

Knowledge on Intrapartum Danger Sign Influences Place of Delivery: The Case of Raya Kobo District, Northeastern Ethiopia

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Abstract: *Background:* A skilled birth attendance for every pregnant woman during childbirth is the most crucial intervention for improving maternal health. This study aimed to assess institutional delivery service utilization and associated factors among mothers who gave birth in the last 12 months in Raya Kobo district, Ethiopia.

Methods: A community-based cross-sectional study was carried out in the Raya Kobo district of Amhara Regional State during March 2016. Logistic regression analysis was performed to assess the association between each independent variable and the outcome variable. Variables with a p-value <0.05 were considered significant.

Results: A total of 493 mothers were included in the study, with a response rate of 95.4%. The mean (\pm SD) age of the study participants was 29.13 (\pm 6.93) years. About 73% of the study participants had attended at least one antenatal care follow up for their last pregnancy, and 56.6% (95% CI: 52.0, 61.0%) gave birth at health institutions. Travelling for 30 minutes and less [AOR=2.95(1.89, 4.58)], attending antenatal care [AOR=6.0(3.55, 10.13)], having knowledge about intrapartum danger signs [AOR=2.48(1.44, 4.24)] and getting information from health extension workers (HEWs) regarding maternal health services were positively associated.

Conclusion: The district health office should strengthen its effort to provide free ambulance accessibility and provide information on danger signs of intrapartum complications and the importance of using institutional delivery service to every mother who came to the antenatal clinic. Furthermore, the district health officials should focus on strengthening the capacity of HEWs in relation to maternal health services.

Keywords: Institutional delivery service utilization, Danger sign, Raya Kobo District, Ethiopia.

BACKGROUND

Maternal mortality remains a major public health challenge worldwide. Every day, about 830 women die from childbirth-related complications across the world. Nearly all maternal deaths (99%) occur in the least developed countries [1]. Ethiopia is one of the six countries contributing to more than half of all maternal deaths worldwide [2]. The recent Ethiopian demographic and health survey shows a maternal mortality ratio of 412 maternal deaths per 100,000 live births. This represents 25% of all deaths are among reproductive age (15-49 years) women [3].

Institutional delivery is, therefore, vital to improving maternal and child health. This is because most obstetric complications could be prevented and/or managed if women had access to a health facility [1, 3]. However, the outstanding challenge for many countries is how to ensure that all women have access to skilled attendants during childbirth. In 2013, skilled birth attendants attended 73% of the global childbirths. About half (54%) of births in Africa are attended by a skilled health professional [1, 4].

In Ethiopia, 26.2% and 27.7% of mothers gave birth at health facilities and attended by a skilled attendant, respectively. In the Amhara regional state, 27.1% of women delivered in health facilities [3]. Moreover, Ethiopia's maternal mortality ratio is far from the Sustainable development goal's (SDG 3) global target of maternal mortality ratio to less than 70 per 100,000 live births by 2030 [4]. However, there is no study on the factors associated with institutional delivery service utilization in the district. Therefore, this study was conducted in Raya Kobo District to assess institutional delivery service utilization factors.

METHODS

Study Area and Period

This is a secondary analysis of cross-sectional data [5]. A community-based cross-sectional study carried out in the Raya Kobo district of Amhara regional state from March 01 to 28, 2016. Raya Kobo district is one of North Wello Zone's thirteen districts, located 570 kilometres northeast of Addis Ababa (the capital city of Ethiopia). The district has an estimated total population of 228,798. Of which 53,951 are estimated to be women in the age group of 15-49 years. There are forty-two kebeles (the smallest administrative units next to the district in Ethiopia) under Raya Kobo district: five

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urban kebeles and thirty-seven rural kebeles. In this district, there are forty-two health posts, seven health centres, and eight private clinics. Each health post has two health extension workers.

Sample Size Determination, Sampling Procedure, and Data Collection Process

A sample size of 517 was determined using a single population proportion formula. Then, the sampling procedure was started from the stratification of the thirty-seven kebeles as rural and the five kebeles as urban. The detailed information is found elsewhere [5]. Data were collected using a pre-tested, structured, and interviewer-administered questionnaire adapted from the Maternal and Neonatal Program [6]. The adapted questionnaire was modified and contextualized to fit the local situation and the research objectives.

Study Variables

The dependent variable was the utilization of institutional delivery service. The independent variables were maternal characteristics (age, marital status, ethnicity, educational status, and occupation), household characteristics (religion, income, distance from health institution), husband educational status, obstetric characteristics (gravidity, antenatal care visit), and knowledge on obstetric danger signs. A woman was considered knowledgeable on obstetric danger signs when she reported at least three danger signs during the antepartum, delivery, or postpartum period [6].

Data Processing and Analysis

The data were checked for completeness and inconsistencies. It was also cleaned, coded, and entered into the SPSS version 20 statistical package for analysis. Logistic regression analysis was performed to assess the association between each independent variable and the outcome variable. In univariable logistic regression analysis, crude odds ratio (COR) with a 95% confidence interval were estimated. Then variables with a p -value < 0.3 in the univariable logistic regression analysis were considered in the multivariable logistic analysis. The Hosmer-Lemeshow goodness-of-fit with the entering procedure was used to test for model fitness. Adjusted odds ratios (AOR) with 95% confidence interval were estimated. Variables with a p -value < 0.05 in the multivariable logistic regression analysis were considered as significant.

Ethical Considerations

The Ethical Review Committee of Woldia University approved the primary study that produced these data. An official letter was written from Woldia University to Raya Kobo district administration and health offices. The detailed ethical considerations are found elsewhere [5].

RESULTS

Socio-Demographic Characteristics of the Study Participants

A total of 493 mothers were included in the study, with a response rate of 95.4%. The mean (\pm SD) age of the study participants was 29.13 (± 6.93) years. About 68% of the study participants were Ethiopian Orthodox Christianity followers, and 60.4% had no formal education (Table 1). All of the study participants were ethnically Amhara.

Obstetrical Characteristics of the Study Participants

About 73% of the study participants had attended at least one antenatal care visit for their last pregnancy, and 56.6% (95% CI: 52.0, 61.0%) of the study mothers gave birth at health institutions (Table 2).

Knowledge of the Study Participants about Obstetric Danger Signs

Four hundred thirty-five (88.2%), 91.9%, and 83% of the study participants knew at least one antepartum, intrapartum, and postpartum obstetric danger sign, respectively (Table 3).

Factors Associated with Institutional Delivery Service Utilization

Binary logistic regression analysis showed that maternal educational status, travel time to the nearest health facility, receiving information from health extension workers (HEWs) regarding maternal health services, antenatal care attendance, knowledge about antepartum, intrapartum, and postpartum danger signs were significantly associated with utilization of institutional delivery service at $p < 0.05$. The multivariable logistic regression analysis showed that time spent from home to the nearest facility, antenatal care attendance, maternal knowledge on intrapartum danger signs, and getting information from HEWs regarding maternal health services remained statistically significant at $p < 0.05$ (Table 4).

Table 1: Socio-Demographic Characteristics of Mothers (n=493) in Raya Kobo District, Northeastern Ethiopia, 2020

Variables	Frequency	Per cent
Age (in years)		
<20	23	4.6
20-34	343	69.6
>34	127	25.8
Religion		
Orthodox	335	68.0
Muslim	158	32.0
Marital status		
Married	356	72.2
Single	10	2.0
Widowed	20	4.1
Divorced	107	21.7
Maternal educational level		
Illiterate	242	49.1
Read and write only	56	11.4
Primary	160	32.5
Secondary and above	35	7.0
Maternal occupational status		
Housewife	436	88.5
Government employee	8	1.6
Private business	37	7.5
Daily labourer	12	2.4
Average monthly household income (ETB)		
≤100	293	59.4
101-300	75	15.2
≥301	125	25.4
ETB: Ethiopian Birr		

Table 2: Obstetrical Characteristics of Mothers in Raya Kobo District, Northeastern Ethiopia, 2020

Variables	Frequency	Percent
Gravidity (n=493)		
1	107	21.7
2-4	273	55.4
≥5	113	22.9
Antenatal follow up (n=493)*		
Yes	358	72.6
No	135	27.4
Number of antenatal follow up (n=358)		
1	10	2.8
2-3	197	55.0
≥4	151	42.2
Place of delivery (n=493)		
Home	214	43.4
Government hospital	79	16.0
Health centre	193	39.2
Private health institution	7	1.4
Travel time to the nearest health facility (n=493)		
<15 minutes	217	44.0
15-30 minutes	79	16.0
>30 minutes	197	40.0
Receive information from HEWs regarding maternal health services (n=493)		
Yes	227	46.0
No	226	54.0

*at least one visit. HEWs= Health Extension Workers. Maternal health services: antenatal, delivery, and postnatal care.

Table 3: Knowledge of Mothers about Obstetric Danger Signs in Raya Kobo District, Northeastern Ethiopia, 2020

Knowledge of obstetric danger signs	Frequency	Per cent
Know at least one antepartum danger sign (n=493)		
Yes	435	88.2
No	58	11.8
Know at least three antepartum danger signs (n=435)		
Yes	263	60.5
No	172	39.5
Know at least one intrapartum danger sign (n=493)		
Yes	453	91.9
No	40	8.1
Know at least three intrapartum danger signs (n=453)		
Yes	356	78.6
No	97	21.4
Know at least one postpartum danger sign (n=493)		
Yes	409	83.0
No	84	17.0
Know at least three postpartum danger signs (n=409)		
Yes	363	88.8
No	46	11.2

Table 4: Factors Associated with Institutional Delivery Service Utilization in Raya Kobo District, Northeastern Ethiopia, 2020

Variables	Institutional delivery		COR (95% CI)	AOR (95% CI)
	Yes	No		
Marital status				
Never married	4	6	1	1
Ever married	275	208	1.98(0.55, 7.18)	1.47(0.32, 6.79)
Time spent (home to the nearest facility)				
≤ 30 minutes	210	87	4.44(3.02, 6.53)*	2.95(1.89, 4.58)*
>30 minutes	69	127	1	1
Religion				
Orthodox	197	138	1	1
Muslim	82	76	0.76(0.52, 1.11)	1.14(0.70, 1.83)
Antenatal follow up [§]				
Yes	252	106	9.51(5.89, 15.35)*	6.0(3.55, 10.13)*
No	27	108	1	1
Maternal educational status				
Formal	134	61	2.32(1.59, 3.38)*	1.54(0.97, 2.43)
Non-formal	145	153	1	1
Receive information from HEWs regarding maternal health services				
Yes	164	63	3.42(2.34, 4.99)*	1.79(1.14, 2.79)*
No	115	151	1	1
Knowledge of antepartum danger signs				
Yes	149	81	1.88(1.31, 2.71)*	1.12(0.69, 1.78)
No	130	133	1	1
Knowledge of intrapartum danger signs				
Yes	103	34	3.10(1.99, 4.81)*	2.48(1.44, 4.24)*
No	176	180	1	1
Knowledge of postpartum danger signs				
Yes	84	46	1.57(1.04, 2.38)*	0.9(0.52, 1.54)
No	195	168	1	1

Hosmer and Lemeshow Test=0.425. COR= Crude odds ratio. HEWs= Health Extension Workers. Maternal health services: antenatal, delivery and postnatal care. AOR= Adjusted odds ratio. CI= confidence interval. [§]at least one visit. *Significant at p<0.05.

Compared to mothers who travelled for more than 30 minutes from their home to the nearest health facility, mothers who travelled for 30 minutes and less were [AOR=2.95(1.89, 4.58)] more likely to give birth at a health institution. Mothers who had attended antenatal care were [AOR=6.0(3.55, 10.13)] six times more likely to give birth at health institutions compared to mothers who lack antenatal care attendance. Compared to mothers who had no knowledge on intrapartum danger signs, mothers who had knowledge on intrapartum danger signs were [AOR=2.48(1.44, 4.24)] 2.5 times more likely to give birth at a health institution. Mothers who got information from HEWs regarding maternal health services were [AOR=1.79(1.14, 2.79)] about two times more likely to give birth at health institution compared to mothers who lack information (Table 4).

DISCUSSION

This analysis revealed that 56.6% of women gave birth at health facilities. This was relatively consistent with the findings at Woldia [7] and Mirab Abaya district [8]. This was lower than the findings at Arba Minch Town [9] and Debre Berhan district [10]. However, it was higher than other studies in Ethiopia [11-19]. This could be due to socio-demographic, economic, and cultural differences.

Availability of health facility is one of the factors that can affect the utilization of institutional delivery. Compared to mothers who travelled for more than 30 minutes from their home to the nearest health facility, mothers who travelled 30 minutes and less were about three times more likely to give birth at health institutions. This is in line with the study findings reported elsewhere in Ethiopia [17, 19-22]. In addition, qualitative results revealed that mothers would deliver in a health facility if it is closer to their village [23]. This could be explained in such a way that living far from facilities may be uncomfortable for pregnant women to deliver in health facilities.

Mothers who had attended antenatal care (ANC) were six times more likely to give birth at health institution compared to mothers who lack antenatal care attendance. Similar findings were reported in different parts of Ethiopia [11, 12, 14, 15, 24]. In Dega Damot District of the northwest of Ethiopia, women reported that they were counselled to deliver at health facilities during ANC attendance[16]. Women who completed four or more antenatal visits were more likely to utilize institutional delivery services as

compared to women who completed fewer than four visits in Nepal [21]. This might be the fact that mothers who attended antenatal follow up might be counselled by health professionals about the advantages of institutional delivery [19].

Compared to mothers who did not know intrapartum complications, mothers who had knowledge on dangers signs of intrapartum complications were more likely to give birth at health facilities. Similar findings were reported from other studies [9, 18, 21, 22, 25]. Likewise, in Sidama Zone, women who knew the risk of giving birth at home were seven times more likely to utilize skilled birth attendants compared to those who did not know [12]. Mothers who had reported obstetric complications in the previous childbirth were more likely to deliver in a health facility than mothers who had not encountered complications [17, 20]. Furthermore, the main reason to attend institutional delivery in the North West of Ethiopia was the fear of complications [16].

Mothers who got information from health extension workers (HEWs) about maternal health services were about two times more likely to give birth at a health facility compared to mothers who lack information. This might be explained in such a way that HEWs serve as a major source of health information in Ethiopia. They provide support to households for behavioural change and motivate them to utilize primary health care services, including institutional delivery service. A qualitative study in Ethiopia indicated that HEWs in Amhara Region teach mothers about the need to deliver in a health facility [23].

This study's strength is that being community-based could reflect the mothers' actual experience in the study area. One of the limitations of the study is that it was difficult to establish a cause-effect relationship. The findings could also be affected by recall and interviewer bias. However, due attention was given to the study procedures throughout the study period.

CONCLUSION

This analysis showed that 56.6% of women gave birth at a health facility in Raya Kobo district. Antenatal care attendance, travelling time that takes to reach the health facility, maternal knowledge on intrapartum danger signs, and getting information from health extension workers (HEWs) about maternal health services were the factors associated with the utilization of institutional delivery service. Therefore, the district

health office should strengthen its effort to provide free ambulance accessibility and provide information on the complications of delivery and the importance of using institutional delivery service to every mother who came to the antenatal clinic. Furthermore, the district health officials should focus on strengthening the capacity of HEWs concerning maternal health services.

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AVAILABILITY OF DATA AND MATERIALS

All data generated or analyzed during this study are included in the manuscript.

AUTHORS' CONTRIBUTIONS

MLL designed this problem, performed the data analysis, data interpretation and drafted the manuscript. NBY conceived, designed the primary study, supervised the data collection, and designed this problem and data interpretation. MLL and NBY critically edited and approved the final manuscript.

COMPETING INTERESTS

The authors declare that they have no competing interests.

CONSENT FOR PUBLICATION

Not applicable.

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