

Determinants of Institutional Delivery Among Mothers Who Gave Birth in the Last One Year in Dejen Woreda, Ethiopia, 2016: A Cross Sectional Study

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To cite this article:

Melaku Desta, Temesgen Getaneh, Tebikew Yeneabat, Yewbmirt Sharew, Mulugeta Animaw, Haymanot Tsegaw. Determinants of Institutional Delivery Among Mothers Who Gave Birth in the Last One Year in Dejen Woreda, Ethiopia, 2016: A Cross Sectional Study. *Journal of Family Medicine and Health Care*. Vol. 3, No. 3, 2017, pp. 45-51. doi: 10.11648/j.jfmhc.20170303.11

Received: August 14, 2017; **Accepted:** August 31, 2017; **Published:** October 23, 2017

Abstract: Background: Globally maternal mortality remained a public health challenge. Institutional delivery ensures safe birth which reduces maternal mortality and morbidity. This study aimed to assess determinants of institutional delivery among mothers who gave birth in the last one year. Methods: A community-based cross-sectional study was conducted during May 16 to 28, 2016 in Dejen woreda. Multistage sampling technique was used for selection of 361 participants and collected data were entered and analyzed using Statistical package for social sciences (SPSS) version 20. Multiple logistic regression was employed to identify factors associated with the institutional delivery at p-value <0.05` and to control the confounders. Results: Institutional delivery service utilization was 71.7%. Educational status, age and residence of the mother, having antenatal care visit/frequency of ANC visit, gravidity and husband's preference were independent predictors of institutional delivery service utilization. Conclusion and recommendation: Many women gave birth at health institution in Dejen Woreda. Younger age, having secondary and above educational status and urban residents, having 4 or above ANC visit, primiparaous and husband's preferred health facility had significantly associated with increased institutional delivery. Empowering women, ensuring all women to receive ANC visit according to the recommended number of visit, improving the quality of information on skilled delivery and enhancing partner's involvement, as well as increasing accessibility of health facilities in the rural areas, could increase institutional delivery service utilization.

Keywords: Institutional Delivery, Determinants, Dejen Woreda

1. Introduction

Globally, maternal mortality ratio (MMR) has declined by 45% between 1990 and 2013. developing countries account for 99% (286,000) of global maternal deaths, with sub-Saharan Africa (SSA) region accounting for 62% (179,000) followed by Southern Asia, 23.9% (69,000) [1, 2]. Sixty-one percent of births are attended by a skilled health worker globally. In Ethiopia, only 10% percent of births are delivered with the assistance of a trained health professional (doctor, nurse or midwife) and 28% of deliveries were

attended by traditional birth attendants. Skilled attendance during labor, delivery and the early postpartum period could reduce an estimated 16–33% of maternal Deaths [3, 4]. Eighteen percent of maternal deaths occur directly related to pregnancy and childbirth. Primary causes of maternal mortality in Africa are hemorrhage (34%), other direct causes (17%) and major causes of maternal deaths in Ethiopia are similar to most developing countries such as infection, hemorrhage, obstructed labor, abortion and hypertension in pregnancy [5-8].

Recent efforts to reduce maternal mortality in developing countries have focused primarily on training and deploying

skilled birth attendants and upgrading emergency obstetric care facilities [9, 10]. World Health Organizations (WHO) strongly advocates skilled care for every birth to reduce the global burden of 536, 000 maternal deaths every year [11, 12]. A community-based cross-sectional study conducted in Nepal showed that out of the total participants, 77.3% had institutional delivery [13]. Another study conducted in Tanzania showed that only 74.3% of all deliveries occur in health facilities. It also revealed that wealthiest women, women who had primary or higher education, single and primiparous women and urban residents gave birth at health institution [14]. Another study conducted in Kenya showed that birth attended by skilled birth attendant was low (37.8%) and educational level of the mother, type of occupation of the mother, household income, transport to the facility, parity, reliability of transport at odd hours, occupation of husbands and decision making [15] and also, in Ghana awareness of ANC service, family preference/ families previous hospital delivery and distance from health facility were predictors of skill delivery [16].

A similar study in Sekela District, North West of Ethiopia revealed that only 12.1% mothers gave birth at health facilities and urban residents, mothers whose age group of 15-19 year and mothers who had ANC visit were predictors of institutional delivery [17-18]. A study conducted in Woldia town and Dodota Woreda, showed that 48.3% and 18.2% gave their last birth at health institutions respectively and in Dodota mothers who were informed about place of delivery were 55 times more likely to deliver at health facilities and women who reside in rural areas were less likely to deliver at health institutions [19, 20]. Similarly, the cross sectional study conducted in Tigray region and Munisa Woreda showed that 4.1% 10.3% and 12.3% gave birth at the health facility [21-23]. Another study conducted in Sidama zone showed that age and educational status of the mothers and husbands, a 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 [24].

Institutional delivery ensures safe birth, reduce both actual and potential complications and maternal death and increase the survival of most mothers and new born. Different actions had taken by the government to reduce maternal mortality, increasing institutional delivery service utilization of mothers under the care of skilled birth attendants as one of the key strategies. However, institutional delivery was much lower than the national level (10.2%) in Amhara region [3] and there is no available data study on the utilization and factors of institutional delivery in the study area. Therefore this study is aimed to assess institutional delivery service utilization and associated factors among women who gave birth in the last one year in Dejen woreda. The study will give important clues for health professionals to recognize and offer early interventions and help policy makers and health managers to communicate with concerned bodies to improve institutional delivery service and also as a baseline data for further studies.

2. Method and Material

2.1. Study Setting and Population

A Community based cross sectional study was conducted in Dejen woreda during May 16-28, 2016. Dejen woreda, northwest Ethiopia. Dejen is one of the woredas of East Gojjam Zone in Amhara Regional state. It is 229 km from Addis Abeba, 335 km from BahirDar and 70 km from Debre Markos. It bordered on the South by the Abay river, West Awabel Woreda, North by Enemay Woreda and East by Shebel Berta Woreda. It has 5 health center, 23 health posts and 46 number of health extension workers in the same year during the study. Based on the information get from health office of Dejen Woreda, the Woreda has a total population of 117,774. Among this 105,600 live in the rural areas, the rest of population lives in the urban area. Among the total population, 60,844 are females. All Mothers who gave birth in the last one year in Dejen Woreda were included and mothers who gave birth in the last one year those unable to communicate and seriously ill mothers during data collection were not included.

2.2. Sample Size Determination and Sampling Procedure

The sample size was determined using single population proportion formula, $n = (z\alpha/2)^2 \cdot p(1-p)/d^2$. An estimated of 361 sampled mothers who gave birth in the last one year were calculated by taking the proportion (p) of institutional deliveries 12.1% (conducted in Sekela District, West Gojjam Zone), margin of error 5% with 95% confidence interval, 10% of nonresponse rate and design effect of 2. Multistage sampling technique was used in the study. The primary sampling unit was the Woreda in which the five Kebeles were selected by simple random sampling from the total of 23 kebeles. The sample size was distributed to Kebeles by population proportion to size (PPS) formula. The secondary sampling units were the Kebele (the smallest administrative unit in Ethiopia) which was selected by simple random sampling method. Women in the selected Kebeles were selected by using simple random sampling based on the sampling frame obtained from health extension worker of each Kebele. House to house visit was carried out on randomly selected mothers to identify mothers who were eligible. Revisit of three times was made in a case where eligible respondents were not available at the time of the survey.

2.3. Data Collection Technique and Quality Control

Both closed and opened ended structured questionnaire were adapted from differently related kinds of literature [17, 18] and modified in our context, which used to assess factors of institutional delivery. A pre-tested questionnaire was prepared in English and translated into the local language (Amharic) and finally to English. Training was given for data collectors. Five midwives were collecting the data and two health professionals were recruited as supervisors. Data quality was ensured during collection, coding, entry, and

analysis by investigator and supervisor. The collected data were checked on the daily basis for completeness and consistency.

2.4. Data Processing and Analysis

The data were checked, cleared and entered into SPSS computer software and analysis was done by using SPSS version (20.0). Initially, a bivariate analysis was performed between institutional delivery service utilization and each of the potential factors associated with it. Multiple logistic regressions were carried out to examine the existence of the relationship between the outcome variables and selected determinant factors. Variables with a p-value less than 0.02 in the univariate analysis were then entered into a multiple logistic regression analysis. Variables with a P value <0.05 were considered as statistically significant factors.

2.5. Ethical Considerations

Ethical clearance and permission were obtained from Debre Markos University, College of Medicine and Health Science Ethical Review Committee and permission was secured from Dejen Woreda health office. The study participants were informed about the purpose of the study, the importance of their participation, and the right to withdraw at any time. Verbal informed consent was obtained and data were kept confidential.

3. Result

3.1. Socio-demographic and Obstetric Characteristics of Respondents

A total of 361 mothers who gave birth in the last one year were interviewed yielding a response rate of 100%. Among the 212 (58.7%) were in the age group of 25- 34yrs. The mean age of the respondents was 27.75 (SD \pm 5.50) and majorities (83.7%) of them were married. Among the respondents, 262 (72.6%) were followers of Ethiopian Orthodox Christianity and 345 (95.6%) were Amhara ethnically. A higher proportion (40.2%) of the respondents were unable to read and write followed by attended secondary education (21.9%). more than half of women's husband (53.7%) were farmers (Table 1).

One hundred sixty-four (45.4%) of the mothers became pregnant before the age of 20 years. The minimum and maximum ages at first pregnancy were 15 and 34 years respectively with mean 21.34 years (SD \pm 2.75.) Two hundred and fifteen (59.6%) had experience two to four pregnancies while 45 (12.5%) of the mothers have been pregnant more than five times in their lifetime. The majority (83.4%) of the respondents had planned their pregnancy. Two hundred seventy (74.8%) of the respondents attended Ante natal care at the health facility during recent delivery among them only 53.7% had four or more ANC visits while 1.9% had visited only once during their pregnancy. Most of the respondents have indicated that 254(78.4%) their husbands preferred to have their deliveries at the health facility (Table 2).

3.2. Institutional Delivery Service Utilization

In the recent birth, only 259 (71.7%) of the mothers gave birth at health institutions.

Trust on traditional birth attendants (TBAs) (33.3%), lack of transportation (30%) and distance from a health facility (27.5%) were the most common reasons for home delivery (figure 1).

The majority of the respondents were delivered at health facility due to fear of complication 112(43.2%) followed by for getting better service 98(37.8%) (figure 2).

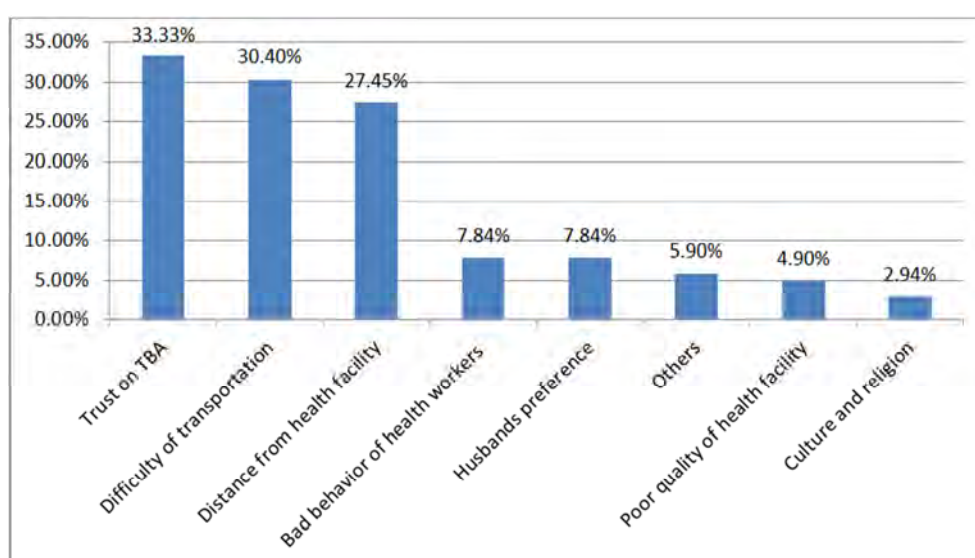
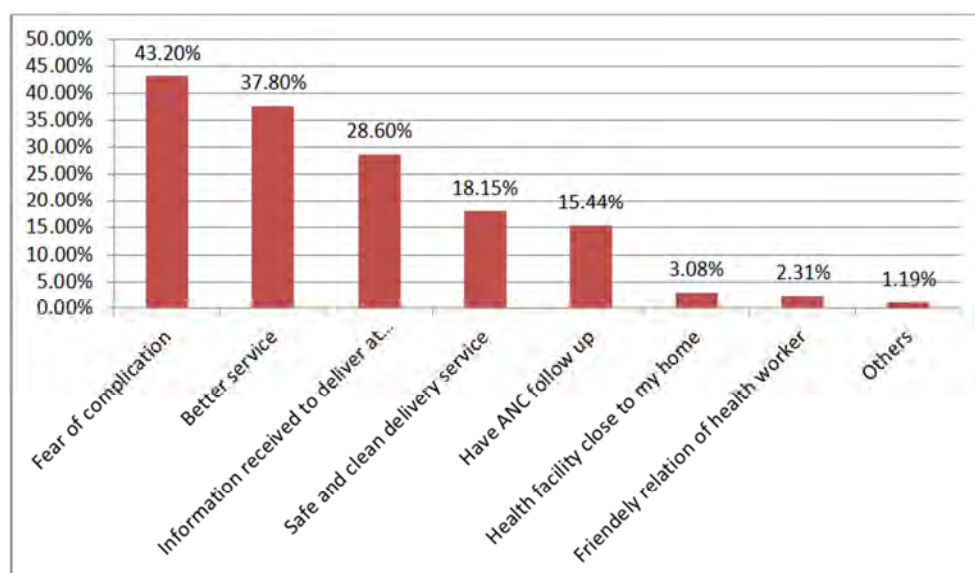
Table 1. Socio demographic characteristics of mothers in Dejen district, North East Ethiopia, 2016(N=361).

Variable	Frequency	Percentage%
Age of respondent		
15-24	102	28.3
25-34	212	58.7
35 and above	47	13
Marital status of mother		
Single	7	1.9
Married(living together)	302	83.7
Separated	22	6.1
Divorced	26	7.2
Widowed	4	1.1
Religion		
Orthodox	262	72.6
Protestant	10	2.8
Muslim	89	24.7
Ethnicity		
Amhara	345	95.6
Oromo	16	4.4
Residence of mother		
Rural	228	63
Urban	133	37
Educational status of mother		
Illiterate(unable to read and write)	145	40.2
literate(can read and write)	18	5
Primary education(1-8)	56	15.5
Secondary education(9-12)	79	21.9
Collage and above	63	17.5
Occupational status of husband (324)		
Farmer	174	53.7
Government employed	69	21.3
Private employed	40	12.3
Daily labor	30	9.3
Other	11	3.4
Monthly income in ETB		
<=900	33	9.2
901-1999	99	27.0
2 000 and above	228	63.3
Distance from health facility		
<1hr	229	63.4
>=1hr	132	36.6

Table 1. Obstetric characteristics in Dejen District, North East, Ethiopia, 2016(N=361).

Variable	Frequency	Percentage%
Age at 1 st marriage (n=354)		
<=15years	17	4.8
16-19 years	170	48
≥20 years	167	47.2
Age at first pregnancy		
<=20	164	45.4
21-34	197	54.6
Gravidity		
1	101	28
2-4	215	59.6
≥5	45	12.5

Variable	Frequency	Percentage%
Last pregnancy		
Planned	301	83.4
Unplanned	60	16.6
ANC follow up		
Yes	270	74.8
No	91	25.2
Number of ANC visit(n=270)		
One	5	1.9
Two and three	120	44.4
Four and above	145	53.7

**Figure 1.** Reasons for giving birth at home among mothers who gave birth in the last one year, Dejen district, North East Ethiopia, 2016.**Figure 2.** Reasons for health facility visit among mothers who gave birth in the last one year, Dejen district, North East, Ethiopia, 2016.

3.3. Factors Associated with Institutional Delivery Service Utilization

The association of dependent and independent variable using bivariate and multivariate logistic regression were

assessed. On bivariate analysis age, residence and educational status of the mother, husband's educational status, husbands preference of delivery, occupational status of the mother, husband's occupational status, gravidity, the status of

last pregnancy, ANC visit and distance from a health facility were the factors found to be significantly associated with institutional delivery. Variables with p -value < 0.2 in bivariate logistic regression analysis entered to multiple logistic regression models to control the effect of confounder/s.

In the multivariate analysis age, residence and educational status of the mother, ANC visit during last pregnancy/frequency of ANC visit, husbands preference and gravidity were remained significantly associated with institutional delivery. Accordingly, Mothers with the age range of 15-24yrs were about two times more likely to give birth at health facility when compared to those aged above 35yrs (AOR=1.75, 95% CI=[2.41-5.92]). Mothers who were urban residents were about 8 times more likely to give birth in health facilities than rural mothers (AOR=7.62, 95% CI=[1.63-35.689]).

Mothers with an educational level of secondary and above were about 9 times (AOR=9.51, 95% CI= [2.69-3.61]) more

likely to give birth to the health facility than those mothers with primary education and below. ANC visit during last pregnancy was also found to be a strong predictor of institutional delivery service utilization, which was 15 times more likely to deliver in health facilities than those who did not have ANC visit during last pregnancy (AOR=14.56, 95% CI=[12.54-95.25]). In addition, women who had received greater than or equal to four ante natal care were two times more likely to utilize institutional birth attendances as compared to those utilize only one visit (AOR=2.12, 95% CI=[3.09- 7.08]).

Women with gravidity greater or equal to five were 98% less likely to give birth at the health facility than those with primigravida (AOR= 0.02, 95% CI = [1.17-3.07]). Furthermore, mothers who had husbands preferred health facility delivery were 2 times more likely to utilize health facility compared to counterparts (AOR= 1.89, 95% CI= [2.043-3.56]) (Table 3).

Table 2. Factors associated with institutional delivery utilization among mothers in Dejen district, North East Ethiopia, 2016.

Variable	Place of delivery		COR (95%CI)	AOR(95%CI)
	Health institution	Home		
Age	15-24	74	2.533(1.235,5.195)	1.749(2.406-5.917)*
	25-34	161	3.025(1.575,5.8120)	1.138(0.201-6.1452)
	≥ 35	24	1	1.00
Residence	Rural	131	1	1.00
	Urban	128	5	18.956(7.470-48.104)
Education of mother	Primary and below	125	1	1.00
	Secondary and above	134	8	12.596(5.880-26.984)
ANC visit	Yes	245	53.900(26.697-108.222)	14.559(12.538-95.252)*
	No	14	1	1.00
Frequency of ANC visit	1	4	1	1
	2-3	105	1.750(1.183,16.722)	1.64(0.345- 3.45)
	≥ 4	136	3.778(1.381,37.410)	2.12(3.095- 7.08)*
Occupation of women	House wife	85	1	1.00
	Gov and private employee	123	6.909(3.460,13.795)	2.137(0.900-5.077)
	Other	51	5.584(2.091,14.910)	4.769(0.920-24.712)
Occupation of husband	Farmer	98	1	1.00
	Gov and private employee	98	3.566(2.122,5.992)	2.212(0.608-8.049)
	Other	36	8.280(3.133,21.883)	2.988(0.667-13.374)
Gravidity	1	81	1	1
	2-4	155	2.471(1.282,4.762)	1.721(0.139-5.816)
	≥ 5	23	3.874(1.808,8.303)	0.02 (1.169-3.074)
Status of last pregnancy	Planned	223	1.906(1.070,3.395)	0.597(0.155-2.300)
	Unplanned	36	1	1.00
Distance	< 60 min	202	9.844(5.800,16.709)	1.678(0.657-4.28)
	≥ 60 min	57	1	1.00
Husband preference	Home	44	1	1
	Health facility	188	1.683(1.961,2.947)	1.89(2.043- 3.56) *

* Statistically significant at p -value 0.05 and the confidence interval didn't include 1 while the remaining was not statistically significant.

ANC: Ante Natal Care

4. Discussion

Delivery assisted by skilled providers is the most important proven intervention in reducing maternal mortality and one of the Millennium Development Goal (MGD) indicators to track national effort towards safe motherhood [2]. This community-based cross sectional study attempted to determine institutional delivery service utilization and associated factors among mothers who gave

birth in the last one year in Dejen district. The prevalence of institutional delivery in the study area was 71.7%. This finding is lower than according to a study done in Nepal which was 77.3[13]. The possible explanation might be the fact that mothers in these countries had better educational status (since only 17.6% was illiterate) and better ANC service utilization (since more than 95% had ANC follow up). The finding of this study is lower than WHO recommendation of every pregnancy should be assisted by

skill attendance [11]% yet better than Kenya, institutional delivery is 38% [15], the national prevalence [3] and a study in Amhara region, Sekela [16] and Dodota district [18]. This might be due to time gap, increased opportunity for education and difference in place of residence.

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 [13]. The possible reason for the discrepancy might be due to differences in the context and socio-culture status. The current study suggested that the younger women were more likely to give birth in health facilities when compared with older one. Mothers with the age range of 15- 24yrs were about two times more likely to give birth at health facility when compared to those aged above 35yrs (AOR=1.749, 95%, CI=[2.41-5.92]. This is in line with a study conducted in sekela district[18] and sidama zone [24] which showed that younger mothers whose age group of 15-19 year were more likely to deliver at health facilities than mothers with age group 35 and above. This might be those mothers perceive the severity of pregnancy/ labor inducing complications in the earlier age than elders.

This study also showed that mothers who attend secondary education and above were about 9 times more likely to deliver at health facilities than mothers who had primary education and below (AOR=9.51, 95% CI= [2.69-3.61]). This finding was similar to other studies conducted in Tanzania[14], Sekela[18] and Dodota District[20] which showed that mothers with an educational level of secondary and above were more likely to give birth in health facilities than those with primary education and below. This might be that educated mothers have better awareness about the benefit of maternal health care and health service utilization. Residence of the respondents was significantly associated with institutional delivery. Mothers who lived in urban Kebeles were about 8 times more likely to deliver at health facilities than those who lived in rural Kebeles. This finding was consistent with studies conducted in Tanzania, Sekela and Dodota district [14-20]. This may be due to better access to education, maternal health services, media for health information and minimal distance from health facilities for urban women.

ANC visit during last pregnancy/ frequency of ANC visit is another significant factor, in which those visited ANC were about 15 times more likely to give birth at the health facility than those didn't visit ANC (AOR=14.56, 95% CI=[12.54-95.25]). In addition, women who had received greater than or equal to four ante natal care were two times more likely to utilize institutional birth attendances as compared to those utilize only one visit (AOR=2.12, 95% CI=[3.09- 7.08]). The finding was consistent with a study conducted in Sekela District [18]. This might be because of the information give at visit could had influenced their decision to deliver in health facility and during ANC visit mothers increase practices on institutional delivery.

Birth order or gravidity is another factor found to be significantly affecting the use of safe delivery services. This

is consistent with a study in sidama zone [24]. Husband's preference was another factor affecting of institutional delivery. Mothers who had husband's preferred health facility delivery were more likely to utilize health facility compared to counterparts (AOR= 1.89, 95% CI= [2.043- 3.56]. This is not consistent with a study done in sekela [16] and sidama [21]. This might be due to increase of husband's awareness about institution delivery and socio cultural difference.

Strength and weakness of the study

As a strength the study was conducted at community level and try to where, the limitation of the study is did not show causal relationship. Hence, it is a cross sectional design, provided only a snapshot of the issues.

5. Conclusion and Recommendations

This study revealed that more than half of women gave recent birth at health institution by skilled birth attendance in the study area. Younger age, having secondary and above educational status and urban residents, having 4 or above ANC visit, primiparaous and husband's preferred health facility had significantly associated with increased institutional delivery.

Thus, it is recommended that the responsible body should work hard to empower women and ensuring all women to receive antenatal care visit according to the recommended number of visit and improving the quality of information towards reducing home delivery. In addition, enhancing involvement of partner in maternal health service, increasing accessibility of health facilities in the rural areas and collaboration between the formal health system and TBAs with the aim of encouraging TBAs to refer pregnant women to deliver in health facilities could increase institutional delivery service.

Competing Interest

The authors declare that there is no any competing interest.

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