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ARTICLE

Full Length Research Paper

Knowledge of obstetric danger signs and birth preparedness practices among pregnant women in rural communities of Eastern Ethiopia

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Key elements of the birth plan package include recognition of danger signs. Although there are some studies on birth preparedness and complication readiness in Ethiopia; most of them studied women attending antenatal care. Moreover, there is no data on the eastern part of the country where the culture is more liberal and cash crop is the mainstay of the livelihood. This study explored the association between knowledge of obstetric danger signs and birth preparedness among pregnant women in rural communities. A cross sectional community based study was conducted in Dere Teyara District (Woreda) of Rural Harari Region in the Eastern Ethiopia from March to May, 2013. The sample size was determined using formula for estimation of single population proportion. A total of 436 pregnant women were selected using simple random sampling technique. A pre tested interviewer administered structured questionnaire was used to collect relevant data. The data were coded and entered into and analyzed using SPSS for windows version 20. Multivariable logistic regression analyses were used to isolated independent predictors of good birth preparedness. Out of 423 respondents, 42.8% (181/423) of the pregnant women had good birth preparedness. A total of 28.6, 28.6 and 40.9% had good knowledge on obstetrical danger sign during pregnancy, delivery and post-partum period, respectively. The main danger signs during pregnancy mentioned were vaginal bleeding (75.5%) and severe headache (68.8%), while severe vaginal bleeding (81.1%) and prolonged labor (39.2%) were mentioned to be danger signs during delivery. Severe vaginal bleeding (68.3%) and swollen hands/face during the postpartum period (44.7%) were stated to be danger signs in the post partum period. On multivariable logistic regression model, women who had literate husbands were 2.8 times more likely to have good preparedness (adjusted odds ratio (AOR)=2.83; 95% confidence interval (CI)=1.423, 5.655). Literate mothers were 2.46 times more likely to be birth prepared (AOR=2.46; 95% CI= 1.09, 5.57). Likewise, women who started the first antenatal visit before four months of pregnancy were 15.5 times more likely to have good birth preparedness (AOR=15.50; 95% CI=3.713, 64.67). It was also observed that, women who had two or more ANC visits were nearly twice as likely to have good birth preparedness (AOR=1.96; 95% CI=1.13, 3.41). Women with good knowledge on obstetric danger signs during pregnancy (AOR=2.517; 95% CI=1.39, 4.55) and postnatal period (AOR=2.245; 95% CI=1.26, 3.97) were also more likely to be birth prepared than those without this knowledge. Antenatal care attendance, knowledge about obstetric danger signs and literacy status of the woman and her husband were strong predictors of birth preparedness practices. The findings imply the need for behavior change communication on obstetric danger signs and the importance early initiation of ANC follow up, especially to illiterate women to reduce maternal mortality.

Key word: Birth preparedness, complication readiness, birth.

INTRODUCTION

World Health Organization(WHO) estimates that 300 million women in the developing world suffer from short-term or long-term illness brought about by pregnancy and child birth (WHO, 2005) leading to high toll of maternal mortality (WHO, 2003; 2005). More than half of these deaths occur in Sub-Saharan Africa (Berhan and Berhan 2014; ESPS, 2005; WHO, 2007). Maternal mortality rate in Ethiopia (676 per 100,000 live births), is still among the highest in the world. The major causes of maternal death are obstructed/prolonged labor, ruptured uterus, severe preeclampsia, an eclampsia Central Statistical Agency (CSA, 2012). Approximately, 15% of pregnant women develop life-threatening complications that are unpredictable and may progress rapidly to a fatal outcome (Bazant and Koeing, 2009). Despite a little improvement in ANC attendance coverage (34%). institutional delivery rate is still low (Central Statistical Agency Ethiopia and ICF International, 2012). Life-threatening delays can happen at home, on the way to care, or at the place of care (WHO, 2007). Maternal mortality is closely correlated with access to and the quality of health facilities and professionals (Koblinsky et al., 2008). Birth preparedness and complication readiness (BPACR) is a safe motherhood strategy with the objective of promoting the timely use of skilled maternal and neonatal care during child birth and obstetrical emergencies by reducing delays to seek care, in reaching care, and in receiving care (World Health Organization (WHO, 2002; 2006). It is the process of planning for normal birth and anticipating the actions needed in case of an emergency to promote the timely use of skilled maternal care (JHPIEGO, 2004a). Pregnant women's knowledge of obstetric danger signs and their birth preparedness aims at enhancing utilization of skilled care in low income countries (Baye et al., 2004). Every woman and newborn faces risk, implying the need for preparedness of health care providers and the facilities to address emergencies at all times in order to save lives (JHPIEGO, 2001). In principle, all pregnant women should have a written plan for birth and for handling unexpected adverse events, such as complications or emergencies that may occur during pregnancy, childbirth or immediate postnatal period (Kaye et al., 2003; UNDP, 2010). The key elements of the birth plan package include recognition of danger signs, plan for birth attendant, plan for the place of delivery, and saving money for transport and other costs in case need arises (JHPIEGO, 2008). BPCR is a comprehensive matrix that includes preparing pregnant women, their families, communities, providers, facilities, and policy makers to reduce the delays that contribute to maternal and newborn deaths by ensuring the woman receives timely and appropriate care with timely preparation and rapid action. It must include plans and actions that can be implemented at each of these points (JHPIEGO, 2008).

Knowledge of danger signs is essential to make fast decisions for seeking emergency interventions (Rogo et al., 2001). Ministry of Health of Ethiopia and WHO recommend that pregnant women should receive focused antenatal care (UNICEF, 1999). Birth preparedness is a fundamental component of ANC aiming at reducing any unnecessary delays to seek emergency obstetric care (United Nations Children's Fund (WHO, 2006). Complication readiness (emergency funds, transport, blood donor, and designated decision-maker) receive greater emphasis in emergency obstetric care programs (JHPIEGO, 2004b). When complications occur, the unprepared family will waste a great deal of time in recognizing the problem, getting organized, getting money, finding transport, and reaching the appropriate referral facility (Kabakyenga et al., 2011). Studies among ANC attending pregnant women in Uganda, Kenya, Nigeria, and Tanzani showed that maternal education was positively associated birth preparedness (Mutiso et al., 2008; Ekabua et al., 2011; Kabakyenga et al., 2011; David et al., 2012). In Ethiopia, although there are some studies that documented birth preparedness and complication readiness in the northern (Hiluf and Fantahun, 2007) and the southern (Hailu et al., 2011) part of the country, they were not community based and some of the studies did not address some aspects of birth preparedness. Moreover these studies do not represent the eastern part of the country where there is more liberal culture and cash crop is the mainstay of livelihood. The eastern part of Ethiopia is different in cultural practices surrounding birth and in various other ways from areas where studies are done in Ethiopia as it is a cash crop area. This study was undertaken to examine the knowledge of obstetric danger signs and birth preparedness practices among pregnant women in rural Harar, East Ethiopia using a community based study.

MATERIALS AND METHODS

Study setting and subjects

A community based cross sectional study was conducted in rural Harari Regional State from March to May, 2013. Harari Region is located in 515 km away from Addis Ababa eastward and has 36 Kebeles, out of which 19 are urban and 17 are rural. It had a total population of 183,344, of which 50.3% were men and 49.7% were

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women. It has one health center and 6 health posts based on the 2007 census. All pregnant women who live in the three rural district of Harari Region, namely: Dere Teyara, Erer, and Sofi were considered as a source population, while all pregnant women who live in selected Kebeles of Dere Teyara district who fulfilled the inclusion criteria were the study population. Dere Teyara has a total population of 31,879, of which pregnant women are estimated to be 1594.

The inclusion criteria were being pregnant and living in the study area for the last six months before the survey. Pregnant women who were critically ill and who were unable to communicate at the time of the survey were excluded. Sample size was determined using a formula for estimation of a single population proportion assuming the proportion of women with good birth preparedness to be 22% from previous study (27) (Hiluf and Fantahun, 2007) with 95% confidence level and a margin of error of 5%.

$$n_{i} = (Z\alpha/2)^2 p(1-P) / d^2$$

Where n= sample size, $Z\alpha/2$= standard normal variable at for 95% confidence level (1.96), p = expected prevalence of good birth preparedness = 22%, and d = precision (margin of error) = 0.05. With the aforementioned inputs, the minimum sample required was 264. Since the source population is less than 10,000, the sample size was adjusted with the following correlation formula.

$$nf = \frac{ni}{1 + \frac{ni}{N}}$$

$$nf = \frac{264}{1 + \frac{264}{806}}$$

$$nf = 198$$

Considering a design effect of 2 and 10% non-response rate, the total sample size became 436.

Sampling technique

From three rural Woredas, Dere Teyara Woreda (district) was selected randomly and all Kebeles (smallest administrative unit equivalent to country) were listed and included in the study. Sample size was proportionally allocated to each Kebele. A sampling frame enlisting all eligible study subjects was prepared and used for randomly selecting the women from each kebele. All women who reported to be pregnant based on the missed last menstrual period were included in the study.

Measurement and variables

Birth preparedness was used as dependent variable, while age, marital status, religion, ethnicity, education, income, family size, husband's occupation and education, knowledge of danger signs, parity, and complications experienced history of still birth, antenatal care (ANC) follow up and number of visits, and time of first antenatal care visits were used as independent variables.

A structured Amharic version questionnaire on monitoring BPACR developed by JHPIEGO maternal and neonatal health program (JHPIEGO, 2004a) was adapted according to local context and the objectives of the study and was used for data collection.

Some of the questions were taken from safe motherhood questionnaire with Cronbach's alpha of 0.81 and modified based on

study interest. The English version questionnaire was translated to Amharic and Oromifa by a person who speaks both English and the respective languages. Another individual of similar ability retranslated the Amharic and Afan Oromo version back to English for checking for its original meaning. Proper training of the data collectors and supervisors, and pre-testing of the instrument was done before the actual data collection time.

The data collection tool was pre tested on 5% of the total sample size in Gelmeshera Kebele, which is not included in the actual sample. Findings and experiences from the pre-test were used for modifying the interview method and data collection tool.

Three health extension workers who are fluent speakers of the local language conducted census of all pregnant women. Six health extension workers interviewed eligible pregnant women after taking thorough training on the objective of the study and the questionnaire. Two bachelor midwife nurses were selected from hospital supervised the data collectors. Data collectors and supervisors were trained for two days. The data were analyzed with the following operational definitions.

Birth preparedness practice

There are 10 questions assessing birth preparedness. For each of the questions, having the practice was rendered a score of 1, and lack of the practice question was rendered a score of zero. The values were summed to get the birth preparedness index. Pregnant women were classified to have good birth preparedness in the current pregnancy if she had score three-fourth (75%) of the total. Danger signs are not the actual obstetric complications, but symptoms that are easily identified by non-clinical personnel. Danger sign of pregnancy, labor, and delivery are shown as follows (WHO, 2002).

Knowledge of obstetrical danger signs during pregnancy: There were ten question assessing knowledge of danger signs during pregnancy. All correct responses were given a score of "1" and all wrong responses were given a score of "0" and the values were summed to produce a knowledge score. A pregnant woman was considered good knowledgeable, if she has the highest Tertile of knowledge score.

Knowledge of obstetrical danger signs during labor: There are seven question assessing knowledge of danger sign during labor. All correct responses were given a score of "1" and all wrong responses were given a score of "0" and the values were summed to produce a knowledge score. A pregnant woman was considered good knowledgeable, if she has the highest Tertile of knowledge score.

Knowledge of obstetric danger signs during postnatal: There are twelve question assessing knowledge of danger sign during postnatal. All correct responses were given a score of "1" and all wrong responses were given a score of "0" and the values were summed to produce a knowledge score. A pregnant woman was considered good knowledgeable, if she has the highest Tertile of knowledge score.

The key danger signs during pregnancy: These signs include severe vaginal bleeding, swollen hands/face, and blurred vision.

The key danger signs during labor and childbirth: These signs include severe vaginal bleeding, prolonged labor (> 12 h), convulsions, and retained placenta.

The key danger signs during the postpartum period: These signs include severe vaginal bleeding, foul smelling vaginal discharge, and high fever.

Data analysis

The questionnaire was checked for completeness and coded before data entry. Data were entered, cleaned and analyzed using SPSS for windows version 20.0. First, simple frequency distribution and cross tabulation was done to determine associations. Descriptive statistics (frequency, mean and standard deviation) were used for most variables and Chi-square test was employed to determine the association between the dependent and independent variables.

Independent variables that had significant association with dependent variable on the bivariate analyses were entered into the multivariable logistic regression model to identify their independent effects. Statistical significance was declared at P<0.05. Interaction between variables was checked by introducing an interaction term.

Ethical clearance was obtained from the Ethical Review Committee of Jimma University, College of Public Health and Medical Sciences. Letter of cooperation was also given to Regional Health Bureau and Woreda Health Offices. The participants were informed that they have the right to not participate in the study and they can withdraw any time during data collection. Confidentiality was ensured using house numbers instead of their personal identifiers.

RESULTS

Out of 436 women identified for the study, 423 (97%) responded to the interview. The mean age of respondents was 28.92(±5.3) years. The majority (97.2%) were Muslims by religion and Oromo by ethnicity (99.1%). Majority (98.1%) of the women was married and 76.8% of the respondents were housewives. 240 (56.9%) were illiterate. With regard to their husband's educational status, 43.5% were illiterate and 70.9% were farmers (Table 1). Although, 87.2% of the respondents had attended ANC at least once, and 53% started their follow up between 4 and 6 months of pregnancy and 28.1% had first ANC visit by a skilled provider in the first three months of pregnancy.

Out of the 423 respondents, 88.9% were reported to have gotten information about danger sign during pregnancy. From those who had information, 75.7% mentioned vaginal bleeding, while varying proportions reported the other danger signs. Similarly, 90.1% were reported to have information about obstetrical danger sign during labor and delivery. The main danger signs known were severe vaginal bleeding (81.1%) followed by obstructed labor (39.2%) and swollen hands/face (44.7%).

Out of the 423 respondents, only 28.6, 28.6, and 40.9% had good knowledge on obstetrical danger sign during pregnancy, delivery, and post-partum period, respectively (Table 2). A total of 46.2% had heard about birth preparedness. The majority reported that they made some arrangement for the birth of their baby, of which 89.8% saved money, 72.1% identified skilled provider, 59.3% saved emergency fund, 57.2% identified place of delivery, 55.1% identified facility which works 24 h, and 30.5% arranged means of transportation (Figure 1).

Overall, 42.8% (181/423) of the pregnant women had good birth preparedness. Bivariate analyses of associations between socio-demographic factors and birth preparedness practice showed that being a housewife (P<0.0001), occupation of the husband (P<0.0001), having illiterate husband (P=0.004) and having large family size (P=0.003) were associated with poor birth preparedness (Table 3).

Similarly, analyses of association between obstetric factors and birth preparedness showed that ANC follow up (P<0.0001), gestational age (P=0.044), number of ANC follow-up visits (P<0.0001), time of the first ANC follow up visit (P<0.0001), total number of pregnancies that the women had (P<0.0001), total number of deliveries that the woman had (P<0.0001), knowledge of obstetric danger signs during pregnancy, delivery and postpartum period (P<0.0001), and source of birth preparedness information had significant association with birth preparedness practice (Table 4). Educational status of the husband and woman were among the socio-demographic factors which were significantly associated with birth preparedness. There was a statistically significant association between educational status of husband and birth preparedness.

On multivariable logistic regression model, women with literate husbands were 2.8 times more likely to have good preparedness for birth and its complication when compared with women whose husbands are illiterate (adjusted odd ratio (AOR)=2.83; 95% confidence interval (CI)=1.423, 5.655). Literate mothers were 2.46 times more likely to be birth prepared than illiterate (AOR=2.46; 95% CI=1.09, 5.57). Likewise, women who started the first antenatal visit before four months of pregnancy were 15.5 times more likely to have good birth preparedness (AOR=15.50; 95% CI=3.713, 64.67). Similarly, women who had two or more antenatal care (ANC) visits were nearly twice as likely to have good birth preparedness (AOR=1.96; 95% CI=1.13, 3.41).

Knowledge on obstetrical danger signs during pregnancy and postnatal period were significantly associated with birth preparedness. Women with good knowledge on obstetrical danger signs during pregnancy (AOR=2.517; 95% CI=1.39, 4.55) and during postnatal period (AOR=2.245; 95% CI=1.26, 3.97) were more likely to be birth prepared than those without. Interaction was checked between parity and time of first ANC visit and gestational age and the number of ANC visits. However, none of the interaction terms were significant (Table 5).

DISCUSSION

The overall birth preparedness practice in the study population was 42.8%. This is somewhat higher than other studies done in Adigrat in Northern Ethiopia (22%) and Aleta Wondo in the Southern Ethiopia (17%). This variation might be due differences in the study period where the current study was carried out during the time when there was an increase in expansion of service with rapid advancement in technology (Hiluf and Fantahun, 2007; Hailu et al., 2011). Moreover, eastern part of the

Table 1. Distribution of socio-demographic and economic variables of pregnant women.

Variable	Frequency (n=423)	Percent
Age in years		
15-19	8	1.9
20-24	89	21
25-29	137	32.4
30-34	116	27.4
35+	73	17.3
Marital status		
Married/in union	415	98.1
Not married	8	1.9
Religion		
Muslim	419	99.1
Other[1]	4	0.9
Ethnicity		
Oromo	411	97.2
Others2	12	2.80
Occupation of mother		
Housewife	325	76.8
Govt. employee	30	7.1
Private business	68	16.1
Educational status of mother		
Illiterate	218	51.5
Literate	205	48.5
Educational status of father		
Illiterate	188	44.4
Literate	235	55.6
Family size		
1-3	103	24.3
4-6	228	53.9
>6	92	21.7

Other[1]= orthodox, protestant, Other[2]= Amhara, Harari

country, where this study is conducted is more of a cash crop area and culturally women are more assertive compared to the other areas which might have contributed to their decision making power and better birth preparedness. However, although the level of birth preparedness observed in our study seems to be a bit higher than reports of others studies, it is far from optimal level expected, given the high maternal mortality rate in the Ethiopia, which needs consideration for strengthening.

It was also observed that women who had good knowledge on obstetric danger signs during pregnancy and during postpartum were 2.5 and 2.2 times as likely to have good birth preparedness, respectively. This finding is consistent with the report of study in Uganda (Mutiso et al., 2008). It has been evident that pregnant women's knowledge of obstetric danger signs is critical factor to reduce maternal mortality (WHO, 2007). This implies the need for enhancing the knowledge of pregnant women on the danger signs through multiple channels including delivering key message on danger signs by midwives and nurses during ANC visit, through education of pregnant women by the health extension workers and women's development army at the community level and using radios and other mass media.

Table 2. Danger signs that could be observed during pregnancy labor and in the postpartum period mentioned by the pregnant women.

Danger signs during pregnancy mentioned	%
Vaginal bleeding	75.7
Severe headache	68.8
Blurred vision	12.8
Convulsion	16.1
Swollen hands/face	59.3
High fever	20.3
Loss of consciousness	19.6
Difficulty breathing	14.2
Severe Weakness	36.9
Severe abdominal pain	21
Accelerated/reduced fetal movement	10.9
Mentioned membrane rapture	38.3
Danger signs during labor/Childbirth mentioned	**%**
Vaginal bleeding	81.1
Severe headache	19.1
Convulsions	19.4
High fever	19.1
Loss of consciousness	20.8
Prolonged labor	39.2
Retained placenta	72.8
Danger signs during postpartum period mentioned	**%**
Severe vaginal Bleeding	68.3
Severe headache	22.7
Blurred vision	9.2
Convulsions	18
Swollen hands/face	44.7
High fever	22.2
Loss of consciousness	21
Difficulty breathing	14.7
Severe weakness	29.1
Foul smelling vaginal discharge	35.9

*The responses do not add up to 100 as more than one response is possible.

The results of multivariable logistic regression analyses showed after adjusting for other variables, having literate husband, being literate pregnant woman, having the first ANC visit before four months after onset of pregnancy, having good knowledge of overall danger signs and having good knowledge of danger signs during pregnancy were independent predictors of the birth preparedness practices.

Literate women were 2.5 times more likely to be birth prepared for birth than those who were illiterate. This might be related to the fact that educated women could have the power to make their own decision in matters related to their own health and the expected expenses. This finding is consistent with studies in Adigrat (Hiluf and Fantahun, 2007) and Nigeria (Ekabua et al., 2011), where literate women were 2 times as prepared for birth than the illiterate ones. Evidence shows that woman who is educated is able to make informed decisions about her own health compared to her illiterate counterpart (David et al., 2012; Hiluf and Fantahun, 2007).

Our results also showed that pregnant women who had literate husbands were 2.8 times more likely to have good birth preparedness than those who had illiterate husband. This finding agrees with the report of a study in Tanzania (David et al., 2012). The possible reason may be that educated husbands are able to better understand the health messages acquired from various sources and help their wives to use maternity services.
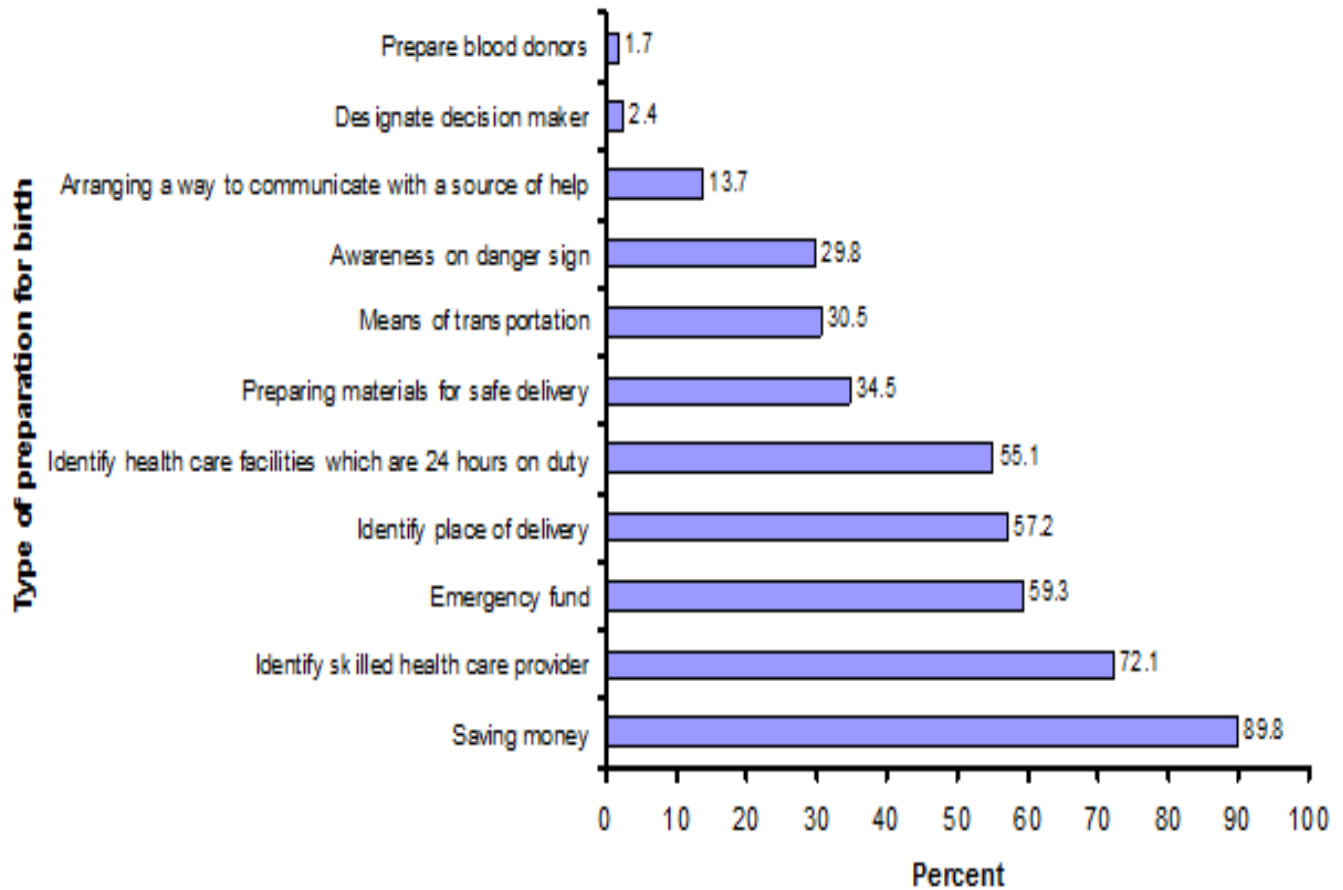
Figure 1. Preparedness practices of respondents for birth in Dereteyara woreda, Harari

Table 3. Association of maternal socio-demographic associated with their birth preparedness practice of pregnant women.

Age of mother	Good preparedness		Poor preparedness		P
	Frequency	%	Frequency	%	
20-24	1	12.5	7	87.5	
25-29	32	36.0	57	64.0	0.125
30-34	61	44.2	77	55.8	
35 and above	87	46.3	101	53.7	
Marital status					
Not married	1	12.5	7	87.5	0.08
Married	180	43.4	235	56.6	
Occupation of the mother					
Housewife	119	36.6	206	63.4	<0.0001
Other	62	63.3	36	36.7	
Educational status of the mother					
Illiterate	85	39.0	133	61.0	0.103
Literate	96	41.6	109	53.2	
Educational status of the husband					

Table 3. Cont'd

Illiterate	66	35.1	122	64.9	0.004
Literate	115	48.9	120	51.1	
Occupation of the husband					
Not applicable	0	0.0	4	100.0	
Government Employee	29	76.3	9	23.7	
Private employee	3	60.0	2	40.0	<0.0001
Private business	30	39.5	46	60.5	
Farmer	119	39.7	181	60.3	
Family size					
1-3	35	34.0	68	66.0	
4-6	115	50.4	113	49.6	0.003
7 and above	31	33.7	61	66.3	

Other*[1]= orthodox, protestant, Other**= Amhara, Harari.

Table 4. Association of obstetric factors with birth preparedness of pregnant women in Dere Teyara District, Harari Region.

Variable	Poor preparedness		Good preparedness		P
	Frequency	%	frequency	%	
Have ANC follow up					
No	51	94.4	3	5.6	<0.0001
Yes	191	51.8	178	48.2	
Gestational age by weeks at the time of the survey					
4	18	42.9	24	57.1	
5-8	213	58.0	154	42.0	0.044
Above 8	11	78.6	3	21.4	
Number of ANC follow up visits					
None	54	88.5	7	11.5	
1	92	59.0	64	41.0	<0.0001
≥ 2	96	46.6	110	53.4	
Time of first ANC follow up visits in months					
<1	51	94.4	3	5.6	
1-3	48	40.3	71	59.7	
4-5	122	54.5	102	45.5	<0.0001
>5	21	80.8	5	19.2	
Number total of pregnancy					
1	27	81.8	6	18.2	
2-3	80	51.9	74	48.1	
4-5	73	50.0	73	50.0	<0.0001
≥6	62	68.9	28	31.1	
Number of total delivery					
0	28	80.0	7	20.0	
1-2	82	52.6	74	47.4	
3-4	71	49.3	73	50.7	<0.0001
≥5	61	69.3	27	30.7	

Table 4. cont'd

History of still birth					
None	215	56.3	167	43.7	
One	23	62.2	14	37.8	0.174
Two	4	100.0	0	0.0	
Knowledge of obstetric danger sign during pregnancy					
Poor knowledge	198	65.6	104	34.4	<0.0001
Good knowledge	44	36.4	77	63.6	
Knowledge of obstetric danger sign during labor					
Poor knowledge	196	64.7	107	35.3	<0.0001
Good knowledge	46	38.3	74	61.7	
Knowledge of obstetric danger sign during post natal					
Poor knowledge	174	69.6	76	30.4	<0.0001
Good knowledge	68	39.3	105	60.7	
Information of term "birth preparedness					
No	28	93.3	2	6.7	<0.0001
Yes	214	54.5	179	45.5	
Source of BBP information					
Health professional	97	46.0	114	54.0	
TTBA	23	67.6	11	32.4	<0.0001
Mothers /media	94	63.5	54	36.5	

Table 5. Multivariable logistic regression model predicting good Birth preparedness practice among pregnant women.

Variable	AOR	95% CI
Educational status of husband		
Illiterate	1	(1.423-5.655)**
Literate	2.838	
Educational status of woman		
Illiterate	1	(1.093-5.570)*
Literate	2.461	
Time of first ANC visit		
< 4 month	15.497	(3.713-64.6740)**
4-5 month	10.048	(2.564-39.387)**
>5 month	1	
Number of ANC visits		
1	1	(1.130 -3.413)*
>=2	1.963	
Overall knowledge of obstetric danger sign		
Poor Knowledge	1	(1.268-3.974)**
Good knowledge	2.250	

Table 5. Cont'd.

Knowledge of obstetric danger sign during pregnancy		
Poor Knowledge	1	(1.390-4.559)**
Good knowledge	2.516	
Parity	1.370	(0.506-3.706)
Parity × Time of First ANC Visit < 4 months	1.691	(0.986-2.899)
Parity × Time of first ANC visit 4-5 Months	0.889	(0.364-2.171)
Party × Time of First ANC visit > 5 Moths	1	
Gestational age (Months)	0.898	(0.447-1.805)
Gestational age × number of ANC Visits	0.768	(0.301-1.961)

*Significant at p-value <0.05.   **Significant at p-value<0.01. "1" referent group.

Evidence suggests that ANC is more effective when received earlier in the pregnancy (WHO, 2002). Early booking and regular attendance to antenatal care in the course of pregnancy are important for monitoring the health status of the women and the fetus, detecting diseases and complications and providing appropriate treatment and care. Furthermore, it gives an opportunity for the woman to be counseled and make an appropriate plan for delivery.

Women who had their first ANC visit before 4 month of pregnancy were 15.5 times as likely to have good birth preparedness compared with those who had the first visit late, which is consistent with reports from other areas (David et al., 2012; Hiluf and Fantahun, 2007). Early booking of ANC could give the woman an opportunity to be counseled and make an appropriate plan for delivery.

In addition, women who had two and above ANC visits were 1.9 times more likely to have good birth preparedness than those who had ANC visit once. This is inconsistent with the result of a study conducted in Uganda which showed that ANC attendance of four or more times was not associated with being well birth prepared (Mutiso et al, 2008), which could be due to the differences in the methodologies and cultural context in which the studies were conducted.

This findings call for the need to strengthen behavior change communications to enhance the knowledge of pregnant women on obstetric danger signs to reduce maternal mortality. In the Ethiopian context, this can be done by strengthening the existing health extension activities where the health extension workers go from door to door and educate pregnant women at the community level. Moreover, the health development army can also be used to pass the key messages to pregnant women to promote early ANC booking and attendance of prenatal services regularly.

This study demonstrated the birth preparedness and complication readiness using community based study which fills an information gap in the eastern part of the Ethiopia which has a different cultural context. As the data collectors were health extension worker, there might be some socially desirability bias. However, respondents were clearly informed to give their genuine answers as their response does not have any effect on them. The fact that pregnancy was self-reported is also another limitation of the study.

Conclusion

This study identified poor comprehensive knowledge on danger sign of obstetrics and practices of birth preparedness. The percentage of pregnant women with good birth preparedness was 42.8%.

Pregnant women with good overall knowledge of obstetric danger signs, women who started the first ANC visit early and those who had two or more ANC visits were more likely to have good birth preparedness practice implying the need for behavior change communication about the obstetric danger signs on the need to start ANC early through intensive use of the health extension workers. Targeting none educated mothers and their non-educated husbands through use of health extension workers are recommended to enhance awareness about obstetric dangers signs and utilization of delivery services to reduce maternal mortality. Women with illiterate husbands and those who were illiterate themselves were less likely to have good birth preparedness practice.

Strengthening of health services in promoting early ANC attendance and improving the information given during the follow up, with special emphasis to birth preparedness in general and information on danger signs in particular is recommended.

Empowerment of women by expanding education opportunity and increase women's autonomy within the family to enhance their ability to earn the control house hold saving and decide by themselves on their own health.

Conflict of interests

The authors have not declared any conflict of interests.

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REFERENCES

Baya B, Sangli G, Maiga A (2004). Measuring the effects of behavior change interventions in Burkina Faso with population-based survey results. Baltimore, Maryland, USA: JHPIEGO. pp. 18-45.

Bazant Eva S, Koeing MA (2009). Women's satisfaction with delivery care in Nairobi's informal settlements. Int. J. Qual. Health Care. 21(2):79-86.

Berhan Y, Berhan A (2014). Review ofmeternal mortality in Ethiopia: a story of the past 30 years. Ethiop. J. Health Sci. Ethiop J Health Sci. 24 Suppl:3-14.

Central Statistical Agency Ethiopia (CSA) (2012). Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International. http://www.unicef.org/ethiopia/ET_2011_EDHS.pdf

David P, Andrea U, Pembe B, Mganga F(2012). Birth preparedness and complication readiness among women in Mpwapwa district, Tanzania. Tanz. J. Health Res. 14(1):1-7.

Ekabua JE, Ekabua KJ, Odusolu P, Agan TU, Iklaki CU, Etokidem AJ (2011). Awareness of birth preparedness and complication readiness in southeastern Nigeria. ISRN Obstet Gynecol. 2011:1-6.

Ethiopian Society of Population Studies (2005). Maternal Mortality Findings from EDHS. Available at: http://www.ab.xlibx.com/1medicine/22166-1-maternal-mortality-findings-from-edhs-2005-ethiopian-society-p.php

Hailu M, Gebremariam A, Alemseged F, Deribe K (2011). Birth preparedness and complication readiness among pregnant women in Southern Ethiopia. PLoS One 6(6):e21432.

Hiluf M, Fantahun M (2007). Birth Preparedness and Complication Readiness women in Adigrat town, north Ethiopia. Ethiop. J. Health Dev. 22(1):14-20.

JHIPEGO, Maternal and neonatal program (2001). Maternal and Neonatal health (MNH) Program, Birth preparedness and complication readiness. A matrix of shared responsibilities. Maternal and Neonatal Health. 23-31. Available at: http://www.jhpiego.org/files/bpcrmatrix.pdf

JHPIEGO (2001). Maternal and Neonatal health (MNH) Program, Birth preparedness and complication readiness. A matrix of shared responsibilities. Maternal and Neonatal Health. pp. 23-31

JHPIEGO (2004a). Birth preparedness and complication readiness, tools and indicators for maternal and newborn health. Johns Hopkins, Bloomberg school of Public Health, Center for communication programs, Family Care International. Available at: http://pdf.dec.org/pdf_docs/PNADA619.pdf

JHPIEGO (2008). Best practices in maternal and newborn care: A learning resource package for essential and basic emergency obstetric and newborn care. Jhopiego, John Hopkins university. Available at: http://reprolineplus.org/resources/best-practices-maternal-and-newborn-care-learning-resource-package-essential-and-basic

JHPIEGO (2004b). Monitoring birth preparedness and complication readiness: tools and Indicators for maternal and newborn health. Baltimore. Available at: http://www.jhpiego.org/files/BPCRtoolkit.pdf

Kabakyenga JK, Östergren PO, Turyakira E, Pettersson KO (2011). Knowledge of obstetric danger signs and birth preparedness practices among women in rural Uganda. Reprod. Health 8:33.

Kaye D, Mirembe F, Aziga F, Namulema B (2003). Maternal mortality and associated near-misses among emergency intrapartum obstetric referrals in Mulago Hospital, Kampala, Uganda. East Afr. Med. J. 80(3):144-149.

Koblinsky M, Anwar I, Mridha MK, Chowdhury ME, Botlero R (2008). Reducing Maternal Mortality and Improving Maternal Health: Bangladesh and MDG 5. J. Health Popul. Nutr. 26(3):280-294.

Marge K, Iqbal A, Malay KM, Mahbub EC, Roslin B (2008). Reducing Maternal Mortality and Improving Maternal Health: Bangladesh and MDG 5. J. Health Popul. Nutr. 26(3):280-294.

Mutiso SM, Qureshi Z, Kinuthia J (2008). Birth preparedness among antenatal clients. East Afr. Med. J. 85(6):275-283.

Rogo KO, Aloo-Obunga C, Ombaka C, Oguttu M, Orero S, Oyoo C, Odera J (2001). Maternal mortality in Kenya: the state of health facilities in a rural district. East Afr. Med. J. 78(9):468-72.

The Partnership for Maternal, Newborn & Child Health (2011). Essential Interventions, Commodities and Guidelines for Reproductive, Maternal, Newborn and Child Health. Geneva, Switzerland: PMNCH. Available at: http://www.who.int/pmnch/topics/part_publications/essential_interventions_18_01_2012.pdf

UNDP (2010). Ethiopia MDGs report. Available at: http://www.undp.org/content/dam/undp/library/MDG/english/MDG%20Country%20Reports/Ethiopia/ethiopia_september2010.pdf

United Nations Children's Fund (1999). Programming for Safe Motherhood: Guidelines for Maternal and Neonatal Survival. UNICEF Headquarters, Health Section Programme Division. P 131.

World Health Organization (2003). Pregnancy, childbirth, postpartum and newborn care: a guide for essential practice. Geneva.

World Health Organization (WHO) (2005). World health day making every mother and child count. Geneva: Available at: http://www.who.int/world-health-day/previous/2005/en/

World Health Organization (WHO) (2005). Household-to-Hospital continuum of maternal and newborn care. Available at: http://www.coregroup.org/storage/documents/Workingpapers/HHCC_screen.pdf

World Health Organization (WHO) (2006). Birth and emergency preparedness in antenatal care. Standards for maternal and neonatal care. Available at: http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/emergency_preparedness_antenatal_care.pdf

World Health Organization (WHO) (2006). Meeting of Development Partners: Maternal and Newborn Health with a focus on country implementation Stockholm, Sweden. pp. 21-22.

World Health Organization (2007). Maternal mortality in 2005: Estimates developed by WHO, UNICEF, UNFPA and the World Bank. Geneva: World Health Organization. Available at: http://www.who.int/whosis/mme_2005.pdf

World Health Organization (WHO) (2007). Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer. Available at: www.ino.searo.who.int/LinkFiles/Reproductive_health_Beyond_the_numbers.pdf

World Health Organization (WHO) (2002). Antenatal Care Randomized Trial: Manual for the Implementation of New Model; WHO, Geneva, WHO. Available at: http://apps.who.int/iris/handle/10665/42513

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