Alcohol use and associated factors among pregnant women during the mid-pandemic of COVID-19 at Debre Tabor Comprehensive Specialized Hospital, South Gondar Zone, Ethiopia

Anguach Shitie[1] 🆔, Alemu Birhanu[2], Amsalu Worku[2] and Ergoye Melese[2]

Abstract

Objective: The aim of this study was to assess the proportion of alcohol use and associated factors among pregnant women attending antenatal care during the mid-pandemic of COVID-19 at Debre Tabor Comprehensive Specialized Hospital from May 1–30, 2021.

Methods: A hospital-based, cross-sectional study was conducted on 612 pregnant women attending a prenatal clinic. Data were entered into EpiData version 3.1 statistical software and then exported to Statistical Package for Social Science version 25 for analysis. A binary logistic regression model was used to predict the association between alcohol use and the independent variable. $p = 0.05$ variables were considered statistically significant associated factors.

Results: The prevalence of alcohol consumption by pregnant women was 26.3%: residence (Adjusted Odd Ratio (AOR) = 4.08, 95% confidence interval: 2.23, 7.48), antenatal care follow-up before the survey (AOR = 2.69, 95% confidence interval: 1.37, 5.26), unplanned pregnancy (AOR = 3.28, 95% confidence interval: 1.88, 5.70), partner alcohol use (AOR = 6.88, 95% confidence interval: 3.92, 12.06), and knowledge toward effect of alcohol on the fetus (AOR = 2.26, 95% confidence interval: 1.17, 4.33).

Conclusions: The magnitude of alcohol use during pregnancy was high and this might be related to the pandemic. Antenatal care follow-up before the survey, unplanned pregnancy, partner alcohol use, and knowledge were found to be statistically significant associated factors.

Introduction

The impact of the COVID-19 pandemic on alcohol use has been a topic of concern. Pregnant women are currently experiencing elevated anxiety and depression symptoms, which may increase the risk of substance use and potentially result in poor perinatal and neurodevelopmental outcomes for children.[1] Alcohol is a teratogen, and prenatal exposure may adversely impact the developing fetus, increasing the risk for negative outcomes, including fetal alcohol spectrum disorder (FASD). Global trends of increasing alcohol use among women of childbearing age due to economic development, changing gender roles, increased availability of alcohol, peer pressure, and social acceptability of women's alcohol use may put an increasing number of pregnancies at risk for prenatal alcohol exposure. This risk has been exacerbated by the ongoing COVID-19 pandemic in some countries.[2]

[1]College of Medicine and Health Sciences, Wollo University, Dessie, Ethiopia
[2]College of Medicine and Health Sciences, Bahir Dar University, Bahir Dar, Ethiopia

Corresponding author:
Anguach Shitie, College of Medicine and Health Sciences, Wollo University, Dessie, Ethiopia.
Email: anguachshitie20@gmail.com

The broad effects of the pandemic are likely to lead to excessive alcohol consumption. Stress from these events and anxiety about the future can increase drinking and exacerbate symptoms of alcohol use disorder. We also know that feeling socially isolated, a possible effect of physical distancing, can worsen symptoms of anxiety or depression, which may encourage more alcohol intake. Indeed, the current COVID-19 crisis appears to have already fueled increases in retail alcohol sales. From the stress of unemployment to feelings of isolation during physical distancing, there are many reasons the COVID-19 emergency may be influencing alcohol consumption.[3] As stay-at-home orders began in some US states as a mitigation strategy for coronavirus disease (COVID-19) transmission in 2019, Nielsen reported a 54% increase in national sales of alcohol for the week ending March 21, 2020, compared with 1 year before; online sales increased 262% from 2019.[4] Reasons for increased drinking included increased stress (45.7%), increased alcohol availability (34.4%), and boredom (30.1%). Participants who reported being stressed by the pandemic drank more drinks over a longer period of time, raising concerns from both an individual and a public health standpoint.[5]

Prenatal alcohol exposure is one of the most important causes of preventable cognitive impairment in the world.[6] Alcohol consumption can lead to illness and even death. In 2016, alcohol caused 3 million deaths (5.8% of all deaths in the world) and 5.1% of the global burden of illness and injury.[1] Alcohol consumption during pregnancy may cause a number of health complications for the mother and developing fetus.[7] There is no safe time or quantity of alcohol to consume during pregnancy, and total abstinence is advised for the duration of the pregnancy.[8] Alcohol drinking increases the risk of spontaneous abortions, especially in the first trimester of pregnancy, and can cause infertility in males and females. Alcohol consumption during pregnancy can have a severe impact on the developing embryo. Fetuses develop the fetal alcoholic syndrome when exposed to very high repetitive doses, and there is a risk of "alcoholic effects" when exposed to lower repetitive doses, which manifest as slight intellectual impairment, growth disturbances, and behavioral changes.[9]

The global prevalence of alcohol use during pregnancy is estimated to be 10%. In developing countries, especially in sub-Saharan Africa, the prevalence of alcohol consumption during pregnancy is high.[10] In Ethiopia, the magnitude of alcohol consumption during pregnancy is estimated to be 30%.[11] Both manufactured and different locally made and culturally accepted alcoholic drinks are used with different estimated alcoholic contents (2–4% for "tela" (traditional beer), 7–11% for "teji" (honey wine), and up to 45% for "areki" (strong colorless liquor distilled from grain)). These alcoholic beverages are commonly consumed on a daily basis during meals, ceremonies (e.g., Eder, celebration of events), relaxation after work, and leisure activities.[12–14]

In pregnant women, alcohol consumption has negative health consequences both for the mother and the fetus, as well as for the whole community. It can cause fetal alcohol syndrome. FASDs are a group of conditions that can occur in a person who was exposed to alcohol before birth. These effects can include physical problems and problems with behavior and learning. A person with FASD frequently has a combination of these issues: body weight, poor coordination, hyperactive behavior, difficulty with attention; poor memory difficulty in school: learning disabilities, speech and language delays, intellectual disability or low intelligence quotient (IQ); poor reasoning and judgment skills; sleep and sucking problems as a baby: vision or hearing problems; problems with the heart, kidneys, or bones: a shorter-than-average height, a small head, abnormal facial features, such as a smooth ridge between the nose and upper lip, prenatal and postnatal growth deficiencies, specific craniofacial dysmorphic features; mental retardation; behavioral changes; and a variety of major anomalies.[9,15] Most of these features are found in babies with FASDs. In addition, alcohol may cause miscarriage[16] and stillbirth,[17] Research indicates that even low levels of prenatal alcohol exposure, particularly in early pregnancy, are not only limited to infancy but may also adversely affect children's IQ, mental health, memory, and verbal or visual performance.[18]

Hence, in recognizing the strong link between alcohol consumption during pregnancy and feto-maternal morbidity and mortality, huge emphasis should be given to alcohol consumption during pregnancy and factors that contribute to alcohol use. Therefore, this study was aimed at assessing the proportion of alcohol use and associated factors among pregnant women attending antenatal care (ANC).

Methods and materials

Study area

The study was conducted in Debre Tabor town at the Debre Tabor Comprehensive Specialized Hospital. Debre Tabor is a town in the South Gondar zone, which is found in the northern part of Amhara, 98 km away from Bahir Dar, the main city of Amhara regional state, and 666 km away from Addis Ababa. Its climate type is Weyna Dega. According to the 2015 population projection estimate, there were 55,596 residents, and around half of them were females. There are three health centers, four health posts, five private clinics, and one comprehensive specialized hospital in the town.

Study design and timeframe

An institutional-based cross-sectional study design was conducted from May 1–30, 2021.

Study population

All systematically selected pregnant women attending the ANC clinic during the mid-pandemic of COVID-19 at Debre Tabor Comprehensive Specialized Hospital during the data collection period

Inclusion criteria

All pregnant women attending an ANC clinic during the mid-pandemic of COVID-19 at Debre Tabor Comprehensive Specialized Hospital during the data collection period

Exclusion criteria

Those pregnant women who were severely ill (but not by alcohol) and unable to respond to the question at the time of the interview were excluded from the study.

Sample size determination

A separate sample size was calculated for each specific objective (to determine the magnitude of pregnant women's alcohol use and to identify the factors associated with alcohol use) by using both single and double population proportion formulas. The sample size for the first objective (to determine the magnitude of alcohol use among pregnant women) was calculated using the single population proportion formula, $n = (Z/2)2P(1P) d2$, with the following assumptions: n = the study's minimum sample size; $(Z/2)2$ = the standard normal distribution with 95% confidence interval (CI), $P = 37.1\%$,[19] taken from an Addis Ababa study; and a tolerable margin of error ($d = 0.04$). The sample size for the second objective was calculated by Epi Info V.7 StatCalc using different factors. The sample size for the first objective was greater than that of the second objective. The final sample size was derived by adding a nonresponse rate of 10%. The final calculated sample size for this study was 618.

Data collection tools and procedures

A pretested, semi-structured, and interviewer-administered questionnaire was used to collect data. The questionnaire was developed after reviewing relevant literature.[19,20] It was prepared originally in English and translated into the local language (Amharic) for the purpose of data collection, and then it was translated back to English to maintain the consistency of the tool. Four diploma nurses and two BSc nurses were hired to supervise activities.

Data quality assurance

A 1-day training was given for data collectors and supervisors. The data were checked daily for completeness and accuracy by the principal investigator and supervisors. A pretest was conducted on 5% of the sample size to ensure the validity, reliability, and clarity of the data collection instrument. Based on the findings from the pretest, modifications were made to the questionnaire, and the arrangement of questions was revised. A double data entry was made, and the entry error was corrected by going back to the questionnaires.

Dependent variable

Alcohol use during this pregnancy was the dependent variable.

Independent variables

The independent variables were age, religion, ethnicity, marital status, education, occupation, average monthly income, residence, gestation in weeks, ANC follow-up before the data collection period, gravidity, parity, planned pregnancy, history of abortion, khat chewing, tobacco use during pregnancy, understanding the effects of alcohol use on fetal, attitudes toward alcohol use, and family social support.

Operational definitions

Alcohol use. Alcohol use during current pregnancy was defined as any use of drinks with industrially prepared alcoholic content (ethanol or ethyl content) or locally prepared ones, like teji, areki, and tela, irrespective of its dose and frequency (respondents who answered "Yes" to the question "Have you ever consumed alcohol during your current pregnancy?").[21,22]

Good knowledge about alcohol effect on fetus. If respondents answered greater or equal to the mean value,[20] the respondent has good knowledge about the effect of alcohol use on the fetus.

Poor knowledge about alcohol effect on fetus. If respondents answered less than the mean value, they have poor knowledge about the effect of alcohol use on the fetus.

Poor family support. Respondents who scored less than the mean on the Multidimensional Scale of Perceived Family Social Support (MSPSSf) had poor family social support.[19,23]

Good family social support. If respondents scored greater than or equal to the mean from the MSPSSf.

Statistical analysis

The collected data were visually checked for completeness before being coded and entered into EpiData version 3.1. The data were then exported to the Statistical Package for Social Science version 25 for analysis. During the process

of analysis, descriptive statistics like frequencies, means, and percentages were used to provide an overall and coherent presentation and description of the results. Binary logistic regression was done to see the significant relationship between each independent variable and the dependent variable. Variables with a 95% confidence interval and a *p* value of 0.25 during the bivariable logistic regression analysis were entered into a multivariable analysis to see the relative effect of confounding variables and interactions of variables. On the variables in the multivariate analysis to determine independent predictors of alcohol use, odds ratios with 95% CI were performed on them. A *p*-value less than or equal to 0.05 in the multivariable analysis was taken as the cutoff value to be declared significant. Model fitness was checked by the Hosmer–Lemeshow test.

Results

Sociodemographic characteristics

A total of 612 participants were included in the study, with a response rate of 99.02%. The mean age of respondents was 28.18 ± SD 5.1, with a range of 18–42 years. The majority (97.2%) of the respondents were married, and 28.3% were government employees. About 86.1% of respondents were urban residents, and 35% completed college or higher education. The majority of pregnant women (79.6%) earn more than $2,000 per month (Table 1).

Obstetrics related variables

The majority of the respondents (46.2%) were in the second trimester, followed by 38.6% of pregnant women in the third trimester. Among the 513 respondents, 83.8% had an ANC visit prior to the interview, and 54.3% of them were cautioned against drinking alcohol during their appointment. The majority of the respondents were nulliparous and gravida. Around 11.4% had had an abortion before (Table 2).

Knowledge of the effect of alcohol use on fetuses among pregnant women

Four hundred and eighty pregnant women (78.4%) have good knowledge of the effects of alcohol on the fetus, and 77 (16.04%) of them use alcohol during pregnancy, whereas 132 pregnant women (21.6%) have poor knowledge of the effects of alcohol on the fetus, and 84 (63.6%) of them use alcohol during pregnancy (Figure 1).

Family social support of respondents

Among the total respondents, 575 (94.0%) of pregnant women have good family social support. Of these, 124

Table 1. Sociodemographic characteristics of the respondents in Debre Tabor Comprehensive Specialized Hospital during the mid-pandemic of COVID-19 (*n* = 612), 2021.

Variables		Frequency	%
Age	⩽20	32	5.2
	21–24	124	20.3
	25–29	262	42.8
	⩾30	194	31.7
Religion	Orthodox	561	91.7
	Muslim	47	7.7
	Protestant	4	0.7
Marital status	Single	11	1.8
	Married	595	97.2
	Divorced	5	0.8
	Widowed	1	0.2
Educational status	Can't read and write	97	15.8
	Primary education	132	21.6
	Secondary education	169	27.6
	College and above	214	35.0
Occupation	Homemaker	254	41.5
	Merchant (own business)	117	19.1
	Farming	65	10.6
	Employed	173	28.3
	Other	3	0.5
Residence	Rural	85	13.9
	Urban	527	86.1
Monthly family income in Ethiopian Birr	501–999 birr	6	1.0
	1000–1999	119	19.4
	⩾2000	487	79.6

(21.5%) used alcohol during pregnancy, whereas only 37 (6.0%) of pregnant women have poor family social support and all of them consumed alcohol during pregnancy (Figure 2).

Prevalence of alcohol use among pregnant women

The overall prevalence of alcohol use among pregnant women during the mid-pandemic of COVID-19 in Debre Tabor Comprehensive Specialized Hospital was found to be 26.3% (95% CI: 23–29.6%) (Figure 3).

Factors associated with alcohol use among pregnant women

In multivariable binary logistic regression only variables residence, ANC follow-up before data collection, unplanned pregnancy, partner alcohol use, and knowledge were statistically associated with alcohol use during pregnancy.

Alcohol use during pregnancy was four times more likely among respondents who lived in cities compared to those who lived in rural areas (AOR = 4.08, 95% CI: 2.23, 7.48). Women who did not have an ANC before the survey

Table 2. Distribution of obstetric characteristics of pregnant women in Debre Tabor Comprehensive Specialized Hospital during the mid-pandemic of COVID-19 ($n = 612$), 2021.

| Variables	Frequency	%
Gestational age of participant		
<3 months	93	15.2
3–6 months	283	46.2
>6 months	236	38.6
ANC follow-up		
Have visited before the interview	513	83.8
Not visited before the interview	99	16.2
Advice about alcohol during ANC visit		
Yes	332	54.2
No	181	29.6
Total	513	
Gravidity		
1	288	47.1
2	166	27.1
≥3	158	25.8
Parity		
No child	292	47.7
1	176	28.8
2	75	12.3
3 and above	69	11.3
Plan of current pregnancy		
Planned	401	65.5
Unplanned	211	34.5
History of abortion		
Yes	70	11.4
No	542	88.6

ANC: antenatal care.

were 2.69 times more likely to drink alcohol during their pregnancy than those who did (AOR = 2.69, 95% CI: 1.37, 5.26). Alcohol use during pregnancy was three times more likely among respondents who had an unplanned pregnancy compared to those who had a planned pregnancy (AOR = 3.28, 95% CI: 1.88, 5.70). Women with an alcoholic partner were 6.8 times more likely than women without an alcoholic partner to drink alcohol during pregnancy (AOR = 6.88, 95% CI: 3.92, 12.06). Pregnant women with poor knowledge were 2.26 times more likely to use alcohol during pregnancy as compared to those who have good knowledge (AOR = 2.26, 95% CI: 1.17, 4.33) (Table 3).

Discussion

The magnitude of substance use among pregnant women attending ANC was 26.3% (95% CI: 23–29.6%), which is in line with studies carried out in Brazil[24] and Europe[25] but lower than that found in studies conducted in Ghana,[26] Addis Ababa,[19] and Bahir Dar[27]. On the other hand, the findings of this study were higher than studies done in Tanzania,[28] Southern Ethiopia,[29] and Debre Birhan.[30] This observed variation could be related to differences in research time, socio-cultural variables, study population differences, and assessment instruments utilized across investigations as well as the COVID-19 pandemic, which increased alcohol use by introducing stress.[31]

The study showed that the different factors associated with the outcome variable, such as residence, ANC follow-up before data collection, unplanned pregnancy, partner
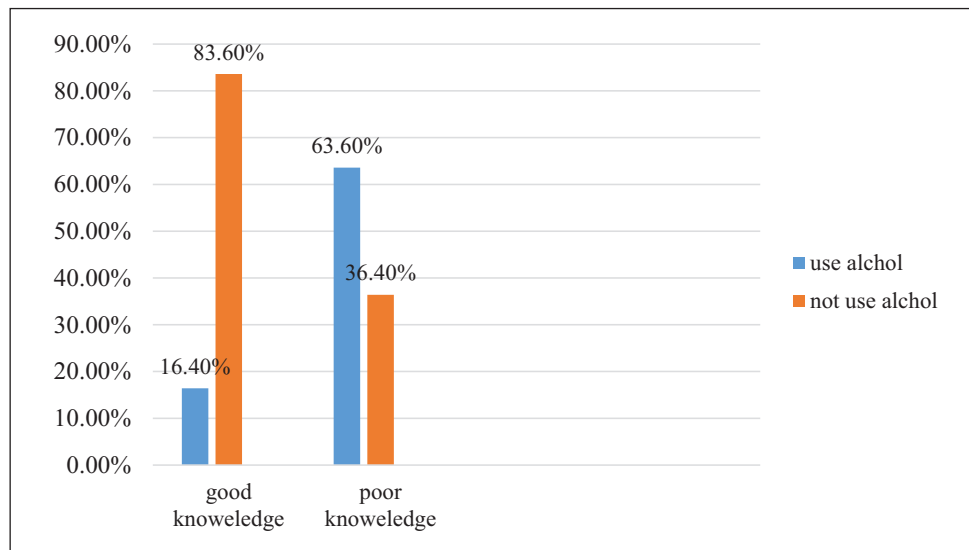
Figure 1. Knowledge of pregnant women about effect of alcohol on the fetus in Debre Tabor Compressive Specialized Hospital ($n = 612$), 2021.
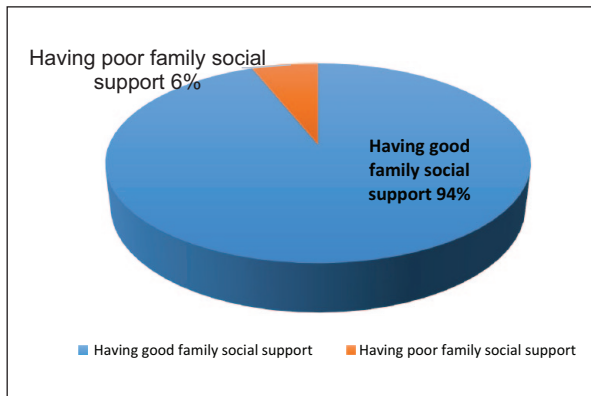
Figure 2. Family social support among pregnant women in Debre Tabor Comprehensive Specialized Hospital ($n = 612$), 2021.
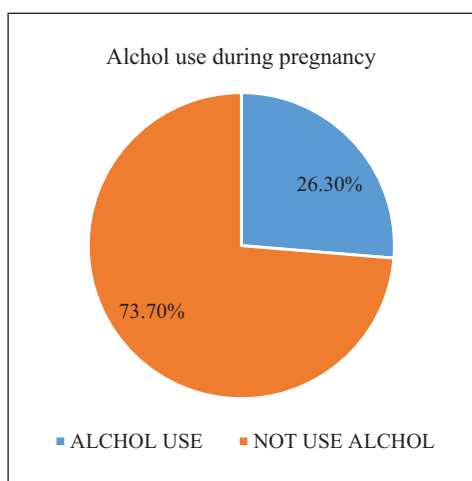

Figure 3. Proportion of alcohol use among pregnant women who attend antenatal care clinic during the mid-pandemic of COVID-19 in Debre Tabor Compressive Specialized Hospital ($n = 612$), 2021.

alcohol use, and knowledge, had a statistically significant association with alcohol use during pregnancy.

Surprisingly, respondents who reside in urban areas were more likely to drink alcohol than their counterparts, which is in line with the results found in sub-Saharan Africa[32] and Ethiopia.[12] This might be due to the easy availability of alcohol in urban areas and its major economic source in urban areas. Furthermore, the findings of this study revealed that respondents who had no ANC follow-up before the data collection had higher odds of alcohol use, which is in line with the findings of other literature from Southern Ethiopia[29] and Debre Birhan.[30] The possible reason could be that those women who had ANC follow-up before the survey might have had the opportunity to get counseling service to reduce the effect of alcohol consumption on a fetus during pregnancy.

Moreover, in our analysis, women whose partner drank alcohol were more likely to drink alcohol during pregnancy than women with a partner who did not use alcohol. This study is in line with the findings of other literature from sub-Saharan Africa[32] and Bahir Dar.[27] The reason might be that pregnant women can be easily invited by their partners to drink alcohol during pregnancy. The fact is that when a pregnant woman is repeatedly invited to use substances by her intimate partner, she becomes provoked to accept and consume them. As a result, pregnant women should be routinely screened to determine whether their partners use alcohol. Then, couple counseling should be given. The counseling should also include information about the catastrophic fetal and neonatal effects of alcohol use during pregnancy.

This study also revealed that pregnant women having poor knowledge about the effect of alcohol consumption on fetal experience higher levels of alcohol use than pregnant women having good knowledge, which is concurrent with studies done in sub-Saharan Africa (10), Ghana (20), and Australia.[33] This might be because pregnant women did not know about the effect of alcohol on the fetus. Therefore, antenatal health-care providers in the study area should routinely provide health education to create maternal awareness about the teratogenic effects of alcohol use during pregnancy.

Our analysis showed that women whose pregnancies were unplanned were more likely to use alcohol than those whose pregnancies were planned. This finding is similar to studies done in Southern Ethiopia[29] and Debre Birhan.[30] The possible justification for this might be that women with unplanned pregnancy may drink before pregnancy confirmation since it is unplanned and due to the social and psychological crisis of unplanned pregnancy that can have the potential to push pregnant women to the initiation of alcohol or other substance use to get relief from their stress.

Limitations of the study

Information in the survey is based on self-reports, so there may be social desirability bias. Which is the tendency of the participants to answer the questions according to socially accepted manner and they may underreport their alcohol consumption.

Conclusions

In this study, the prevalence of alcohol use during pregnancy was high as compared to the majority of other studies and this might be related to the pandemic. The finding observed that residence, ANC follow-up before survey, unplanned pregnancy, partner alcohol use, and knowledge were found to be statistically significant associated with alcohol consumption during pregnancy.

Table 3. Factors associated with alcohol use among pregnant women visiting antenatal clinic during the mid-pandemic of COVID-19 at Debre Tabor Comprehensive Specialized Hospital, Ethiopia, 2021 (n = 612).

Variables	Alcohol use during pregnancy		Crude OR (95% CI)	Adjusted OR (95% CI)	p-Value
	Yes	No			
Age					
≤20	12	20	1.09 (0.50–2.37)	0.95 (0.37–2.44)	0.925
21–24	26	98	2.48 (1.47–4.17)	1.41 (0.68–2.93)	0.344
25–29	46	216	3.09 (2.01–4.75)	1.08 (0.60–1.94)	0.785
≥30	77	117	1.00	1.00	
Residence					
Rural	60	25	1.00	1.00	
Urban	101	426	10.12 (6.05–16.93)	4.08 (2.23–7.48)	<0.001
History of ANC follow up					
Yes	98	415	1.00	1.00	
No	63	36	7.41 (4.65–11.79)	2.69 (1.37–5.26)	0.004
Pregnancy plan					
Planned	46	315	1.00	1.00	
Unplanned	115	96	9.24 (6.13–13.92)	3.28 (1.88–5.70)	<0.001
History of abortion					
Yes	43	27	5.72 (3.39–9.65)	1.91 (0.95–3.83)	0.067
No	118	424	1.00	1.00	
Partner alcohol use					
Yes	137	182	8.43 (5.25–13.53)	6.88 (3.92–12.06)	<0.001
No	24	269	1.00	1.00	
Knowledge					
Have good knowledge	77	403	1.00	1.00	
Have poor knowledge	84	48	9.15 (5.95–14.08)	2.26 (1.17–4.33)	0.014

ANC: antenatal care; OR: odds ratio; CI: confidence interval.

Author contributions

AS, AB, AW, and EM are involved in the study from the inception to design, acquisition of data, analysis, interpretation, and drafting of the article. All authors read and approved the final article.

Availability of data and materials

Full data for this research is available through the corresponding author upon request.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethics approval and consent to participate

Ethical clearance was obtained from Bahir Dar University, College of Medicine and Health Sciences, Research and Ethical Review Committee (protocol number 134/2021). Participation was voluntary and information was collected anonymously after obtaining voluntary written informed consent from each respondent by assuring confidentiality throughout data collection period. For those less than 18 years of age and illiterate, written informed consent were taken from their legal guardians Participants were told the objective of the study and their right to refuse or answer the questionnaires and were given the right to stop or withdraw at any point of time during data collection. Confidentiality was maintained by omitting their name and personal identification.

Informed consent

Participation was voluntary and information was collected anonymously after obtaining voluntary written informed consent from each respondent by assuring confidentiality throughout data collection period. For those less than 18 years of age and illiterate, written informed consent were taken from their legal guardians. Participants were told the objective of the study and their right to refuse or answer the questionnaires and were given the right to stop or withdraw at any point of time during data collection. Confidentiality was maintained by omitting their name and personal identification.

ORCID iD

Anguach Shitie https://orcid.org/0000-0002-4928-1064

Supplemental material

Supplemental material for this article is available online.

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