24, 95% CI, 1.54, 3.26]. Compared with unmarried pregnant women, the alcohol intake of married pregnant women in the first three months of pregnancy was 2.37 times their alcohol intake (AOR = 2.37, 95% CI: 1.14, 4.67).

Compared with pregnant women without a history of stillbirth, pregnant women with a history of stillbirth are twice as likely to drink alcohol in the first trimester of pregnancy (AOR = 1.99, 95% CI: 1.2, 4.14) (Table 3).

Table 3 Bivariate and Multivariable analyses for alcohol intake during the first trimester of pregnancy among women in Dabat Demographic and Health survey sites

SN	Variable	Alcohol intake in the FTM		COR with 95% CI	AOR with 95% CI
		Yes	No		
	Age in year				
	15–24	59	52	1	1
	25–34	125	89	1.24 (0.78, 1.96)	1.30 (0.69, 2.43)
	> / = 35	152	102	1.31 (0.84, 2.06)	1.093 (0.47, 2.54)
	Religion				
	Orthodox Christian			23.61 (3.11, 79.30)	12.49 (1.59, 97.99)
	Muslim			1	1
	Residence				
	Urban	9	36	1	1
	Rural	327	207	6.32 (2.98, 13.39)	6.83 (2.55, 18.32)*
	Occupation				
	Farmer	113	113	1	1
	House wife	202	114	1.77 (1.25, 2.52)	2.24 (1.54, 3.26)*
	Merchant	21	16	1.31 (0.65, 2.65)	1.43, (0.85, 3.65)
	Educational status				
	No Formal class	272	170	2.83 (1.4, 5.74)	1.6 (0.57, 4.50)
	Grade 1–8	51	50	1.81 (0.82, 3.95)	1.21 (0.42, 3.51)
	High school and above	13	23	1	1
	Marital Status				
	Married	313	213	1.92 (1.08, 3.39)	2.31 (1.14, 4.69)*
	Unmarried	23	30	1	1
	Number of pregnancy				
	1–2	55	45	1	1
	3–4	117	94	1.02 (0.63, 1.64)	0.66 (0.36, 1.21)
	> / = 5	164	104	1.29 (0.81, 2.05)	0.70 (0.30, 1.65)
	Still birth recoded				
	Yes	30	14	1.60 (0.83, 3.09)	1.99 (1.20, 4.14)*
	No	306	229	1	1

*P-value < 0.05 is associated with the outcome variables

4 Discussion

This study confirmed that more than half of pregnant women (336 (58.0%, 95% CI: 54.1, 61.8)) consumed alcohol during the first trimester of pregnancy. This finding is higher than the 11.2% reported in the United Kingdom [17]. The possible reason may be that our research was conducted in rural areas of Ethiopia, and there is insufficient understanding of the negative effects of alcohol intake on the fetus and mother.

Respondents living in rural areas were 6.8 times more likely to drink alcohol in the first three months than those living in urban residential areas. A possible explanation could be due to the information gaps that mothers living in rural areas are exposed to during pregnancy about the negative effects of alcohol intake on fetuses and mothers. Given the existence of various types of alcohol and the economic conditions in which urban dwellers can consume it [18]. The fact that pregnant women living in rural areas have fewer choices in recreational activities may be more of an overview of alcohol consumption [19]. Alcohol is found to be cheaper in rural areas than in urban areas and may increase alcohol intake in pregnant mothers living in rural areas. In addition, in rural areas, the choices of entertainment venues and socialization opportunities are limited, such as sports centres and coffee shops, which may be factors that cause rural residents to drink more alcohol. Furthermore, social contact is limited in rural areas, and expectant mothers wishing to become pregnant will experience alcohol-related isolation to make time [20].

Pregnant women who worked as housewives were 2.24 times more likely to drink alcohol in the first trimester than women who worked on farms. Reporting from South Africa [21], Addis Ababa [14], Bahir Dar City [16]. A possible reason could be that pregnant mothers often engage in behaviours that prepare them for alcohol, such as arekie, tela, and teji, which may lead to increased alcohol intake. Furthermore, there is a lack of awareness of the effects of alcohol consumption on the fetus in pregnant women working at home [22, 23].

The alcohol intake of married pregnant women in the first three months of pregnancy is 2.37 times that of unmarried pregnant women. This finding is consistent with the United States [24–26]. The possible reason might be lower relationship satisfaction, poorer communication, and increased risk of intimate partner violence, due to the result of certain psychological conditions that have impact on developing alcoholism, pregnant women whom suffer from social anxiety and depression more likely develop alcohol intake during the period of pregnancy. In view of the fact that this finding has not been supported by another study [27], unmarried women are one of the factors that affect the binge eating of pregnant women in the first trimester of pregnancy.

Women with a history of stillbirth were twice as likely to drink alcohol in the first trimester compared with women without a history of stillbirth. This finding was supported by the United States [28]. In addition, prenatal alcohol consumption is positively associated with placental dysfunction, reduced placental size, impaired blood flow and nutrient transport, and glandular changes such as endocrine function in stillbirth [29].

5 Limitation

This research is of great significance. However, it has some limitations. First, the limitation is that for the cross-sectional and non-experimental study design; it is difficult to attribute causality. Second, it may affect recall bias to determine alcohol intake. Second, it may affect by recall bias to determine the alcohol intake determination.

6 Conclusions

In Dabat's demographic and health research site, the rate of alcohol intake in the first trimester of pregnancy is high. Pregnant women's sociodemographic characteristics and history of stillbirth were significantly associated with alcohol consumption. Therefore, increasing maternal awareness of the negative effects of alcohol consumption among mothers living in rural areas is important to modify higher rates of alcohol consumption in the first trimester. Mothers with a history of stillbirth need attention.

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Author contributions AAG: conceive study, tool, development, design, data collection process, logistic management, data management, analysis, and manuscript write-up; AGW: conceive study, tool development, design, data collection process, logistic management, data management, and analysis; DTB: tool development, design, data collection process, data management, analysis and manuscript write up; NBT: participated in conception, design, data collection process, data management, and analysis; MHG: participated in proposal development, data collection process, data management, and analysis; HYY: tool development, design, data collection process, data management, and analysis; EAC: participated in tool development, design, data collection process, data management, and analysis; AML: data management, analysis and manuscript write up; BAD: participated in tool development, design, data management, analysis and manuscript write up; AT: participated in data management, analysis and manuscript write up; AKB: participated in data management, analysis and manuscript write up; BAA: participated in conception, design, data management, analysis and manuscript write up; GAB: participated in proposal development, data collection process, data management, and analysis. All authors have reviewed and approved the manuscript.

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Data availability All required data are found in the main manuscript.

Declarations

Ethics approval and consent to participate The study approval was obtained from University of Gondar, Ethical Institutional Review board (IRB) and certify that the study was performed in accordance with ethical standard of Declaration of Helsinki and comparable ethical standards.

Consent for publication Not applicable.

Competing interests The Authors declare that they have no conflict of interest.

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