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DETERMINANTS FACTOR FOR DELIVERY CARE UTILIZATION OF CHILD-BEARING MOTHERS IN KAFFA, SHEKA AND BENCH MAJI ZONES OF SNNPR, SOUTH-WESTERN, ETHIOPIA

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ABSTRACT

Many studies have found that the use of delivery health services is related to demographic, cultural, and socio-economic factors, such as age of women, birth order, women and husband education, religious background, occupation, marital status, traditional belief and extra. It was clearly seen in Ethiopia; the levels of maternal and infant mortality and morbidity are among the highest in the world. One explanation for poor health outcomes among women and children is the non use of health care services by a sizable proportion of women in Ethiopia. Many literatures have clearly demonstrated affairs and their loss from maternity-related causes is a significant social and personal tragedy, especially in southern Ethiopia. The purpose of this paper is to identify determinants significantly influencing the delivery care care utilization of childbearing mothers in the Kaffa, Sheka and Bench Maji zones of SNNPR, Ethiopia. 1715, childbearing mothers were selected. Binary logistic regression model was fitted data. The parameters were estimated by maximum likelihood. Measures of goodness of fit were Hosmers-lemsshow test. The data were found to have 25 % of mothers had given birth in home and 75% of mothers had given birth in health institution. The rate ratio for childbearing mothers knowledgeable about danger sign equals exp(0.0563)= 1.058 (adjusted for the other variables), which implies that those mothers knowledgeable were 1.058 times more likely deliver in health institution than those mothers not knowledgeable about danger sign during pregnancy. The rate ratio for childbearing mothers come from distance $\leq 5km$ equals exp 0.0484) = 1.049 (adjusted for

the other variables), which implies that those mothers come from distance $\leq 5km$ *are 1.049 times more likely to deliver in health institution than those mothers come from* $> 5km$.

KEYWORDS: *Delivery Care Utilization; Binary logistic Regression; Odd Ratio; Birth.*

INTRODUCTION

A skilled attendant of delivery is defined according to the WHO as an accredited health professional such as a midwife, doctor or nurse who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns (WHO, 2010).

Skilled attendants at delivery are the most widely adopted process indicator that closely correlated with maternal and prenatal mortalities (Gubhaju B. et al. 2001 and WHO, 1997). Regarding delivery care one third of births take place at home without receiving assistance from a skilled birth attendant (WHO, 2010). Previous empirical studies (i.e. DHS, WHO and ICPD) have found that the use of delivery health services is related to demographic, cultural, and socio-economic factors, such as age of women, birth order, women and husband education, wealth index, religious background, employment, marital status, traditional belief and etc. A study by Addai (2000) in Cairo found that older mothers are more likely to use delivery health care services than younger mothers. The result of this study is also consistent with Chakra borty et al. (2003).

In Ethiopia, finding form analysis of EDHS, 2000, identified that, there is a little difference among urban and rural area. Urban area women use more modern delivery health care due to the accesses of service. Masaki M. and Bina G., (2012) using logistic regression model analysis that education of women is the most important factor in determining increased utilization of maternal health services. It is well recognized that mother's education has a positive impact on health care utilization. In a study in Peru using DHS data, using logistic regression model found quantitatively important and statistically significant effect of mother's education on the use of prenatal care and delivery assistance. Similar study conducted using EDHS data of (2005), by the Ethiopian Society of Population Studies (2008), indicated female education retains a net effect on delivery health service use, independent of other women's background characteristics, households' socioeconomic status and access to health care services.

Kemal, (2009) using regression model showed that husbands' education is another factor which affects utilization of delivery health care services. Husbands' education is found to have a significant positive association with maternity care service utilization. (Elo, 1992) also found that husband's education is found to have a significant positive association with delivery care service utilization. Several studies have found a strong association between birth order and use of health care services. Because of perceived risk associated with first pregnancy, a woman is more likely to seek DHC services for first birth than higher-order births. Having more children may also cause resource constraints, which have a negative effect on health care utilization (Wong et al., 1987). In Addis Ababa as Mehari, (2012) studied using logistic regression model show that the household wealth has a very significant impact on the utilization of delivery healthcare services, with wealthier families more likely to use the health service. In Addis Ababa using logistic regression model religion is found to be significantly related with use of delivery care services (Mehari, 2012).

From the literature review we have learned that most of the researcher studied that demographic, cultural and socio-economic factors such as age of women, birth order, women's and husband's education, wealth index, religious back ground, employment, marital status and traditional belief are the most factors that influence delivery health care by using logistic regression model. Delivery health care service utilization is believed to reduce maternal mortality and morbidity directly through detection and treatment of pregnancy related illness or indirectly through detection of woman at increased risk of complications of delivery in ensuring that they delivered in suitable equipped facilities (Guillermo et al., 1992). The delivery of health care depends on group of trained professionals and paraprofessional coming together interdisciplinary as teams. The importance of delivery health care services in reducing maternal and infant morbidity and mortality has received increasing recognition since the International Conference on Population and Development (ICPD) in Cairo.

As part of a global initiative the millennium development goal (MDG) has the aim of reducing maternal mortality ratio by two third and achieving universal coverage of reproductive health by 2015. This goal was proposed to address the existing burden of maternal mortality which did not change significantly with the existing initiatives.

Statement of Problem

Women are the most responsible body for the family welfare. Women's health plays an important role in determining the health of the future population, because woman's health has an intergenerational effect. The utilization of the existing facilities for modern delivery will also low, which is clearly inadequate to reduce maternal deaths and to attain the MDG target in Teppi town which indicates the service will not bought to the desired level. So this study was designed to address the following basic questions regarding modern delivery health care service.

- ✓ What are the factors affecting utilization of delivery care utilization?
- ✓ Identify the problem of that related to delivery health care services?

Objectives of the Study

General objective: The general objective of this study was to determine the delivery care of delivery health care utilization oh child bearing mothers

- ✓ Specific Objectives: To identify the factors that affect utilization of delivery health care service and to justifying the problem that related to delivery health care services.

Significance of the Study

Awareness on usage of delivery health care service creates maternal morbidity and mortality prevention activity among community. This study is being important to contribute an input for plan of modern delivery health care to enhance the awareness of the community toward delivery health care services specifically in three zones and also it helps for health professionals to improve their capacity on service delivery mode and care providers to fulfill the necessary medical equipment. Besides, essential developing evidence –based interference that make the difference in justifying health problems, promoting health and finally improving the quality of the delivery health care in kaffa, Sheka and Benchi Maji Zones.

MATERIALS AND METHODS

Study Area

The study was conducted in Kaffa, Sheka and Benchi Maji zones, Southern Ethiopia.

Data Source: The source of the data was primary data in which childbearing mothers whose age was 15-49 years.

Study Design: Cross-sectional survey design was mainly used for collection of information on the variables of interest (response variable) and related factors (explanatory variables) at a given point in time.

Study Population: The study population was all childbearing mothers with the age of 15-49 years who had a birth in the five years preceding the survey in Kaffa, Sheka and Benchi Maji Zones. Kaffa Zone has ten Woredas and one city administration, Sheka has three Woredas and one city administration and Benchi Maji zone has ten Woredas and one city administration.

According to Zonal CSA, 2007, Kaffa Zone has 871,984 populations; from this 442,166 are females of which 197,829 are women reproductive age (15-49). Among all women, 32,182 are living in urban of which 17,783 are reproductive age (15-49) and 409, 984 women living in rural, of which 180,046 are reproductive age (15-49). Sampling units was childbearing mothers whose child age less than five years in selected three rural Woredas (Sayilem, Gimbo and Decha) and urban town (Bonga town) with respective selected Kebeles in Kaffa Zone of SNNPR, South-West, Ethiopia.

According to Zonal CSA (2007), Sheka Zone has 199,314 populations; from this 98,255 are females of which 48,939 are women reproductive age (15-49). Among all women, 16,482 are living in urban, of which 9,568 are reproductive age (15-49) and 81,773 women living in rural, of which 39, 371 are reproductive age (15-49). Sampling units was childbearing mothers whose child age less than five years in selected one Woredas (Yeki) and one town administration (Masha town) in Sheka Zone of SNNPR, South-West, Ethiopia.

According to Zonal CSA (2007), Bench Maji Zone has 652,531 populations; from this 329,183 are females of which 157,740 are women reproductive age (15-49). Among all reproductive women, 19,626 are living in urban and 138,114 women living in rural. Sampling units was childbearing mothers whose child age less than five years in selected two Woredas (Shay Bench and Maji) and one town administration (Mizan Aman Town) with respective selected *Kebeles* (*wards*) in Benchi Maji Zone of SNNPR, South-West, Ethiopia.

Variables Considered in the Study

Socio-demographic and environmental characteristics were considered as the most important determinants of delivery care utilization of mothers.

Dependent variable: In this study the dependent variable was the delivery care utilization of child bearing mothers in the age of 15-49 years.

Explanatory variables: Based on the conceptual framework on delivery care utilization, the main factors used in this study and the codes of categories are described in the following table.

Table 1: Independent Variables.

No.	Variable	Categories
1.	Zones	0= Keffa, 1=Sheka, 2= Bench Maji
2.	Age of mothers at the last pregnancy	0= <20,1= 20-24, 2=25-29, 3= 30-34,4=>=35
3.	Marital status	0= single, 1= married, 2=divorced, 3=widowed 4=separated
4.	Religion	0=orthodox, 1=catholic, 2=Muslim, 3=Protestant, 4=others
5.	Level of Mothers education	0=illitrate, 1=elementary, 2=secondary, 3=higher +
6.	Level of fathers education	0=illitrate,1=elementary,2=secondary,3=higher +
7.	Mother's occupation	0=farming,1=trader,2=piece work,3=Office work
8.	Husband's occupation	0=farming,1=trader,2=piece work,3=Office work
9.	Abortion	0=No, 1=Yes
10.	Distance from nearest health station	0=<5km, 1=>=5km
11.	Decision maker to seek health care	0=self,1=husband,2=jointly,3=other
12.	Knowledge status of danger sin during pregnancy	0=knowledgeable, 1=not knowledgeable
13.	Birth order	0=[1,2),1=[2-3],2=(3-5], 3=5+
14.	Sources of information and knowledge of participating mothers on ANC	0=radio,1=health professions,2=traditional delivery,3=relatives,4=partner, 5=none
15.	Volunteers	0=No, 1=Yes
16.	Place of residence	0=Rural,1=Urban
17.	Transport problem	0= No,1= Yes
18.	Satisfied with the services	0= No,1= Yes
19.	Timely visited	0= No,1= Yes

Sampling Procedure and Sample Size Determination

Using simple random sampling method from Kaffa zone urban Woredas, Bonga town and from rural Woredas Gimbo and Decha were selected as a first stage clusters. Respective kebeles were selected randomly from selected Woredas as second stage clusters. Hence, from urban, Bonga town; from 32 rural kebeles of Gimbo Woreda Kushit and Choba; from 60 rural kebeles of Decha Woreda, Yeba and Ermo were selected using lottery method for complete enumeration from clusters as two stage clusters.

From Sheka zone, urban Woredas, Masha city administration and from rural Yeki Woredas were selected as first stage clusters. Respective kebeles were selected randomly from selected Woredas as second stage clusters; from 22 rural kebeles of Yeki Woreda, Ermich and Fide were selected using lottery method for complete enumeration from clusters as two stage clusters.

From Benchi Maji zone; urban Woredas, Mizan Aman city administration and from rural Woredas Shay Bench and Maji were selected as first stage clusters. Respective kebeles were selected randomly from selected Woredas as first stage clusters. Hence, from urban Kebeles of Mizan Aman, 03; from 20 rural kebeles of Shay Bench Woreda, Kusha and Maha; from 22 rural kebeles of Maji Woreda, Haro and Kushit were selected using lottery method for complete enumeration from clusters as two stage clusters.

The sample size was calculated using a single population proportion formula using the following parameters: confidence level, margin of error, and expected prevalence of the delivery care utilization of mothers. Then

$$n = \frac{(Z_{\alpha/2})^2 PQ}{d^2} x deff \quad \ldots\ldots\ldots\ldots\ldots\ldots 1 \text{ (Cochran, 1977)}$$

Where, n is the required sample size, $Z_{a/2}$ is a 95% confidence level for normal distribution which is 1.96, d is margin of error (3%), P is expected prevalence of the number of delivery care utilization of child bearing mothers(41%), and $deff$ is the design effect which means the loss of effectiveness by the use of cluster sampling, instead of simple random sampling. The default value of $deff$ the sample design effect should be set at 1.66 unless there is supporting empirical data from previous or related surveys that suggest a different value (MiniEDHS, 2014).

Thus, considering $p = 0.41$ and $deff = 1.66$ the sample size for this study becomes

$$n = \frac{(1.96)^2 * 0.41 * 0.59 * 1.66}{(0.03)^2} \sim 1715 \quad \ldots\ldots\ldots\ldots\ldots\ldots 2$$

Table 2: Proportional Allocation of Sample Size for the Three Zones.

Zones	Rural		Urban		Total Sample Size
	Proportion	size	Proportion	Size	
Kaffa	180046/404508*1715	763	17783/404508*1715	75	838
Shaka	39371/404508*1715	167	9568/404508*1715	41	208
BenchiMaji	138114/404508*1715	586	19626/404508*1715	83	669
Grand Total		1516		199	1715

Data Collection Methods

Data were collected using structured questionnaire by administering face to face interview within 4 months. The study unit holds in our arms all childbearing mothers that were confessed to the study districts in the study area at the time of data collection. In addition to English, the questionnaires were translated into Amharic language; professionals were recruited living in the study sub-districts to interview child bearing mothers with the age of 15-49 years. They were took intensive one-day training by the investigators and professional expert on interviews techniques, observational, data recording, approaches to promote health education, and advocacy of mothers health follow-up.

Inclusion and exclusion criteria

All childbearing mothers whose age 15-49 years and have children during the survey were considered as inclusion and mothers who haven't children were not included in the study.

Data analysis

Investigating statistical question and also it provides us with process for determining the structure of data that should direct as to wards the proper inference procedure.

Descriptive Statistics

Descriptive statistics are utilized numerical structure of data set to summarize and to present that information in convenient form.

Inferential statistics

Logistic Regression model

Logistic regression analysis extends the techniques of regression analysis to research situations in which the outcome variable is categorical. Generally, the response variable is binary, such as (delivery status (home or health institution). Binary logistic regression is most useful when you went to model the event probability for a categorical response variable with

two outcomes. Since the probability of an event must lie between 0 and 1, it is impractical to model probabilities with linear regression techniques, because the linear regression model allows the dependent variable to take values greater than 1 or less than 0. The logistic regression model is a type of generalized linear model that extends the linear regression model by linking the range of real numbers to the 0-1 range.

The regression coefficients are estimated through an iterative maximum likelihood method. More generally, the response variable in logistic regression is usually dichotomous, we were define such a response variable as Y, and denote the even y=1, when the subject has the characteristic of interest and y=0, when the subject does not have that characteristic of interest. So an alternative form of the logistic regression equation is the logit transformation of Pi given as: $logit[P_i] = log\left(\frac{Pi}{1-P_i}\right) = \beta_0 + \beta_1 X_{11} + \beta_2 X_{12} + \cdots + \beta_k X_{1k}$……3.

The coefficient can be interpreted as the change in the log-odds associated with a one unit change in the corresponding independent variable or the odd increases multiplicatively by $e^{\beta t}$for every one unit change increase in X_t=1, 2…k.

Parameter Estimation for Logistic Regression

The maximum likelihood and non-iterative weighted least squares are the two most computing estimation methods used in fitting logistic regression model (Hosmer and Lemeshow, 1989).

Consider the logistic model$P(X_1) = \frac{e^{X\beta}}{1+e^{X\beta}}$, since observed values of Y say, Yi's (i=1, 2… n) are independently distributed as binomial and, the maximum likelihood function of Y is given by.

$$L(\beta|Y) = \prod_{i=1}^{10} p(Y_t|X_{t1}, X_{t2} \ldots . X_{tk}) = \prod_{t=1}^{10} \left[\frac{e^{X\beta}}{1+e^{X\beta}}\right]^{Y_t} \left[\frac{1}{1+e^{-X\beta}}\right]^{1-y_t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

Model Diagnostic Test.

The Homers and Lemeshow Test Statistic

The Homers and Lemeshow goodness of fit statistic is used to measures the correspondence between the actual and predicted values of the dependent variable. The Hosmer –Lemeshow test is commonly used to test for assessing the goodness of fit of model and allows for any number of explanatory variables, which may be continuo's or categorical. The test is similar

to chi-square goodness of goodness of fit test and has the advantage of portioning the observation into groups of approximately equal size, and therefore there are less likely to be groups with very low observed and expected frequencies. In this case, better model fit is indicated by a smaller difference in the observed and predicted classification.

RESULTS AND DISCUSSION

The distribution of mothers who had a live birth in the five years preceding the survey who delivered in home and health institution is given in Table 3. A total of 1715 women birth at least once within the last five years before the survey were interviewed from three zones (Kaffa, Sheka and Benchi-Maji). 429 (25%) of the childbearing mothers had delivered in home while 1286 (75%) of the childbearing mothers had delivered in health institution. The percentage and frequency of each socio demographic factors were given in table 3 below.

Table 3: The Socio-Demographic Factors of Delivery Care Visit Utilization of Childbearing Mothers in Kaffa, Sheka and Benchi Maji Zones.

Variables	Variable Categories	Place of delivery		Chi-Square test	
		In home (%)	In health institution (%)	df	p-value
Zones	Keffa	111(6.5)	395(23.0)	2	0.002
	Sheka	96(5.6)	349(20.3)		
	Benchi-Maji	222(12.9)	542(31.6)		
Age of mothers	<20	5(0.3)	25(1.5)	4	0.194
	20-24	104(6.1)	270(15.7)		
	25-29	131(7.6)	461(26.9)		
	30-34	86(5)	250(14.6)		
	≥35	103(6)	280(16.3)		
Age at first pregnancy	<20	130(7.6)	322(18.8)	4	0.008
	20-24	197(11.5)	569(33.2)		
	25-29	57(3.3)	233(13.6)		
	30-34	24(1.4)	115(6.7)		
	>35	21(1.2)	47(2.7)		
Marital status	Single	17(1)	52(3)	3	0.125
	Married	353(20.6)	1066(62.2)		
	Divorced	36(2.1)	129(7.5)		
	Widowed	23(1.3)	3.9(2.3)		
Residence	Urban	95(5.5)	642(37.4)	1	0.000
	Rural	334(19.5)	644(37.6)		
Religion	Orthodox	175(10.2)	586(33.1)	5	0.000
	Catholic	18(1)	64(3.7)		

	Muslim	44(2.6)	182(10.6)		
	Protestant	147(2.6)	443(25.8)		
	Traditional	45(26)	28(1.6)		
	Others	(0.0.)	1(0.1)		
Mother educational status	Illiterate	234(13.6)	341(19.9)	3	0.000
	Elementary	148(8.6)	385(22.4)		
	Secondary	30(1.7)	311(18.1)		
	Higher +	17(1)	249(14.5)		
Husband educational status	Illiterate	181(10.6))	259(15.1)	3	0.000
	Elementary	167(9.7)	342(19.9)		
	Secondary	53(3.1)	307(17.9)		
	Higher and above	28(1.6)	378(22)		
Mothers occupation	Farmer	356(20.8)	661(38.5)	3	0.000
	Trader	51(3)	281(16.4)		
	Piecework	3(0.2)	23(1.3)		
	Office	19(1.1)	321(18.7)		
Husband occupation	Farmer	342(19.9)	607(35.4)	3	0.000
	Trader	55(3.2)	259(15.1)		
	Piecework	4(0.2)	9(0.5)		
	Office	28(1.6)	411(24.0)		
Abortion	Yes	72(4.2)	227(13.2)	1	0.714
	No	357(20.8)	1059(61.7)		
Distance	<=5	230(13.4)	959(55.9)	1	0.000
	>5	199(11.6)	327(19.1)		
Decision	My self	573.1)	166(9.7)	3	0.774
	Husband	21(1.2)	54(3.1)		
	Jointly	354(20.6)	1059(61.7)		
	Others	1(0.1)	7(0.4)		
Danger sign	Knowledgeable	103(6)	647(37.7)	1	0.000
	Not Knowledgeable	236(19)	639(37.3)		
Birth Order	[1-2)	71(4.1)	171(10)	3	0.000
	[2-3]	207(12.1)	382(22.3)		
	(3-5]	73(4.3)	428(25)		
	5+	78(4.5)	305(17.8)		
Information	Radio	23(1.3)	53(1.8)	5	0.000
	Health profession	261(15.2)	990(57.2)		
	Traditional delivery	16(0.9)	13(0.8)		
	Relatives	21(1.2)	31(1.8)		
	Partners	10(0.6)	71(4.1)		
	Them selves	98(5.7)	128(7.5)		
Volunteers	Yes	46(2.7)	42(2.4)	1	0.000
	No	383(22.3)	1244(72.5)		
Timely visited	Yes	183(10.7)	1018(59.4)	1	0.000
	No	246(14.3)	268(15.6)		
Transportation	Yes	111(6.5)	335(19.5)	1	0.499
	No	318(18.5)	951(55.5)		
Satisfaction	Yes	224(13.1)	110(64.2)	1	0.000
	No	205(12)	185(10.8)		

From the chi-square test: All except decision making, abortion, transportation, marital status and age of mothers are significantly associated with the delivery care utilization of mothers in the three zones.

In the zone: 395(23.0) of mothers who lived in Kaffa zone delivered in health institution while111 (6.5) of mothers delivered in home; 349(20.3) of mothers in Sheka zone delivered in health institution while 96(5.6) of mothers delivered in home and 542(31.6) of mothers in Benchi Maji zone delivered in health institution while 222(12.9) of mothers delivered in home.

Age of first pregnancy: 322(18.8) of the childbearing mothers were in the age group of bellow twenty; 569(33.2) in the age group between twenty and twenty four; 233(13.6) with the age group twenty five and twenty nine; 115(6.7) with the age group thirty and thirty four and 47(2.7) with the age group of thirty five and above delivered their children in health institution while 130(7.6) mothers with the age of bellow twenty; 197(11.5) of mothers with the age of twenty and twenty four; 57(3.3) of mothers with the age of twenty five and twenty nine; 24(1.4) of mothers with the age of thirty and thirty four; 21(1.2) of mothers who delivered in home.

Marital status: 17(1); 353(20.6); 36(2.1); 23(1.3) of mothers respectively were single, married, divorced and windowed delivering in their child home while, 52(3); 1066(62.2); 129(7.5) and 3.9(2.3) of mothers respectively and their marital status were respectively are single, married, divorced and windowed and who delivered in health institution.

Religious aspect: 175(10.2); 18(1); 44(2.6); 147(2.6); 45(26) 0(0.0.) of mothers whose religion respectively are Orthodox, Catholic, Muslim, Protestant, Traditional and Others delivered in home while 586(33.1), 64(3.7), 182(10.6); 443(25.8); 28(1.6) and 1(0.1) of mothers delivered in health institution.

Residence aspect: 95(5.5) and 334(19.5) of mothers who were in urban and rural respectively delivered in home while 642(37.4) and 644(37.6) of mothers delivered in health institutions.

Education Level: 234(13.6); 148(8.6); 30(1.7) and 17(1) of child bearing mothers whose education status respectively were illiterate; Elementary; Secondary and Higher+ delivered in

home while 341(19.9); 385(22.4); 311(18.1) and 249(14.5) of mothers delivered in health institution.

Decision making: 573.1); 21(1.2); 354(20.6); 1(0.1) of child bearing mothers were decided by Myself, Husband, Jointly and others delivered in home while 166(9.7); 54(3.1); 1059(61.7); and 7(0.4) of mothers respectively delivered in health institution.

With regard to **birth interval**: 71(4.1) ; 207(12.1); 73(4.3); 78(4.5) and 23(1.3) respondent or child bearing mothers with their birth interval between [1-2); [2-3]; (3-5] and 5+ respectively delivered in home while 171(10); 382(22.3); 428(25); 305(17.8) and 53(1.8) with birth interval [1-2); [2-3]; (3-5] and 5+ respectively of mothers responded that they delivered in health institution.

With regard to **source of information**: 53(1.8); 990(57.2); 31(1.8); 71(4.1) of mothers gained information from Radio; Health profession; Traditional delivery; and partners respectively delivered in home while 23(1.3); 261(15.2); 16(0.9); 21(1.2) and 10(0.6) gained information from Radio; Health profession; Traditional delivery; and partners respectively delivered in health institution.

Table 4: Hosmer and Lemeshow Test of goodness of fit the model.

Step	Chi-square	df	Sig.
1	23.826	8	0.120

The insignificance of the test indicated that the model is well fitted

Table 5: The maximum likelihood parameter estimates of Binary logistic regression.

Parameter	Variable category	Estimate	Std Error	95% Conf Limits		P-value
Intercept		0.8459	0.3835	0.0942	1.5976	0.0274
zone	Keffa	0.0365	0.0333	-0.0288	0.1017	0.2732
	Sheka	0.0333	0.0348	-0.0350	0.1016	0.3395
	Benchi maji(ref)					.
Residence	Urban	-0.0267	0.0276	-0.0807	0.0274	0.3340
	Rural(ref)					.
Marital status	Single	0.0249	0.0647	-0.1019	0.1518	0.7000
	Married	0.0303	0.0489	-0.0656	0.1262	0.5356
	Divorced	0.0461	0.0543	-0.0603	0.1525	0.3960
	Windowed(ref)					.
Religion	Orthodox	-0.3406	0.3582	-1.0426	0.3614	0.3416
	Chatolic	-0.3416	0.3598	-1.0468	0.3636	0.3424
	Protestant	-0.3187	0.3587	-1.0218	0.3844	0.3744

	Muslim	-0.2996	0.3581	-1.0014	0.4022	0.4028
	Traditional	-0.3478	0.3610	-1.0554	0.3597	0.3353
	Others (ref)					.
Mother education status	Illiterate	-0.0871	0.0476	-0.1805	0.0062	0.0674
	Elementary	-0.0868	0.0442	-0.1734	-0.0001	0.0496
	Secondary	0.0040	0.0386	-0.0716	0.0796	0.9169
	Higher+(ref)					.
Husband educational status	Illiterate	-0.0280	0.0475	-0.1212	0.0652	0.5563
	Elementary	-0.0311	0.0435	-0.1163	0.0540	0.4735
	Secondary	0.0633	0.0388	-0.0127	0.1393	0.1026
	Higher+(ref)					.
Mother' s occupation	Farmer	-0.0175	0.0465	-0.1086	0.0735	0.7060
	Trader	-0.0061	0.0407	-0.0859	0.0737	0.8803
	Piecework	0.1079	0.0774	-0.0439	0.2596	0.1635
	Office(ref)					.
Hus occup	Farmer	-0.0850	0.0424	-0.1681	-0.0020	0.0448
	Trade	-0.0369	0.0391	-0.1135	0.0398	0.3461
	Piecework	-0.1811	0.1070	-0.3908	0.0287	0.0906
	Office(ref)					.
abortion	Yes	-0.0357	0.0251	-0.0848	0.0135	0.1551
	No(ref)					.
Decision making	My self	-0.2162	0.1296	-0.4702	0.0378	0.0953
	Husband	-0.1668	0.1327	-0.4269	0.0933	0.2087
	Jointly	-0.1941	0.1270	-0.4430	0.0548	0.1264
	Others(ref)					.
danger sign	Knowledgeable	0.0563	0.0216	0.0140	0.0986	0.0090
	Not knowledgeable					.
Birth order	[1-2)	-0.0172	0.0338	-0.0835	0.0491	0.6106
	[2-3]	-0.0226	0.0286	-0.0787	0.0334	0.4287
	(3-5]	0.0277	0.0272	-0.0256	0.0810	0.3086
	5+(ref)					.
Source of information	Radio	0.1156	0.0504	0.0169	0.2143	0.0217
	Health profession	0.1590	0.0309	0.0984	0.2195	<.0001
	Traditional delivery	0.0709	0.0728	-0.0717	0.2135	0.3300
	Relatives	0.0665	0.0576	-0.0464	0.1795	0.2484
	Partners	0.2147	0.0516	0.1135	0.3159	<.0001
	Themselves (ref)					.
noofvisit		0.0504	0.0060	0.0386	0.0622	<.0001
Volunteerism	Yes	-0.0391	0.0411	-0.1197	0.0416	0.3423
	No	0.0000	0.0000	0.0000	0.0000	.
timelyvisited	Yes	0.0591	0.0245	0.0112	0.1071	0.0157
	No(ref)					.
Transport	Yes	-0.0271	0.0230	-0.0723	0.0181	0.2393
	No (ref)					.
satisfaction	Yes	0.2068	0.0244	0.1591	0.2546	<.0001
	No (ref)					.
Age	<20	0.0937	0.0723	-0.0480	0.2354	0.1948

Of mothers	20-24	0.0211	0.0315	-0.0407	0.0829	0.5033
	25-29	0.0460	0.0278	-0.0086	0.1005	0.0987
	30-34	-0.0123	0.0286	-0.0683	0.0438	0.6683
	≥35(ref)					.
Age at first pregnancy	<20	-0.1064	0.0565	-0.2171	0.0042	0.0595
	20-24	-0.0958	0.0532	-0.2001	0.0084	0.0716
	25-29	-0.0695	0.0535	-0.1743	0.0353	0.1936
	30-34	0.0080	0.0538	-0.0974	0.1134	0.8816
	≥35(ref)					.
Distance in km	<=5	0.0484	0.0227	0.0040	0.0928	0.0326
	>5(ref)					.

** refers to p<0.05. ** refers to p<0.01. *** refers to p<0.001*

The odds ratio for mothers not timely per visited timely equals exp0.0271) = 0.973 (adjusted for the other variables), which implies that those mothers not timely visited were 0.973 times less likely delivered in health institution than those mothers who were delivered in home. Or the probability of mothers who not timely visited were 2.67 times less likely delivered in institution than home.

The odds ratio for mothers who were satisfied equals exp (0.2068)=1.229 (adjusted for the other variables), which implies that those mothers who were satisfied are 1.229 times more likely to deliver in health institution than those mothers who were not satisfied. In other words, the odds of the mother satisfaction are significantly higher for mothers not satisfied during pregnancy.

The odds ratio for mothers whose who used radio source of information is radio equals exp(0.1156)= 1.122 (adjusted for the other variables), which implies that those mothers gained information from radio are 1.122 times more likely deliver in health institution than those mothers who gained information from themselves. The odds ratio for mothers who gained information from health professionals are equals exp(0.1590)= 1.172 (adjusted for the other variables), which implies that those mothers who gained information from health professionals were 1.172 times more likely to deliver in health institution than those mothers as compared to the reference variable and similarly the odds ratio for mothers who gained information from partners equals exp(0.2147)= 1.239 (adjusted for the other variables), which implies that those mothers who gained information from partners were 1.239 times more likely to deliver in health institution than mothers their information were themselves.

The odds ratio for mothers whose husband occupation were farmer are exp(-0.0850)= 0.919 (adjusted for the other variables), which implies that those mothers whose husband occupation were farmer 0.919 times less likely to deliver in health institution than those mothers whose husband occupation were office.

The rate ratio for childbearing mothers knowledgeable about danger sign equals exp(0.0563)= 1.058 (adjusted for the other variables), which implies that those mothers knowledgeable were 1.058 times more likely deliver in health institution than those mothers not knowledgeable about danger sign during pregnancy. The rate ratio for childbearing mothers come from distance less than and equal to five kilo meter equals exp 0.0484) = 1.049 (adjusted for the other variables), which implies that those mothers come from distance less than end equal to five kilo meter are 1.049 times more likely to deliver in health institution than those mothers come greater than five kilometer.

DISCUSSION

Delivery care service utilization is very important to reduce maternal death due to give birth at home with traditional delivery methodology. In fact, the deaths of child bearing mothers are expected to minimize when they give birth at any health institution with skilled attendant delivery. Binary logistic regression is intensively used to estimate the parameters on the effect of socio-demographic on delivery care service utilization. With this regard, the magnitudes of the problems were quantified and analyzed using both descriptive statistics and inferential statistics. In descriptive statistics, among one thousand seven hundred fifteen child bearing mothers, twenty five percent of mothers gave birth at home where as seventy five percent of child bearing mothers in health institution. The current study showed too much progression for modern delivery care utilization as compared to the study conducted done in determinants of conventional health service utilization among pastoralists in northeast Ethiopia (Tewodros Dubale, Damen Haile Mariam, 2007).

Seventy five percent of mothers gave birth at health institution has a significant improvement on maternal health care and this may be attention was given for maternal care by Ethiopian Ministry of Health. It is confidently to say the health human power, accessibility of health institution(clinics, hospitals), skilled health extension programs and awareness about bad cultures and believes with regard to maternal care were expectedly given in Ethiopia as compared to the study conducted in the Sudan house hold survey results shows a very low

proportion of institutional delivery (twenty percent). Sudanese women perceive delivery at health facilities as meaning that they are unable to deliver normally. Delivery at home, where there is no means of reliable transportation, may lead to maternal death in cases of emergency; furthermore, obstructed labor during home delivery is a known cause of fistula in Sudan (Mohamed and Boctor 2009).

The current study showed that it is more prevalent that they deliver in health institution as compared to United Nations data about maternal health care from developing countries are as follows; 40% of deliveries took place in health facilities (United Nations,2004); and skilled health personnel assisted nearly 61% of births in 2006 (United Nations,2008). Obviously, the current study indicated that the commitment of Ethiopian government to maternal health care have reached ultimately positive.

When it has been seen the result of the current study, seventy five percent of child bearing mothers utilized health care service those who lived in rural area is 37.6 percent and still it is significantly high as compared to the study conducted in the Factors affecting maternal health care services utilization in rural Ethiopia specifically in Demography survey data South Nation Nationalities peoples of Regional State is (6.4 percent) (Kassu Mehari, Eshetu Wencheko, 2011).

From the chi-square test of association, mother education, mother occupation, husband occupation, husband education, distance from health facility, religion and time take to the service were significantly associated with the delivery care service utilization at 5% level of significance and similar study conducted an assessment of factors affecting the utilization of maternal health care service delivery: the perspective of rural women in the case of Duna Woreda, Hadiya Zone (Abaychew Zeleke,2015).

Antenatal care visit is the main factor that contributed to increase the delivery care utilization in health institution to reduce maternal death due to delivery complication. The current study revealed that antenatal care visit is significantly influencing the delivery care service utilization in Kaffa, Sheka and Benchi Maji Zones under binary logistic regression model and similar study conducted in Sudan for Utilization of ANC services in Sudan is influenced by a number of factors. The mothers' level of education has a direct positive relation with utilization of the services, and utilization of ANC in urban areas is five times higher than that in rural areas (Ibnouf et al. 2007).

CONCLUSION AND RECOMMENDATION

From descriptive statistics, among 1715 mothers 25% mothers gave birth at home where as 75% gave birth in health institution. Based on the result from the parameter binary logistic regression model, source of information (radio, health professions and partners), number of antenatal care visit, time of visit, satisfaction of mothers due to service given, mother education and husband occupation are significantly influencing the delivery care utilization of child bearing mothers in three zones. Henceforth, it is recommended to the concerned body to set policy or strategy to tackle the problem that hinders the mothers who will give birth at home.

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Statement of Data availability

The data are collected primary source of information from Kaffa, Sheka and Benchi Maji Zones, Ethiopia.

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