

BMJ Open Factors associated with institutional delivery among mothers who gave birth within 1 year prior to the study at Gilgelbelles town, Northwest Ethiopia: a mixed-methods study

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ABSTRACT

Objectives This study aimed to assess factors associated with institutional delivery among mothers who had delivered within 1 year prior to the study at Gilgelbelles town, Northwest, Ethiopia.

Design A community-based mixed-methods study was conducted from 1 February 2020 to 2 March 2020.

Setting This study was conducted at Gilgelbelles town, Northwest Ethiopia.

Participants Included 422 mothers who delivered 1 year prior to the study at Gilgelbelles town.

Outcome measures Utilisation of institutional delivery and factors associated with institutional delivery.

Methods The quantitative data were collected by the simple random sampling technique, entered into Epi data V.3.1, and analysed using SPSS V.23.0. The qualitative data were collected by using in-depth interviews and thematic analysis was done manually to supplement the quantitative result.

Results In this study, 39.6% (95% CI=34.8 to 44.3) of mothers were given childbirth at the health facility. In multivariable analysis maternal age group of 15–20 years, secondary and above educational level, good knowledge on danger signs of obstetric, antenatal care visits, good awareness of birth preparedness and complications readiness plan, getting married after the age of 18 years, faced at least one complication during pregnancy, less than two children, travelled <30 min to reach a nearby health facility, having decision making power and not practised traditional malpractice during labour were significantly associated with institutional delivery. The qualitative result shows that cultural factors of the society and the lack of adequate delivery material in the health facility were identified as the major reason for the low utilisation of institutional delivery services.

Conclusion This study showed that the proportion of institutional delivery was low. Sociodemographic, reproductive and knowledge-related factors were associated with institutional delivery. This indicates a need of taking appropriate interventions by integrating other stakeholders to increase the utilisation of institutional delivery services.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Conducting the census to identify mothers who had delivered 1 year prior to the study.
- ⇒ There was recall bias regarding requesting the numbers of the antenatal care (ANC) visits and the timing of the ANC visit started.
- ⇒ The tendency to give desirable information by the women could result bias in the findings.

INTRODUCTION

Globally, one in seven pregnancies develops life-threatening complications during pregnancy, delivery or the postpartum period.¹ Worldwide, >141 million women give birth every year, and every day 890 mothers die from causes related to pregnancy and childbirth, and 99% occur in low-income and middle-income countries.² The majority of maternal mortality occurs in labour and the postpartum period.³

About 70%–80% of maternal death attributed to pregnancy and its complication like haemorrhage, pre-eclampsia/eclampsia, infection, unsafe abortion and obstructed labour, and 20%–30% are due to the indirect causes like anaemia, HIV/AIDS, malaria, cardiac problems and diabetes mellitus.^{4–6} According to the 2016 Ethiopian demographic and health survey report (EDHS), the maternal mortality rate was 412/100 000 live births,⁷ and based on the 2019 mini EDHS report in Ethiopia the neonatal and postneonatal mortality rate was 30 and 13 per 1000 live births, respectively.⁸

The risk of maternal death can be reduced by ensuring that women have access to high-quality obstetric care before, during and after childbirth.⁹ According to the WHO recommendation, skilled care is crucial to saving



the lives of both pregnant women and newborns before, during and after childbirth and they should receive quality care throughout pregnancy, childbirth and the postnatal period.¹⁰ A large proportion of maternal and neonatal deaths occur during the first 48 hours after birth, which is an important period to treat any complications arising from the delivery, as well as to provide the mother with important information on how to care for herself and her child.³ However, in Ethiopia only, 34% of women reported receiving a postnatal check-up in the first 2 days after childbirth.⁸

Different studies conducted in different countries showed that multiple factors are associated with the utilisation of institutional delivery services, and some of the factors are maternal age, income status of the family, educational level of the mothers and husbands, occupation, religion, residence, attending antenatal care (ANC) visits, age at first marriage, pregnancy and childbirth, types of pregnancy (planned/unplanned), gravidity, parity, information on the advantage of institutional delivery, access to mass media, knowledge on danger signs of obstetric, awareness of birth preparedness and complication readiness plan (BPCRP), the occurrence of danger signs during pregnancy, accessibility of health facility and decision-making power of the mother in the house.^{11–27}

In 2015, during the 70th United Nations General Assembly, the Millennium Development Goals were replaced by the Sustainable Development Goals (SDG). The SDG focus on the reduction of the global maternal mortality ratio to <70 per 100 000 live births or no country has no more than 140 maternal mortality ratio, reducing neonatal deaths to 12 per 1000 live births, and under-five deaths to <25 per 1000 live births through eliminating preventable maternal, neonatal and child deaths by the year 2030.²⁸ Increasing the utilisation of maternal healthcare services is a good strategy for reducing maternal morbidity and mortality.⁴

The Ethiopian government implement free delivery services in all public health facilities in 2013 to increase the utilisation of institutional delivery services.²⁹ The provision of these free delivery services at public health facilities to some extent increased the utilisation of maternal and child healthcare services.³⁰ For instance, the proportion of women who received ANC from skilled healthcare providers shows an increment from 27% in 2000 to 74% in 2019 and 43% had four or more ANC visits. However, the proportion of delivery attended by skilled healthcare providers shows a slight increment from 6% in 2005 to 50% in 2019. A similar trend was observed for the percentage of live births that occurred in a health facility, which increased from 5% in 2005 to 48% in the mini 2019 EDHS report, and it was, 26% in the Benishangul Gumuz region.⁸

Different studies conducted in Ethiopia identified: cultural beliefs, traditional practices during and after delivery, considering delivery as a natural event, inadequate infrastructure and transport, lack of knowledge on the benefits of maternal healthcare services utilisation,

greater freedom of movement at home, to get support from the family they need, trust in traditional birth attendants (TBA); lack of decision-making power of women, previous negative experiences with health facilities, fear of going to an unfamiliar setting, lack of privacy, poor quality of care, health workers' negative attitude as barriers of the utilisation of institutional delivery services.^{31–36}

Reducing maternal and neonatal complications is possible by using the maternal and child healthcare services provided by skilled healthcare providers in the health facility.^{37–39} Using skilled care during pregnancy, delivery and the postpartum period is an important intervention to reduce both actual and potential complications of the mothers and newborns.

Objectives of the study

- ▶ To determine the proportion of institutional delivery among mothers who had delivered within 1 year prior to the study at Gilgelbelles town, Northwest, Ethiopia.
- ▶ To identify factors associated with institutional delivery among mothers who had delivered within 1 year prior to the study at Gilgelbelles town, Northwest, Ethiopia.

METHODS

Study design and period

A community-based mixed-methods study involving a cross-sectional study for the quantitative part and in-depth interviews for the qualitative part was conducted from 1 February 2020 to 2 March 2020 at Gilgelbelles town.

Study setting

The study was conducted at Gilgelbelles town, Northwest Ethiopia. Gilgelbelles town is located in the Benishangul Gumuz region and found 536 km away from Addis Ababa, the capital city of Ethiopia, and 394 km from Benishangul Gumuz regional city, Assosa. Gilgelbelles is the administrative town of Metekel zone and Mandura woreda. The town has a total population of 40 846, of these, 19 200 are males and 21 646 are females.⁴⁰ The number of females in the reproductive age group constitutes 25% of the total population and out of the reproductive age groups, 852 mothers gave birth 1 year prior to the study. There are a total of 10 106 households and 4 kebeles (the lowest administrative unit in Ethiopia, next to the district) in the town. The town has one public health centre, four health posts and two private clinics.

Study population

The study included randomly selected consenting mothers who had delivered within 1 year prior to the study at Gilgelbelles town for a quantitative study, while seven key informants were included from different groups of the society (two rural kebele leaders, three mothers who had delivered within 1 year prior to the study at Gilgelbelles town and two midwives) for qualitative study.

Inclusion and exclusion criteria of the quantitative part

All mothers, who gave birth for the last 1 year and lived for at least 6 months in Gilgelbelles town were included,

while mothers who were included in the qualitative part were excluded.

Sample size and sampling

The sample size was calculated using a single population proportion formula by considering the following assumptions: prevalence of utilisation of institutional delivery in northwest Ethiopia 51 %, ⁴¹ $Z_{\alpha/2}$ =critical value for normal distribution at 95% confidence level, which is equal to 1.96 (Z value of $\alpha=0.05$) or 5% level of significance ($\alpha=0.05$) and a 5% margin of error ($d=0.05$).

$$\text{Sample size (n)} = \frac{(Z_{\alpha/2})^2 p(1-p)}{d}$$

The sample size was adjusted by adding a 10% non-response rate and the final sample size was 422 mothers who gave birth 1 year prior to the study at Gilgelbelles town for the quantitative study and 7 key informants for the qualitative study.

All the four kebeles of Gilgelbelles town were included in the study. The total sample size was proportionally allocated for each kebele of the town based on the total number of mothers among mothers who had delivered within 1 year prior to the study at Gilgelbelles town. Before data collection, a census was conducted to identify numbers of mothers who had delivered within 1 year prior to the study in each kebele of the town. After the census, the total number of mothers who gave childbirth within 1 year prior to the study in the town was 852. The number of mothers who gave childbirth was 183 in kebele 01, 165 in kebele 02, 239 in kebele 03 and 265 in kebele 04. The total sample size was proportionally allocated for each kebele of the town, based on their population size, by using the following formula:

$$\text{Sample in the kebele} = \text{total sample (n)} \times \frac{\text{population in the kebele (Ni)}}{\text{total population in the kebeles (N)}}.$$

The total sample size after proportional allocation was 91 in kebele 01, 82 in kebele 02, 118 in kebele 03 and 131 in kebele 04. The study participants were selected by a computer-based generated simple random sampling techniques.

Study variables

Dependent variable

Institutional delivery (which was coded as ‘yes’ if the mother gave childbirth at the health facility for the index child and ‘no’ if otherwise).

Independent variables

Sociodemographic factors (maternal age, religion, educational level and occupation of the mothers, educational level and occupation of husband, family size, age at marriage, age at first pregnancy and average monthly income of the family), maternal reproductive and health facility-related factors (age at first marriage, pregnancy and childbirth, family size, number of children, history of ANC visits, gestational age at first ANC visit, number of ANC visits, problem faced during pregnancy, mode of delivery, availability of health facility in nearby,

decision-making power of the mothers), knowledge on danger signs of obstetric and awareness of BPCRP.

Operational definitions

Institutional delivery

Institutional delivery was defined as the mothers who used health facilities (public hospital or health centre, and/or private hospital, or private clinic) for delivery of her index child under the supervision of skilled birth attendants. ⁴²

Home delivery

When a mother gave childbirth at her home or others’ home (neighbour, relatives or family) or birth takes place outside of a health institution. ⁴³

Permanent residence

Mothers who have been residing in the study area, for at least 6 months before the data collection. ⁴⁴

Knowledge of danger signs of obstetric

Refer to knowledge of the mothers about the danger signs of obstetric (during pregnancy, childbirth and in the post-natal period). A total of 15 items were used and for each item, those who respond ‘yes’ were scored (+1), and those who respond ‘no’ scored (0). The mother was considered to have good knowledge if she correctly answered greater than or equal to the mean score of the total knowledge assessing questions. ^{12 45}

Awareness of BPCRP

Refer to the awareness of the mothers on the BPCRP. A total of eight items were used and for each item, those who respond ‘yes’ were scored (+1), and those who respond ‘no’ scored (0). The mother was considered to have a good awareness of the danger signs of pregnancy if she correctly answered greater than or equal to the mean score of the total awareness assessing questions.

History of faced pregnancy danger sign(s)

Refers to any danger sign of pregnancy reported by the mother, which occurred during her index pregnancy. ¹²

Decision-making power

The ability of the woman to decide her place of delivery without any external influence. ⁴⁶

Data collection tools

A structured interviewer-administered questionnaire was used to collect the quantitative data which were adapted from relevant works of literature and modified to the local context. Questionnaires were first prepared in the English language, then it was translated into Amharic by an individual who has a good working knowledge of these languages, then retranslated back into English to check the consistency. The questionnaire consisted of sociodemographic characteristics, maternal reproductive characteristics, knowledge of obstetric complications, awareness of BPCRP and health facility factors. In-depth interview



guidelines were used for the qualitative study (see online supplemental file).

Data quality control

The data collectors and supervisors were trained for 2 days by the investigators. The questionnaire was pretested before the actual data collection period on 5% (21) mothers at Genete Mariam kebele, which has similar characteristics to the study population to ensure the clarity of the questionnaire, to check the wording and confirm the logical sequence of the questions. After necessary modifications, correction was done to standardise and ensure its reliability and validity of additional adjustments were made based on the results of the pretest.

Data collection procedures

The data were collected by trained four diploma midwives and supervised by two BSc midwives. During the data collection period, daily supervision was done for data completeness. The qualitative data were collected through in-depth interviews with different groups of the society (from community leaders, mothers who gave childbirth and healthcare providers). The principal investigators conducted in-depth interviews.

Data processing, analysis and interpretation

The data were entered into Epi data V.3.1, edited and cleaned for inconsistencies, missing values and outliers, then exported to SPSS V.23.0 for analysis. The score for the knowledge of danger signs of obstetric and awareness of BPCR-related questions were summed and categorised. During analysis, all explanatory variables which have a significant association in bivariate analysis with a *p* value of <0.20 were entered into a multivariable logistic regression model to get the adjusted OR (AOR) and those variables with 95% CI and a *p* value of <0.05 was considered as statistically significant with the utilisation of institutional delivery. The multicollinearity between independent variables was checked by the variance inflation factor and was found acceptable (<2). The goodness of fit of a statistical model was checked by using Hosmer-Lemeshow goodness-of-fit test and its *p* value was 0.623. Frequency tables and descriptive summaries were used to describe the study variables. The qualitative data analysis was done manually by grouping into themes. The result was presented in narratives and triangulated with the quantitative results.

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.

RESULTS

Sociodemographic characteristics of the mothers

A total of 422 mothers participated with a response rate of 100%. The mean age of mothers was 27.91 years with (±6.21 SD). Of the mothers, 133 (31.5%) were found in

the age group of 26–30 years, and 251 (59.5%) lived in urban. Nearly two-thirds (63.3%) of the mothers had no formal education, and 261 (61.85%) were housewives. About 188 (45.8%) of the husbands were farmers, and 258 (61.1%) had a monthly family income <1999 Ethiopia Birr (table 1).

Reproductive characteristics of the mothers

In this study, 327 (77.5%) of the mothers got married after the age of 18 years, and 267 (63.3%) had <2 children. Of the mothers, 228 (54.0%) had a history of ANC visits for the index pregnancy, and 61 (14.5%) faced at least one danger sign of pregnancy. Among mothers who faced danger signs during pregnancy, 37 (60.6%) and 26 (42.6%) mothers responded vaginal bleeding and severe headache were major problems they faced during pregnancy. About 304 (72.0%) of the mothers travelled >30 min to reach the nearby health facility, and 297 (70.4%) had bilateral decision-making power in the house (table 2).

Knowledge of danger signs of obstetric

Based on the predetermined criteria, 113 (26.8%) of mothers had good knowledge of obstetric danger signs. Of the mothers, 234 (55.4%), 163 (38.6%) and 140 (33.2%), respectively responded vaginal bleeding, high-grade fever and reduced fetal movement as the major danger signs of obstetric. Nearly 94% of the mothers heard about the advantage of institutional delivery, and 248 (58.8%) heard from healthcare providers (table 3).

Awareness of BPCR

In this study, 123 (29.1%) mothers had a good awareness of BPCR, and 196 (46.4%), 182 (43.1%) and 166 (39.3%) mothers responded by arranging a way of communication for transportation, preparing essential items for delivery and identifying the place of delivery as the major components of BPCR (table 4).

Institutional delivery

In our study, 39.6% (95% CI=34.6, 43.8) of the mothers gave birth at the health facility. Of the mothers, 381 (90.3%) gave birth through spontaneous vaginal delivery and 134 (31.8%) practised traditional malpractice during labour like massaging the abdomen with butter. The major reasons for institutional delivery were to get better services (144 (86.2%)) and was counselled to give childbirth at a health facility (141 (84.4%)). Among mothers who gave birth at home, 138 (54.1%) and 78 (30.6%) felt more comfortable at home, and reported family preference as a major reason for home delivery respectively. Of the mothers, 134 (31.8%) practised traditional malpractices during labour at home or on the way to a health facility like massaging the abdomen with butter. Among them, 121 (90.3%) and 99 (73.9%), respectively responded to relieving the pain and facilitating the labour as their major reason for practising traditional malpractice during the labour (table 5).

Table 1 Sociodemographic characteristics of the mothers who had delivered within 1 year prior to the study at Gilgelbelles town, Northwest, Ethiopia, 2020 (n=422)

Variables	No. (%)
Maternal age (years)	
15–20	42 (10.0)
21–25	118 (28.0)
26–30	133 (31.5)
31–35	66 (15.6)
≥36	63 (14.9)
Residence	
Urban	251 (59.5)
Rural	171 (40.5)
Marital status	
Married	411 (97.4)
Others*	11 (2.6)
Religion	
Orthodox	247 (58.5)
Muslim	75 (17.8)
Protestant	66 (15.6)
Catholic	34 (8.1)
Maternal educational level	
Had no formal education	267 (63.3)
Primary education	54 (12.8)
Secondary education	36 (8.5)
Diploma and above	65 (15.4)
Occupation of the mother	
Housewives	261 (61.8)
Employed (government/NGO)	91 (21.6)
Others†	70 (16.6)
Education of husband (n=411)	
Had no formal education	202 (49.1)
Primary education	62 (15.1)
Secondary education	43 (10.5)
Diploma and above	104 (25.3)
Occupation of husband (n=411)	
Farmer	188 (45.8)
Employed (governmental/NGO)	132 (32.1)
Others‡	91 (22.1)
Average monthly income of the family	
<1999 ETB§	258 (61.1)
2000–3999 ETB	92 (21.8)
>4000 ETB	72 (17.1)

*Widowed, divorced and single.
 †Merchants, students and day labourer.
 ‡Car driver, merchants, carpenter and day labourer.
 §US\$1=35 ETB at the time of data collection.
 ETB, Ethiopian birr; NGO, non-governmental organisation.

Table 2 Reproductive characteristics of the mothers who had delivered within 1 year prior to the study at Gilgelbelles town, Northwest, Ethiopia, 2020 (n=422)

Variables	No. (%)
Age at first marriage	
Before the age of 18 years	95 (22.5)
At or after the age of 18 years	327 (77.5)
Age at first pregnancy	
Before the age of 18 years	15 (3.6)
At or after the age of 18 years	407 (96.4)
Age at first childbirth	
Before the age of 18 years	9 (2.1)
At or after the age of 18 years	413 (97.9)
Numbers of children	
1–2	267 (63.3)
≥3	155 (36.7)
Family size	
≤5	344 (81.5)
>5	78 (18.5)
History of ANC visit	
Yes	228 (54.0)
No	194 (46.0)
Number of ANC visited (n=228)	
<3	123 (53.9)
4+	105 (46.1)
Gestation age at first ANC visit (n=228)	
First trimester	111 (48.7)
Second trimester	95 (41.7)
Third trimester	22 (9.6)
Danger signs faced during pregnancy	
Yes	61 (14.5)
No	361 (85.5)
Types of danger signs faced by the mothers (multiple responses possible) (n=61)	
Vaginal bleeding	37 (60.6)
Swelling of hands and face	10 (16.4)
Severe headache	26 (42.6)
Blurring of vision	9 (14.8)
Reduced fetal movement	8 (13.1)
Severe abdominal pain	2 (3.2)
High-grade fever	20 (32.8)
Excessive vomiting	15 (24.6)
How long does it take to reach the nearest health facility from your home (one-way walking time)	
≤30 min	118 (28.0)
>30 min	304 (72.0)
Decision maker in the house	
Together (wife and husband)	297 (70.4)

Continued

**Table 2** Continued

Variables	No. (%)
Husband alone	125 (29.6)

ANC, antenatal care.

Factors associated with institutional delivery

In bivariate analysis, maternal age, residency, educational level of the mother, age of the mothers at first marriage, numbers of children, family size, history of ANC visits, facing problems during pregnancy, awareness of BPCR, knowledge of danger signs of obstetric, have information about the advantage of institutional delivery, time to reach the nearest health facility, not practised traditional malpractice at labour, decision-making power in

Table 3 Knowledge of danger signs of obstetric among mothers who had delivered within 1 year prior to the study at Gilgelbelles town, Northwest, Ethiopia, 2020 (n=422)

Variables	No. (%)
Heard about the advantage of health facility delivery	
Yes	395 (93.6)
No	27 (6.4)
Source of information (multiple responses possible), n=395	
Healthcare providers	248 (58.8)
Mass media	194 (45.9)
Others*	59 (14.0)
Danger signs of obstetric (multiple responses possible)	
Vaginal bleeding	234 (55.4)
Swelling of hands and face	87 (20.6)
Severe headache	106 (25.1)
Dizziness and blurring of vision	71 (16.8)
Reduced fetal movement	140 (33.2)
Severe abdominal pain	30 (7.1)
Excessive vomiting	61 (14.4)
Gush of fluids	93 (22.0)
Premature onset of labour	49 (11.6)
Prolonged labour	88 (20.8)
Convulsion	63 (14.9)
Retained placenta	54 (12.8)
Epigastria pain	76 (18.0)
High-grade fever	163 (38.6)
Foul-smelling vaginal discharge	65 (15.4)
Knowledge of danger signs of obstetric complications	
Good knowledge	113 (26.8)
Poor knowledge	309 (73.2)

*Family, friends and neighbourhood.

Table 4 Awareness of BPCR among mothers who had delivered within 1 year prior to the study at Gilgelbelles town, Northwest, Ethiopia, 2020 (n=422)

Variables	No. (%)
BPCR (multiple responses are possible)	
Identify the place of delivery	166 (39.3)
Preparing essential items for delivery	182 (43.1)
Identifying danger signs	98 (23.22)
Identifying the nearest health facility	125 (29.6)
Designating decision-maker on her behalf	71 (16.8)
Arranging a way of communication for transportation	196 (46.4)
Saving money for emergency cases	128 (30.3)
Arranging blood donors	23 (5.4)
Awareness of BPCR	
Good awareness	123 (29.1)
Poor awareness	299 (70.9)

BPCR, birth preparedness and complication readiness plan.

the house and monthly income of the family were significantly associated with institutional delivery at a p value of <0.20.

In the multivariable analysis, mother who are found in the age group of 15–20 years (AOR=5.83, 95% CI=1.21 to 28.14), secondary and above educational level (AOR=3.88, 95% CI=1.29 to 11.72), getting married after the age of 18 years (AOR=4.37, 95% CI=1.26 to 15.13), mothers who have less than two children (AOR=2.71, 95% CI=1.02 to 7.17), good knowledge of danger signs of obstetric (AOR=2.83, 95% CI=1.11 to 7.21), good awareness of BPCR (AOR=2.88, 95% CI=1.18 to 7.05), having history of ANC visits (AOR=6.86, 95% CI=2.63 to 17.91), faced at least one danger sign of pregnancy (AOR=3.48, 95% CI=1.18 to 10.23), travelled <30 min to reach a nearby health facility (AOR=4.80, 95% CI=2.03 to 11.35), not practising traditional malpractice during labour (AOR=5.70, 95% CI=1.61 to 20.12) and having decision-making power in the house (AOR=2.43, 95% CI=1.03 to 5.78) were significantly associated with institutional delivery at a p value of <0.05 (table 6).

Qualitative results

A total of seven participants participated in the qualitative study. Those participants were married and able to speak the Amharic language, which includes two community leaders, three mothers who gave birth 1 year before the study (two home delivery and one institutional delivery) and two healthcare providers. Of the key informants, five of them had formal education, while mothers who gave birth at home had no formal education. All mothers who gave birth 1 year before the study and participated in the in-depth interviews were housewives. Based on the qualitative interview analysis report, to explore the underlying factors affecting the utilisation of institutional delivery,

Table 5 Proportion of institutional delivery among mothers who had delivered within 1 year prior to the study at Gilgelbelles town, Northwest, Ethiopia, 2020 (n=422)

Variables	No. (%)
Place of delivery	
Health facility	167 (39.6)
Home	255 (60.4)
Mode of delivery	
Spontaneous vaginal delivery	381 (90.3)
Instrumental vaginal delivery	24 (5.7)
Caesarean section	17 (4.0)
Reason for using institutional deliver (multiple responses are possible) (n=167)	
Was informed to deliver in the health facility	141 (84.4)
The health facility is closer to home	89 (53.3)
To get better services	144 (86.2)
To lower maternal and neonatal complications	117 (70.1)
To avoid traditional malpractice	123 (73.6)
Previous good outcomes at a health facility	95 (56.9)
Labour problem/difficulty labour	21 (12.6)
The bad outcome from previous home delivery	6 (3.6)
Practised traditional malpractice during the labour	
Yes	134 (31.8)
No	288 (68.2)
Reason for traditional malpractice (multiple response are possible) (n=134)	
To relieve the labour pain	121 (90.3)
To facilitate the labour	99 (73.9)
To prevent maternal and fetal complications	42 (31.3)
Reason for home delivery (multiple responses are possible) (n=255)	
I feel more comfortable giving birth at home	138 (54.1)
Due to parent preference	78 (30.6)
Presence of TBAs	66 (25.9)
It is my usual practice	43 (16.9)
Lack of knowledge	57 (22.3)
Too far health facility	26 (10.2)
No problem during the labour at home	61 (23.9)
It is a cultural practice	14 (5.5)
Others*	19 (7.4)

*Health professional does not allow family members to accompany in the labour ward, labour was too quick to reach a health facility and I have a previous bad outcome in giving birth at the health facility.
TBA, traditional birth attendant.

four major themes were identified: *theme 1*: economic factors, *theme 2*: the importance of institutional delivery, *theme 3*: barriers of institutional delivery and *theme 4*: traditional beliefs. Each category is presented and discussed in detail with appropriate descriptions and quotes.

Theme 1: economic factors

According to the in-depth interview, most of the participants mentioned the economic status of the family as a reason for not using institutional delivery services.

...the mothers may stay at least two or more days in the health facility and during this time the family of the mother can't buy food for the other accompanied members and the visitors. But, if the mothers gave childbirth at home, the family members can serve the victors with homemade foods. (Community leader one, found in the age group of 36–40 years old)

...at the health center, they give food for my wife only, but, I and the other people may not have enough money to buy food at a hotel/restaurant for the whole family when we stay in the health facility; however, essential foods are obtainable at home immediately after childbirth. (Community leader (two), found in the age group of 46–50 years old)

Theme 2: importance of institutional delivery

The majority of the participants agreed that institutional delivery is important to prevent maternal and fetal complications.

...as my observation, it is very important to give childbirth in the health institution. Because some problems occurred during labor and delivery that needs health professionals' support. They could easily get help at the health facility in case of complications. (Mother who gave birth at a health facility, found in the age group of 26–30 years old)

On the other hand, some of the participants agreed that some of the women perceived that they have to go to a health facility if there are only complications, otherwise they will prefer to give childbirth. They also mentioned a lack of knowledge about the importance of institutional delivery and not using maternal and child healthcare services during pregnancy as a reason for not using institutional delivery services.

...institutional delivery is helpful but, in our experience, and on my wife, she had no complication to go to the health facility. We have transportation access, strong linkage of health extension workers with health center even in case of complications after calling to health workers of the health post we can go to the nearby health facility. (Community leader (two), found in the age group of 36–40 years old)

...I was delivered at home and even I didn't attend ANC visits. (Mother (one) who gave birth at home, found in the age group of 26–30 years old)

**Table 6** Logistic regression analysis for the proportion of institutional delivery among mothers who had delivered within 1 year prior to the study at Gilgelbelles town, Northwest Ethiopia, 2020 (n=422)

Variables	Institutional delivery		COR (95% CI)	AOR (95% CI)	P value
	Yes	No			
Maternal age (years)					
15–20	22	20	6.60 (2.60 to 16.73)	5.83 (1.21 to 28.14)	0.028*
21–25	59	59	6.00 (2.72 to 13.25)	1.67 (0.37 to 7.46)	0.501
26–30	63	70	5.40 (2.47 to 11.82)	0.94 (0.22 to 4.02)	0.934
31–35	14	52	1.61 (0.64 to 4.05)	1.29 (0.26 to 6.29)	0.755
≥36	9	54	1	1	
Residency					
Urban	102	69	4.23 (2.79 to 6.41)	1.14 (0.52 to 2.48)	0.751
Rural	65	186	1	1	
Maternal educational level					
Secondary and above	91	10	34.29 (16.75 to 70.18)	3.88 (1.29 to 11.72)	0.016*
Primary education	20	34	2.22 (1.18 to 4.14)	0.64 (0.23 to 1.78)	0.387
Had no formal education	56	211	1	1	
Getting married					
After 18 years	157	170	7.85 (3.94 to 15.65)	4.37 (1.26 to 15.13)	0.020*
Before 18 years	10	85	1	1	
Number of children					0.045*
1–2	145	122	7.18 (4.31 to 11.98)	2.71 (1.02 to 7.17)	
≥3	22	133	1	1	
Family size					0.814
3–5	150	194	2.77 (1.56 to 4.95)	0.87 (0.27 to 2.80)	
≥6	17	61	1	1	
History of ANC visit				6.86 (2.63 to 17.91)	0.001*
Yes	158	70	46.40 (22.45 to 95.87)		
No	9	185	1		
Faced problems during pregnancy				3.48 (1.18 to 10.23)	0.024*
Yes	51	10	10.77 (5.28 to 21.97)		
No	116	245	1		
Awareness of BPCRCP				2.88 (1.18 to 7.05)	0.020*
Good awareness	99	24 231	14.01 (8.32 to 23.61)		
Poor awareness	68		1		
Knowledge of danger signs of obstetric					
Good knowledge	86	27	8.97 (5.43 to 14.80)	2.83 (1.11 to 7.21)	0.029*
Poor knowledge	81	228	1		
Have information about the advantage of institutional delivery					
Yes	161	234	2.41 (0.95 to 6.10)	3.32 (0.31 to 35.83)	0.322
No	6	21	1	1	
Time to reach the nearest health facility					
≤30 min	99	19	18.08 (10.33 to 31.66)	4.80 (2.03 to 11.35)	0.001*
>30 min	68	236	1		
Practised traditional malpractice during the labour					
No	161	127 128	27.04 (11.55 to 63.34)	5.70 (1.61 to 20.12)	0.007*
Yes	6		1	1	

Continued

Table 6 Continued

Variables	Institutional delivery		COR (95% CI)	AOR (95% CI)	P value
	Yes	No			
Has decision-making power in the house					
Yes	69	228	11.99 (7.25 to 19.85)	2.43 (1.03 to 5.78)	0.044*
No	98	27	1	1	
Monthly income of the family in ETB					
≥4000	72	16	11.80 (6.31 to 22.10)	0.83 (0.21 to 3.27)	0.786
2000–3999	92	40	4.38 (2.65 to 7.26)	1.03 (0.40 to 2.67)	0.946
≤1999	59	199	1	1	

*P<0.05.
 ANC, antenatal care; AOR, adjusted OR; BPCR, birth preparedness and complication readiness plan; COR, crude OR; ETB, Ethiopian birr.

...some mothers will not deliver in the health facility since they didn't face complications, but they got the health facility only in the presence of complications. (Mother who gave birth at a health facility, found in the age group of 26–30 years old)

Theme 3: barriers to institutional delivery

The lack of adequate waiting rooms and delivery material in the health facilities is identified by healthcare providers as a reason for low institutional delivery service utilisation.

...there is no waiting room and there is a problem in keeping privacy like screen due to lack of separated delivery room. We have only one delivery couch even not in good condition to give delivery service. (Female midwife working at the health post, found in the age group of 26–30 years old)

Of the participants, some of them stated that sometimes the health facility is crowded and the health facility may not have enough beds. The healthcare provider's attitude may also make the mothers choose to give childbirth at home.

...to tell you the truth in my first birth I was delivered at a health facility. But know I delivered at my home. Since at home; I move freely during labor, I can walk freely outside of the home and I can get sun exposure. There is massaging of the abdomen with butter, a warm environment, and encouragement, which gives more comfort during labor and childbirth. In the health facility, doctors said everything is normal and they don't come earlier to listen to the problems. They come only at the time of delivery. (Mother (two) who gave birth at home, found in the age group of 31–35 years old)

Theme 4: traditional beliefs

Some respondents stated that there is a perception that women can go to the health facility to give childbirth only if there are complications.

...I think the main reason for not giving childbirth at a health facility is that women think delivery is a normal event. Women follow their traditional way of delivering at their home than going to a health facility. (Female midwife working at the health center, found in the age group of 26–30 years old)

On the other hand, due to cultural reasons, women may not allow to give childbirth in the house.

...at the onset of labor, after I had informed my best friend (female) I prepared necessary equipment for labor like bed, clothes... and then I had gone out of my house because my husband doesn't want to see the laboring mothers in the house. This is due to our culture. (Mothers (one) who gave birth at home, found in the age group of 26–30 years old)

DISCUSSION

Ending preventable maternal deaths can only be achieved if all women have access to and use high-quality obstetrics care throughout pregnancy. To achieve the SDG targets 3.1 and 3.2 by the year 2030, all women should have to give childbirth in health institutions.²⁸ This study identified that 39.6% (95% CI=34.8 to 44.3) of the mothers gave childbirth at the health institution. This result is in line with the studies conducted in Wolaita and Dawro Zones (38.0%),⁴⁷ Enderta district (37.9%),⁴⁸ Mandura district (38.0%),¹⁷ Western Ethiopia (39.7%)²⁰ and Fentale district in Afar regional state (35.2%).⁴⁹ However, it is higher than studies conducted in Dangila district (18.3%),⁴⁵ Ankasha Guagusa Woreda (20.9%),⁵⁰ South West Showa of Oromia (28.6%),⁵¹ in a predominantly pastoralist community of Afar Region (18.4%),⁵² Banja district (15.7%),¹¹ Dabat health centre (31.0%),¹⁶ Cheha district (31.0%)²⁷ and Assosa district (24.8%).⁵³ The possible reason for this discrepancy might be the study setting and the year of study. As we have seen through time, the utilisation of maternal and child healthcare increased and this may increase their chance of getting information

about the advantage of the utilisation of institutional delivery services. The other probable reason might be the implementation of health extension workers, which may help to mobilise the community and increase their knowledge on the utilisation of the services provided in the health facilities.

The finding in this study is lower than 2019 mini EDHS report (48.0%),⁸ and with studies conducted in Pawi district (60.0%),⁵⁴ Bahir Dar town (78.8%),⁵⁵ Mizan Aman Town (66.5%),⁵⁶ Central Gondar Zone (58.17%),¹⁵ Debre Berhane (80.2%),⁵⁷ Sodo town (62.2%),⁵⁸ West Central Ethiopia (70%),⁵⁹ Jimma Town (74.4%),⁶⁰ Bench Maji zone (78.3%),¹³ Dallocha town (74.0%),⁶¹ Gambella region (63.1%),⁶² Southwest Ethiopia (76%),¹² Mana district (86.4%)⁶³ and Woldia Town (74.7%).⁶⁴ The possible reason might be the difference among the study areas and those study areas are exclusively urban where there is better access to health facilities. The higher home delivery prevalence in our study might be due to the economic level of the family. As seen in our study, 61.1% of the mothers have an average monthly income of <1999 Ethiopian birr per month. There is supporting evidence from studies conducted in different areas, that being the wealthiest increases the utilisation of institutional delivery services.^{23 65} In addition to this in our study, 63.3% of the mothers had no formal education and this may contribute to the low utilisation of institutional delivery in the study area. Mothers who had no formal education may not know the advantage of institutional delivery.

In this study, sociodemographic, reproductive, health facility, knowledge and awareness-related factors were significantly associated with institutional delivery. Young mothers were 5.83 times more likely to give childbirth at the health facility. This is in line with other studies.^{11 43} The possible reason might be that younger women are more likely to be educated and have knowledge of the benefits of healthcare facility delivery than older women. However, this finding is in contrast to other studies conducted in Ethiopia shows that increased age of the mothers is associated with institutional delivery.^{12–15} The possible explanation might be when the age of the mothers increased, the decision-making ability of the mothers may increase and thus may also increase the utilisation of institutional delivery services.

Having secondary and above educational levels increased the utilisation of institutional delivery by 3.88 times. This finding is in line with studies conducted in Ethiopia^{11 17 55 66 67} and Pakistan.⁶⁸ This could be explained by the fact that education increases access to information including pregnancy-related risks and the advantage of using institutional delivery services. Getting married after the age of 18 years increased the odds of using institutional delivery by 4.37 times. This is supported by another study.⁴³ The possible explanation might be those mothers who got married after the age of 18 years may also become pregnant after the age of 18 years and they may have decision-making power, this could increase the utilisation of institutional delivery. While those who get married

before the age of 18 years become pregnant before the age of 18 years, and they might have less autonomy in deciding on the place of delivery, thus could decrease the utilisation of institutional delivery services.

Mothers who have less than two children were 2.71 times more likely to give birth at the health facility. This finding was in line with other studies.^{18 46 69} Mothers with more parity may consider that giving birth at home is not risky as they have previously experienced birth at home.^{16 17 19} The other possible reason might be having larger household members would be made busy and have no extra time to go to the health facility to use maternal healthcare services and this could decrease the utilisation of institutional delivery. Having good knowledge of the danger signs of obstetric increased the utilisation of institutional delivery by 2.83. This finding is in line with studies conducted in Ethiopia,^{11–13 17 63} and a study conducted in Tanzania.²¹ This might be knowledgeable women having a high probability of capturing the benefits of using institutional delivery in different sources like in ANC visits or from mass media. Additionally, mothers who knew danger signs could have a greater fear of complications thus may lead them to seek skilled attendance during childbirth. Risk perception of pregnancy could increase the use of obstetric health services.²² Knowledge is an important factor that affects attitude, intention and behaviour.

The odds of using institutional delivery were 2.88 times higher among women who had a good awareness of BPCR. The possible reason might be they have good information about the advantage of institutional delivery over home delivery and they get convinced to deliver at the health facility during their ANC visits. Counselling on BPCR is a major task at ANC visits. Having ANC visits increased the utilisation of institutional delivery by 6.86 times. This finding is in line with studies conducted in Ethiopia,^{12 13 42 63 65 70–72} Tanzania,²⁶ Ghana,⁷³ and Nigeria.⁷⁴ This might be since ANC visit is one of the strategies given due attention in improving the health of pregnant women. It is an opportunity to provide appropriate information for the mothers about pregnancy, delivery, postnatal danger signs and the importance of institutional delivery. For instance, in our study among women who gave childbirth at a health facility, 84.4% were informed to deliver in a health facility by healthcare providers.

Mothers who have faced at least one danger sign of pregnancy were 3.48 times more likely to give birth at a health facility. This finding is in line with studies conducted in Ethiopia,^{12 43 53} and the Philippines,²⁴ and a qualitative study conducted in Indonesia.²⁵ The possible reason might be mothers who have faced problems during pregnancy may visit the health facility and during this time they may also get information about the possible occurrence of complications during delivery and the postnatal period. Because of the fear of the complication they may give birth at a health facility.

The odds of using institutional delivery services were 4.80 times higher among mothers who travelled <30 min to reach a nearby health facility. This finding is in line

with other studies done in Ethiopia.^{15 17 27 63 75} The possible reason might be having accessible and equipped health facilities with adequate material may have increased the utilisation of the service provided in the health facility. Mothers who have not practised traditional malpractice during labour were 5.70 times more likely to give birth at a health facility. This finding was congruent with studies conducted in Ethiopia and Kenya.^{76 77} This indicates that practising traditional malpractice like abdominal massage by butter at the onset or during labour decreases the probability of mothers giving birth at a health facility. Giving childbirth at home may give them more comfort, as seen in our study among 138 (54.1%) mothers who gave birth at home mentioned feeling more comfortable at home as their major reason for home delivery. This was congruent with a study conducted in the Gambella region.⁶²

Mothers who have decision-making power at home were 2.43 times more likely to give birth at a health facility. This finding is supported by studies conducted in the Central Gonder zone and Tanzania.^{15 26} The possible reason might be that they have equal authority to decide on the health of their family, which in turn might have increased their utilisation of the services provided at the health facility by the skilled healthcare providers. The other probable reason might be making the decision together on the issue of the family may make them have the autonomy to choose the place of delivery freely. This finding is supported by a study done in Butajira, Ethiopia.⁷⁸ In the in-depth interviews, we identified the economic condition of the family, lack of knowledge about the importance of institutional delivery, not using maternal and child healthcare services during pregnancy, cultural beliefs of the community and shortage of essential delivery materials in the health facilities identified as the underlining contributing factors for the low utilisation of institutional delivery. This finding is in line with other studies conducted in Ethiopia.^{34 36}

Limitations of the study

This study has certain limitations. Recall bias might be introduced in some of the questions that required the women to recall past information such as the history of ANC visits and the timing of ANC visits. Additionally, we have not included husbands, and TBA in the qualitative study to explore their opinion on institutional delivery.

CONCLUSION

In this study area, institutional delivery was low. Maternal sociodemographic, reproductive, knowledge and health facility-related factors were significantly associated with institutional delivery services utilisation. The qualitative result revealed that cultural beliefs of the community and the lack of adequate delivery material in the health facility were identified as the major underlying factors for the low utilisation of institutional delivery in the study area.

Therefore, the healthcare providers, health extension workers and community-based volunteers need to focus on strengthening and educating the community about

the advantage of institutional delivery. Policymakers and health planners would continue to design programmes and plans that will encourage the mothers to use maternity care. Additionally, the health extension workers should strengthen their efforts by providing information about the services provided by the TBAs are neither effective nor safe as compared with the services provided by the skilled healthcare providers and to avoid traditional malpractice like massaging the abdomen with butter.

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Patient consent for publication Consent obtained directly from patient(s).

Ethics approval Ethical clearance was obtained from the Institutional Review Board of Bahir Dar University, College of Medicine and Health Sciences (IRB protocol number 0040/2020). A letter of permission was also obtained from Gilgelbelles town health office for each kebele. The purpose of the study was explained to each mother. At the time of data collection, written informed consent was obtained from each mother for those aged ≥ 18 years and from parents/guardians for those aged < 18 years. All respondents assured that the data would not have any negative consequences on any aspect of their life.

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