




BMJ Open Prevalence of teenage pregnancy and associated factors among preparatory and high school students in Wolaita Sodo town, southern Ethiopia: an institution-based cross-sectional study

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To cite: Kumma WP, Chaka FG, Daga WB, *et al.* Prevalence of teenage pregnancy and associated factors among preparatory and high school students in Wolaita Sodo town, southern Ethiopia: an institution-based cross-sectional study. *BMJ Open* 2023;**13**:e070505. doi:10.1136/bmjopen-2022-070505

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-070505>).

Received 29 November 2022
Accepted 25 May 2023



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ABSTRACT

Objective To assess the prevalence of teenage pregnancy and associated factors among teenage schoolgirls aged 15–19 years in Wolaita Sodo town, southern Ethiopia.

Design Cross-sectional survey.

Setting This study was conducted among teenage girls from preparatory and high schools in Wolaita Sodo town, southern Ethiopia, between 1 April and 30 May 2019.

Participants 588 (97.8%) of 601 randomly selected teenage schoolgirls aged 15–19 years (selected via a multistage random sampling technique) participated in the study.

Outcome measures Teenage pregnancy and associated factors.

Results The prevalence of teenage pregnancy among schoolgirls in Wolaita Sodo town was 14.6% (95% CI 11.9% to 17.7%). The current pregnancy rate was 33.7% (95% CI 23.9% to 44.7%). Having a family history of teenage pregnancy (AOR 3.3; 95% CI 1.3 to 8.4) and access to mass media (AOR 2.5; 95% CI 1.1 to 6.2) were positively associated with teenage pregnancy, while condom use (AOR 0.1; 95% CI 0.03 to 0.5) and knowledge of where to get modern contraceptives (AOR 0.4; 95% CI 0.2 to 0.9) were negatively associated.

Conclusions The prevalence of teenage pregnancy among schoolgirls in Wolaita Sodo was high. Having a family history of teenage pregnancy and access to mass media were positively associated with teenage pregnancy, whereas reported condom use and knowledge of where to get modern contraceptives were negatively associated with teenage pregnancy among schoolgirls.

INTRODUCTION

The WHO defines the age groups 10–19 years and 13–19 years as adolescents and teenagers, respectively.¹ Adolescence is the transitional period from childhood to adulthood, characterised by significant physiological, psychological and social changes.^{2–3} Adolescent pregnancy is defined as pregnancy in girls aged 10–19 years.⁴ Teenage pregnancy

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study had a large sample size and a low non-response rate.
- ⇒ Since the study is cross-sectional, it cannot investigate temporal relationships.
- ⇒ Because behavioural variables are evaluated based on self-reports, social desirability bias may be an issue.
- ⇒ Even though it is currently believed that all teenage girls in the study area attend school, there can be girls missing from school for socioeconomic reasons, so our study may lack representativeness at the community level.

and childbirth among women under 20 years of age continue to be a major global public health challenge, affecting more than 16 million girls and young women worldwide. In many nations, unmarried adolescent mothers are likely to encounter social exclusion, which may result in rejection by their family and peers.^{5–7}

In low-income and middle-income countries (LMICs), teenagers aged 15–19 years had an estimated 21 million pregnancies annually, of which about 50% were unintended and gave rise to approximately 12 million births. According to these data, 55% of unintended pregnancies among teenage girls result in abortions, which are usually unsafe in LMICs.⁸ The proportions of adolescent fertility rates ranged from 2% in China to more than 50% in sub-Saharan Africa.⁹ Sub-Saharan Africa had the highest rate of adolescent fertility in the world, with 101 births per 1000 in 2013.^{8,10,11} One of every three among the 14.3 million adolescent girls who gave birth in 2008 around the world

was from sub-Saharan Africa.¹² In this region, births to adolescent girls between 15 years and 19 years account for 16% of all births each year.¹¹⁻¹³ Ethiopia ranks among the highest teenage fertility rates in sub-Saharan Africa, with 72.4 births per 1000 young women aged 15–19 years.^{14 15}

Teenage pregnancy is prevalent and an essential demographic factor in Ethiopia.¹⁶ According to the 2016 Ethiopian Health and Demographic Survey findings, the prevalence of teenage pregnancy was 13%. It varies depending on the residence, with 5% in urban areas and 15% in rural areas. Moreover, disparities are seen across regions, with the highest at 23% in Afar and the lowest at 3% in Addis Ababa. Additionally, the proportion varies with age; it rose rapidly from 2% among women aged 15 years to 28% among those aged 19 years.¹⁷ Teenage pregnancy remains a significant public health and demographic challenge in the country.^{16 18}

Various reports and publications have identified determinants of teenage pregnancy, such as not living with parents, low socioeconomic status, early sexual intercourse and a low level of contraception knowledge.¹⁸⁻²¹ In Ethiopia, there are limited data on the prevalence and factors associated with teenage pregnancy. Particularly in the study area, evidence of the prevalence and factors associated with teenage pregnancy is scarce. Therefore, this study aimed at assessing the prevalence of teenage pregnancy and associated factors among teenage school-girls aged 15–19 years in Wolaita, southern Ethiopia.

METHODS

These results are reported following the STROBE cross-sectional study and CROSS Survey reporting guidelines.^{22 23}

Study design and setting

An institution-based cross-sectional study was conducted among teenage schoolgirls in Wolaita Sodo town, southern Ethiopia, from 1 April to 30 May 2019. The population of Wolaita Sodo town projected for the year 2021 was 194977. In Wolaita, teenage girls aged 10–19 years and 15–19 years account for 12.6% and 5.8% of the total population, respectively.^{15 24 25} The town consists of one public university, two public and six private colleges, four public and two private preparatory schools, and seven public and three private high schools.

Sample size determination

The sample size was calculated using OpenEpi V.3.03 software. The sample size determined for this study was 601 and computed using the following assumptions: 95% confidence level, 80% power, one for a ratio of unexposed to exposed groups, 4.6% teenage pregnancy among teenagers who lived with their parents, and 11.5% teenage pregnancy among teenagers who lived with one of their parents, a design effect of two, and a 10% non-response rate.¹⁸

Sampling techniques and data collection procedures

The study participants for this study were selected using a multistage random sampling technique. There were 16 schools (6 preparatory and 10 high schools) in the town. After stratifying the schools into preparatory and high schools, three preparatory schools and five high schools were selected using the lottery method. We prepared a separate sampling frame consisting of lists of 15–19 years old female students in alphabetical order in each school and grade level (9–12) with the support of the schools' administrations. The samples were distributed among the schools and grade levels based on samples proportional to their size. Finally, we selected the study participants from the prepared list using a computer-based random number generator (<https://www.random.org/integers/>).

We recruited six data collectors and two supervisors for data collection and supervision. We also provided training on the methods, objectives and other technical aspects of the study to the data collectors and supervisors for 3 days. The questionnaire prepared in English was translated into the local language (*Amharic*) and then re-translated into English for consistency (online supplemental file 1). Two different individuals who speak both English and Amharic fluently were used for the translation and re-translation. To ensure the quality of the data, pretesting of the questionnaire was conducted on 5% of the sample size among teenage girls selected from schools that were not included in our study. Inputs obtained from the pretest were used to improve the questionnaire and acquaint the data collectors with the data collection process. Finally, a pretested and self-administered questionnaire was used to collect the actual data from the study participants. During the data collection, every female student included in the study took a single seat with a sparse arrangement of chairs and desks. Then the questionnaires were distributed among the students after a short orientation. The principal investigator and the supervisors closely supervised the data collection process.

Measurement definitions

Ever pregnant was measured by asking the respondents whether they had ever been pregnant or not and including pregnancies that ended in a live birth, a still-birth or an abortion. Emergency contraceptives are emergency measures in that women take special pills to prevent pregnancy within 3 days after having unprotected sexual intercourse. We have asked a question with four choices of responses to assess the knowledge of the study participants regarding the exact timing of taking emergency contraceptives. Therefore, those who responded *within 72 hours after having unprotected sexual intercourse* were considered knowledgeable regarding the exact timing of taking emergency contraceptives. The response regarding the participant's knowledge of the fertile period in the menstrual cycle was considered appropriate if the participant selected 14 days before the next menstrual cycle. Parent-daughter interaction was measured by asking the following four questions: do your parents communicate

with you on issues related to sexuality, love and friendship openly; do your parents know about your love or sexual partner; do your parents follow you when you are out of the house and with whom you stay; do your parents like your love and sexual relationship with a boyfriend? The summation of the responses given to the above four questions was used to assess parent-daughter interaction, and those with a score <1 were categorised as having poor interaction and good if they scored ≥ 1 .¹⁸ Family history was defined as having a family member, such as a sister or mother, with a history of teenage pregnancy.

Alcohol drinking was defined based on the self-reported consumption of a standard alcoholic drink such as 285 mL of beer, 120 mL of wine and 30 mL of spirits of five or more for men or four or more for women on a single occasion within the past 30 days.²⁶ Current smoking was also defined based on the self-reported current (daily) use of smoked tobacco or smokeless tobacco products.²⁶ *Khat* (*Catha edulis forsk*) chewing was defined based on the self-reported current chewing of *khat*. It is a stimulant native to East Africa and the Arabian Peninsula.^{27 28}

Data entry and analysis

The quantitative data collected from a pretested, structured and self-administered questionnaire were entered into EpiData V.3.1 and exported to SPSS V.20 for analysis. All the independent variables satisfied the assumption for the multicollinearity test with a variance inflation factor less than 10 or a tolerance (1R) greater than 0.1.

The profile of the study participants, prevalence, knowledge, awareness, and behaviour of teenage pregnancy were computed and described using tables. Variables in the bivariate analysis with a value of $p < 0.25$ were considered candidates for multivariate analysis. Further, adjusted ORs with a 95% CI and a value of $p < 0.05$ were used to ascertain the statistical significance of associations. The model's fitness was acceptable, with a value of $p = 0.595$ using the Hosmer and Lemeshow goodness-of-fit test.

Patient and public involvement

None.

RESULTS

Sociodemographics, knowledge, awareness and behaviour of teenage girls

A total of 588 female students participated in the study, with a response rate of 97.8%. Three hundred seventy-nine of the 588 (64.5%) study participants were between 15 years and 17 years of age. The median age of the teenage schoolgirls was 17 (IQR 16–18) years. Of the total number of teenage schoolgirls in the study, 403 (68.5%) were educated at the level of grades 9–10. Most of the participants (401 or 68.2%) were living with their two biological parents (table 1).

Three hundred eighty-eight (66.0%) teenage students had daily access to mass media. Of the total teenage

schoolgirls, 79 (13.4%) had experienced alcohol drinking and 25 (4.3%) had practised khat chewing. Two hundred seventy-five (46.8%) teenage girls had interactions with their parents concerning sex. Regarding the teenage girls' knowledge of the fertile period of the menstrual cycle, 141 (24.0%) responded 4 days before and after the 14th day of the first menstrual cycle (table 1).

Sexual practices and contraceptive utilisation of teenage girls

A quarter (148 (25.2%)) of the teenage schoolgirls had sexual intercourse experience, of which 123 (83.1%) occurred between the age of 10 years and 17 years. Regarding the sexual initiation of the first sex, 61 (41.2%) were peer-influenced. Of the total number of teenage students who had sex, 60 (40.5%) used modern contraceptives, of which 26 (43.3%) used emergency contraceptives. Regarding the exact timing of taking an emergency contraceptive, 17 (65.4%) started within 24 hours after having unprotected sex. Of the total teenage schoolgirls who participated in this study, only 174 (29.6%) knew where to get modern contraceptives (table 2).

Prevalence of teenage pregnancy

Out of the total number of teenage schoolgirls who participated in this study, 86 (14.6%) reported teenage pregnancies and 29 (33.7%) were currently pregnant. When asked about the pregnancy's status, 66 (76.7%) of the adolescent schoolgirls said it was unintended. Regarding the outcome of the pregnancy, 27 (31.4%) teenage schoolgirls carried out abortions (table 3).

Factors associated with the teenage pregnancy

Participants who had a family history of teenage pregnancy were positively associated with teenage pregnancy (AOR 3.3; 95% CI 1.3 to 8.4). Teenage pregnancy was 2.5 times higher among teenage schoolgirls who had frequent access to mass media (AOR 2.5; 95% CI 1.1 to 6.2). On the other hand, teenage schoolgirls who used condoms during sexual intercourse were negatively associated with teenage pregnancy (AOR 0.1; 95% CI 0.03 to 0.5) as compared to their counterparts. Similarly, teenage schoolgirls who knew where to get modern contraceptives were negatively related to teenage pregnancy (AOR 0.4; 95% CI 0.2 to 0.9) (table 4).

DISCUSSION

Teenage pregnancy among schoolgirls in Wolaita Sodo town was high with a prevalence of 14.6% (95% CI 11.9 to 17.7), of which current pregnancy was 33.7% (95% CI 23.9 to 44.7). Family history of teenage pregnancy and access to mass media were positively associated with teenage pregnancy, while condom use and knowledge of where to get modern contraceptives were negatively associated.

The current study reported a similar finding with the pooled prevalence of adolescent pregnancy in East Africa.²⁹ The prevalence in the present study was higher

**Table 1** Knowledge, awareness and behaviour of the teenage schoolgirls on factors influencing teenage pregnancy in Wolaita Sodo town, southern Ethiopia, 2019 (n=588)

Variables	Categories	Frequency (n)	Per cent (%)
Age in years	15–17	379	64.5
	18–19	209	35.5
Grade	9– 10	403	68.5
	11–12	185	31.5
Relationship with the heads of the household	Two biological parents	401	68.2
	One of the biological parents	71	12.1
	Neither of the biological parents	83	14.1
	Husband	33	5.6
Receive pocket money	No	258	43.9
	Yes	330	56.1
Access to mass media	No	38	6.5
	Yes	550	93.5
Frequency of access to mass media (n=550)	Daily	388	66.0
	Weekly or more	162	27.6
Alcohol drinking	No	509	86.6
	Yes	79	13.4
Khat chewing	No	563	95.7
	Yes	25	4.3
Cigarette smoking	No	571	97.1
	Yes	17	2.9
Sex education at school	No	336	57.1
	Yes	252	42.9
Parent-daughter interaction about sex	No	313	53.2
	Yes	275	46.8
Having information about menstruation	No	10	1.7
	Yes	578	98.3
Place of receiving information about menstruation (n=578)	Peers	151	25.7
	Family	245	41.7
	School	111	18.9
	Health personnel	32	5.4
	Media	29	4.9
	Others	10	1.7
Time received information about menstruation	Before menarche	425	72.3
	After menarche	153	26.0
Fertile period of the menstrual cycle	I don't know	365	62.1
	4 days before and after the 14th day	141	24.0
	5 days before and after the 10th day	33	5.6
	6 days before and after the 12th day	20	3.4
	8 days before and after the 16th day	29	4.9

compared with a similar study conducted in southern Ethiopia,²⁰ while it was lower than the findings reported from north-east Ethiopia¹⁹ and western Kenya.²⁹ It might be difficult to provide a sound reason for the difference; however, it could be related to the social and cultural conditions of the study areas. Out of the total number of teenage pregnancies among the schoolgirls reported

in this study, 33.7% were currently pregnant. This is consistent with the finding reported from north-east Ethiopia.¹⁹ Regarding the condition of the pregnancy, 76.7% reported that the pregnancy was unintended. This is in line with the findings from the previous studies in Ethiopia.^{19,20} This might be partially explained by the sociodemographic condition of the population.

Table 2 Sexual practices and contraceptive utilisation of the teenage schoolgirls in Wolaita Sodo town, southern Ethiopia, 2019

Variables	Categories	Frequency (n)	Per cent (%)
Ever had sex (n=588)	No	440	74.8
	Yes	148	25.2
Age at first sex (n=148)	15–17 years	123	83.1
	18–19 years	25	16.9
With whom had first sex (n=148)	Fellow student	65	43.9
	Employee	48	32.4
	A teacher from the school	19	12.8
	Businessman	16	10.8
Sexual initiation during first sex (n=148)	Peer influenced	61	41.2
	Willingly or love	59	10.0
	Forced or raped	28	4.8
Number of lifetime sexual partners (n=148)	One	106	71.6
	Two	18	12.2
	Three or more	24	16.2
Ever used modern contraceptives (n=148)	No	88	59.5
	Yes	60	40.5
Knowledge of where to get modern contraceptives (n=588)	No	414	70.4
	Yes	174	29.6
Place where to get modern contraceptives (n=174)	Public health facilities	134	22.8
	Marie Stopes	11	1.9
	Private health facility	29	4.9
Reason for contraceptive non-use (n=88)	No knowledge	45	51.1
	Family/community influence	31	35.2
	Pregnancy	12	13.6
Ever used an emergency contraceptive (n=60)	No	34	56.7
	Yes	26	43.3
The exact time of taking emergency contraceptives (n=26)	Within 24 hours of unprotected sex	17	65.4
	Within 48 hours of unprotected sex	3	11.5
	Within 72 hours of unprotected sex	6	23.1

Of the total number of teenage schoolgirls involved in this study, 46.8% had interactions with their parents concerning sex. This is higher than the finding reported from another study in Ethiopia.²⁰ This might be due to sociocultural variation between the populations. Regarding the sexual experience of teenage schoolgirls, a quarter (25.2%) of the participants had sexual experience, which is lower than the finding from the previous study in Ethiopia.¹⁹ The probable explanation for the difference might be the socioeconomic and cultural context of the study areas. In the present study, out of the total number of study participants who had sexual experience, 41.2% of the first sexual intercourse was initiated by peer influence. This is higher than the finding reported in western Kenya.²⁹ The variation might be due to the difference in

the composition of the study population. This might indicate the importance of targeting peer groups for future intervention programmes in controlling teenage pregnancy among schoolgirls.

Out of the total number of teenage students who had sexual experience, 40.5% used modern contraceptives. This is in agreement with the findings of previous studies in Ethiopia.^{19 20} This may indicate gender power disparities, which may impact the ability of teenage schoolgirls to refuse sex without contraceptive methods such as condoms or the knowledge gap about the importance of modern contraceptives. Similarly, among the teenage schoolgirls who used modern contraceptives, 43.3% used emergency contraceptives, which is also consistent with the finding from another study in Ethiopia.²⁰ Regarding

Table 3 Prevalence of teenage pregnancy among teenage schoolgirls in Wolaita Sodo town, southern Ethiopia, 2019

Variables	Categories	Frequency (n)	Per cent (%)
Ever been pregnant (n=588)	No	502	85.4
	Yes	86	14.6
Currently pregnant (n=86)	No	57	66.3
	Yes	29	33.7
Feelings about pregnancy (n=86)	Nothing	26	30.2
	Unhappy	32	37.2
	Happy	28	32.6
Condition of pregnancy (n=86)	Unintended	66	76.7
	Intended	20	23.3
The outcome of pregnancy (n=86)	Aborted	27	31.4
	Still pregnant	29	33.7
	Stillbirth	9	10.5
	Delivered/live birth	21	24.4
Family history (n=588)	No	505	85.9
	Yes	83	14.1

Table 4 Multivariate association of variables with teenage pregnancy among schoolgirls in Wolaita Sodo town, southern Ethiopia, 2019

Variables (n=588)	Categories	Teenage pregnancy		COR (95% CI)	AOR (95% CI)
		No n (%)	Yes n (%)		
Age	15–17 years	335 (88.4)	44 (11.6)	1.0	1.0
	18–19 years	167 (79.9)	42 (20.1)	1.9 (1.2 to 3.0)	1.3 (0.6 to 2.9)
Relationship with the heads of the household	Two of biological parents	364 (90.8)	37 (9.2)	1.0	1.0
	One of biological parents	62 (87.3)	9 (12.7)	1.4 (0.7 to 3.1)	1.37 (0.4 to 4.9)
	Neither of biological parents	61 (73.5)	22 (26.5)	3.6 (2.0 to 6.4)	2.0 (0.7 to 5.5)
	Husband	15 (45.5)	18 (54.5)	11.8 (5.5 to 25.4)	2.0 (0.6 to 7.2)
Access to mass media	Daily	345 (88.9)	43 (11.1)	1.0	1.0
	Weekly or more	128 (79.0)	34 (21.0)	2.1 (1.3 to 3.5)	2.5 (1.1 to 6.2)*
Alcohol drinking	No	447 (87.8)	62 (12.2)	1.0	1.0
	Yes	55 (69.6)	24 (30.4)	3.2 (1.8 to 5.4)	0.4 (0.1 to 1.1)
Khat chewing	No	490 (87.0)	73 (13.0)	1.0	1.0
	Yes	12 (48.0)	13 (52.0)	7.3 (3.2 to 16.6)	1.8 (0.5 to 6.6)
Cigarette smoking	No	496 (86.9)	75 (13.1)	1.0	1.0
	Yes	6 (35.3)	11 (64.7)	12.1 (4.4 to 33.8)	4.3 (0.9 to 20.5)
Condom use	No	23 (32.9)	47 (67.1)	1.0	1.0
	Sometimes	22 (41.5)	31 (58.5)	0.7 (0.3 to 1.5)	0.6 (0.2 to 1.4)
	Every time during sex	17 (68.0)	8 (32.0)	0.2 (0.1 to 0.6)	0.1 (0.03 to 0.5)**
Know where to get modern contraceptive	No	125 (71.8)	49 (28.2)	1.0	1.0
	Yes	377 (91.1)	37 (8.9)	0.3 (0.2 to 0.4)	0.4 (0.2 to 0.9)*
Family history	No	452 (89.5)	53 (10.5)	1.0	1.0
	Yes	50 (60.2)	33 (39.8)	5.6 (3.3 to 9.5)	3.3 (1.3 to 8.4)*

*Significant at p value: * <0.05, ** <0.01; COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio

knowledge of the exact timing of taking an emergency contraceptive, 65.4% responded within 24 hours of having unprotected sex. This is in line with the result reported in another study from southern Ethiopia.²⁰ The majority knew the exact time to take it; however, there was a significant proportion of the participants who didn't know when to take the emergency contraceptive. Knowing the exact time to take emergency contraceptives prevents unintended pregnancy. Therefore, it is essential to create awareness of the exact timing of taking emergency contraceptives and develop primary intervention strategies that target high-risk groups.

In the current study, a family history of teenage pregnancy, access to mass media, condom use, and knowledge of where to get modern contraceptives have shown a statistically significant association with teenage pregnancy. Having a family history of teenage pregnancy was positively associated with teenage pregnancy. The lifestyle and living environments within the families are probably the most likely to be contributing factors. Similarly, access to mass media was positively associated with teenage pregnancy among schoolgirls. This might be due to their listening to the radio or watching television with content that is not appropriate for their age. On the other hand, using a condom during sexual intercourse had a protective association with teenage pregnancy among schoolgirls. Other studies from Ethiopia and elsewhere in Africa reported similar findings.^{18,30} Likewise, knowledge of where to get modern contraceptives had a protective association with teenage pregnancy among schoolgirls. A similar finding was also reported in another study in Ethiopia.¹⁸ This might reinforce teenage schoolgirls' attitudes and behaviour positively towards the utilisation of modern contraceptives and then protect them from having an unintended pregnancy.

Our study had some inevitable limitations. The study, being a cross-sectional survey, lacks temporal relationships. Even though currently all teenage girls in the study area are believed to attend school, there can be girls missing from school for socioeconomic reasons. For this reason, our study may lack representativeness at the community level. On the other hand, our study had strengths, such as a large sample size and high response rate.

CONCLUSIONS

The prevalence of teenage pregnancy among schoolgirls in Wolaita Sodo town was high. A family history of teenage pregnancy and access to mass media were found to increase the odds of teenage pregnancy among schoolgirls in the study area, whereas condom use, and knowing where to get modern contraceptives were found to reduce the odds of teenage pregnancy among schoolgirls. We suggest that local and national governments, community-based organisations, non-governmental organisations and the public promote the use of contraceptives during sex, such as condoms, to prevent unintended teen

pregnancies among teenage schoolgirls. We also recommend enhancing the provision of information on where to get contraceptives, as observed in the current study. We also suggest educating the public and teenage schoolgirls to avoid risk factors such as consuming media that promotes unsafe sex.

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Acknowledgements The authors thank Wolaita Sodo University for support in both technical and ethical matters. The authors also thank the administration of the Wolaita Sodo Town Schools for their cooperation. The authors also thank the study participants' collaboration and the data collectors' participation in this effort.

Contributors WPK, FGC, WBD, MAA, MM and EWW conceptualised and planned the study. WPK and FGC carried out protocol development, data collection and supervision activities. Formal analysis of the data was performed by WPK and FGC. The original manuscript was prepared by WPK, and the review and editorial activities were done by WPK and FGC. WPK, FGC, WBD, MM and EWW approved the final version of the manuscript.

Funding This work was partially supported by Wolaita Sodo University (award/grant number N/A). The funders had no role in the study's design, data collection, analysis, decision to publish or preparation of the manuscript.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by the Ethical Review Committee of College of Health Sciences and Medicine, Wolaita Sodo University (CHSM/ERC/03/15). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. The data are available on reasonable request from the corresponding author WPK (wondimagegn.p.kumma@student.uib.no; ORCID: <https://orcid.org/0000-0001-6319-6715>).

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