Predictors of Health Facility Delivery Service Utilization in Lemo District, South Ethiopia: Unmatched Case Control Study

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Abstract

Background: In Ethiopia, the level of maternal mortality is among the highest in the world [676 per 100,000 live births]. This is attributed to among other factors non use of modern health services, particularly health facility delivery. The risk of maternal death can be reduced if mothers give birth at the health facilities, where skilled birth attendants make close follow up, early detection and take corrective measures against complications. Hence, this study was aimed to assess determinant factors contributing to health facility delivery services utilization in Lemo district, South Ethiopia.

Methods: Community based unmatched case control study assessed predictors of health facility delivery in Lemo district using interviewer administered questionnaire. The collected data were analyzed using SPSS version 16.0. Logistic regression analysis was done to identify predictors of health facility delivery among women who has given birth in the last three years prior to the study.

Results: Family sizes of 1-4, husbands attended higher education, women occupation being merchant, husbands’ occupation being daily laborer and merchant were socio-demographic predictors of health facility delivery. In the other way, history of at least one abortion, history of still birth and receiving counselling during antenatal care were obstetric predictors of health facility delivery in Lemo district.

Conclusions: Health facility delivery service utilization was significantly associated with counselling received on birth preparedness and complication readiness plan during antenatal care visit, previous experience of abortion and stillbirth. Family size of 1-4, husbands attended higher education, women occupation being merchant, husband occupation being merchant and daily laborer were also found to be associated with facility delivery. Ways to improve mothers’ awareness about maternal health services given, the benefits of receiving these services and complications related to pregnancy and delivery should be designed and implemented.

Keywords: Predictors; Health facility delivery service utilization; Lemo district; South Ethiopia

Background

Maternal morbidity and mortality arising from inadequate health services is an important national and global health concern. One of the Millennium Development Goals (MDG5) is to reduce the maternal mortality ratio by 3/4 between 1990 and 2015 [1,2]. Mortality rates are higher in developing than developed countries where investment in human resources and medical resources are limited [3]. The place of delivery is an important aspect of reproductive health care provided to the mother and the quality of care received by the mother depends upon the place of delivery [4].

Globally, every day about 1000 women died due to complications of pregnancy and childbirth, including severe bleeding after childbirth, infections, hypertensive disorders and unsafe abortion in 2008. Out of the 1000, 570 lived in sub-Saharan Africa, 300 in South Asia and five in high-income countries. The risk of a woman in a developing country dying from a pregnancy-related cause during her lifetime is about 36 times higher compared to a woman living in a developed country [5]. In sub-Saharan Africa including Ethiopia, despite many decades of public health interventions, pregnancy-related complications continue to be a leading cause of death and disability for women of reproductive age [6].

Regarding Ethiopia were this study was conducted, improving maternal health remains one of the most important challenges that the country is facing. Ethiopia is one of the countries that have highest maternal mortality ratio (MMR) in the world, which is estimated to be 676/100,000 live births [7]. Despite the fact that the Ethiopian government and international organizations had been working for reducing maternal mortality in the previous years making health facility services accessible and usable for pregnant women, maternal mortality remains increased in some digits (673 in 2005 and 676 in 2011 per 100,000 live births). Part of this mortality is attributed to poor delivery care [1,7].

The highest incidence of maternal and perinatal mortality occurs around the time of birth with the majority of deaths occurring within the first 24 hours after birth [8]. These deaths could be avoided if preventive measures were taken and adequate cares available particularly during pregnancy, childbirth and postpartum period through obstetric care services. However, only 10% of births in Ethiopia are delivered at a health facility (9% in a public facility and 1% in a private facility) by the assistance of skilled birth attendants (Doctor, Nurse and Midwives). The percentage of deliveries in a health facility doubled from 5 percent in 2005 to 10 percent in 2011. The vast majority (90%) of deliveries
were attended at home by people who have no proficiency to attend and manage complications of labour and delivery. These include health extension workers\(^1\) (1%), relative, or some other person (57%), traditional birth attendant (28%) and unattended (4%). Besides, percentage of facility delivery varies from place to place in Ethiopia. For instance, urban births are notably more likely than rural births to be delivered in a health facility (50% versus 4%). In Southern Nations Nationalities and Peoples (SNNP) regional state where this study was conducted, the percentage of health facility delivery is lower than all other regions of Ethiopia (6.2%). The percentage of births delivered in health facility was also less than 10% in Affar (6.8%), Oromiya (8%), Somalia (7.6%), and Benishangul-Gumuz (9.1%) regions. However, 82% of births in Addis Ababa (capital city of Ethiopia) and 39% of births in Dire Dawa delivered at health facility. Another explanation for low maternal health service utilization is family planning (27%), antenatal care (34%) and postnatal care (6%)\(^7\).

Proper medical attention during labour and delivery at the health facilities can reduce the risk of death of the mother and newborn that might happen as a result of complications (such as prolonged/obstructed labour, hemorrhage, eclampsia, etc) through close follow up, early detection and taking corrective measures. Likewise, infections that can cause the death or serious illness of the mother and/or the newborn baby can be avoided by applying appropriate infection prevention strategies if mothers give birth at the health facilities where skilled birth attendants exist\(^7\).

Reviewed literatures from different parts of the world including Ethiopia revealed that health facility delivery service utilization increased with increasing maternal education level\(^7-9\), health decision making power\(^9,10,12,13\), access to health information and services\(^2,7,11-18\) and antenatal care service utilization\(^3,6,10,11,18\). Besides, pregnancy intention\(^2\), parity\(^9,12\) and previous obstetric complications\(^11,13-16\) were other factors associated with facility delivery service utilization.

Previous studies focused on prevalence and reasons for home delivery however, no more analytical studies that focus on enabling factors at community level conducted yet. Thus, conducting analytical studies to identify determinant factors contributing to health facility delivery in different places with varied accessibility and availability of health services is necessary. Therefore, the objective of this study was to assess determinant factors contributing to health facility delivery service utilization in Lemo district. Consequently, the findings of this study will provide baseline information for relevant stakeholders for planning and implementation of health facility and community based interventions in Lemo district.

Methods and Materials

Study setting

This study was conducted from February 15, 2013 to May 28, 2013 in Lemo district, Hadiya zone located in South Ethiopia. It is 230 km far from the capital city, Addis Ababa and 194 km from regional capital city, Hawassa. Lemo district bordered with Misha district and Silte zone in the North, Soro district and Kembata zone in the South, Soro district and Gembora district in the West and Analemo district in the East. Based on health profile of Lemo district health office, the total population is 140,262 (49.47% male and 50.53% female) for the year 2010/11. There are seven health centers consisting of thirty-five health posts\(^2\) in the district. One health center provides basic essential obstetric care for at least five kebeles. Each kebele has also two health extension workers who provide basic health services such as family planning, antenatal care, attend normal delivery, immunization, referral etc\(^25\).

Study design

Community based unmatched case control study was conducted to assess predictors of health facility delivery service utilization in Lemo district, South Ethiopia.

Population

The target populations for this study were all child bearing age women (15-49 years) who are permanent residents of the Lemo district and who have given child birth in the last three years prior to the date of data collection. The study participants were sample of child bearing age women who had given birth at least once in the last three years prior to the study irrespective of outcome, gestation or place of delivery.

Definition of cases and controls

Cases defined as child bearing age women who had given the most recent child birth at health facility in the last three years prior to the date of data collection. Controls defined as child bearing age women who had given the most recent child birth out of health facility in the last three years prior to the date of data collection.

Sample size and sampling procedure

Sample size was calculated using Epi info version 3.5.1 software using proportion of women who had completed at least secondary school among cases and controls estimated to be 26.2 % and 7.8 % respectively. This proportion taken from a study done in Ayssaita and Dubti Towns\(^20\) among those factors which has an association with institutional delivery service utilization and which gives the maximum sample size using power of 90%, with 95% confidence level, odds ratio 4.9 and case to control ratio of 1:2. Total sample size calculated was 210 (70 cases and 140 controls); adding 10% possible non-response rate, the total sample size was 231 (77 cases and 154 controls). Lemo district has thirty five kebeles\(^4\). Considering resources, four kebeles were selected for the study using simple random sampling (lottery) method. The list of women who has given child birth in the last three years prior to data collection was taken from each of the selected kebele’s health post records. The registration procedures and completeness of the records were checked. House number of the women who has given recent child birth in the last three years was identified and sampling frame was prepared for cases and controls in each of the selected kebeles. Finally, the required number of sample cases and controls were selected from each kebeles using systematic random sampling technique.

Data Collection

Instrument

A pre-tested and structured interviewer administered questionnaire was adapted from previous study\(^1,7,9-14\) and reviewing relevant literature to the problem under study to include all the possible variables that address the objective of the study. The questionnaire contained close end questions (one word response). The questionnaire was designed to obtain information on socio-demographic and economic characteristics, maternal health service utilization, obstetric history, access to health facility and services, women decision making power and perceptions on health services. Knowledge about danger signs during pregnancy and delivery was measured by asking women whether they know or not know about it. Attitude towards obstetric services were measured by attitude question using five point Likert scale.
and positive attitude was considered for women answered greater than the average/mean score from attitude questions while negative attitude for those less than average score. The questionnaire was first prepared in English and translated to Amharic language and back translated to English to check consistency of words and concepts. Two days training was given for four data collectors and two supervisors on the objective of the study. Data collectors were diploma nurses and supervisors were Bachelor of Science (BSc) holders in nursing and public health. Data collectors and supervisors were recruited from Lemo district who knew the local culture and languages. The questionnaire was pretested on 5% (4 cases and 8 controls) of respondents in kebeles having similar socio demographic characteristics with the study participants (Analemo district) and minor modification was made accordingly. Finally, data were collected by face to face interview.

Data processing and analysis

The collected data were checked manually for completeness and consistency by supervisors during field work and rechecked again at office by investigators before data entry. Then, data were entered to statistical package for social science (SPSS) window versions 16.0. Entered data were explored to check outliers, missing values and cleaned before analysis. Finally descriptive statistics (frequency tables) were done to summarize data and bivariate analysis was made to see the association of individual explanatory variables to health facility delivery service utilization. Based on the findings of bivariate analysis, variables having significant association at (P < 0.25) with health facility delivery were entered to multivariable logistic regression analysis using enter method to identify independent socio-demographic and obstetric predictors of health facility delivery service utilization. Finally, P-value less than 0.05 in multivariable analysis was used to declare association between independent predictors and the health facility delivery service utilization.

Ethical considerations

Ethical approval was obtained from ethical review committee of Wachemo University through faculty of medicine and health sciences. Participants were informed and given full rights and freedom to participate in the study or not to participate. Privacy and confidentiality were maintained during interview. The participants were told any information they provided would be kept confidential. Participant’s name and house number never appeared on data collection tools. Besides, the study subjects were informed that their responses would not result in any harm to them. The purpose, general content and nature of the investigation were explained to each respondent to obtain a verbal consent before inclusion into the study. Questions and concerns raised by the participants were clarified. Finally, the participants who agreed to give their data were included in the study.

Results

Socio-demographic and economic characteristics

A total of 231 (77 cases and 154 controls) respondents were interviewed. The mean age of cases and controls was 33.4 and 31.3 years respectively. Forty five (58.4%) of the cases and 65 (42.2%) of the controls have a family size of 1-4, 31(40.3%) of the cases and 77(50%) of the controls have a family size of 5-8 and 1(1.3%) of the case and 12(7.8%) of the controls have a family size of 9-14. Of 231 respondents, 34(44.2%) of cases and 88(57.1%) of controls were married, 6(7.8%) of cases and 20(13.1%) of controls were unmarried, 17(22.1%) of cases and 23(14.9%) of controls were divorced and 20(25.9%) of cases and 23(14.9%) of controls were widowed (Table 1 for detailed socio-demographic and economic characteristics).

| Socio-demographic variables | Health facility delivery (Cases=77) | Home delivery (Controls=154) |
|-----------------------------|------------------------------------|-----------------------------|
| Age                         |                                    |                             |
| 15-19                       | 3                                  | 5                           |
| 20-24                       | 4                                  | 16                          |
| 25-29                       | 19                                 | 39                          |
| 30-34                       | 15                                 | 51                          |
| 35-49                       | 36                                 | 43                          |
| Religion                    |                                    |                             |
| Orthodox                    | 8                                  | 18                          |
| Muslim                      | 12                                 | 28                          |
| Protestant                  | 51                                 | 74                          |
| Catholic                    | 6                                  | 30                          |
| Apopostolic                 | 0                                  | 4                            |
| Ethnicity                   |                                    |                             |
| Hadiya                      | 35                                 | 61                          |
| Kembata                     | 24                                 | 35                          |
| Amhara                      | 6                                  | 31                          |
| Gurage                      | 7                                  | 22                          |
| Wolayita                    | 5                                  | 5                            |
| Women occupation            |                                    |                             |
| Farmers                     | 13                                 | 31                          |
| Daily laborers              | 17                                 | 31                          |
| Merchants                   | 15                                 | 10                           |
| Government employees        | 23                                 | 58                          |
| Housewives                  | 8                                  | 23                          |
| Students                    | 1                                  | 1                            |
| Women education             |                                    |                             |
| Unable to read and write    | 12                                 | 12                          |
| Read and write              | 21                                 | 70                           |
| Primary education           | 21                                 | 36                          |
| Secondary education         | 22                                 | 7                            |
| Attended higher education   | 1                                  | 29                           |
| Ng of children < 5year      |                                    |                             |
| Less than or equal to 1     | 32                                 | 23                          |
| 2                           | 44                                 | 114                         |
| 3                           | 1                                  | 17                          |

Table 1: Socio demographic characteristics of respondents and place of delivery in Lemo District, South Ethiopia, May -2013.

Obstetrics characteristics

From all cases and controls, 52(67.5%) of cases and 106 (68.8%) of controls wanted their last pregnancy. However, 25(32.5%) of cases and 48(31.2%) of controls responded that they did not want their last pregnancy. Seventy (90.9%) of cases and 148(96.1%) of controls had history of antenatal care follow up during the time of last child pregnancy and the other 7(9.1%) of cases and 6(3.9%) of controls had no any antenatal care follow up. Majority of the cases 72(93.5%) and controls 124(80.5%) were counselled during antenatal care. Nineteen (24.7%) of cases and 2(1.3%) of controls had history of still birth and 58(75.3%) of cases and 152(98.7%) of controls had not history of still birth. Most, 44 (57.1%) of the cases and 95 (61.7%) of controls had experienced problems during their last child delivery respectively. However, 33 (42.9%) of the cases and 59 (38.3%) of the controls responded that they had not experienced problem during the last child delivery. Most of the cases, 55(71.4%) and controls, 119(77.3%) didn't know the general danger signs during the time of
pregnancy and delivery. Majority of the cases, 71(92.2%) and controls, 136(88.3%) knew the importance of giving birth at health facility while 42(34.5%) of cases and 85(55.2%) of controls know the risk of home delivery.

**Health facility utilization characteristics**

Most of the cases 69(89.6%) and controls 130(84.4%) had health facility around their residency and the health facility was found below 10 Km around their residential area. However the decision making power by themselves to utilize the health facility was only 9(11.7%) and 14(9.1%) for cases and controls respectively. In majority of the controls 85(55.2%) the decision making power was held by their husband. Only 26(33.8%) of cases and 58(37.7%) of controls agreed that the health facility around their residency and the health facility was only 9(11.7%) and 14(9.1%) for cases and controls respectively. The health facility around their residential area was found below 10 Km around their residential area. However the health facility delivery service was utilized more likely than women with no abortion history. Women with history of stillbirth, receiving counseling regarding birth preparedness and complication readiness during antenatal care visit and mother age at delivery were significantly associated with health facility delivery service utilization at p-value < 0.25.

In the multivariable analysis, adjusting possible confounding variables: family size 1-4 [AOR=2.96 (95%CI: 1.482, 5.918)] were utilized health facility delivery service more likely than women with 5 and above family size. Merchant women [AOR=3.39 (95% CI: 1.033, 11.121)] were utilized health facility delivery service more likely than farmer women. Women whose husbands were daily labourer and merchant [AOR= 2.761 (95%CI: 1.01, 7.535)] and [AOR= 2.905 (95% CI: 1.187, 7.111)] respectively were utilized health facility delivery service more likely than women whose husbands were farmer. Women whose husbands completed higher education [AOR=9.15 (95% CI: 2.359, 35.491)] were utilized health facility delivery more likely as compared to those women whose husbands were unable to read and write (Table 2).

**Obstetrics determinants of health facility delivery service utilization**

Health facility delivery service utilization was assessed for its association with obstetrics variables. Bivariate analysis in the binary logistic regression model showed that frequency of abortion, history of stillbirth, receiving counseling regarding birth preparedness and complication readiness during antenatal care visit and mother age at delivery were significantly associated with health facility delivery service utilization at p-value < 0.25.

In the multivariable analysis, adjusting possible confounding variables: women with one time abortion history [AOR=6.757 (95%CI: 2.568, 17.783)] had utilized health facility delivery service more likely than women with no abortion history. Women with history of stillbirth [AOR=36.01 (95%CI: 7.24, 179.12)] had utilized health facility delivery service more likely than women with no history of stillbirth. Women who received counselling regarding birth preparedness and complication readiness during antenatal care visit [AOR=5.795 (95%CI: 1.580, 21.253)] had utilized health facility delivery service more likely

| Place of delivery | Health facility (Cases=77) | Home (Controls=154) | COR (95%CI) | AOR (95%CI) |
|-------------------|---------------------------|---------------------|-------------|-------------|
| Socio demographic and economic variables | N (%) | N (%) | COR (95%CI) | AOR (95%CI) |
| Religion | | | | |
| Orthodox | 8(10%) | 18(11.7%) | 1 | 1.190[0.614, 2.324] |
| Muslim | 12(15.6%) | 28(18.2%) | 0.337[0.128, 0.888] | 0.565[0.215, 1.429] |
| Protestant | 51(66.2%) | 74(48%) | 1.743[0.471, 6.443] | |
| Catholic | 6(7.8%) | 30(19.5%) | | |
| Apoplistic | 0(0%) | 4(2.6%) | | |
| Family size | | | | |
| 1-4 | 45(58.4%) | 65(42.2%) | 1.925[1.106, 3.353] | 2.962[1.482, 5.918] |
| 5 and above | 32(41.6%) | 89(57.8%) | | |
| Work | | | | |
| Farmer | 13(16.9%) | 31(20.1%) | 0.946[0.422, 2.121] | 1.253[0.556, 2.825] |
| Government employee | 23(29.9%) | 58(37.8%) | 1.308[0.544, 3.144] | 3.577[1.278, 10.013] |
| Daily laborer | 17(22%) | 31(20.1%) | 0.829[0.295, 2.330] | 2.385[1.38, 4.107] |
| Merchant | 15(19.5%) | 10(6.5%) | 3.577[1.278, 10.013] | 1.182[0.43, 3.253] |
| House wife | 8(10.4%) | 23(14.9%) | | |
| Student | 1(1.3%) | 1(0.6%) | 2.385[1.38, 4.107] | 3.39[1.033, 11.121] |
| Husband work | | | | |
| Farmer | 13(16.9%) | 49(31.8%) | 2.432[1.060, 5.580] | 2.761[1.010, 7.550] |
| Daily labourer | 20(26%) | 31(20.1%) | 2.277[0.859, 4.898] | 2.905[1.187, 7.110] |
| Government employee | 29(37.7%) | 48(31.2%) | 2.175[0.800, 5.253] | 1.976[0.692, 2.561] |
| Husband education | | | | |
| Unable to read and write | 20(26%) | 59(38.3%) | 1.264[0.615, 2.598] | 1.253[0.556, 2.625] |
| Read and write | 21(27.3%) | 49(31.8%) | 1.770[0.782, 4.005] | 1.520[0.572, 4.040] |
| Primary education | 15(19.4%) | 25(16.2%) | 1.844[0.721, 4.714] | 2.387[0.809, 7.041] |
| Second education | 10(13%) | 16(10.4%) | 6.490[2.009, 20.963] | 9.150[2.359, 35.491] |
| Higher education | 11(14.3%) | 5(3.3%) | | |

Note: Significant associations (P < 0.05) are shown in bold; < 1 represents the reference category.

**Table 2:** Socio-demographic and economic determinants of health facility delivery service utilization in Lemo District, South Ethiopia, May -2013.
than women who were not received counseling during antenatal care visit (Table 3).

### Discussion

This community based study attempted to identify the predictors of health facility delivery service utilization among mothers who gave birth within the last three years to the study in Lemo district. The findings of this study showed that husband education, husband occupation, mother occupation, family size, frequency of abortion experience, history of stillbirth and receiving counseling during antenatal care visits were the predictors of health facility delivery service utilization in Lemo district.

Women with a family size of 1-4 were nearly 3 times more likely to utilize health facility delivery service as compared to women with a family size of 5 and above [AOR=2.962 (95% CI: 1.482, 5.918)]. The finding implies that families with smaller size might be worried for their children since they might have not reached desired number of children. According to the nationwide demographic and health survey of Ethiopia, the average number of children that the women bear in their reproductive age is 4.8 [7]. More, families with smaller size might have lower expenses so that they could be able to pay transportation fee and medical costs. In contrary, smaller family size could be as result of loss of children by death. This finding was supported with the reported finding of the study conducted at East Wollega zone, Western Ethiopia in which a family size of less than five has significant association with institutional delivery service utilization [19].

Husband education found to be contributing factor for women’s choice of health facility delivery. Accordingly, women whose husbands completed higher education were 9 times more likely to utilize health facility delivery service than women whose husbands were unable to read and write [AOR=9.150 (95%CI: 2.359, 35.491)]. This implies educated husbands might involve women in making decision regarding the choice of place of delivery. Thus, male involvement in birth preparedness and complication readiness plan would help facility delivery service utilization since the decision makers in many of the Ethiopian society are males. This finding was supported by Ethiopia demographic and health survey [7] and other studies done in Iran [20], Tanzania [21], Uganda [22] and Nepal [23] in which women whose husbands attended higher education and employed were more likely utilized health facility delivery. These findings also indicate the difference in opportunity given for male education than female education in different cultural settings. The other likely reason might be husbands who attended higher education would have better access to information about the importance of health facility delivery service utilization and the risk of home delivery since the delivery at home is mostly done by untrained or unskilled attendants, usually by relative otherwise traditional birth attendants who have no proficiency to do so.

Disparity in women occupation had shown to have effect on place of delivery. Women who are merchant [AOR=3.39 (95% CI: 1.03, 11.12)] were 3 times more likely to utilize health facility delivery than those women who are farmers. This implies merchant women have better access to get information about place of delivery since they move from market to market and rural to urban to sell or buy their goods. Besides, merchant women might be able to pay obstetric care costs and transportation fee. This finding is not supported with study conducted in Nigeria [24,25] in which women who were farmers utilized health facility delivery more likely than their counter parts. This difference might be due to women access and opportunity to work and better income generating jobs between the two countries.

Likewise, husband work showed significant association with health facility delivery. Women whose husbands are daily labourer [AOR=2.761 (95%CI: 1.010, 7.55)] and merchant [AOR=2.905 (95% CI: 1.187, 7.11)] were nearly 3 times more likely to utilize health facility delivery as compared to women whose husbands are farmers. The observed finding implies that merchant and daily laborer husbands could be able to afford for obstetric care costs and transportation fees since husbands are the decision-makers in most of the Ethiopian society. In the other way, merchant and daily laborer husbands might have gotten better access to health information from different sources while moving from place to place for daily work and exchange of their goods in different market places.

On the other hand, obstetric variables have shown significant association with health facility delivery service utilization. In this regard, the number of abortion a woman experienced was independent predictor of health facility delivery service utilization. Those women who had at least one time experience of abortion [AOR=6.757 (95%CI: 2.568, 17.783)] were nearly 7 times more likely to utilize health facility delivery service than women who had no abortion at all. The finding implies that women who faced miscarriage and its consequences that affected their well-being might have a fear about reoccurrence of such complications in their future pregnancies. So that they might have a need to visit maternal health service units seeking health care for their own well being and good outcome of pregnancy. Thus, they might

| Obstetric variables | Place of delivery | Health facility (Cases=77) | Home (Controls=154) | COR (95%CI) | AOR (95%CI) |
|---------------------|-------------------|---------------------------|--------------------|------------|------------|
| Frequency of abortion | 0                 | 45(58.4%)                 | 125(81.2%)         | 1          | 1          |
|                     | 1                 | 21(27.3%)                 | 10(6.5%)           | 5.833 [2.552, 13.331] | 6.757 [2.568, 17.783] |
|                     | 2 and above       | 11(14.3%)                 | 19(12.3%)          | 1.608 [0.710, 3.640] | 1.841 [0.483, 7.012] |
| History of stillbirth | Yes              | 19(24.7%)                 | 2(1.3%)            | 24.89 [5.62, 110.26] | 36.017 [7.24, 179.12] |
|                     | No                | 58(75.3%)                 | 152(98.7%)         | 1          | 1          |
| Counselling received | Yes              | 72(93.5%)                 | 124(80.5%)         | 3.484 [1.294, 9.379] | 5.795 [1.58, 21.25] |
|                     | No                | 6(6.5%)                   | 30(19.5%)          | 1          | 1          |
| Age at delivery <18 | 56(72.7%)         | 120(78%)                  | 33(21.4%)          | 1          | 1          |
| 18-35               | 16(20.8%)         | 30(19.5%)                 | 1              | 1          | 1          |
| >35                 | 5(6.5%)           | 10(6.5%)                  | 2              | 1          | 1          |

Note: Significant associations (P < 0.05) are shown in bold; 1 represents the reference category.

Table 3: Obstetrics predictors of health facility delivery service utilization in Lemo District, South Ethiopia, May -2013.
decide to give birth at health facility where assistance from skilled health care providers exists.

Similarly, women who had history of stillbirth [AOR=36.01 (95%CI: 7.24, 179.12)] were 36 time more likely to give birth at health facility as compared to women who had no history of stillbirth. This implies women were utilizing health facility delivery service when they faced some form of complication in the past that has happened during pregnancy or giving child birth, otherwise giving birth at home is considered as normal in many of the society in Ethiopia. The nationwide study, EDHS 2011 [7] indicated that only 10% of births were attended by skilled care provider at health facility. This finding is also supported by the reported finding of the study conducted at North Gondar, Ethiopia [11] in which women with past experience of intra partum complication were more likely utilized health facility delivery service.

Maternal health service utilization specifically counselling received regarding birth preparedness and complication readiness plan during antenatal care visits was contributing a lot for health facility delivery service utilization. Accordingly, women who received counselling during antenatal care follow-up [AOR=5.795 (95%CI: 1.580, 21.253)] were nearly 6 times more likely to utilize health facility delivery than their counter parts. This finding implies that antenatal care visit may not guarant health facility delivery rather it is the counselling received during antenatal care visits that enabled women to give birth at health facility. This finding is supported by reported result of the study conducted in Southern Tanzania [21] in which women who were advised to deliver in a health facility during antenatal care visit utilized health facility delivery service more likely than their counter parts. The findings suggest that encouraging women to utilize maternal health services like antenatal care, thereby arrangements will be made for place of delivery through discussion on birth preparedness and complication readiness plan. So that women will be familiarized with health facility and give birth at the facilities. If husbands/partners involved during antenatal care visit and counselling procedures, health facility delivery might be increased since they are the decision makers for maternal health service utilization.

The limitations of this study could include the following:

Firstly, the list of participants was taken from the registration book of health post after enumeration was done; thus, it might introduce selection bias since some households during the enumeration may be missed unknowingly. Secondly, the selected study participants were interviewed about the conditions of the past which the participants might be failed to remember hence, it might be liable to recall bias.

Conclusions

Finding of this study revealed that health facility delivery service utilization was significantly associated with counselling received regarding birth preparedness and complication readiness plan during antenatal care visits, previous experience of abortion and stillbirth. Socio-demographic factors such as family size of 1-4, husbands attended higher education, merchant women; merchant and daily laborer husbands’ were the other factors contributed for facility delivery service utilization in lemo district. Ways to improve mothers’ awareness about maternal health services given, the benefits of receiving these services, and complications related to pregnancy and delivery should be designed and implemented. Strengthening information, education and communication (IEC) activities including counseling on maternal health care service units in general and antenatal care unit in particular about birth preparedness and complication readiness plan and on the importance of health facility delivery service utilization and risks of home delivery at every child birth are necessary. Due emphasis should be given to male involvement in maternal health service units and empowering men and women to be involved in income generating activities was also recommended.

List of Abbreviations

ANC: Ante Natal Care; AOR: Adjusted Odds Ratio; CI: Confidence Interval; EDHS: Ethiopia Demographic and Health Survey; IEC: Information Education and Communication; Km: Kilometer; MDG: Millennium Development Goal; MMR: Maternal Mortality Ratio

Competing Interests

The Authors declared that they have no competing interests

Authors’ Contributions

BH and YG: designed the project proposal. BH and YG: handled overall data collection process. BH, YG and MA: done statistical analysis and interpreted the data. BH: prepared the manuscript. BH, YG and MA: Revised and approved the final manuscript.

Acknowledgements

We thank Wachemo University for providing the fund for this study without which this study would not have been possible. Our deepest gratitude goes to Lemo district office specially the lemo district women for giving us crucial data without which this research would not have been realized. The data collectors and supervisors were also acknowledged for their contribution during data collection. We are also grateful to the language editor, Habtemariam Amare for his thorough reading and edition of this manuscript.

Endnotes

1. "Health extension workers-- are a category of health care providers found in some countries including Papua New Guinea and Ethiopia. They usually work in health posts in rural and medically underserved areas, where they provide a range of community health services and a package of essential interventions to meet population health needs at this level."

2. "Health post – the smallest unit of health facility at the lower level of administration (kebele)"

3. "Kebele – is the smallest administrative unit of the Federal Democratic Republic of Ethiopia"

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