

Magnitude and Determinants of Utilization of Skilled Birth Attendance among Women of Child Bearing Age in Sidama Zone, Southeast Ethiopia

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Abstracts: **Background:** Skilled birth attendance is correlated with lower maternal mortality rates globally. Providing skilled care during pregnancy and delivery reduces maternal deaths. **Methods:** A community based cross sectional study was conducted from April 18 to 28, 2014 in Loka-Abaya district, southeast Ethiopia. Multistage sampling technique was used for selection of study participants. A pretested semi-structured questionnaire was used to collect data. Bivariate and multivariate logistic regression analysis was used to identify the determinants of skilled birth. **Results:** A total of 550 women participated in the study. The mean age of the subjects was 18.61 ± 2.269 years. 41.2% of the subjects attended 1-6 grade schooling. 26.8% of the mothers gave birth at health facilities. Only 13.9% of the mothers encountered at least one complication. The study showed that age and educational status of the mothers and husbands, frequency of antenatal visit, birth order, and maternal knowledge and prior experience of delivering at a health facility were independent predictors of skilled birth attendance. **Conclusions:** The study revealed that the prevalence of utilization of skilled birth attendance for the recent birth was low. Younger age, educational status of mothers and their husbands, lesser birth order, frequency of antenatal care, previous experience of delivery at health institutions and maternal knowledge had positively affected skilled birth attendance. Thus it is recommended that the responsible bodies should strive to improve the awareness and health seeking behavior of mothers.

Keywords: Skilled Birth Attendance, Sidama, Ethiopia

1. Introduction

According to the world health organization, maternal health refers to the “health of women during pregnancy, childbirth and the postpartum period”. In many women, pregnancy, childbirth, and the postpartum period can lead to death because of complications that can be prevented or effectively managed. One of the eight Millennium Development Goals adopted by United Nations in September 2000 was improving maternal health. Despite proven interventions that could prevent disability or death during pregnancy and childbirth, maternal mortality remains a major burden in many developing countries (1,2).

The maternal mortality ratio (MMR) is a measure that identifies the number of maternal deaths to the number of live births. In 2013 the ratio was 210 deaths per 100000 live

births down from 400 maternal deaths per 100000 live births in 1990. Maternal mortality ratio revealed a wider range between developing and developed regions. The burden of maternal mortality was 233 deaths per 100000 live births in developing regions whereas developed regions accounted for only 12 deaths per 100,000 live births. This comparison has long been cited as the “widest disparity in all statistics of public health”. Sub-Saharan Africa had the highest MMR at 387 maternal deaths per 100000 live births, while Eastern Asia had the lowest among MDG developing regions, at 37 maternal deaths per 100000 live births. The MMRs of the remaining MDG developing regions, in descending order of maternal deaths per 100000 live births are Southern Asia (310), Oceania (200), South-eastern Asia (150), Latin America and the Caribbean (80), Northern Africa (78), Western Asia (71) and the Caucasus and Central Asia (46) (3).

Worldwide maternal mortality has been fallen by 45%

between 1990 and 2013 even though Complications of pregnancy and childbirth are the leading cause of disability and death among women between the ages of 15-49. Among low income countries, Southern Asia has made steady progress, with a 64% decline in maternal mortality between 1990 and 2013. In contrast, the ratio has fallen by only 49% in Sub-Saharan Africa, though evidence suggests that progress has picked up speed since 2000 (4). Even though the vast majority of maternal deaths are avoidable, the majority of African countries including Ethiopia are failing to make sufficient advancements toward improving their Maternal Mortality Ratios; in contrast, some countries are implementing innovative initiatives to accelerate progress toward Millennium Development Goal 5 (5).

Every day, pregnancy- and childbirth-related complications account for approximately 800 maternal deaths around the world. Every minute, 110 women in the world experience a complication in their pregnancy and one of them will die. For each woman that dies, more than 25 others suffer a debilitating injury, often with life-long consequences. Millions of women lack the means to prevent unwanted pregnancies, and to prevent and address complications and disease during pregnancy. Further, the global adult lifetime risk of maternal mortality (i.e. the probability that a 15-year-old woman will die eventually from a maternal cause) is 1 in 180. The adult lifetime risk of maternal mortality in women from sub-Saharan Africa was the highest at 1 in 39, in contrast to 1 in 130 in Oceania, 1 in 160 in Southern Asia, 1 in 290 in Southeastern Asia and one in 3800 among women in developed countries (2).

Ethiopia is one of the countries with the highest rates of maternal deaths in the developing world. Moreover, maternal death is expected to be reduced by two-thirds from levels recorded in 1990 to reach the MDG target of 267 deaths per 100,000 deliveries by the end of 2015 (6). The most recent (2013) estimate of Ethiopia's maternal mortality ratio was 497 per 100,000 live births that remains among the highest in the world (3). In 2010/2011, maternal deaths represent 30% of all deaths to women age 15-49, compared with 21% in the 2005 and 25% in the 2000. In spite of the fact that the fifth MGD calls for a reduction in the maternal mortality ratio by 75% between 1990 and 2015, the country is clearly off-track on goal five with the MDG target of 267 per 100,000 births by 2015 (7,8,9). The major causes of maternal death are obstructed/prolonged labor (13%), ruptured uterus (12%), severe pre-eclampsia/ eclampsia (11%) and malaria (9%). Moreover, 6% of all maternal deaths were attributable to complications from abortion (10).

Even though one of the targets of the Ethiopian reproductive health strategy is to increase the proportion of births attended by skilled health personnel in a health facility to 60% by 2015 (11), the proportion of births with a skilled attendant is very low even for women who have access to the services. This is because of the major supply side constraints affecting maternal health: - shortages of skilled mid wives, weak referral system at health center levels, inadequate availability of BEmONC and CEmONC equipment, and

under-financing of the service. On the demand side, cultural and societal norms, distances to functioning health centers and financial barriers were the major constraints (10).

In the face of accelerated effort to meet MDG goal nationwide, however, there is no current study that shows the level and factors associated with low utilization of the available delivery service in the study area. Thus this study was aimed at providing evidence on magnitude skilled birth attendance and factors associated with it in the study area so that responsible bodies in sector will use the finding for designing effective interventions to improve the situation.

2. Methods

The study was conducted in Loka-Abaya Woreda (sub-district), southern Ethiopia from April 18 to May 18, 2014. A community based cross-sectional study was employed using both quantitative and qualitative data collection methods. The study included women in childbearing age who were permanent residents at least for one year in the study area. The Sample size was determined by single population proportion formula with assumption of $p=20.4\%$ (6), 95% confidence interval, 5% marginal error and 10% of non-response rate and a design effect of 2 b/s of multistage sampling that resulted in the calculated sample size of 550 (12,13, 14). The district was selected by purposive sampling while 7 (30%) kebeles (villages) were selected by simple random sampling technique from 24.

The dependent variable of measurement was Utilization of skilled birth service while the independent variables were Socio demographic and obstetrics characteristics of women and their knowledge and attitude towards obstetric risks. A semi- structured questionnaire adapted from different literatures (7,13) was used for data collection. Seven diploma graduated health professionals those speak local language (Sidamiffa) and working outside the study health centers collected the data with support of one BSC holder supervisor by conducting face-to-face interview with mother in their home. In addition, focus group discussion [FGD] had been held with three focus groups each consisting of six to eight participants selected from currently married men and women in the reproductive age group and Religious leaders to elicit their perception towards skilled birth attendance.

The questionnaire was pretested on 5% of the respondents in Jirmancho kebele neighboring the study kebeles. One day training was given to data collectors and supervisors. Data were checked for completeness, entered into computer analysed by SPSS version 16.0. The result was presented using tables and figures. Qualitative data from FGD was analyzed by thematic areas and triangulated with quantitative findings to substantiate the findings.

Ethical clearance was obtained from ethical Review committee of College of Public Health and Medical Sciences, Jimma University. The regional health bureau and other respective offices were informed by letters while verbal consent was obtained from respondents during data collection.

3. Results

3.1. Socio-Demographic Characteristics of the Respondents

A total of 550 women were interviewed with response rate of 100% among which 279 (50.7%) were in the age group of 20- 34yrs. Majority, (99.6%), were currently married with mean age of 18.61 ± 2.26 years at first marriage. A higher proportion (41.2%) of the respondents attended 1-6 grade followed by 30.4% attended 7 grade and above. Only 8% were engaged in paying jobs and 43.8% of their husbands completed at least secondary school while majority (89.8%) were farmer. 25.4% do have more than four family members per households with mean of 4.81 (Table 1).

Table 1. Socio demographic characteristics of the respondents in Loka Abaya district, Sidama Zone, Southeast Ethiopia, and April 2014.

Variables	Frequency	Percent
Occupation (n=550)		
House wife	527	95.8
Merchant	14	2.5
Religion of the respondents(550)		
Protestants	476	86.5
Others	74	13.5
Gov't employee	9	1.5
Husband occupation(n=548)		
Farmer	492	89.8
Gov't & private employee	27	4.9
Merchant	25	4.6
Daily laborer	4	0.5
Respondent's educational level (n=550)		
Secondary and higher	177	32.2
Primary	272	49.5
No formal education	101	18.4
Husband's educational status(n=548)		
Secondary and higher	263	48
Primary	239	43.4
No formal education	46	8.4

3.2. Obstetric Characteristics of the Respondents

Three hundred and sixty one (66%) of the mothers were 20-29 years old and 139 (25.5%) were older than 30 years during their last recent birth. Four hundred and thirty eight (80.8%) had experienced one to four pregnancies while 96 (8%) had been pregnant more than eight times in their life. Majority of the mothers (73.3%) had never given birth at health facilities. Five hundred twenty seven (99.1%) of the respondents had at least one live birth out of which 71 (13.9%) had encountered at least one bad obstetric outcome. Seventy-two (14.1%) of the mothers faced at least one complication of labor during the last recent birth out of whom 39 (56.5%) had excessive vaginal bleeding. Majority (84%) of the respondents had planned their last pregnancy.

four hundred sixty six (85%) of the respondents had used ANC among which only 26.7% had four or more ANC visits while the majority (58.4%) had visited only once during their pregnancy.

In the recent birth only 141 (26.8%) of the mothers gave birth at health facilities and almost all of them 140 (99.2%) were attended by health professionals. Only 71 (13.9%) of the mothers encountered at least one childbirth complication and 26 (12.1%) of them were referred. With regard to the mode of deliveries 514 (98.5%) had spontaneous vaginal delivery (SVD), four (0.8%) by instrumental delivery and three (0.6%) of the mothers had cesarean section (C/S) respectively. Among the complications, excessive vaginal bleeding (56.5%) and prolonged labor (33.3%) were the major ones (Table 2).

Table 2. Selected Obstetric characteristics of the respondents in Loka Abaya district, Sidama Zone, South East Ethiopia, and April 2014.

Variables	Frequency	Percent
Age at first Pregnancy(n=549)		
15-19	275	50.1
20-24	48.1	48.3
25-34	9	1.6
Gravidity (n=542)		
1	123	22.7
4-Feb	315	58.1
>=5	104	19.2
Birth order(n=550)		
1	155	28.1
2-4	379	68.9
>=5	16	2.9
Outcome of pregnancy (n=532)		
Live birth	527	99.1
Other outcome*	5	0.9
Received ANC at last pregnancy(n=548)		
Yes	466	85
No	82	15
ANC frequency(n=469)		
1-3	322	68.7
4 and above	124	26.7

Different reasons were mentioned for preference home delivery to facility delivery with the most common being presence of traditional birth attendants (52.8%) nearby. The participant also said they seek health facility service for getting better care (68.2%) followed by occurrence of a problem during labor and delivery. The FDG participants shared this perception and related the lower utilization of health facility service to lower knowledge on risk of labor and delivery and lower decision making power of women to choose where to give birth in addition to shortage of equipment and supplies in health facilities and unwelcoming providers' behaviors. A forty four years old male participant stated as "...in rural areas health facilities are not attractive for mother b/s of unclean equipment, bad odor, lack of water and electric power and the professionals are not sensible to attend mothers in difficult labor.." (Figure 1).

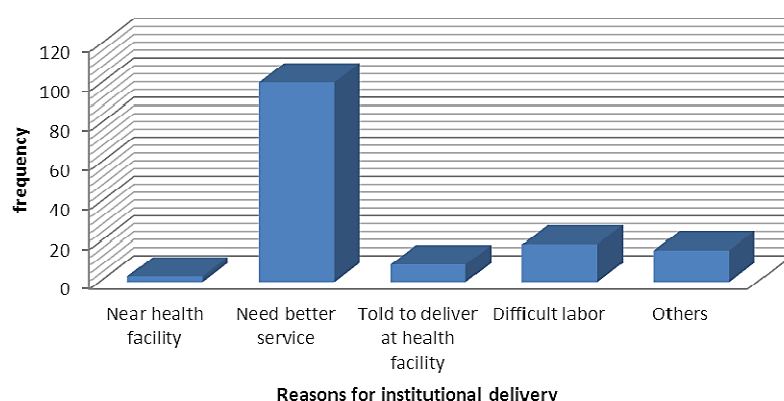


Figure 1. Reason for giving birth at health facility in Loka abaya district, Sidama zone, south east Ethiopia, April 2014.

3.3. Knowledge and Attitude About Pregnancy, Labor and Delivery Service

About half of the mothers, 284 (51.7%), knew at least one risks of pregnancy out of which 142 (48.1%), 121 (41%) and 29 (9.8%) mentioned pregnancy related diseases, maternal death and fetal death respectively. One hundred thirty two (26%) of the mothers encountered at least one of the danger signs during their last pregnancy and 110(80.3%) consulted trained health professionals while 15 (10.9%) had used traditional medicine for the sign.

Three hundred seventy five (68.3%) knew at least one key danger sign of labor out of whom 223(59.6%) mentioned prolonged labor followed by early rupture of membrane (21.4%). Besides, 465 (84.7%) of the mothers were aware of the risks of delivering at home in the absence of trained health professionals. On the other hand, 523 (95.3%) were aware of the benefits of delivering at health facilities. Regarding attitudes of respondents 493 (89.6%) and 521 (94.7%) of the respondents had favorable attitudes towards health facility delivery care (Table 3).

Table 3. Knowledge and attitudes of respondents towards pregnancy, labor and delivery danger signs, Loka Abaya district, southeast Ethiopia, April 2014.

Variables	Frequency	Percent
Know the benefits health facility(n=549)		
Yes	523	95.3
No	26	4.7
Know the risk of home delivery(n=549)		
Yes	465	84.7
No	84	15.3
Know the risk of pregnancy(n=549)		
Yes	284	51.7
No	265	48.3
Know the danger sign of pregnancy(n=550)		
Yes	282	51.3
No	268	48.7
Know the danger sign of labor(n=549)		
Yes	375	68.3
No	174	31.7
Attitude to health facility services(n=546)		
Favorable	522	94.9
Unfavorable	22	4

3.4. Health System Related Factors and Women's Decision-Making

Majority of the respondents (82.8%) lived within one to two hour walking distance of a health center (HC) nearer to their home. 526 (95.6%) of the mothers stated that the nearest health facilities were providing delivery care by skilled professionals. Among delivery service users, majority (96.8%) have received the services free of charge (Table 4).

Table 4. Health service utilization and women's decision making in Loka Abaya district, Sidama Zone, South east Ethiopia, April 2014.

Variables	Frequency	Percent
Walking hours to nearest HF (n=546)		
1hr	482	82.8
>1hr	94	17.2
Nearest HF providing delivery care (n=549)		
Yes	526	95.6
No	14	2.6
Ever used HF for delivery service(n=547)		
Yes	526	96.2
No	21	3.8
Delivery service provided (n=156)		
Free of charge	151	96.8
On payment	5	3.2
Decision maker about who would attend labor(n=550)		
Self	283	51.7
Husband	264	48
Relatives	2	0.4
Other	1	0.1
Decision maker for any expense(n=550)		
Self	20	3.6
Husband	198	36
Me and my husband	332	60.4

Concerning decision-making to deliver in health facility, more than half (54.5%) of the women decided by themselves while husbands and relatives made decisions for the rest (Figure 2).

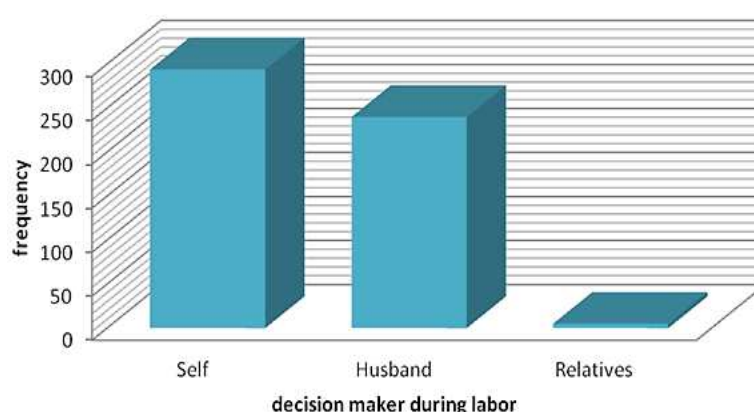


Figure 2. Decision makers of place of delivery for childbirth in Loka abaya district, Sidama zone, southeast Ethiopia April 2014.

3.5. Magnitude of Skilled Birth Attendance

Only 26.4% of the mothers gave birth in the health facilities in their recent childbirth. Majority (85%) of the mothers used antenatal care but 73.6% gave birth at home. Out of those mothers delivered at home, 284 (52 %) were assisted by family members. Among those who delivered at health institutions, only 2.3% had given birth at hospitals while the remaining had delivered at the health centers.

3.6. Predictors of Utilization of Skilled Birth Attendances

We assessed the association dependent and independent variable using bivariate and multivariate logistic regression. Accordingly, we put variables those showed p-value of <0.5 in bivariate logistic regression analysis into multiple logistic regression model to rule out confounder/s. The result of multivariate analysis showed that age and educational status of the mothers, husband's education, frequency of antenatal care visit, birth order, and maternal knowledge on risk of giving birth at home and knowledge on benefit of giving birth at health facility, and prior experience of delivering at a health facility were independent predictors of skilled birth attendance. Accordingly, Mothers with the age range of 15-

19yrs were about five times more likely to give birth at health facility when compared to those aged above 35yrs (AOR=4.87, 95% CI=1.44-16.43). Women had not attended the primary education were about 19% less likely to attend skilled delivery than their counterparts (AOR= 0.19, 95% CI (0.49-0.76). In addition women married to husbands those completed secondary school were about fifteen times more likely to give birth at health facility than those uneducated (AOR=14.79, 95% CI=3.01-65.67).

Women with birth order above four were 98 % less likely to give birth at health facility than those with first order births (AOR=1.98, 95%CI=0.161-0.52). Moreover mother who had received less than four ante natal care were 43% less likely to utilize skilled birth attendances as compared to those utilize four or more (AOR=0.43, 95%CI 0.27-0.67). Furthermore, mothers who had ever given birth at least once earlier in health facility tended to utilize skilled delivery services 6.70 times more likely than those who had not (AOR=6.70, 95% CI=3.18-14.16). In addition, Women those had known the risk of giving birth at home were seven times more likely to utilize skilled birth attendances than those who did not know (AOR=7.79, 95%CI=2.29-26.50 (Table 5).

Table 5. Independent predictors of utilization of skilled birth attendance, in Loka Abaya district, Sidama Zone, South east Ethiopia April 2014.

Variables	Place of delivery		Crud	Adjusted OR, 95% CI
	Home (n= 405)	Health Facility (n=145)	OR, 95% CI	
Maternal age at interview				
15-19	72	4	12.83(4.48-36.7)	4.87(1.44-16.43)
20-34	212	65	5.52(1.94-15.6)	3.15(1.01-9.79)
≥ 35	101	72	1	
Educational status of the mother				
Secondary and higher			19.33(4.48-83.3)	0.05(0.12-0.22)
Primary school			3.73(2.06-6.77)	0.19(0.49-0.76)
Non educated			1	
Educational status of the husband				
Secondary and higher	71	5	33.13(8.86-123)	14.79(3.01-65.6)
Primary school	312	136	5.66(2.23-14.36)	2.33(0.86-6.36)
Non educated	0		1	
Frequency of ANC follow up				
3-Jan	227	73	2.29(1.50-3.49)	0.43(0.27-0.67)
≥ 4	84	62	1	

Variables	Place of delivery		Crud	Adjusted OR,95% CI
	Home(n= 405)	Health Facility(n=145)	OR,95% CI	
Birth order				
First birth	177	13	7.01(3.60-13.63)	1.98(0.161-0.52)
Second birth	88	20	4.54(2.32-8.90)	4.90(2.38-10.06)
Third birth	93	47	2.04(0.96-4.43)	
Fourth and above	77	60	1	
Ever given birth at HF				
Yes	350	117	2.08(1.06-4.07)	6.70(3.18-14.16)
No	23	16	1	
Know the risk of home delivery				
Yes	80	4	8.92(3.20-24.83)	7.79(2.29-26.5)
No	305	136	1	

4. Discussion

Majority of deaths from obstetric complications are preventable and that every pregnancy faces risk which may not always be detected through the risk assessment approach during ANC(14). Delivery assisted by skilled providers is the most important proven intervention in reducing maternal mortality and one of the MDG indicators to track national effort towards safe motherhood (15). Our study showed that only 26.4% of mothers attended skilled delivery for their recent birth although the majority (85%) attended antenatal care. This high discrepancy might be related to dissatisfaction some mothers on quality of ANC they received in addition to factors related to access and yet better when compared to the national prevalence of 10% (7).

Age of the mother was an independent predictor of maternal delivery care utilization in this study; this is inconsistent with a study conducted in Nepal. The possible reason for the discrepancy might be due to differences in the context and socio-culture status (16). On the other hand, the current study suggested that the younger women were more likely to give birth in health facilities when compared with older one. Our study also showed that women had not attended at least primary education less likely to attend skilled when compared to better educated one (AOR= 0.19, 95% CI (0.49-0.76). This finding is in line Ethiopian national two round EDHS survey result(7,8,13), took a similar direction with a study in Bako District, Oromia, Ethiopia, which showed that educated women were 2.754 more likely to use skilled birth attendance(14) and some other studies conducted in Tanzania(18) and other low-income countries including Ethiopia (18,19,20,21).

On the other hand, our study revealed that women who were married to husbands who have attended secondary school and above were more likely to utilize skilled birth attendance during delivery as compared to those with non-formal education. In addition, husband's acceptance of the maternal healthcare services is also one of the main factors identified by WHO in 2004. This is similar with the finding in Busia(Kenya) that identified that more spouses of male partners with secondary level of education and above sought skilled care at delivery than the spouses of less educated male partners (22).

Birth order is another obstetric factor found to be significantly affecting the use of safe delivery services. This is consistent with many studies conducted in Ethiopia and abroad (23,24) which revealed that probability of giving birth at health facilities decreased in grand multipara (≥ 5 birth) mothers than births of four or less. This shows that as birth order increased the chance of giving birth at health institution decreased, implying that mothers tend to seek modern obstetric care for their first pregnancy than for the subsequent pregnancies (14).

In the current study antenatal care was among the determinant of skilled attendance. Those mothers never attended and attended once only were found to use about 43% less likely the professionally assisted delivery (PAD) than those who received more than four times. This finding is consistent with many studies conducted elsewhere in Ethiopia and other developing countries [13,23, 24,25]This implies that as the number of antenatal visits increases, the likelihood of giving birth in a health facility rather than at home also increases.

Previous experience with childbirth in a health facility will determine mothers' choice of deliver place. In this study only 7.1 % of the women had ever given birth at health facility before the immediate birth out of which 82.9%) had delivered their last baby at health institutions. This is Consistent with the studies conducted in Nigeria and Cambodia that showed that women's use of skilled attendance at delivery for the most recent pregnancy was strongly related with receiving care for the preceding birth (19,26). This can be explained as due to mothers' confidence and trust on health facilities developed following the previous use of the services.

Perceived quality of a health facility care will influence the level of utilization of that facility by the community. In the current study, many FGD respondents expressed that majority of mothers don't like to deliver in health facilities as result of the facilities not being attractive; unclean with bad odor, lack of water in addition negligence of the professionals in attending mothers during labor and delivery. This is in line with similar studies conducted in northern Ethiopia and Nigeria. The latter study showed that mothers did not use the health facility for childbirth because of unsatisfactory services at the health facility(54.2%), unfriendly attitude of staff at the health facility(70.8%),

unavailability of staff at the health facility (64.0%) long waiting time(75%) (19,27).

Furthermore, reasons for preference of home delivery in the finding of this study were presence of traditional birth attendants nearby, smooth and short labor duration at home, husbands' disapproval for health facility birth, maternal choice to deliver in the presence of relatives, lack of accompany and female providers in health facilities, and experience of previous normal home delivery. This might be related with low maternal awareness in timing and signs of labor, inability of women to decision making for their care, mothers' cultural belief to be supported by relatives' and preference of female care providers during labor and delivery.

In the current study, only (0.5%) of the deliveries was attended by cesarean section. It is far below the minimum standard (5%-15%) recommended by WHO(2013)but consistent with that of south west Ethiopia (1%) and Gondar (1.5%) (27). It might be related with inaccessibility of comprehensive emergency care units. This is supported by Focus group discussion that indicated health workers are not qualified to manage basic and emergency obstetrics care.

Our study showed that maternal knowledge on the risk of home delivery was independent predictor of utilization of skilled birth attendances. This finding is in line with a study conducted in north shoa zone, Ethiopia and different to study conducted in south west Ethiopia (27,28). This suggests that mothers who are able to recognize risk of giving birth at home have great fear of possible negative outcome home delivery.

In conclusion this study revealed that the prevalence of utilization of skilled birth attendance for the recent birth in the study area was low. The Factors associated with this low utilization were related to characteristics of mothers and health system. The independent predictors of utilization of skilled birth attendance were age of the mothers, educational status of mothers and their husbands, birth order, frequency of antenatal care, previous experience of delivery at health institutions and maternal knowledge on risks of home delivery.

Thus it is recommended that the responsible bodies should strive to equip the health facilities with appropriate standard human and material resources and give continuous support to ensure quality of care. the health care providers on their side should work hard to improve attitude of mothers and their significant others towards health facility care by advocating benefits of skilled birth attendance and risk of home delivery while the woreda responsible health officials should equip the Health centers with necessary medical equipment and supplies.

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Authors' Contributions

We, the three researchers, have made significant contribution in the proposal development, defending for fund obtaining, data collection and data analysis and manuscript preparation process of this work. We, the three, authors read and approved the final manuscript.

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