ORIGINAL ARTICLE

SAFE DELIVERY SERVICE UTILIZATION IN METEKEL ZONE, NORTHWEST ETHIOPIA

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ABSTRACTS

BACKGROUND: *Safe delivery service is essential for improvement of maternal and child health. However, in Ethiopia the utilization of this service is very low even for women who have access to the service. The current magnitude of safe delivery and influencing factors are not well assessed in Benishangul Gumuz region in general and in Metekel Zone in particular. The objective of this study was to assess the status of safe delivery service utilization and associated factors among women, who delivered in the past five years.*

METHODS: *A community based cross sectional study was conducted from January 25 to February 10, 2007 on randomly selected sample of 1,038 women, who had at least one delivery in the past five years before the survey. Structured questionnaire was used to collect the quantitative data. Focus Group Discussions and in-depth interviews were used to supplement the quantitative data. The data were analyzed using SPSS for Windows version 12.0.1. Independent variables affecting safe delivery service utilization were determined using multiple logistic regression.*

RESULTS: *A total of 1,038 mothers were interviewed giving a response rate of 97.9%. One hundred twenty five (12.0%) of the subjects received safe delivery services for their last delivery. Of all respondents, 816(78.6%) were knowledgeable about safe delivery service and 503(72.6%) of the home deliveries were reported to have been attended by relatives/family. The main reason for home delivery was absence of health problem during labor 493(71.2%). Problem during labor, antenatal care follow up, knowledge about delivery services, ethnicity and decision making power of subjects were found to have a statistically significant association with preference of safe delivery place.*

CONCLUSION: *There is low utilization of safe delivery service in the Zone. Socio-demographic characteristics, obstetric conditions, and cultural influences were the common factors affecting safe delivery service utilization. Therefore providing information, education and communication on delivery service utilization with special emphasis to Gumuz women is recommended.*

KEY WORDS: *Safe delivery, Service utilization, Metekel Zone, Northwest Ethiopia.*

INTRODUCTION

Women, a large proportion of a society, are at a greater disadvantage in terms of high maternal morbidity and mortality. Women play a principal role in the rearing of children and the management of family affairs, and their loss from maternity-related causes is a significant social and personal tragedy. According to the World Health Organization (WHO), about 580,000 women of reproductive age die each year from complications arising from pregnancy and childbirth (1, 2).

Studies that focused on maternal mortality and morbidity in developing countries have repeatedly emphasized the need for antenatal care and availability of trained personnel to attend women in labor and delivery. In spite of the importance of maternity care, poor access to and low utilization of such services, continue to be important determinants of maternal mortality and morbidity throughout the world (3). In Ethiopia, the maternal mortality was estimated to be 673 deaths per 100,000 live births. Infant mortality rate was 77 per 1,000 live births, which is among the highest in the world. As emphasized in Ethiopian demographic and health survey (EDHS) 2005 report, one explanation for poor health outcomes among women and children in Ethiopia and other developing countries is non-use of modern health care services by a sizable proportion of women (4).

As most of the deaths occurring from obstetric complications are preventable, the safe motherhood initiative strongly emphasized ensuring a skilled attendant at every delivery. However, in Ethiopia the proportion of births attended by skilled personnel is very low even for women with access to the services. As observed in EDHS 2005, only about 28% of mothers received antenatal care (ANC) from a health professional for their most recent birth, and only 6% of babies were delivered by a health professional and 5% at a health facility (4, 5).

Despite the fact that safe delivery service utilization is essential for improvement of maternal and child health, little is known about the current magnitude of use of this

service and associated factors in Benishangul-Gumuz Region in general and in Metekel Zone in particular. To the investigators knowledge, there is no study carried out in the zone to assess the status of safe delivery service utilization and associated factors. Therefore, this study aimed to fill this gap through community based cross-sectional survey.

MATERIALS AND METHODS

A community based cross-sectional study was conducted from January 25 to February 10, 2007, to assess the status of safe delivery service utilization among women of childbearing age, who had at least one delivery in five years prior to the survey, in Metekel zone, Benishangul Gumuz Regional state, Northwest Ethiopia. Metekel Zone is one of the three Zones found in Benishangul Gumuz regional State, located 570 Kms North West of Addis Ababa. Administratively, the zone is structured into 6 'Woredas', having 7 urban and 97 rural 'Kebeles'. The total population of the zone is estimated to be 218,105(6). The majority (89.5%) of the population live in rural area and economically dependent on farming. Gumuz is the predominant ethnic group in the zone followed by Shinasha. The Zone has 1 hospital, 4 health centers, 11 clinics, 18 health posts, and 13 private rural drug vendors. The health coverage of the Zone in the year 2004 was about 66.4%. Antenatal care service coverage and institutional delivery were 31.3% and 7.8%, respectively indicating low utilization of safe delivery service in the Zone (6).

Bullen 'woreda', one of the two 'woredas' randomly selected for the study, has 16 'kebeles' with a total population of 25,092. The 'woreda' has 1 health center and 4 health posts with potential health service coverage of 67%. The other 'woreda' selected for the study, Dibate, has 31 'kebeles' with a total population of 51,130. The 'woreda' has 1 health centre and 6 health posts with potential health service coverage of 76% (6).

Sample size was calculated by using Epi Info version 6.04d statistical software for estimating single population proportion based on the following assumptions. Proportion of women in reproductive age group utilizing safe delivery service be 7.8% (6), considering 95% confidence level and the desired margin of error between the sample and true population of 2.5%. The sampling procedure utilized multi-stage sampling technique. To have adequate and representative sample size, a design effect of 2 was considered. Non-response rate of 20% was used. Thus, the final sample size calculated was 1,060.

A multi-stage sampling technique was used in selecting the study participants for the quantitative study. In the 1st stage, instead of distributing the samples to all the six 'Woredas', two (Bullen and Debate) were selected by lottery method for logistic and cost reasons. In the 2nd stage all the 'Kebeles' in the two selected 'woredas', which have has access to safe delivery services, were identified from both urban and rural areas. In the 3rd stage, by using simple random sampling technique, one urban 'kebele', and two rural 'kebeles' were selected from each 'woreda'. The actual rural to urban ratio of the population of the zone was 9:1. But, by considering resources and homogeneity of all the rural 'kebeles' 2:1 ratio was used. For the selected six 'kebeles' house-to-house visit was carried out to identify women, who gave birth in the past five years before the survey.. Finally, simple random sampling technique was utilized to select households from each 'kebele' to identify the study subjects.

To supplement the quantitative data by qualitative method, 6 focus group discussions containing a total of 60 people were held, with both men and women groups. Participants were selected through consultation of women associations, grassroot community organizations and 'kebele' and 'woreda' administrations. The focus group homogeneity was assured by matching for age, marital status, educational status and social strata. ,Twenty key informant interviews were also conducted on purposively selected local subjects.

A structured and pre-tested questionnaire which was first prepared in English and translated to Amharic language was used to collect the quantitative data. Discussion and interview guides were prepared and used for the qualitative method.

Ten 12th grade completed interviewers, and four Nurse Supervisors, who were fluent speakers of the local languages (Amharic, 'Gumuzigna' and 'Shinashigna') were given training on the interview techniques and the questionnaire for two days before data collection. Investigators verified 10% of the data during collection. The questionnaire was checked using range and consistency check methods. The data were coded before entering into a computer then cleaned and analyzed using SPSS for Windows version 12.0.1. The significance of the differences in patterns among values of associated factors was tested using χ^2 test at a level of significance of 5% by bivariate analysis. Odds ratio with 95% CI were calculated using logistic regression model to control confounders and identify the factors affecting safe delivery service utilization.

This study was conducted after approval of the proposal by ethical review committee of Jimma University. Written consent was obtained from Metekel Zone, Bullen and Debate 'woreda's administrations. Verbal informed consent was obtained from each respondent and confidentiality was assured before conducting the data collection.

The following standard and operational definitions were used;

Access to safe delivery: availability of health facility providing delivery service within 2 hours distance on foot (5).

Knowledgeable: mean score for knowledge questions of 0.5 and above when 1 is given for correct answer and 0 is given for incorrect answer.

Safe Delivery: delivery that is conducted by health professionals at health institutions.

Safe delivery service utilization: giving birth in health institution attended by health professionals.

Table 2 . Some Obstetric characteristics of respondents (N=1038) in Metekel Zone, Benishangul Gumuz Region, North West Ethiopia, January- February 2007.

Variables	Number	Percent
Age at first marriage (in years)		
<15	901	86.8
15-19	124	11.9
20-24	12	1.2
25-29	1	0.1
Age at first pregnancy (in years)		
<20	778	75.0
20-29	258	24.8
30+	2	0.2
Gravidity		
1	143	13.8
2-4	474	45.7
>=5	421	40.6
Parity		
1	159	15.3
2-4	468	45.1
>=5	411	39.6
Number of delivery in last 5 years	455	43.8
1	470	45.3
2	113	10.9
>2		
Abortion in life time		
Yes	122	11.8
No	916	88.2

RESULTS

One thousand thirty eight (1038) women, who gave at least one delivery in the past five years prior to this survey, were interviewed from a total of 1060 sampled women with a response rate of 97.9%. Six hundred forty nine (62.5%) were rural residents. 575 (55.4%) were in the age range of 20-29 years with mean age of 28.2 (SD±6.3) years. Shinasha 376(36.2%) and Gumuze 310 (29.9%) ethnic groups accounted for more than half of the study subjects. Eight hundred thirty four (80.3%) were unable to read and write, 986(95.0%) were married and 947(91.2%) were housewives. In the year before the survey, 402(38.7%) and 488(47.0%) of respondents had monthly income of <100 and 100-499 Birr, respectively. About a third, 348 (33.5%), of households owned radio (Table1).

The majority of the respondents 901(86.8%) were married before the age of 15 years. About three-quarter 778(75.0%) of the respondents had their first pregnancy before the age of 20 years. Their mean age at first pregnancy was 18.4 (SD±2.5) years. The average gravidity and parity of the respondents were 4.3 (SD±2.7) and 4.2 (SD±2.6), respectively. Out of the total respondents 122(11.8%) reported that they had encountered at least one abortion in their life time. One hundred forty two (13.7%) responded that they had at least one pregnancy related health problems during pregnancy of their last delivery. Twenty nine (2.8%) had experienced antepartum hemorrhage, 48(4.6%) severe headache, 73(7%) severe abdominal pain, 32(3.1%) drowsiness and 28(2.7%) encountered other problems (Table 2).

Table 1. Selected Socio-demographic characteristics of respondents (N=1038) in Metekel Zone, Benishangul Gumuz Region, North West Ethiopia, February 2007.

Variables	Number	Percent
Place of residence		
Urban	389	37.5
Rural	649	62.5
Age of respondents		
15-19	52	5.0
20-24	250	24.1
25-29	325	31.3
30-34	204	19.7
35-39	134	12.9
40-44	53	5.1
45-49	20	1.9
Ethnicity of respondents		
Shinasha	376	36.2
Gumuz	310	29.8
Amhara	253	24.4
Agew	64	6.2
Oromo	35	3.4
Educational Status		
Unable to read & write	834	80.3
Only read & write	65	6.3
1-6 grade	59	5.7
7-12 Grade	50	4.8
12+	30	2.9
Marital Statue of respondents		
Married	986	95.0
Divorced	29	2.8
Widowed	18	1.7
Single	5	0.5
Occupation		
House wife	947	91.2
Gov Employed	39	3.8
Student	33	3.2
Others[§]	19	1.9
Monthly income (Ethio. Birr)		
<100	402	38.7
100-499	488	47.0
>500	101	9.8
Missing	47	4.5

§ Merchant, daily laborer

Knowledge of the respondents about delivery services was assessed by using seven questions. Accordingly, 816(78.6%) were knowledgeable on delivery services. The knowledge score of respondents varied by residence, 364(93.6%) of urban respondents and 452 (69.6%) of rural respondents were knowledgeable. The score was also varied by ethnicity; Gumuz mothers were less likely to have appropriate knowledge about delivery practice as compared to other ethnic groups (OR=0.05, 95%CI: 0.03, 0.07) (Table 3).

Table 3. Knowledge of respondents about delivery services in Metekel Zone, North West Ethiopia, January-February 2007.

Knowledge variables	Yes N (%)	No N (%)	Total N (%)
Health facility gives delivery services	802(77.3)	236(22.7)	1038(100)
Women can face problems during childbirth	890(85.7)	148(14.3)	1038(100)
Women can face excessive bleeding during delivery	313(30.2)	725(69.8)	1038(100)
Women can face obstructed labor during childbirth	365(35.2)	673(64.8)	1038(100)
Women face intrauterine fetal death during delivery	329(31.7)	709(68.3)	1038(100)
The mother can die during delivery	373(35.9)	665(64.1)	1038(100)
The problems are preventable by institutional delivery	743(71.6)	295(28.4)	1038(100)

One hundred twenty five (12.0%) study subjects attended health institution service for their last delivery. About 81(20.8%) of urban respondents and 44(6.8%) of rural respondents gave their last delivery in health institution. The common reasons given for institutional delivery were presence of problem during pregnancy 54(43.2%), personal choice 32(25.6%) and being informed to deliver in health facilities during ANC follow up 20(16.0%).

Out of 310 Gumuz mothers included in this study, 221(71.0%) delivered in the forest in the absence of any person, where they couldn't be seen by others. All of them mentioned cultural influences as reasons for delivering in the forest. Among these cultural influences 108(48.9%) responded that the child will not survive if born in the house or in the presence of other people. The others 83(37.6%) reported that gods do not like bleeding and giving birth in the room and if done it will kill all individuals in the household resulting in extinction of the Gumuz people.

This result was supported by the qualitative study. According to the key informants and focus group discussants, the Gumuz culture doesn't allow giving birth in the house and the presence of others.

One Gumuz key informant said,

> *'Let alone giving birth and bleeding in the room, the Gumuz woman is not allowed to enter a house and touch others even during menstrual period.'*

Out of the 1038 study subjects, 692(66.7%) had their last delivery at home. Of the 692 mothers, who gave their last birth at home, 493(71.2%) reported that their main reason for home delivery was absence of health problems during labor. Five hundred three (72.6%) of home deliveries were attended by relatives/family. Trained traditional birth attendants (TTBAs) and Traditional birth attendants (TBAs) attended 47(6.8%) and 42(6.1%) of home deliveries, respectively (Table 4).

The reasons given for preferring relatives/family to attend delivery at home were: they perceived that no need of health workers if the labor has no any health problem 382(75.9%), more close attention will be given by the family or relatives 39 (7.7%), usual practice 30 (6%), home delivery is more comfortable in terms of privacy 17 (3.4%), cultural influence 10(2%) and the remaining 25 (5%) mentioned other reasons. Similar reasons were given on the qualitative method. The reasons given by most of the key informants and focus group discussants were low awareness on the advantages of institutional delivery and not realizing that any delivery may face problems.

Out of the total 1038 study subjects, 155(14.9%) reported at least one problem during their last delivery. Prolonged labor 114(11.0%) and bleeding 48(4.6%) were commonly encountered problems. Most, 839(80.8%), of the respondents had their last labor for less than 12 hours. Forty-eight (4.6%) of respondents had post partum complications. Retained placenta and post partum hemorrhage were reported by 21(2.0%) and 12(1.2%) of the respondents respectively. The majority, 963(92.8%), made decision about place of delivery by them selves (Table 4).

On bivariate analysis, socio-demographic characteristics such as urban residence, following non-traditional religion, non-Gumuz ethnicity, mothers' schooling secondary and above, occupation other than housewife, husbands' schooling secondary and above, husband's occupation other than farming, monthly income, having a house with floor of cement and roof made of corrugated sheet and possessing radio were positively associated with preference of safe place of delivery. Occurrence of health problems during pregnancy, ANC follow up, information on institutional delivery, problems during labor, duration of labor, respondent's knowledge about institutional delivery and decision making power were also associated with institutional delivery (Table 5).

Table 4. Delivery Practice of respondents in Metekel Zone, Northwest Ethiopia, January-February 2007.

Variables	Number	Percent
Place of last delivery(N=1038)		
Health facility	125	12.0
Home	692	66.7
Forest	221	21.3
Reasons for Institutional delivery(N=125)		
Encountered problem	54	43.2
Personal choice	32	25.6
Informed by health worker	20	16.0
Usual practice	10	8.0
Previous bad outcome of home delivery	6	4.8
Other *	3	2.4
Reasons for home delivery (N=692)		
Absence of health problem during labor	493	71.2
Usual practice	64	9.3
Close attention from family	52	7.5
Home delivery is more comfortable	32	4.6
Cultural influences	28	4.1
Others **	13	3.3
Reasons for forest delivery(N=221)		
Child will not survive	108	48.9
All household members will die	83	37.5
Others***	30	13.6
Problems faced during labor(N=1038)		
Yes	155	14.9
No	883	85.1
Duration of labor of last delivery(N=1038)		
<12 hours	839	80.8
12-24 hours	133	12.8
>24 hours	56	6.3
Condition of newborn (N=1038)		
Born alive	1020	98.2
Born alive but died immediately	10	1.0
Born dead	8	0.8
Health problems after delivery (N=1038)		
Yes	48	4.6
No	990	95.4
Final decision maker on place of delivery (N=1038)		
Just me	963	92.8
My husband/My relatives	71	6.8
Health workers	4	0.4

*Sudden on set of labor while in health institution for other services

** Lack of transport, lack of money to pay for transport 7 services

*** Health facility is far, unspecified culture

However, on multivariate analysis, presence of problems during labor, particularly having labor of more than 12 hours duration, ANC follow up, being knowledgeable on delivery services, consulting others for decision making and possessing radio were positively associated with preference of safe place of delivery. Those who had problem during labour were six times more likely to use institutional delivery (OR=5.88, 95%CI: 3.13, 11.11). Those who had labor for more than 12 hours, who followed ANC, who had knowledgeable on delivery services were about three times (OR= 2.75, 95%CI: 1.54, 4.92), four times (OR=3.85, 95%CI: 1.89, 7.81), and more than four times (OR=4.40, 95%CI: 1.57, 12.33) more likely to use institutional delivery respectively. Those who consulted others for decision making and who possessed radio were more than five times (OR= 5.59, 95%CI: 2.83, 10.99) and two times (OR=1.98, 95%CI: 1.03, 3.79)more likely to use institutional delivery respectively.. Gumuzes were 75% less likely (OR=0.25, 95%CI: 0.08, 0.80), to use institutional delivery as compared to other ethnic groups (Table 5 & 6).

Table 6. Associations of Obstetric Factors of respondents with preference to place of delivery in Metekel Zone, Benishangul Gumuz Region, North West Ethiopia, January -February 2007.

Variables	Delivery in health Institution		Crude OR (95%CI)	Adjusted OR(95%CI)
	Yes n (%)	No n (%)		
Problems during pregnancy				
Yes	26(18.3)	116(81.7)	1.00	1.00
No	99(11.0)	797(89.0)	0.56(0.34, 0.89)	0.87(0.40,1.93)
ANC follow up				
Yes	108(20.9)	409(79.1)	1.00	1.00
No	17(3.3)	504(96.7)	0.13(0.08, 0.22)	0.26(0.13, 0.53)
Information on ID				
Yes	72(25.9)	206(74.1)	1.00	1.00
No	36(15.1)	203(84.9)	0.51(0.33, 0.79)	0.58(0.33, 1.02)
Problems during labor				
Yes	64(41.3)	91(58.7)	1.00	1.00
No	61(6.9)	822(93.1)	0.11(0.07, 0.16)	0.17(0.09, 0.32)
Duration of labor				
<=12 hours	58(6.9)	781(93.1)	1.00	1.00
>12 hours	67(33.7)	132(66.3)	6.85(4.59, 10.20)	2.75(1.54, 4.92)
Knowledge on delivery service				
Not-Knowledgeable	7(3.2)	215(96.8)	1.00	1.00
Knowledgeable	118(14.5)	698(85.5)	5.19(2.39, 11.30)	4.40(1.57, 12.33)
Decision maker on place of delivery				
Self	90(9.3)	873(90.7)	1.00	1.00
Others	35(46.7)	40(53.3)	8.49(5.13,14.03)	5.59(2.83, 10.99)

Table 5. Association of Socio-demographic characteristics of respondents with preference to place of delivery in Metekel Zone, North West Ethiopia, January-February 2007.

Variables	Delivery in health Institution		Crude	Adjusted
	Yes n (%)	No n (%)	OR (95%CI)	OR(95%CI)
Place of residence				
Rural	44(6.8)	605(93.2)	1.00	1.00
Urban	81(20.80	308(79.2)	3.62(2.45, 5.35)	1.43(0.57, 3.60)
Religion				
Traditional	5(1.7)	293(98.3)	1.00	1.00
Others♣	120(16.20	620(83.8)	11.34(4.59, 28.05)	2.09(0.26, 19.23)
Ethnicity				
Gumuz	5(1.6)	305(98.4)	1.00	1.00
Others♣♣	120(16.5)	608(83.5)	12.05(4.88, 29.41)	4.03(1.25, 12.95)
Educational status				
Below secondary school	88(9.8)	811(90.2)	1.00	1.00
Secondary and above	37(26.6)	102(73.4)	3.35(2.17, 5.18)	1.13(0.51, 2.53)
Occupation				
House wife	101(10.7)	846(89.3)	1.00	1.00
Others ♠	24(26.4)	67(73.6)	3.00(1.80, 5.00)	1.20(0.51, 2.82)
Husband's education				
Below secondary school	70(8.8)	729(91.2)	1.00	1.00
Secondary and above	52(27.8)	135(72.2)	4.02(2.68, 5.99)	1.88(0.88, 4.03)
Husband's occupation				
Farmer	56(7.7)	669(92.3)	1.00	1.00
Others ♠♠	66(25.3)	195(74.7)	4.05(2.74, 9.98)	1.15(0.49, 2.70)
Floor of house				
Mud	115(11.5)	888(88.5)	1.00	1.00
Cement	10(28.6)	25(71.4)	3.09(1.48, 6.58)	1.55(0.54, 4.39)
Roof of house				
Thatched	55(7.5)	681(92.5)	1.00	1.00
Corrugated sheet	70(23.2)	232(76.8)	3.73(2.55, 5.49)	2.87(1.75, 4.70)
Have radio				
Yes	64(18.4)	284(81.6)	1.00	1.00
No	61(8.8)	629(91.20	0.43(0.29, 0.63)	0.51(0.26, 0.97)
Monthly income (Ethio. Birr)				
<100	23(5.7)	379(94.3)	1.00	1.00
100-499	67(13.8)	417(86.2)	2.65(1.62, 4.33)	1.55(0.89, 2.69)
>=500	32(30.5)	73(69.50	7.25(4.00, 12.99)	1.98(0.95, 4.31)

Adjusted for obstetric factors (Problems during pregnancy, ANC follow up, Information on ID, Problems during labor, Duration of labor, Knowledge on delivery service, Decision maker on place of delivery) ♣orthodox, protestant, catholic. ♣♣Shinasha, oromoo, Amhara, Agew. ♠ House wife, Gov't Employed, Student, merchant, daily laborer ♠♠Merchant, Gov't employed, student, daily laborer

Adjusted for Socio demographic characteristics (Place of residence, religion, Ethnicity, educational status, occupation, husband's education, husband's occupation, monthly income, floor of the room, roof of the room, owner ship of Radio).

DISCUSSION

This community based cross-sectional study tried to assess the status of safe delivery service utilization and associated factors among mothers who had at least one delivery in the last five years. There was low utilization of safe delivery services (12.0%) in the study area, which is consistent with the finding in North Gondar zone (13.5%) and Reproductive health need assessment done in Ethiopia (10%) (7,8). But, it is higher than the report on Ethiopian DHS 2005 (5%) (4). This difference could be due to access difference. The DHS used representative sample from the eligible women with out excluding those without access. But, only women who had access to institutional delivery were included in this study.

The likelihood of institutional delivery was six times higher when there was problem during labor. This is comparable with reports from developing countries (4, 7, 8, 9, 10). Antenatal care service utilization increased the likelihood of institutional delivery by four times in this study which is in line with the study done in North Gondar and in Jimma town (7, 11). This could be due to better access to information and having knowledge about importance of institutional delivery during prenatal visit. In line with reports from Pakistan (12), mothers' knowledge about safe delivery increased utilization of safe delivery by more than four times. Gumzes were less likely to use safe delivery services as compared to other ethnic groups which could be due to their low knowledge about safe delivery places, strong cultural influence and misperception about institutional delivery.

In other studies, women's decision-making power increased the likely hood of safe delivery service utilization (11, 12). In contrast, in this study women's decision making by themselves had negative effect on safe delivery service utilization and making decision by others increased the likelihood of institutional delivery by more than five times. This might be due to the reason that women in this area have strong cultural norms to have delivery at home or in the forest and they consult others to make decisions when the labor became complicated, and this could be due to their low awareness about importance of institutional delivery.

Having room made of corrugated iron sheet and functional radio was found to increase the likelihood of institutional delivery by three and two folds, respectively. These could be one of the indicators of high living status that leads to the preference of safe place of delivery consistent with EDHS and other studies conducted in Ethiopia (4, 7, 9, 13). Having functional radio may increase access to information.

Place of residence, educational status, religion, occupation, monthly income and birth order had significant association with safe delivery service utilization in most studies from Ethiopia (4, 7, 9, 11, 13). But, in this study, they had association only on Bivariate analysis and not significantly affected safe delivery service utilization on multivariate analysis. This could be explained by fact that they seek institutional delivery only when the labor is complicated which may be due to lack of awareness that any pregnancy can face problems.

The main reason given for home delivery was absence of health problems during delivery (71.2%) Similar with other studies conducted in Ethiopia (7, 9, 11). As observed in North Gondar, about three fourth of home deliveries in this study were attended by relatives/family or TBAs, who were unskilled on delivery care (7). This reveals most deliveries in Ethiopia are conducted at home by unskilled attendants under unsafe conditions. Trained Traditional birth attendants attended only 6.8% of home deliveries in this study which is similar with the result of the 1990 National Family and Fertility Survey of Ethiopia in which 4% of home deliveries were assisted by TTBAs (14). This might be due to thrust on family/relatives in giving support and close attention.

In conclusion there was low utilization of safe delivery service in the study area and high proportion of Gumuz mothers deliver in the forest. It was also found that mothers in the study area go for institutional delivery if the labor is complicated. Intrapartum complications, knowledge of respondents, ethnicity, having radio, prenatal service utilization and decision maker on place of delivery were identified as factors affecting safe delivery service utilization. This implies that expansion of health facility alone doesn't guaranty its utilization unless there is adequate awareness about the service and its importance.

Based on the results, providing adequate information, education and communication on safe delivery service utilization and influencing factors to the community is recommended. In addition, particular behaviour change communication should be given to Gumuz mothers to avoid forest delivery.

ACKNOWLEDGEMENTS

We would like to thank the Public Health faculty of Jimma University for providing us with financial and material support. Our thank also goes to The Benishangul Gumuz Regional State Health Bureau, particularly Ato Sabil Albeit, head of the Bureau, and Ato Desalegn Regassa, Vice head, for their cooperation and support that facilitated the study process. We would also like to

acknowledge all local administrators of Metekel Zone and all participants of the study.

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