RESEARCH ARTICLE

ASSESSMENT OF SKILLED INSTITUTIONAL DELIVERY SERVICE UTILIZATION AND ASSOCIATED FACTORS AMONG MOTHERS WHO GAVE BIRTH IN THE LAST ONE YEAR IN MAHAL SAYINT WOREDA, SOUTH WOLLO ZONE, NORTH EAST ETHIOPIA

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ABSTRACT

Background: Reducing maternal morbidity and mortality is a global priority which is particularly relevant to developing countries like Ethiopia. One of the key strategies for reducing maternal morbidity and mortality is increasing institutional delivery service utilization of mothers under the care of skilled birth attendants.

Objective: To assess skilled institutional delivery service utilization and associated factors among mothers who give birth in the last one year in Mahal sayint woreda, South Wollo zone, North East Ethiopia.

Method: A community-based cross-sectional survey was conducted among mothers who had delivered in the previous one year. Data were entered in to Epidata 3.1 and analyses were made by using SPSS version 20. Tables and graphs were used to present descriptive analysis. A bivariate logistic regression analysis was done to see the crude association between independent and outcome variables. After that multiple logistic regression model was done and significant statically association were considered based on adjusted odd ratio included in 95% confidence interval at P-value less than 0.05.

Result: A total of 298 mothers were interviewed from 301 total sample sizes which gives 99% response rate. Of the total respondents, 251(84.2 %) gave birth at home due different reasons. Among these reasons ninety (30.3%) of the mothers said having closer attention from family members and 23.8% previous home delivery experience. Age, educational status of the mother, income and number of antenatal care visit were found to be significantly associated with the institutional delivery service utilization in multivariable logistic regression analysis.

Conclusion: Majority of the respondents had a history of home deliveries due to many reasons so that attention should be given by health professionals and Mahal sayint woreda health office.

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INTRODUCTION

Maternal mortality remains unacceptably high across much of the developing world. An estimated 298, 000 maternal deaths occurred worldwide. Sub- Saharan Africa (SSA) and South Asia accounted for 87% of the global maternal deaths (WHO, 2010). In sub-Saharan Africa, a woman's risk of dying from treatable or preventable complications of pregnancy and childbirth over the course of her lifetime is 1 in 22, compared to 1 in 7,300 in the developed regions (United Nations, 2008). In Ethiopia, maternal mortality and morbidity levels are among the highest in the world. The Maternal Mortality Ratio (MMR) in 2011 was 676 per 100,000 live births (Central Statistical Agency, 2005).

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Around 80% of maternal deaths worldwide are brought by direct causes such as hemorrhage, infection, obstructed labor, unsafe abortion and high blood pressure. Severe bleeding which usually occurs after the mother has given birth is the single most feared complication claiming the lives of most mothers (Hogan *et al*., 2010). The highest number of maternal death occur during labour, delivery and up to 24 hours postpartum (the first day after delivery) highlighting the critical need for good quality care during this period (FDRE, 2007). Evidence shows that for the strategies of institutional delivery to be effective, it is essential to understand the factors that influence individual and household factors to utilize skilled birth attendance and institutions for delivery (Nigussie *et al*., 2004). Maternal mortality and morbidity can be reduced through access to appropriate health care during pregnancy and delivery. However, in sub-Saharan Africa women continue to face limited access to such services (Onah *et al*., 2006).

In order to reduce the risk of maternal and infant morbidity and mortality, especially in places where the general socio-economic status is low, access and utilization of the obstetric services is an effective means (Mpembeni *et al.*, 2007). Skilled attendance during labor, delivery and the early post-partum period could reduce an estimated 16–33% of maternal deaths (Van Eijk *et al.*, 2006; Mayhew *et al.*, 2008; Kamal *et al.*, 2009). The risk of maternal deaths and disabilities outside the intrapartum period can be reduced through other appropriate reproductive health services such as antenatal care (ANC), postnatal care (PNC), family planning and safe abortion (Hogan *et al.*, 2010).

The safe motherhood initiative also strongly emphasizes ensuring the availability and accessibility of skilled care at the time of childbirth, of which institutional delivery is one element where emergency obstetric care could be found to handle complicated cases. This is a critical intervention to avoid most maternal deaths occurring from preventable obstetric complications (FDRE, 2007). In Ethiopia North Gondar zone, only 13.5% of pregnant women deliver their last baby in health institutions. The most important barrier to access to health services that Ethiopian women mention were demographic and socio cultural factors ((Nigussie *et al.*, 2004). Improving maternal and infant health continues to be a major challenge such that a woman living in Africa has higher chance of dying during pregnancy or childbirth, as compared to high-income countries (Idris *et al.*, 2006). Institutional delivery service utilization of Ethiopian mothers is low. Therefore, this study aimed to assess factors affecting institutional delivery service utilization among mothers in Mahal sayint woreda, South Wollo zone, North East Ethiopia.

METHODS AND MATERIALS

Study design, area and period: A Community based cross sectional survey was done in Mahal sayint woreda administration situated Eastern part of Amhara regional state in south Wollo zone, 600km North of Addis Ababa the capital city of Ethiopia and 680 km from Bahir-Dar capital city of the Amhara regional state and 200km from Dessie town. The study was done from January 1 to February 30 in 2018.

Source population: All mothers who gave birth in the last one previous year in Mahal sayint woreda.

Study population: All mothers who gave birth in the last one previous year in selected kebeles of Mahal sayint woreda.

Inclusion criteria: All mothers who gave birth in the last one previous year in Mahal sayint woreda.

Exclusion criteria: Those critical ill and hearing impairment mothers were excluded from the study.

Sample size determination: The sample size calculated by assuming proportion of skilled delivery utilization to be 50% with 5% marginal error, 95% confidence interval. Based on this assumption, the sample size for the study was 384. Since the study population is less than 10,000 we used population correction formula, we got 274. Then by adding 10% for non response rate the final sample size was 301 participants.

Sampling technique and procedure

- Step 1:- Simple random sampling was employed to select study kebeles in Mahal sayint woreda.

- Step 2:- the desired numbers of study participants were computed proportionally for each study kebeles.
- Step 3:- systematic sampling technique was used to select study subjects until the desired sample size (n= 301) obtained from the entire study site.

Data collection instrument: A structured questionnaire was used and prepared in English, translated into Amharic and then translated back in to English to check for consistency. Main Points included in the questionnaire were socio demographic characteristics, obstetric characteristics and delivery service utilization in Mahal Sayint woreda administration.

Data collection procedure: Data was collected by interviewer administered questionnaire by five nurses and one supervisor. Training was given for data collectors and supervisor for two days on the objective, relevance of the study, confidentiality of information, respondent rights, informed consent, and technique of interview.

Quality control: Pre-test were done in Legambo woreda on 5% of the sample size and then the questionnaire was assessed for its clarity and the necessary correction was done accordingly. Appropriate instruction were given for data collectors and supervisor and also to ensure the data quality the data collectors and supervisor were appropriately trained for two days. Procedure manual for data collection method were prepared and distributed for data collectors and supervisor. Supervisor and investigators closely follow the data collection process. Good interaction between respondents and interviewer was maintained, filed questionnaires were checked daily for completeness.

Data processing and analysis: Data was entered in to epidata and export to SPSS Version 20 for analysis. Descriptive statistics was used to determine mean and frequency of dependent and independent variables. Binary logistic regression was done to see the crude significant relation of each independent variables and dependent variable. Then multivariate logistic regressions analysis was performed. Finally significant factors were identified based on AOR with 95% confidence level at P-value less than 0.05.

Ethical consideration: Ethical clearance was obtained from Wollo University, college of medicine and health sciences research review committee. Official letter was written to Mahal sayint woreda health office. Written consent was obtained from all study participants after information provided about the purpose of the study, non- invasiveness of the data collection procedure and confidentiality of the information. Respondents allowed refusing or discontinuing participation at any time they want during the interview.

RESULTS

Respondents' Socio-demographics characteristics: Out of the total sample size (n=301), actually 298 of them participated in the interview that gives 99% response rate. Of these 277(93%) were rural resident. Only 112(37.6%) of the mothers attended grade one to eight while 7 (2.3%) of the mothers were illiterate. Regarding the ethnicity 276(92.6) were Amhara. Among the respondents, 164 (55%) of mothers were housewives. As to the husband's occupational status, about192 (64.4%) were farmers (See table 1).

**Table 1. Socio-demographic characteristics of the study respondents in Mahal sayint woreda,
Amhara regional state, North East Ethiopian**

Variables	Response	Frequency (n=298)	Percentage (%)
Age in years	< 19	6	2
	19-35	268	89.9
	>35	50	16.8
Family size	Two	47	15.8
	2-5	214	71.8
	More than five	37	12.4
Residence	Urban	21	7
	Rural	277	93
Ethnicity	Amhara	276	92.6
	Tigrai	19	6.4
	Others*	3	1.0
Religion	Muslim	187	62.8
	Orthodox	105	35.2
	Others**	6	2
Occupation status of the woman	Housewife	164	55
	Government employ	41	13.8
	Merchant	76	25.5
	Others***	17	5.7
Occupation status of the husband	Farmer	192	64.4.
	Merchant	76	25.5
	Others***	30	10.1
Educational status of the woman	Illiterate	7	2.3
	1-8th	112	37.6
	9-12th	143	48.0
	12+ and above	36	12.1
Usage of communication	Have no radio or TV	16	5.4
	Have no cell phone	8	2.7
	Have both radio/TV and cell phone	274	91.9
Distance from hospital to home in hours	Take less than half hour	198	66.4
	Take more than one hour	100	33.6
Monthly average income ETB	Has not official income	42	14.1
	<500	5	1.7
	500-999	132	44.3
	1000-2499	116	38.9
	>2500 ETB	3	1.0

Note that: others* =   Oromo and Gurage
      Others** = protestant Others*** = carpenter, laborer, home servant

Table 2. Obstetric characteristics of the study respondents in Mahal sayint woreda, Amhara regional state, North East Ethiopia

Variables	Response	Frequency(n=298)	Percentage (%)
Gravidity	I-V	264	88.6
	>V	34	11.4
Parity	One	199	66.8
	Two	25	8.4
	Three	68	22.8
	Four	6	2
Abortion	Yes	21	7
	No	277	93
Still birth	Yes	39	13.1
	No	259	86.9
Gestational age of baby for the last pregnancy	Preterm	35	11.7
	Term	194	65.1
	Post term	69	23.2
ANC visit in current pregnancy	Yes	295	99
	No	3	1
Purpose of ANC visit	For ANC	266	89.3
	For other reasons	32	10.7

Table 3: Multivariate logistic regression analysis of factors associated with delivery service utilization among mothers in Mahal sayint woreda, Amhara regional state, North East Ethiopian

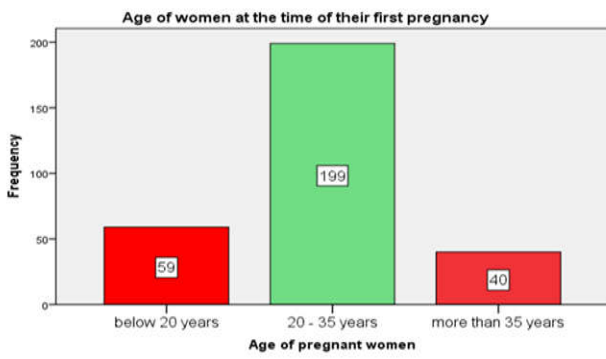| Variables	Response	AOR (95%CI)
Age in years	< 19 or >35	1
	19-35	4.3(3.4,5.7)*
Educational status of the woman	Illiterate	1
	1-8th	2.4(1.3,4,2)*
	9-12th	4.6(2.4,5.9)*
	12+ and above	3.42(2.5,4.7)*
Income	500-999	1
	1000-2499	3.4(1.3,5.7)*
	≥2500 ETB	5.23(3.6,9.3)*
Number of ANC visit	First	1
	Second	4.3(2.3,6.7)*
	Third	5.6(3.4,8.9)*
	Fourth	6.4(4.6,9.5)*

*Statistically significant at p-value <0.05

Figure 1. Shows the frequency of age's of women on their first pregnancy in Mahal sayint woreda, Amhara regional state, North East Ethiopian
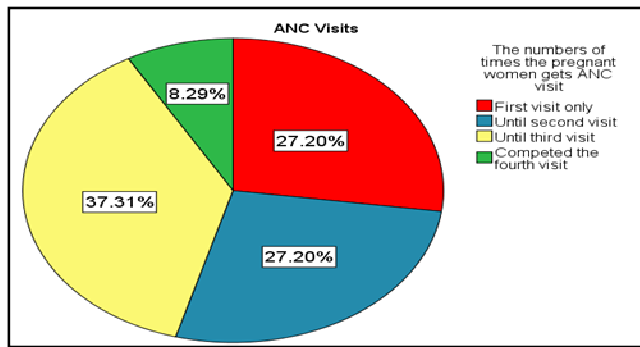

Figure 2. Shows the percentage of pregnant women visit health institution for ANC service utilization in Mahal sayint woreda, Amhara regional state, North East Ethiopia
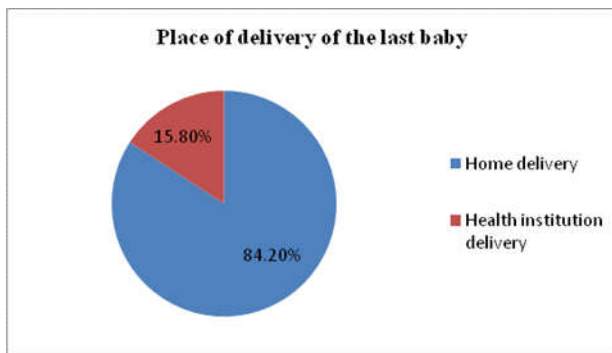

Figure 3. Shows percentage of place of delivery utilization in Mahal sayint woreda, Amhara regional state, North East Ethiopian
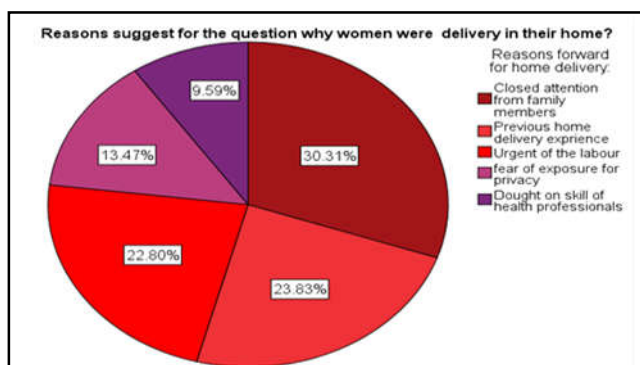

Figure 4. Shows the percentage of study respondents for the why women delivered in their home rather than health institution in Mahal sayint woreda, Amhara regional state, North East Ethiopian

Economically, 132 (44.3%) of the households have had monthly income of between 500-999 ETB. Two hundred seventy-four (91.9%) have had radio or TV and cell phone and eight (2.7%) had no cell phone. Concerning the time, they travelled on foot to reach the nearby health center 198(66.2%) of them said less than half hour was waking (See table 1).

Obstetric characteristics of the respondents: One hundred ninety-nine (66.8%) of the mothers became pregnant between the age of 20-35years. The minimum and maximum ages at first pregnancy were 15 and 45 years (See figure 1). Two hundred sixty-four (88.6%) of the mothers were gravida one to four. One hundred ninety-nine (66.8%) were para one while two hundred fifty-nine (86.9%) had still birth. Two hundred ninety-five (99%) have had ANC visit in health centers. Two hundred sixty-six (89.3%) of them visited health facilities for ANC purposes during their pregnancy and 194(65.1%) were delivered at term (See table 2). Among the mothers who attended ANC, one hundred eleven (37.3%) of them visited health facilities three times for ANC service utilization (See figure 2).

Institutional delivery service utilization: Majority of the study respondents, 181(60.7%) have had decided their place of delivery by themselves. Of the total respondents, 251(84.2 %) gave birth at home (See figure 3). From the total mothers, 210(70.5%) were delivered by TBA and 150(50.3%) had preferred to delivered by midwives. Many different reasons were forwarded for the question why a woman has had home delivery. Ninety (30.3%) of the mothers said having closer attention from family members, while 29(9.59%) said were doubt on skill of health professionals (See figure 4).

Factors associated with institutional delivery service utilization: In multivariable logistic regression analysis age, educational status of the mother, income and number of ANC visit were found to be significantly associated with the institutional delivery service utilization. Mothers who were in the age range of nineteen to thirty five were about 4 times (AOR = 4.3, 95% CI=[3.4,5.7]) more likely to give birth in health facilities than mothers whose age less than nineteen or greater than 35 years. Mothers with educational level of 12th plus and above were about 3 times (AOR=3.42, 95% CI= [2.5, 4.7]) more likely to give birth in health facilities than illiterate (AOR = 2.4, 95% CI = [1.3, 4, 2]). Mothers who have had an income ≥2500 ETB were 5 times (AOR = 5.23, 95% CI= [3.6, 9.3]) more likely to give birth in health facilities than mothers who have had income between 500-999 ETB. ANC visit during last period of pregnancy was also found to be a strong predictor of institutional delivery service utilization (See table 3).

DISCUSSION

This community based cross-sectional study attempted to identify the magnitude of delivery service utilization and affecting factors among mothers who were delivered their babies with the previous one year in Mahal sayint woreda administration in Amhara regional state North East Ethiopia. This study result showed that the magnitude of home delivery service utilization was 251(84.2%).This was higher as compare to similar studies conduct in Malawi 42.0% (Palamuleni, 2011), 69% in Nepal (Dhakal *et al.,* 2011), 70% in Northern Nigeria (Idris *et al.*, 2006) and 81.8% in Dodota district (Fikre *et al.,* 2012). The reason might be due to socioeconomic and

topography of our study area. On the other hand our study shows better than studies results 87.6% in Eastern Burma (Mullany *et al.,* 2008). This might be due to our study were more latest and there was an improvement awareness with service delivery strategy and performance of implementation enhanced with time. In addition, the finding of our study was higher than a cross sectional studies done in Tanzania among mothers who had delivered babies within one year prior to the survey which showed that the rate of utilization of home delivery was 53.3% (Mpembeni *et al.,* 2007). This might be quality of service improvement and culture difference. In addition this large difference could be due to the negative influence of husbands and family members in rural mothers. Mothers with age range 19-35 years were about 4 times more likely to give birth in health institutions than mothers with age less than 19 or more than 35 years.

The possible explanations might be younger women are more likely to be not educated than middle age women and older women consider that giving birth at home is not risky as they have previously experienced birth in their home when we compare with the middle age. Educational status of the mother had significant association with institutional delivery service utilization. Mothers who attended education had more likely to utilize institutional delivery service than those mothers who were illiterate. This finding was similar to the study done in Ethiopia on factors influencing the use of maternal healthcare services (Mekonnen *et al.,* 2003). Similarly supporting finding of the study conducted in North Gondar and Nepal indicated that mothers with educational status of secondary school and above were more likely to delivery in health facilities than mothers with illiterate (Nigussie *et al.*, 2004; Dhakal *et al.*, 2011). This implies that educational status of the mother increases awareness of mother towards the importance of health facility delivery. This study also revealed that mothers who visited ANC until the fourth visit of pregnancy were about six times more likely to deliver in health facilities than mothers who had first visit ANC only. This showed that as mothers attend health care more times for ANC got more awareness about the necessity of health institution delivery services.

Limitations of the study: Since the study design were cross-sectional method the direction of causal relationship between variables can't always be determined. The findings in this study were based on quantitative method only that lacked qualitative studies like focus group discussion and in-depth interview.

Conclusion and Recommendation

Very high (84.2 %) home delivery service utilization was observed in the study area. Closer attention and care from family members and relatives, delivering at home was usual experience, fear of exposure for privacy, doughty on skill of health professional services at health facilities and labour was unexpected were the main reasons given by mothers not attending health care delivery. Therefore health improvement strategies to increasing mothers' knowledge and awareness about the services, the benefits of these services and complications related to pregnancy and delivery should be designed and implemented by health professionals and Mahal sayint woreda health office.

Conflicts of Interest: The authors declare that they have no competing interests.

Abbreviations – ANC: antenatal care; AOR: Adjusted odds ratio; CI: confidence interval; COR: crude odd ratio; MMR: Maternal Mortality Ratio; PNC: postnatal care; SSA: Sub-Saharan Africa; SD: Standard deviation; SPSS: Statistical program for social sciences; TBA: Traditional birth attendant

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