

Perceived physical accessibility, mother's perception of quality of care, and utilization of skilled delivery service in rural Ethiopia

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Abstract

Objective: Despite the concerted effort to improve skilled delivery service utilization in Ethiopia, a considerable proportion of births still occur at home by traditional birth attendants, notably in a rural setting. Hence, the aim of this study was to investigate whether mother's perceived service quality and physical accessibility affect skilled delivery service utilization.

Methods: A community-based cross-sectional study was conducted from 1 July 2019 to 30 August 2019, among mothers who gave birth in the last 12 months before the study, in selected five districts of Kaffa Zone, Ethiopia.

Result: In this study, 262 (70.1%) of mothers utilized skilled delivery service in their recent childbirth. Mothers regarding the nearby health facility's physical environment as "Good" (adjusted odds ratio = 2.48, 95% confidence interval = 1.44, 4.25), mothers mentioning time to reach to the nearby health facility "< 1 h" (adjusted odds ratio = 1.92, 95% confidence interval = 1.11, 3.34), and mothers regarding prompt transport service from home to the nearby health facility "Available" (adjusted odds ratio = 2.01, 95% confidence interval = 1.11, 3.63) were positively associated with skilled delivery services' utilization. Furthermore, completing secondary education and above, attending three and more antenatal care visits, and having good knowledge of danger signs during pregnancy showed a significant association.

Conclusion: Although the study evidenced statistically significant association between perceived physical accessibility and perceived service quality, further study is recommended to investigate the relationship between actual physical accessibility and actual service quality. Targeted health education program intended to improve skilled delivery service utilization should give due emphasis on enhancing antenatal care service uptake, and raising mothers' awareness on danger signs during pregnancy, with particular focus on those mothers with low schooling.

Keywords

Physical accessibility, quality of care, skilled delivery service, Kaffa, Ethiopia

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Introduction

Maternal health is still one of the core agendas of the international community as it was asserted by Sustainable Development Goals (SDGs), that demand significant reduction in maternal mortality ratio (MMR) by 2030, it set different targets depending on countries' baseline level of MMR.¹ Although significant improvement has been made in the past two decades, about 295,000 mothers died during and following pregnancy and childbirth in 2017. This figure is unacceptably high. The overwhelming majority of this mortality (94%) happened in a low-resource setting, and most could have been avoided. Sub-Saharan Africa and southern Asia contributed to approximately 86% of the estimated global maternal mortality in 2017.²

There has been a considerable decline in the magnitude of MMR in Ethiopia. According to 2016 EDHS (Ethiopia Demographic and Health Survey), Ethiopia has made remarkable progress in mitigating maternal mortality from 871 deaths in 2000 to 412 deaths per 100,000 live births in 2016.³ However, the decline rate is still less than 6.4% which

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is needed to attain the SDGs of 70 maternal deaths per 100,000 live births.¹

Enhancement in the coverage of the proportion of births attended by a skilled attendant and their provision of care may have attributed to the decline in maternal mortality and morbidity.⁴ Nevertheless, the estimated coverage of birth attended by skilled attendants revealed inequality between World Health Organization (WHO) regions as 59% of the births in sub-Saharan Africa region, where maternal mortality is the highest, are attended by skilled attendant while other WHO regions over 68%–99% of all births are attended by skilled birth attendants.⁵

Facility-based childbirth can decrease maternal mortality and morbidity through skilled birth attendance.^{5,6} Skilled birth attendance is where a pregnant woman is attended by a qualified healthcare provider in a setting that has required resources during childbirth.⁷ Proper medical attention and hygienic condition during childbirth decrease the risk of complication, infection, or deaths of the mother and the newborn.⁸

Despite the various efforts made by the Ethiopian government to ensure skilled attendants at birth, a considerable proportion of births are attended by unskilled birth attendants at home or in other informal institutions.^{9–12} The proportion of home delivery is even much higher in rural settings, where pregnant mothers have to travel a long distance to get the service.^{13–16} Several individual, social, and cultural determinates have been suggested for poor skilled delivery service utilization by different studies conducted in various parts of the country.^{10,12,13} However, mothers' perception of quality and physical accessibility as determinants of skilled delivery service utilization in a rural setting has not been sufficiently addressed. Hence, this study investigated whether mothers' perception to quality of care and physical accessibility affects skilled delivery service utilization in rural Kaffa zone, Ethiopia.

Methods

Study setting

The study was conducted in Kaffa Zone, Southwest Ethiopia, from 1 July 2019 to 30 August 2019. Kaffa Zone is located in the Southwest direction of Ethiopia in between 60° 24' to 70° 70' North and 350° 69' to 360° 78' East, and it is 460 km away from the capital city, Addis Ababa. Based on the 2007 census of the central statistical agency (CSA) of Ethiopia, the total population of the zone for the year 2017 was estimated to be 1,171,133, of whom 578,151 (49.4%) were males and 592,982 (50.6%) were females. Despite several interventions, still home delivery is prevalent in the area, and this study was driven by the report of the zone. The zone has one general public hospital, one primary hospital, and 43 public health centers; they provide preventive, curative, and rehabilitative care. Administratively, the zone is found under the SNNPR regional state and divided into

ten districts and one city administration.^{17,18} Among the 10 districts, mothers residing in the rural Kebeles of Chena, Decha, Gimbo, Gewata, Menjiwob, and Tello districts were considered in this study.

Study design and population

A community-based cross-sectional study design was employed. The source population were all women of child-bearing age (15–49 years) in Kaffa Zone who had experienced at least one birth, whereas the actual study population were randomly selected mothers who had given birth in the past 12 months prior to the survey and who lived at least 1 year in the zone prior to the study. Mothers who were mentally or physically ill and not able to be interviewed were excluded from the study.

Sample size and sampling procedure

The sample size was calculated using a single population proportion formula, taking the following assumptions: marginal error of 5%, confidence level 95%, and expected prevalence of skilled delivery service utilization in the area 38.2% (taken from a similar study conducted in Northwest Ethiopia).¹⁹ After adding a 10% non-response rate, the final sample size became 399. When recruiting study participants, a multi-stage sampling procedure was used. First, at zone level, six districts (Chena, Decha, Gimbo, Gewata, Menjiwob, and Tello) were selected by employing a lottery method. Again, with a similar approach, 15 rural Kebeles were selected from the above five districts, three Kebeles from each district. For the purpose of allocating a proportionate sample to each Kebele, a list of all mothers who gave birth in the past 12 months before the commencement of the study was obtained from respective Kebele administration. Then, the total calculated sample size was proportionally allocated to each Kebele, based on the number of mothers residing in each Kebele. At community/household level, study participants were selected by a systematic random sampling technique, using a list of mothers residing at particular Kebele as a sampling frame.

Data collection tools and procedure

An interviewer-administered structured tool was used to collect data. The tool was developed after reviewing similar studies conducted in a different part of the country.^{12,19,20} It has five sections: the first section was about mothers' socio-demographic characteristics, the second section was about mothers' obstetric characteristics, the third was about mothers' knowledge of danger signs during pregnancy, the fourth section contains items related with mother's perception to physical accessibility and quality related with skilled delivery service of the nearby health facility, and the final section enquires about skilled delivery service utilization in their

recent childbirth. Data were collected by eight health extension workers having previous experience on survey data collection technique and the overall data collection procedure was supervised by three BSc health professionals. Attempt was made not to assign health extension workers (data collectors) in the catchment area of the health facility they are currently working in. Before data collection, 3 days of training on data collection techniques and the procedure was given both for data collectors and supervisors. The interview was taken place at each participant's home after assuring their privacy. The tool used to collect data is available as Supplementary Material.

Inclusion and exclusion criteria

Pregnant women within the age group ≥ 18 and residing for more than 6 months in the area were included in this study. Whereas, pregnant women who were unable to respond due to illness or other physical impairment were excluded from the study.

Measurements

The primary variable of interest for this study were: skilled delivery service utilization, mothers' perception to the nearby health facility's physical environment, mother's perception to service providers' technical ability, time to reach to the nearby health facility (on foot), mother's perception to availability of prompt transport service from home to the nearby health facility, and mother's perception of delivery service charge. The tool was adopted from a similar study.²⁰ Furthermore, mothers' socio-demographic characteristics, mothers' obstetric characteristics, and mothers' knowledge of danger signs during pregnancy were also considered in the analysis.

Skilled delivery service utilization. Skilled delivery service utilization is the use of delivery services provided at health facilities and attended by skilled attendants in clinics, health centers, public and private hospitals among mothers who gave birth in the last 12 months for their last delivery.

Mothers' perception to the nearby health facility's physical environment. This was assessed using five items inquiring about the presence of waiting area, maternity ward's toilets, hand washing and shower, infrastructures like electricity, water, and easiness of getting maternity ward starting from the gate. Each item had 5-point Likert-type scale from strongly disagree (1) to strongly agree (5). The total sum was dichotomized into "Good" and "Poor" depending on the mean score. This dimension had an internal consistency or reliability score of 0.81.

Mother's perception to service providers' technical ability. This construct was intended to measure how mothers perceive the professional ability of the care provider in terms of handling labor and complication. This was assessed using three items

inquiring about support given during, labor and delivery, care given to newborn, and pain management. Each item had 5-point Likert-type scale from strongly disagree (1) to strongly agree (5). The total sum was dichotomized into "Good" and "Poor" depending on the mean score. This dimension had an internal consistency or reliability score of 0.76.

Time to reach to the nearby health facility (on foot). This was assessed by asking mothers, what time it takes from home to the nearby health facility, on foot. Their responses were dichotomized into "<1 h" and " ≥ 1 h."

Mother's perception of the availability of prompt transport service from home to health facility. This was assessed from mothers' self-report; mothers responding "Yes" to the statement "prompt transport service (an ambulance) from home to the nearby health facility is available" were code 1; otherwise, 0.

Mother's perception of service charge. This was assessed from mothers' self-report; by asking mothers how they perceive the delivery service charge in the nearby health facility, and three options were provided "High," "Moderate," and "Low."

Mother's knowledge of danger signs during pregnancy. Mother's knowledge of danger signs during pregnancy was measured by a list of nine danger signs stated by WHO guide for essential practice (Childbirth, postpartum, and Newborn).²¹ Mothers were regarded to have "Good knowledge," if they were able to spontaneously mention at least four of the nine danger signs, otherwise, "Poor knowledge."

Data processing and analysis

Data were checked for completeness, edited, cleaned, coded, and entered into Epi Data version 3.1 and then exported to SPSS version 20 for analysis. Descriptive statistics were computed to assess the prevalence of skilled delivery service utilization and other relevant variables. In the descriptive statistic, frequencies, proportion, and mean were calculated and the results of the analysis were presented in text, tables, and graphs. An unadjusted logistic regression model was fitted to detect whether there was any association between the outcome variable (skilled delivery services' utilization) and mother's socio-demographic characteristics, obstetrics characteristics, knowledge of danger signs during pregnancy, and perceptions to quality and physical accessibility-related with skilled delivery service. Then, variables demonstrating $p < 0.25$ on the unadjusted logistic regression model were considered candidates for the multivariate logistic regression. The final, multivariate logistic regression model was fitted to investigate the independent effect of each explanatory variable on the likelihood skilled delivery service utilization; odds ratio and their 95% confidence intervals (CIs) were computed and variables with p -value less than 0.05 were considered as significantly significant.

Table 1. Socio-demographic characteristics of study participants, Ethiopia, August 2019.

Variables	Categories	Frequency	%
Age	18–20	96	25.7
	21–29	176	47.1
	30–38	66	17.6
	>39	36	9.6
Marital status	Currently married	330	88.2
	Currently not married	44	11.8
Educational status	No formal education	242	64.7
	Primary education	87	23.3
	Secondary education and above	45	12.0
Religion	Protestant	115	30.7
	Orthodox Christian	198	52.9
	Muslim	43	11.5
	Catholic	18	4.8
Ethnicity	Kaffa	224	59.9
	Amahara	59	15.8
	Bench	50	13.4
	Others	41	11.0
Occupational status	Housewife	177	47.3
	Employed	63	16.8
	Merchant	112	29.9
	Farmers	22	5.9
Monthly income	<600	137	36.6
	600–999	161	43.0
	≥1000	76	20.3

Data quality assurance

The tool which was prepared in English was translated into Amharic, and then back-translated into English to ensure its consistency. Before actual data collection commenced, the tool was pre-tested on 5% of the actual sample size in Sheko district, which is out of the selected area; then, amendments were made accordingly. There was a supervision on a daily basis and checking on 10% of the collected questionnaire. Finally, error reports were checked after entry to Epi data using each case code.

Ethical consideration

Before data collection, ethical clearance was obtained from the College of Health Science, Mizan-Tepi University, and an official permission letter was also obtained from Kaffa Zone administration and Kaffa Zonal health office. Written informed consent was sought from all participants, after explaining the study's purpose, risks, and benefits. Moreover, participants were assured that their participation was voluntary and personal information will never be disclosed.

Result

Socio-demographic characteristics

In this study, 374 mothers willingly responded to the interviewer-administered structured questionnaire making a response rate of 93.7%. The mean age of the respondents' was

24.6 (± 4.2) years. The majority of the respondents, 330 (88.2%) were currently married women. Regarding their educational attainments, more than half of the respondents, 242 (64.7%) had no formal education, while 87 (23%) attended primary education, and the remaining 45 (12%) completed secondary education and above. One hundred and ninety-eight (52.9%) and 115 (30.7%) were Orthodox Christian and Protestant faith followers, respectively (Table 1).

Obstetric and related characteristics

Regarding age at first pregnancy, 219 (58.6%) were pregnant at the age of 19–25 years and 64 (17.1%) were pregnant before they turned 19 years. The majority of respondents made at least one antenatal care (ANC) visit, during pregnancy, of which only 98 (26.2%) of the respondents attended all the WHO recommended ANC visits,⁷ while 113 (30.2%) attended two ANC visits, and the rest 103 (27.5%) made a single visit. The majority of the respondents were multigravida and multipara, and 97 (25.9%) of the respondents reported that their pregnancy was unwanted (Table 2).

Mothers' knowledge of danger signs during pregnancy

About 126 (33.7%) of the respondents were able to mention more than three signs of danger sign during pregnancy and were regarded as having "Good knowledge." Vaginal bleeding

Table 2. Obstetrics and related characteristics of study participants, Ethiopia, August 2019.

Variables	Categories	Frequency	%
Age at first pregnancy	<18	64	17.1
	19–25	219	58.6
	26–30	40	10.7
	>30	51	13.6
Gravidity (number of pregnancies)	One	62	16.6
	Two	107	28.6
	Three and above	205	54.8
Parity (number of children)	One	105	28.1
	Two	99	26.5
	Three and above	170	45.5
ANC attended	No	60	16.0
	One visit	103	27.5
	Two visits	113	30.2
	Three visits and above	98	26.2
Pregnancy status	Unwanted	97	25.9
	Wanted	277	74.1

ANC: antenatal care.

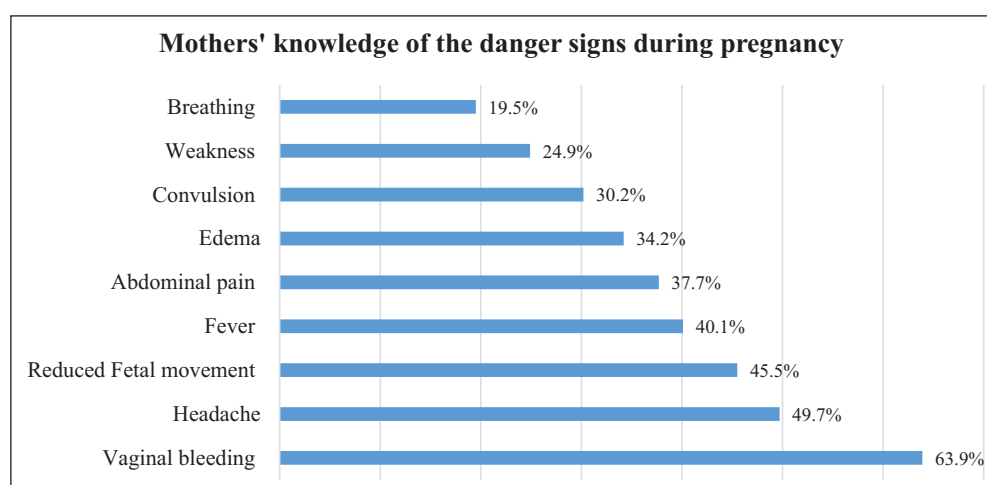


Figure 1. Mothers' knowledge of danger signs during pregnancy in Kaffa Zone, Ethiopia, August 2019 (N = 374). Vertical axis shows the danger signs during pregnancy, and horizontal axis shows the percentage.

(63.9%), headache (49.7%), and reduced fetal movement (45.5%) were the most frequently mentioned danger signs by the respondents (Figure 1).

Mothers' perception of quality and accessibility of skilled delivery service

Mothers' were asked how they perceive the quality, accessibility, and affordability of the skilled delivery service, in the nearby healthcare facility. Accordingly, 231 (61.8%) of the respondents perceived the physical environment of the nearby health facility as "Good," and the service providers' technical ability was designated as "Good" by 258 (69.0%) of the respondents. Regarding time to reach the nearby health facility (on foot), about 215 (57.5%) respondents mention

that it will take less than 1 h from home to the nearby health facility and 131 (35%) respondents claimed that prompt transport service is unavailable when needed (Table 3).

Skilled delivery services' utilization

In this study, 262 (70.1%) of the recent births (occurred in the past 12 months) were attended by skilled birth attendants, of those 148 (56.5%) births were attended at health centers, and 114 (43.5%) births were attended at hospitals. Mothers were asked why they used skilled delivery service and 107 (41%) mothers mentioned that they were advised by health extension workers, 81 (31%) mentioned that they were informed during ANC visit, and 74 (28.24%) thought that it would be safe both for the newborn and for the mother.

Table 3. Mothers' perception of quality and accessibility of skilled delivery service, Ethiopia, August 2019.

Variables	Frequency	%
Mothers' perception to the nearby health facility's physical environment		
Poor	143	38.2
Good	231	61.8
Mother's perception to service providers' technical ability		
Poor	116	31.0
Good	258	69.0
Time to reach to the nearest health facility (on foot)		
< 1 h	215	57.5
≥ 1 h	159	42.5
Prompt transport service from home to the nearest health facility		
Unavailable	131	35
Available	243	65
The service charge for delivery service		
High	42	11.2
Moderate	104	27.8
Low	228	61

Factors associated with skilled delivery service utilization

To select candidate variables for the final multivariate logistic regression, binary logistic regression was carried out. Accordingly, mothers' socio-demographic characteristics, obstetrics characteristics, mothers' knowledge on danger signs during pregnancy, and mothers' perception of quality and accessibility were discretely entered into the bivariate logistic regression, and eventually, 10 variables became candidate yielding a p -value ≤ 0.25 . After adjusting for the mother's age, monthly income, pregnancy status, and mother's perception of the service provider's technical ability, six variables demonstrated a significant association with the likelihood of utilizing skilled delivery service utilization.

Mothers regarding the nearby health facility's physical environment as "Good" (adjusted odds ratio (AOR) = 2.48, 95% CI = 1.44, 4.25), mothers mentioning time to reach to the nearby health facility "less than 1 h" (AOR = 1.92, 95% CI = 1.11, 3.34), and mothers regarding prompt transport service from home to the nearby health facility "Available" (AOR = 2.01, 95% CI = 1.11, 3.63) were positively associated with the likelihood of utilizing skilled delivery services. In addition to the physical accessibility, and mothers' perception of service quality, the likelihood of utilizing skilled delivery service was significantly associated with completing secondary education and above (AOR = 3.52, 95% CI = 1.40, 8.84), attending three and more ANC visits (AOR = 4.41, 95% CI = 1.88, 10.31) and having good knowledge of danger signs during pregnancy (AOR = 2.29, 95% CI = 1.27, 4.12) (Table 4).

Discussion

This study established that 70.1% of the childbirths that occurred in the past 12 months were attended by skilled

health personnel. This prevalence is more or less comparable with studies conducted in Bahir Dar, Tigray, and Tanzania.^{22–24} However, the finding is much higher when compared with studies conducted in the different parts of the country: Munisa, Arsi, Dodota, rural Jimma, and Sekela District. This discrepancy in prevalence could be attributable to the time difference in which the studies are undertaken; in the past few years, the Ethiopian government has made significant efforts to ensure access to skilled delivery service mainly through the expansion of health facility to the wider rural areas, community mobilization by health developmental army, and widespread implementation community-focused program known as the health extension program.²⁵ These coordinated efforts along with socio-economic development might have positively impacted maternal health service utilization in a rural part of the country.

"Three Delays" A Model of the Constraints to Effective maternity Care suggest perceived quality of care as a determinant for poor maternal service utilization. This means mothers not only driven by proven actual quality of care but also by perceived quality of care, this implies information gained from relatives, or friends matters as actual service quality matters. For this, in this particular study, attempts were made to measure mothers' perception of the physical environment, service providers' ability, accessibility, affordability, and service charge.

In this study, mother's perception of the nearby health facility's physical environment significantly predicted mother's utilization of skilled delivery service. Mothers regarding the nearby health facility's physical environment as "Good" were two times more likely to use skill delivery service than those who did not regard so. A similar study conducted in Northern Ethiopia affirmed this claim.²⁰ This implies that the expansion of health facilities to the different corners of the country alone does not guarantee mothers' utilization of skilled delivery service. In a rural setting with the presence of various cultural and social deterrents, it is when mothers' perception of service quality outweighs that they prefer skilled delivery over home delivery by TBAs (traditional birth attendants).

Time to reach the nearby health facility was found to be a strong predictor of skilled delivery service utilization. This finding is line with others studies done in Western Ethiopia, Dembecha District Ethiopia, and Zambia,^{20,26,27} where mothers reaching health facility with a lesser time were more likely to use skilled delivery service than those mothers who had to walk more hours to reach the nearby health facility. Again, the likelihood of utilizing skilled delivery was predicted by the mothers' perception of availability of prompt transport service from home to the nearby health facility. Similarly, a study conducted in Northern Ethiopia reported that less proportion of mother utilized skilled delivery service among who claimed unavailability of easy transport service from home to nearby health facility.²⁰ In Ethiopia, various attempts have been made to improve mothers' physical access to health service; more importantly, through provision of free emergency ambulance services for pregnant mothers, particularly for rural areas, where transport service

Table 4. Factors associated with skilled delivery service utilization in multivariate logistic regression, Ethiopia, August.

Variables	Skilled delivery service		COR (95% CI)	AOR (95% CI)
	Yes (%)	No (%)		
Age (years)				
18–20	63 (65.6)	33 (34.4)	Ref.	Ref.
21–29	132 (75)	44 (25.0)	1.57 (0.91, 2.70)	1.34 (0.72, 2.49)
30–38	42 (63.6)	24 (36.4)	0.91 (0.47, 1.76)	0.56 (0.25, 1.23)
>39	25 (69.4)	11 (30.6)	1.19 (0.52, 2.716)	0.79 (0.28, 2.18)
Educational status				
No formal education	162 (66.9)	80 (33.1)	Ref.	Ref.
Primary education	64 (73.6)	23 (26.4)	1.37 (0.79, 2.37)	1.52 (0.98, 2.92)
Secondary education and above	36 (80.0)	9 (20.0)	1.97 (1.12, 4.30)	3.52 (1.40, 8.84)
Monthly income				
<600	91 (66.4)	46 (33.6)	Ref.	Ref.
600–999	114 (70.8)	47 (29.2)	1.22 (0.75, 2.00)	1.10 (0.50, 2.39)
≥1000	57 (75.0)	19 (25.0)	1.51 (0.80, 2.84)	1.72 (0.74, 4.03)
Pregnancy status				
Unwanted	61 (62.9)	36 (37.1)	Ref.	Ref.
Wanted	201 (72.6)	76 (27.4)	1.56 (0.95, 2.54)	2.07 (0.97, 3.99)
ANC attended				
No	34 (56.7)	26 (43.3)	Ref.	Ref.
One visit	68 (66.0)	35 (34.0)	1.48 (0.77, 2.85)	1.92 (0.93, 3.96)
Two visits	84 (74.3)	29 (25.7)	2.21 (1.14, 4.29)	2.57 (0.97, 5.65)
Three visits and above	76 (77.6)	22 (22.4)	2.64 (1.31, 5.30)	4.41 (1.88, 10.31)
Mothers' knowledge of danger signs during pregnancy				
Poor	164 (66.1)	84 (33.9)	Ref.	Ref.
Good	98 (77.8)	28 (22.2)	1.79 (1.09, 2.94)	2.29 (1.27, 4.12)
Mothers' perception to the nearby health facility's physical environment				
No	90 (62.9)	53 (37.1)	Ref.	Ref.
Yes	172 (74.5)	59 (25.5)	1.71 (1.09, 2.69)	2.48 (1.44, 4.25)
Mother's perception to service providers' technical ability				
Poor	76 (65.5)	40 (34.5)	Ref.	Ref.
Good	186 (72.1)	72 (27.9)	1.36 (0.85, 2.17)	1.60 (0.91, 2.80)
Time to reach to the nearest health facility (on foot)				
<1 h	160 (74.4)	55 (25.6)	1.62 (1.04, 2.53)	1.92 (1.11, 3.34)
≤1 h	102 (64.2)	57 (35.8)	Ref.	Ref.
Prompt transport service from home to the nearest health facility				
Unavailable	91 (69.5)	40 (30.5)	Ref.	Ref.
Available	171 (70.4)	72 (29.6)	1.04 (0.65, 1.65)	2.01 (1.11, 3.63)

COR: crude odds ratio; CI: confidence interval (95%); AOR: adjusted odds ratio; Ref.: reference group.

Bold values indicate statistically significant variable.

The Hosmer and Lemeshow goodness of fit test was 0.61; this implies the model is adequate/appropriate.

is not easily available. However, it is still difficult to for women living in some pocket rural area to use the government's free ambulance service, given poor road construction and difficult weather condition they live in.

Other than the health facility-related factors (mothers' perception of quality and physical accessibility of skilled delivery service), completing secondary education and above, attending three and more ANC visits, and mother's knowledge of danger signs during pregnancy significantly predicted the likelihood of utilizing skilled delivery service. Mothers completing secondary education and above were three times more likely to utilize skilled delivery service than

mothers attending no formal education. Different studies have substantiated this fact that more educated mothers are more likely to seek skilled delivery service than the less educated mothers.^{28–32} In a patriarchal community like Ethiopia, men are the principal decision-makers in all matters including whether their spouses should utilize healthcare services; however, through education, women could challenge this inequality and make a decision on their own health affairs. The other likely explanation for this is that more educated mothers better comprehend the information being disseminated on mainstream media and other written materials promoting the utilization of skilled delivery service.

Mothers who made three and more ANC visits in their recent pregnancy were four times more likely to utilize skilled delivery service than those with no ANC visits at all; this is substantiated by other studies.^{33–35} Maternal continuum care strategy suggests that provision adequate ANC service during pregnancy improves the uptake of subsequent maternal health services including delivery and postnatal care; this might be for the fact that ANC offers a discussion platform between pregnant mothers and healthcare providers during which pregnant women share their concerns on the matters that hinder them not to utilize the service.

Mother's knowledge of danger signs during pregnancy was found to be another important predictor of skilled delivery service utilization; the positive influence of mother's knowledge of danger signs on the utilization of skilled delivery service has been suggested by different studies.^{26,36,37} This could be due to the fact that mothers who recognize the danger signs during pregnancy better understand the possible maternal and neonatal risks associated with home delivery and they are more likely to seek skilled delivery.

Conclusion

Generally, skilled delivery service utilization in rural Kaffa zone is still low when compared with previous studies conducted among urban dwellers. Physical accessibility of the nearby health facility and mother's perception toward the physical environment of the nearby health facility strongly influenced the utilization of skilled delivery service in the area. Furthermore, completing secondary education and above, attending three and more ANC visits, and having good knowledge of danger signs during pregnancy were found to have a positive association with skilled delivery service utilization. Although the study evidenced statistically significant association between perceived physical accessibility and perceived service quality, further study is recommended to investigate the relationship between actual physical accessibility and actual service quality. Targeted health education program intended to improve skilled delivery service utilization should give due emphasis on enhancing ANC service uptake, and raising mothers' awareness on danger signs during pregnancy, with particular focus on those mothers with low schooling.

Limitations

The finding of this study has to be seen in light of some limitations. There might be possibility of social desirability bias as data collectors were from health system the response may be biased toward more positive answers. Another important limitation is the cross-sectional nature of the study means that it is impossible to determine causality.

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Availability of data and materials

The data sets collected and analyzed for this study is available from the corresponding author and can be obtained upon reasonable 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.

Ethical approval

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Informed consent

Written informed consent was obtained from all subjects before the study.

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Supplemental material

Supplemental material for this article is available online.

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