

Determinants of Skilled Institutional Delivery Service Utilization among Women Who Gave Birth in the Last 12 Months in Bako District, Oromia, Ethiopia, 2012/13 (Case-Control Study Design)

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Abstract: Background: High maternal mortality is a continued challenge for the achievement of millennium development goal in sub-Saharan African countries including Ethiopia. Although institutional delivery services utilization ensures safe birth and a key to reduce maternal mortality, interventions at the community or institutions were unsatisfactorily reduced maternal mortality. Institutional delivery service utilization is affected by the interaction of personal, socio-cultural, behavioral and institutional factors. Methods: A community based un-matched Case Control study was conducted in Bako district, West shoa, Ethiopia. Three hundred eighty mothers were included in the study. Data were collected by trained female data collectors via face to face interview and pretested structured questionnaire was used to collect data on different variables. Descriptive statistics, binary and multivariable logistic regression analyses were computed by SPSS version 16. Statistical significance was considered at $p < 0.05$ and the strength of statistical association were assessed by odds ratio (OR) with 95% confidence intervals. Result: In this study, a total of 380 mothers (130 cases and 250 controls) were included in the analysis. Majority (77%) of respondents were Oromo. Ninety four percent (94%) of mothers were married where as 2.4% were singles (never married). Ten percent (10%) of mothers have attended secondary and above grade. Secondary and above education (AOR: 2.754, 95%CI: 1.51–8.91), house wife (AOR: 23, 95% CI: 2.0-25.0), private employee (AOR: 14, 95% CI: 1.04-19.0) were significantly associated with utilization of skilled institutional delivery. Similarly, ANC visit (AOR=0.19[95% CI: 0.086-0.42], joint (husband and wife) final decision where to give birth (AOR=0.25[95% CI: 0.08-0.75], access to transport (AOR=0.53[95% CI: 0.30-0.94] were independently factors affecting institutional delivery service. Conclusion: Women's education, occupation, ANC visit, joint(husband and wife) final decision making on place of delivery and access to transport service were found to be determinant of skilled institutional delivery service utilization. Hence, intensifying education for women and strengthen decision making power of women, enhance transport accessing of women and well communicating benefit of ANC use were recommended.

Keywords: Determinant, Institutional Delivery, Utilization, Skilled, Bako

1. Introduction

Approximately 536,000 maternal deaths occur annually, of which over 95% occur in sub-Saharan Africa and Asia. Africa has the highest burden of maternal mortality in the world and sub-Saharan Africa is largely responsible for the dismal maternal death figure for that region, contributing approximately 98% of the maternal deaths for the region

(WHO 2005, 2010). The lifetime risk of maternal death in sub-Saharan Africa is 1 in 22 mothers compared to 1 in 210 in Northern Africa, 1 in 62 for Oceania, 1 in 120 for Asia, and 1 in 290 for Latin America and the Caribbean (WHO 2005, 2010).

In spite of the national and global effort at curbing

maternal morbidity and mortality, through the safe motherhood initiative, the problem is still disproportionately high in many developing countries (Ransom E., 2002). According to the United Nations International Children's emergency fund estimates, it is estimated that 1,600 women all over the world die each day as a result of pregnancy and childbirth problems and the greater proportion of these deaths occur in developing countries (WHO 2005, 2007; Hill T et al., 2007).

One of the objectives of the United Nations MDGs was to reduce Maternal Mortality Rate (MMR) by an average of 5.4% every year over the period 1990-2015. Most Sub-Saharan African countries are not on the right track for meeting the targets pertaining to MMR. Recent estimates suggest that the average annual rate of reduction in MMR in sub-Saharan African countries is less than 1%. Of the 14 countries in the world with the highest MMR per 100,000 live births, 13 are in sub-Saharan Africa of which Ethiopia is one (WHO, 2007; Hill T et al., 2007; WHO, 2004; FDRE MOH, 2010).

The current estimate of maternal mortality in Ethiopia is 590 in 2008 (FDRE MOH, 2010) per each 100,000 live births, but it would have been 425 per each 100,000 live births at this time in order to achieve the Millennium Development Goals by 2015 (FDRE MOH, 2007). One major reason for very high level of maternal mortality levels in Ethiopia is that of lack of skilled birth attendant during birth (Lawn J., 2005).

In many developing countries including Ethiopia, the majority of births occurred without the help of a skilled assistant however, home or non-skilled deliveries associated with un-hygienic, unsupervised and when intervention is required it usually is not at hand and lead to unwanted maternal and infant outcomes (WHO, 2004).

Most obstetric complications occur around the time of delivery and cannot be predicted. Therefore it is important that all pregnant women have access to a skilled attendant (Cambell O. et al., 2006).

Skilled attendance at delivery is advocated as the "single most important factor in preventing maternal deaths" (Stanton C., 2007). Access to skilled delivery care is also crucial to prevent stillbirths and to improve newborn survival (Cambell O. et al., 2006; CSA, 2005).

Skilled attendance at delivery is one of the key indicators to reflect progress towards the Millennium Development Goal of improving maternal health. Globally, the goal is to have 80% of all births assisted by skilled attendants by 2005, 85% by 2010 and 90% by 2015 (Stanton C., 2007).

Although proportion of skilled birth attendants is one of the indicators for MDG₅ births attended by skilled health personnel in Ethiopia is only 6% during EDHS 2005 and 10% in EDHS 2011 preliminary report, while the remaining are home deliveries (CSA 2005, 2011).

Antenatal care visits constitute one of the few times women in many resource-poor settings seek care for their own health, and represent an important opportunity to help women best prepare for birth, as well as inform them about pregnancy-related complications, and the advantages of

skilled delivery care (Lindmark G. et al., 1998; Moke M. et al., 2010; Carroli G. et al., 2001).

However, in Ethiopian situation ANC coverage is three fold higher than institution based delivery in coverage (EDHS, 2011).

Most studies on determinants of delivery service use consider age; those with a multivariate analysis find either no effect (Ekele B., 2007) of age or a higher use of skilled attendance among older mothers compared to younger mothers (Sabine G., 2009). There is still a debate about how women's age influences utilization of delivery services.

Different studies done in Ethiopia showed that strong association between urban residence and skilled birth assistance (Tura G. et al., 2008; Mekonnen Y., 2003). Study done in Nigeria shows that there is no association between places of residence and skilled birth attendance (Onah H. et al., 2006).

Maternal education is one of the most important factors in determining women's antenatal and delivery care seeking behavior in order to reach adequate maternal health services (Ayele B., 2005). Education helps to have more decision-making power, increased self-worth and self-confidence, better coping (Ayele B., 2005; Amooti B. et al., 2004). Studies in Mexico (Sarah B., 2006) and Tanzania (Mwifadhi M. et al., 2007) showed Mothers with primary and higher education were more likely to deliver at a health facilities compared to those without any formal education; Study done in Nigeria (Stella B. et al., 2009) found a significant positive association between education and maternal health services utilization. Also in agreement with these, in most studies done in Ethiopia education has been consistently associated with utilization of maternal health care (Ayele B., 2005; Mihret H. et al., 2008) Some studies also indicate that considering husband's education find that higher education is associated with skilled attendance at delivery, although the effect is often less than that of the mother's own education (Sabine G., 2009).

In many parts of the world women's power to make decision is limited even in issues related to their own health. In India About two-thirds of women said they could not visit a health center without male permission (Mona S. et al., 2008). Studies conducted in Bangladesh (Ruhul A., 2006) shows that decision where to give birth were decided by mother in-law or husbands. Studies in Africa, Tanzania, (Rose N., 2007) also show women do not deliver in health facility due to husband refusal to pay the expenses. A prospective community based follow up study conducted in Jimma Town shows that odds of intention to have skilled delivery services is 8 times for women who can decide by themselves to have institutional delivery services (Ayele B., 2005).

Studies done in Mexico (Sarah B., 2006) and Ethiopia (Mihret H. et al., 2008) indicate not only by the presence of physical disease but also by cultural perceptiveness of the illness skilled birth assistance is affected. Studies in rural Bangladesh (Ruhul A., 2006) showed the vast majorities believed that childbirth is an act of God and is a natural event.

Study done in Zambia shows perception that pregnancy is not illness (Sarah S., 2009) Beliefs that birth is a test of endurance, and care-seeking a sign of weakness specific requirements around delivery position, warmth, and handling of the placenta may be another reason for delivering alone in some contexts (Sabine G., 2009).

Regarding socio economic factors women with poor household income, and those who are unemployed were less likely to utilize skilled birth assistance across different studies (Sabine G., 2009; Tura G. et al., 2008; Ayele B., 2005).

Study done in Burkinafaso shows that having attended at least 3 ANC visits were positively associated with delivering in a facility (Manuela D et al).

Receiving counseling on birth preparedness during antenatal care appeared to strongly influence women's use of skilled care during delivery (Mihret H. et al., 2008).

Although most pregnancy and delivery related complications cannot be predicted, high quality antenatal care during pregnancy is recognized as an important opportunity for promoting health and education, instituting prophylactic measures for disease prevention, managing existing diseases and other health conditions, and detecting and managing maternal health complications (WHO, 2004).

Studies conducted to assess the relationship between knowledge and skilled delivery service utilization consistently showed that, knowledge is strong predictor of maternity service utilization, those having good knowledge about danger signs of pregnancy and delivery is more likely using skilled delivery (Rose N., 2007; Sarah S., 2009).

The distances from health facilities, in addition to poor road conditions were major concerns, particularly for those living in remote areas (Mwifadhi M. et al., 2007; Sabina G. et al., 2009).

Study done in Zambia shows distance to health facility has similar influence as that of low maternal education, household poverty, or lack of female autonomy in getting skilled assistance (Sarah S., 2009). While another study done in Tanzania shows minor influence of distance to health facility on skilled delivery assistance (Kruger C., 2011). In Ethiopia the situation is similar and women who are living in areas more than one hour distance are less likely to use skilled birth attendance (Ayele B., 2005). Study done Kenya shows that fear of operation is also an important health system related factor that leads to low utilization of skilled birth assistance (Carter, 2010).

Skilled attendance at childbirth is crucial for decreasing maternal and neonatal mortality, yet many women in low- and middle-income countries deliver outside of health facilities, without skilled help. In Oromia National Regional state, ANC utilization is 31.3% only 8% of mothers attend skilled delivery service (EDHS 2011) which in turn was much lower than the national level. Why majority of the women not visiting the facilities for skilled delivery services even after attending ANC during their pregnancy, which means women who at least have access to health facilities? What factors determine women's preference to places of

delivery? Different literature review indicates that, most of the studies done are cross – sectional, in which it will be difficult to establish the temporal relationship between explanatory factors and the outcome variable (skilled delivery utilization).

Hence, this study will be conducted to determine factors affecting utilization of skilled institutional delivery service in Bako woreda, Oromia National Regional State, Ethiopia. The findings from this study will give a highlight into the factors that determine delivery service utilization of pregnant women and this will be helpful for the relevant stakeholders in the planning and implementation of intervention activities to improve the delivery service utilization of pregnant women in the study area, region and country level as well as it will function as the baseline data for study area in the reduction of maternal mortality.

The objective of this study was to assess factors affecting utilization of skilled institutional delivery services among women who gave birth in the last 12 months preceding the study in Bako woreda, West Shoa Zone, Ethiopia, 2012/13.

2. Methods and Materials

The study was carried out in Bako district, West Shewa Zone which is located to the west of Ambo town and located 155 km to the West of Addis Ababa on the way to Welega. The Woreda is divided into four urban kebeles and twenty eight rural kebele. The total population of district is 132,213. There were five public health centers and one private health center and with 76% health coverage.

A community based un-matched Case Control study was conducted in Bako district, West shoa, Ethiopia. Sample size was determined by using Epi Info version 3.5.1 and the following assumption was considered: Confidence level =95%, Power =80%, Case to control ratio = 1:2, Proportion of exposure in controls =59.1% from study done in Metekel zone and ANC use was taken as exposure in control. The final sample size was 380 of 130 cases and 250 controls.

Simple random sampling technique was used for selection of study samples. Six kebele's (1urban and 5 rural) were selected randomly to represent the woreda. Then all mothers who give birth in the last one year were registered in each kebele in two categories. If there are two or more mothers in the same house only the one with recent delivery was taken. The sample was allocated proportionally to represent each Kebele. Data were collected by trained female data collectors via face to face interview and pretested structured questionnaire was used to collect data on different variables. The data were cleaned and entered into EPI-Info 3.5.1 and transferred by stat transfer for further analysis by using SPSS version 16 statistical package.

Descriptive statistics, binary and multivariable logistic regression analyses were computed. Statistical significance was considered at $p < 0.05$ and the strength of statistical association were assessed by odds ratio (OR) with 95% confidence intervals.

3. Ethical Clearance

Letter of ethical approval was received from Institutional Review Board (IRB) of Ambo University. The purpose of the study, potential risk and benefits and rights of participants were explained. Verbal consent was obtained from the participants. The participants were assured about the confidentiality of the information they provided.

4. Result

4.1. Socio-Demographic Characteristics

In this study, a total of 390 mothers were reached and 380 mothers were included in the analysis of which 130 mother gave birth in health institution and 250 mothers were gave birth in home which made the response rate 97.4%. Majority (77%) of respondents were Oromo. The mean (+ SD) age of mothers was 27.9 (+ 5.4) years. Ninety four percent 357 (94%) of mothers were married while 9(2.4%) singles (never married). Ten percent 38(10%) of mothers have attended secondary and above grade. Fifty nine (15%) of mothers reported that their husbands have attended secondary and above grades (table1).

Table 1. Socio-demographic characteristics of Women/mothers, Bako district, West shoa Zone, Oromia, Ethiopia, 2012/13.

Variables	Frequency	Percent (%)
Residence		
Rural	265	69.7
Urban	115	30.3
Ethnicity		
Oromo	293	77.1
Amhara	79	20.8
Others	8	2.1
Religious		
Protestant Christian	165	43.4
Orthodox	115	30.3
Muslim	100	26.3
Marital status		
Single	9	2.4
Married	357	93.9
Divorced	14	3.7
Mother educational status		
Not read & write	197	51.8
Read and write	97	25.5
Primary education	48	12.6
Secondary education & Above	38	10.0
Mother occupation		
House wives	361	95.0
Private employee	11	2.9
Government employee	8	2.1
Husband educational status		
Not read & write	105	27.6
Read and write	126	33.2
Primary education	81	21.3
Secondary education and above	59	15.5

4.2. Obstetric and Maternal Characteristics

The finding of this study showed that the mean (+ SD) age at first pregnancy were 20.6 + 2.5. Thirty five percent 134 (35.3%) of the mothers had got their first pregnancy at their

early age (<19 years). Only 102(36%) of mothers had reported that attend/visit antenatal care four and above for the current birth (Table 2).

Table 2. obstetric and Maternal Characteristics of women, Bako District, west Shoa Zone, Oromia, Ethiopia, 2012/13.

Variables (n=380)	Frequency	Percent (%)
Number of pregnancy		
1	79	20.8
2-4	216	56.8
>=5	85	22.4
Age at 1 st pregnancy		
Less than or equal to 19	134	35.3
20-24	212	55.8
>24	34	8.9
Mean + SD	20.6 + 2.5	
Number of delivery		
1	82	21.6
2-4	217	57.1
>5	81	21.3
Birth order		
1	78	20.5
2-4	220	57.9
5 and Above	82	21.6
Current number of child you have		
Less than or equal to 4	302	79.5
>4	78	20.5
Attend ANC for last pregnancy		
Yes	284	74.7
No	96	25.3
Total	380	
Number of ANC attended		
1	16	5.6
2-3	166	58.4
4 and above	102	36
Total	284	100
Final decision about place of delivery		
My husband	187	49.2
Just me	83	21.8
My husband and me	69	18.2
Relatives	41	10.8

4.3. Factors Associated with Institutional Delivery Service Utilization

4.3.1. Socio-Demographic Determinants of Institutional Delivery

On bivariate analysis, ethnicity, Religious, occupation status & education status of mothers were the factors found to be significantly associated with institutional delivery service utilization.

In a multivariate model, secondary and above education (AOR: 2.754, 95%CI: 1.51-8.91), being Amhara (AOR: 9.5, 95% CI: 1.4-63.6), house wife (AOR: 23, 95% CI: 2.0-25.0), private employee (AOR: 14, 95% CI: 1.04-19.0) were the associated factor of institutional delivery utilization (table 3)

4.3.2. Obstetric and Programmatic Related Determinants of Institutional Delivery

On bivariate analysis; ANC visits, gravid (number of pregnancy), parity, who made final decision on place of delivery and availability of transport were the factors found to be significantly associated with institutional delivery service utilization.

In a multivariate model, ANC visit (AOR=0.19[95% CI: 0.086-0.42], final decision made by both couples together on place of delivery (AOR=0.25[95% CI: 0.08-0.75], access to transport (AOR=0.53[95% CI: 0.30-0.94] were important associated factors of institutional delivery service utilization (Table 3).

Table 3. Socio-demographic,obstetrics and program related factors associated with institutional delivery service utilization among mother who gave birth in the last 12 months in Bako District, West Shoa, Ethiopia,2012/13.

Variables	Place of delivery		COR(95% CI)	AOR(95% CI)
	HI	Home		
Ethnicity				
Oromo	101(77.7%)	192(76.8%)	5.70(1.13-28.7)	5.2(0.8-33.7)
Amhara	23(17.7%)	56(22.4%)	7.3(1.37-38.9)	9.5(1.4-63.6)
Others	6(4.6%)	2(0.8%)	1	1
Religious				
Protestant	56(45.4)	106(42.4)	1.25(0.75-2.07)	1.28(0.64-2.54)
Orthodox	30(23)	85(34)	1.97(1.12-3.5)	1.58(0.77-3.24)
Muslim	41(31.5)	59(23.6)	1	1
Mother occupation				
House wife	117(90)	244(97.6)	14.6(1.77-12.0)	23(2.0-25.0)
Private employee	13(10)	6(2.4)	5.8(0.52-6.4)	14(1.04-19.0)
Government employee	7(5.4)	1(0.4)	1	1
Number of pregnancy				
1	36(27.7)	43(17.2)	0.47(0.21-0.8)	
2-4	72(55.4)	144(57.6)	0.69(0.39-1.22)	
>=5	22(16.9)	63(25.2)	1	1
Parity				
1	37(28.5)	45(18)	0.45(0.24-0.87)	-
2-4	71(54.6)	146(58.4)	0.77(0.43-1.35)	-
>=5	22(16.9)	59(23.6)	1	1
ANC visit				
Yes	117(90)	167(66.8)	0.22(0.12-0.42)	0.19(0.086-0.42)
No	13(10)	83(33.2)	1	1
Final decision about place of delivery				
Mother her self	24(18.5%)	59(23.6)	0.9(0.39-2.08)	0.42(0.14-1.21)
Couples together	24(18.5)	45(18)	0.69(0.29-1.61)	0.25(0.08-0.75)
Husband only	71(54.6)	116(46.4)	0.59(0.28-1.27)	0.46(0.18-1.19)
Other relatives	11(8.5)	30(12)	1	1
Availability of transport				
Yes	60(46.2)	81(32.4)	0.56(0.36-0.86)	0.53(0.30-0.94)
No	70(53.8)	169(67.6)	1	1
Mother education				
Illiterate	46(35.4)	151(60.4)	1	1
Read & write	39(30)	58(23.2)	2(0.96-4.38)	0.7 (0.3-16.7)
Primary level	23(17.7)	25(10)	1.5(0.63-3.52)	1.43 (.71-2.88)
Secondary education and above	22(16.9)	16(6.4)	4.5(2.19-9.3)	2.75 (1.51-8.91)

5. Discussion

The objective of this study was to assess factors affecting utilization of skilled institutional delivery services among women who gave birth in the last 12 months preceding the study.

In this study educational status of mothers was one of the important predictor in determining institutional delivery service utilization in multivariate analysis. Women who attended secondary and above education were about three times (AOR: 2.75, 95% CI: 1.51– 8.91) more likely to give birth at health institution. The data is consistent with studies from developing countries (Shimazaki A. et al., 2013; Karkee R. et al., 2013).It is also consistent with studies from different regions of Ethiopia (Mengesha ZB. et al., 2013; Abebe F. et al., 2012). Education is a key factor in improving institutional delivery service utilization, but it is a challenge for countries like Ethiopia where more than half of the

women (51%) had no formal education (EDHS, 2011). Education is likely to enhance female autonomy so that mothers develop greater confidence and capabilities to make decisions regarding their own health.

Availability of transportation to the health facility (AOR: 0.53, 95% CI: 0.30-0.94) is also factors determining for uptake of skilled birth attendance for delivery. The stakeholders should work to access transportations like ambulance service.

ANC visit (AOR=0.19[95% CI: 0.086-0.42], have showed association with institutional delivery service utilization. ANC visit is associated with facility based delivery in different regions. Studies from some African countries (Mehari AM., 2013; Karkee R. et al., 2013; Mengesha ZB. et al., 2013) indicated that women with more ANC visit were more likely to deliver with the assistance of a skilled birth attendant. Ethiopian demographic and health survey indicated that 34% of women received ANC care but skilled institutional delivery is 10% (EDHS, 2011). It implies that in

Ethiopia there are opportunities to improve institutional delivery service utilization if some behavior changes communication (BCC) interventions takes place on ANC visits more.

Another predicting a factor identified from this study is joint decision on place of delivery. Those mothers who decide jointly with their husband show significant association with skilled institutional delivery service utilization. Studies conduct in other area showed that decision made by women had strong association with institutional delivery (Karkee R. et al., 2013; Mengesha ZB. et al., 2013). This finding is consistent with the research done in North Gondar (Fantahum M. et al., 1990). If women are encouraged by husbands they would also get financial and other social supports to go to health facility which would allow them to have health provider assisted delivery.

6. Conclusion and Recommendation

This study indicated that women's educational, occupational, couples decision made together where to gave birth, ANC visit, and availability of transportation to the health facility were independent associated factors of skilled institutional delivery service utilization. Hence, intensifying education for women and strengthen decision making power of women, enhance accessibility of transport and well communicating about benefit of ANC use were recommended to promote skilled institutional delivery service utilization.

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