Full Length Research Paper

Knowledge of obstetric danger signs and associated factors among pregnant women attending antenatal care at selected health facilities in Illu Ababor zone, Oromia National Regional State, south-west Ethiopia

Dereje Tsegaye*, Muluneh Shuremu, Kebebe Bidira and Benti Negero

Department of Public Health, Faculty of Public Health and Medical Sciences, Mettu University, Mettu, Ethiopia.

This research investigates awareness of the danger signs of obstetric complications. Pregnancy as a normal process that results in a series of both physiological and psychological changes in pregnant women. However, normal pregnancy may be followed by some problems and complications which are potentially life threatening to the mother and/or the fetus. The study aims to assess level of knowledge of obstetric danger signs and associated factors among pregnant women attending Antenatal care (ANC) in ten districts at ten Health Centers (HCs) and Bedele Hospital in Ilu Ababor Zone, Oromia Regional state, South-west Ethiopia. Here, institutional based cross sectional descriptive study was used. A stratified multistage sampling procedure was employed. Both bivariate and multivariate logistic regression analyses were used. Odds ratio with 95% confidence interval was estimated to identify the predictors of knowledge level. The study thus revealed that mothers between the age of 30 to 34 and above 35 yrs were 1.52 and 1.42 more likely to be knowledgeable during pregnancy than those below the age of 30 years (AOR= 1.52 and 95 %CI = 1.28 to 1.99) and (AOR = 1.42 and 95% CI = 1.20 to 1.86) respectively. Mothers with higher education were 1.46 times and 1.24 times more likely to know obstetric danger signs during pregnancy and child birth than those with no formal education (AOR = 1.46 and 95% CI = 1.24 to 1.91) respectively. Mothers who previously gave birth in health institutions were about 3.48 times more likely to be knowledgeable about the danger signs of childbirth and period after delivery as compared to those who gave birth at home (AOR = 3.48 and 95%CI: 3.26 to 3.94), (AOR =2.43 and 95%CI: 2.23 to 2.83) respectively. Finally, age, high level of education, place of last delivery and discussion with husband about ANC service and level of satisfaction with the service were the predictors of knowledge of the mothers about obstetric danger signs in pregnancy, labor and post-partum period. Thus, provision of information, education and communication targeting women, family and the general community on danger signs of pregnancy and childbirth and associated factors was recommended.

Key words: Knowledge, determinate, danger signs, pregnancy, delivery and post-partum

INTRODUCTION

Pregnancy is a normal process that results in a series of both physiological and psychological changes in pregnant women. Though, normal pregnancy may be followed by some problems and complications which are potentially life threatening to the mother and/or the fetus (Fraser and Cooper, 2003).

Preventable mortality and morbidity continued to be an alarming challenge in many developing countries like Ethiopia. Every pregnant woman faces the risk of sudden, unpredictable complications that could end up with death or injury to herself or to her infant. Pregnancy related complications cannot be reliably predicted (JHIPEGO, 2008).

Obstetric danger signs include persistent vomiting, severe persistent abdominal pain, vaginal bleeding during pregnancy and delivery, severe vaginal bleeding after delivery, swelling of face, fingers and feet, blurring of vision, fits of pregnancy, severe recurrent frontal headache, high grade fever, marked change in fetal movement, awareness of heart beats, high blood pressure, sudden escape of fluid from the vagina, prolonged labor (PL), loss of consciousness and retained placenta. Awareness about the significance of symptoms and signs of obstetrics complications may lead to timely access to appropriate emergency obstetric care. Obstetric nurse/midwife plays a crucial role in promoting an awareness of the public health issues for the pregnant woman and her family, as well as helping the pregnant woman to recognize complications of pregnancy and where to seek medical assistance (WHO, 2010).

To overcome obstetric related complications, the Ethiopia government has created strong political will, applying multi-pronged approaches at local and national levels, organized capacity building efforts, and prioritization of funding for maternal health services utilizations, but the effect of large populations, health disparities still exist in vulnerable Ethiopian subgroups, including girls, rural dwelling mothers, and poor communities are major challenges for implementation of this strategy (FMOH, 2010)

Globally, greater than 358,000 women die each year from pregnancy related complications or child birth. Only 1% of the maternal death occurs in high income countries. A woman's life time risk of dying from complications in child birth or pregnancy is an average of 1 in 120 in developing countries as compared to 1 in 44,300 in developed countries. United Nations Millennium Development Goals stated that every year, at least half a million women and girls needlessly die as a result of complications during pregnancy, childbirth or the 6 weeks following delivery. Almost all (99%) of these deaths occur in developing countries (WHO, UNICEF, UNFPA, 2010).

Approximately 80% of maternal deaths worldwide are caused by direct obstetric complications such as hemorrhage, infection, obstructed and prolonged labor, unsafe abortion and hypertensive disorders of pregnancy. Indirect causes such as malaria, diabetes, hepatitis, anemia and other cardiovascular disorders which are aggravated by pregnancy can also lead to maternal death.

Almost 90% of the maternal deaths occur in Sub-Saharan Africa and Asia, making maternal mortality the health statistic with the largest discrepancy between developed and developing countries. While women in north Europe have a 1 in 4,000 likelihood of dying from pregnancy related causes, for those in Africa the chance is 1 in 16 (Hogan H, 2010).

The Maternal Mortality Ratio (MMR) in developing regions was 15 times higher than in developed regions. Sub-Saharan Africa had the highest MMR at 500 maternal deaths per 100,000 live births and in sub-Saharan Africa; a woman's maternal mortality risk is 1 in 30, compared to 1 in 5,600 in developed countries (WHO, UNICEF, UNFPA, 2010)

According to the United Nations Millennium Development Goal, five countries are committed to reducing the maternal mortality ratio by three quarters between 1990 and 2015. Following this commitment, Ethiopia is expected to reduce maternal mortality in 2015 to 267 maternal deaths per 100,000 live births (UN, 2010). But according to 2011 Ethiopian Demographic and Health Survey report, the maternal mortality ratio was 676 maternal deaths per 100,000 live births for the seven year period preceding the survey (CSA, 2011).

With the assumption that "every pregnancy faces risks", women should be made aware of danger signs of obstetric complications during pregnancy, delivery and the postpartum. The knowledge will ultimately empower them and their families to make prompt decisions to seek care from skilled birth attendants (JHPIEGO, 2004).

Most deaths resulting from complications of pregnancy or childbirth are avoidable. This requires preventing of the three delays in seeking health care to have proper management of the complications; according to the National Rural Health Mission, India, the three delays are: Deciding to seek care (1st delay), identifying and reaching health facility (2nd delay) and receiving adequate and appropriate treatment (3rd delay). Among all cases,

*Corresponding author. E-mail: deretsegaye@gmail.com.

the major cause of the first delay is ignorance regarding danger signs in pregnancy, childbirth and post-delivery and delay in making decision to seek care on appearance of these danger signs (El-Zanaty and Way, 2008).

Though maternal mortality rate in Ethiopia has been decreasing according to the latest estimation, maternal mortality rate has declined from 676/100,000 live births in 2011 to 350/100,000 live births in 2014 (CSA, 2014). However, still far to achieve the target for 2015 that is 267/100,000 live births. Little is known about the current level of knowledge and associated factors of obstetric danger sign in the study area. The study will assess the current level of knowledge and associated factors among pregnant women who are attending Ante-Natal Care (ANC) at health facilities in Illu Ababor Zone, South-West Ethiopia. The study, therefore, hoped that will provide a base line for further researches and come up with significant recommendations which could help designing effective operational strategies that will improve the awareness concerning obstetric danger signs and complications related to pregnancy, childbirth and post partum.

METHODS AND MATERIALS

Study design and setting

This institution based cross-sectional study was conducted in public health facilities in Ilu Ababor Zone, Oromia Regional state, south-west Ethiopia. All pregnant women visiting ten health centers and Bedele hospital for ANC during the data collection period were included in the study.

Sample size determination

The sample size was determined using the formula for single population proportion by considering 45.9% proportion of knowledge level of obstetric danger sign among pregnant women in Aleta Wendo district, Sidama Zone (Hailu et al., 2010) , 95% level of confidence, 5% margin of error, design effect 2 and 10% non-response rate yielding the final minimum sample size of 844.

A stratified multi stage sampling technique was used. After stratification of the health facilities into hospitals and health centers, a two stage sampling technique was adopted. The first stage involves the selection of the Health Facilities from each stratum using simple random sampling (SRS) technique. The second stage involves the selection of eligible women using systematic random sampling technique by applying proportionate to size (PPS) allocation to each Health Facility.

A systematic sampling technique was used to recruit consenting pregnant women as they register at the ANC clinic. Each clinic day, the sampling interval was determined using the expected client turnover based on previous records. The first client is the one whose serial number was randomly selected by lottery method. Subsequent client was obtained by adding the day's sampling interval to the previous client's serial number.

Data collection procedure

Data were collected using structured questionnaire of a safe motherhood developed by the Maternal Neonatal Program of JHPIEGO, an affiliate of John Hopkins University (JHIPEGO, 2004). It contains four sections namely; socio-demographic information and reproductive history, knowledge on pregnancy and childbirth, factors associated to pregnancy and childbirth complications, and exposure to media and interventions. The questionnaire was adapted to fit the study area population context and subsequently pretest was performed in the neighboring government health centers so that some modifications were performed.

Two supervisors (undergraduate of health sciences) and six data collectors who were diploma holders with experiences in survey data collection and without language barrier were trained for one week and participated in the pretesting five days prior to the actual data collection date and thereafter conducted the interviews under the supervision of principal investigators. The data collection was conducted from March 01 to 31/2015.

Data quality control

The appropriateness of the questionnaire in terms of content, consistency, language and organization was checked thoroughly and was modified in line with standards, guidance and suggestion from peer reviewers.

Pre test was employed at Mettu Health Center and Bedele Health Center five days prior to actual initiation of data collection on a total of 42 (5%) of respondents was interviewed using the available questionnaire. Findings were discussed among data collectors and supervisors in order to ensure better understanding to the data collection process.

Based on the pretest, questions were revised, edited, and those found to be unclear or confusing was modified. Finally, structured closed ended Afan Oromo and Amharic version questionnaires were used for data collection.

Supervisors and data collectors were trained on data collection process, accuracy and completeness for three consecutive days so that everything was clear. The overall activity was closely monitored by principal investigators of the study during data collection.

To reduce non response rate and unwanted confusion necessary information and description was given to respondents prior initiating interviewing. The data quality was controlled by designing ideal data collection tools and close supervision with aggressive monitoring. The information obtained was checked and cleaned up before and after data entry.

Data analysis

The data were double entered onto EPI data version 3.1 and exported to SPSS (SPSS Inc. version 16.0, Chicago, Illinois) computer software for further analysis. Errors related to inconsistency of data such as missing values and outliers were checked and considered during data cleaning.

Descriptive statistics were used to give a clear picture of dependent and independent variables. The frequency distributions of the variables were worked out using tables and figures. The independent variables were tested for multicollinearity using variance Inflation Factor (VIF) and tolerance test in which the values of both tests were found to be within the normal range. Logistic regression model fit was checked by using Hosmer Lemshow test of significance and omnibus test.

Bivariate analyses were done to assess the association between each independent variable and the outcome variables in the first step. All variables whose p-value was less or equal to 0.3 in the bivariate logistic regression model were entered into the multivariable logistic regression model using backward elimination

method to control for all possible confounders. At this step, odds ratio along with 95% CI was estimated to identify factors associated with Obstetric dander signs among pregnant women and the level of statistical significance was declared at p – value of less or equal to 0.05.

Ethical consideration

The study was approved by the Institutional Research Ethics Review Committee of Mettu University. Informed verbal and written consent was obtained from the study participants before the interview. Illiterate mothers consented by their thumb print after verbal consent. Participants were also informed about the general purpose and benefits of the study. To ensure confidentiality, participants' data were linked to code number.

RESULTS

Socio-demographic characteristics of the respondents

A total of 831 pregnant women were enrolled to this study making the response rate of 98.9%. One-third (33.1%) of the respondents were between the age of 25 - 29 years. More than half (57.8%) of the participants were from rural area. Nearly all 694 (97.5%) were married.

Almost half (47.5%) were Muslim by religion. Out of the total participants, 155 (21.71%) were illiterate. More than three-fourth of the participants (78%) were from Oromo ethnic group. Three hundred ninety-four (47.7%) of the respondents and 38.1% of the respondent's husband attended primary education. Almost half (46.0%) of the pregnant women were housewives and (22.0%) were farmers. More than one - third of the respondents earn a monthly income of ETB 501 – 1000 (Table 1).

Obstetric characteristics

More than one-third 308 (37.1%) of the respondents were multiparas. Three hundred thirty-three (40.2%) of the respondents did not attend ANC at all. Nearly half, 382(46.0%) of the respondents reported to have had ANC follow-up by Midwives. About one-third 354 (29.8%) of the respondents delivered their last delivery at Health Center. More than two-third of the respondents 393 (70.7%) of the respondents had spontaneous vaginal delivery (SVD) in last delivery. About two-third 463 (55.7%) of the respondents were in the second trimester (gestational age greater than 28 weeks.

Information on gender and role in the family

The study revealed that greater part 710(85.4%) of the respondents discussed about ANC with their husbands and 354(42.6%) of the respondents reported to have acceptable role in the family.

Knowledge of obstetric danger signs

Regarding knowledge of key danger signs, severe vaginal bleeding was the most frequently mentioned complication by women during the following phases; pregnancy (64.7%), childbirth (69.9%) and postpartum (82.1%) (Table 2).

Experience of obstetric danger signs

Severe vaginal bleeding was the most frequently mentioned complication by women during pregnancy 85 (21.6%), and postpartum period 90(30.4%) (Table 3). Vaginal bleeding, prolonged labour and severe headache were the most frequently identified obstetric danger signs during labour by respondents.

Knowledge level

More than one-third 309 (37.3%) of the respondents were able to mention at least two key danger signs during pregnancy, 194 (23.3%) during childbirth and 30 (3.6%) during postpartum period. Table 4. show overall Knowledge of Obstetric danger signs among pregnant mothers attending ANC in selected Health facilities, Illubabor Zone South West, Ethiopia April 2015.

Factors associated with anemia among pregnant women

Bivariate logistic regression was carried out to assess possible relationship between knowledge of obstetric danger signs and factors associated with it among pregnant women. Knowledge of obstetric danger signs was 1.6 times higher among age group 35 years and above [COR = 1.57, 95% CI (1.36, 1.90)]. Urban residents were 2 times more likely to be knowledgeable about obstetric danger signs during pregnancy than their rural counter parts [COR=1.90 (95%CI (1.43, 2.53]. Respondents with higher education were 1.3 times more likely to be knowledgeable during pregnancy, 1.4 times more during delivery and 1.4 times more during postpartum period than those with no formal education [COR = 1.28, 95% CI (1.17,1.48)], [COR = 1.40, 95% CI (1.23,1.70)], and [COR = 1.40, 95% CI (1.23,1.70)], [COR = 1.36, 95% CI (1.18,1.72)1.40] respectively. Employed mothers and merchants were both 1.4 times more likely to be knowledgeable than housewives [COR =1.40, 95% CI ((1.25, 1.63)] and [COR =1.40, 95% CI (1.29, 1.65)] respectively. Grandmultiparas were 3 times more likely

Table 1. Socio-demographic characteristics of mothers attending ANC in selected Health facilities in Illubabor Zone, South West Ethiopia, 2015 (n=831).

Characteristics	Number	Percent
Age		
15 - 19	86	10.3
20 - 24	271	32.6
25 - 29	275	33.1
30 - 34	106	12.8
35 - 39	79	9.5
40 - 44	14	1.7
Residence		
Urban	351	42.2
Rural	480	57.8
Marital status		
Married	778	93.6
Divorced/separated	26	3.1
Widowed	16	1.9
Never Married	11	1.3
Religion		
Orthodox	233	28.0
Muslim	380	45.7
Protestant	210	25.3
Others	8	1.0
Ethnicity		
Oromo	648	78.0
Amhara	125	15.0
Gurage	36	4.3
Tigray	11	1.3
Others	11	1.3
Education of the Women		
No formal Education	177	21.3
Primary	364	43.8
Secondary	193	23.2
Higher	97	11.7
Education of Husband		
No formal Education	140	16.8
Primary	303	36.5
Secondary	230	27.7
Higher	158	19.0
Occupation		
House wife	382	46.0
Employee	92	11.1
Merchant	136	16.4
Farmer	183	22.0

Table 1 cont'd

Others*	38	4.6
Income		
<500	181	21.8
501 - 1000	345	41.5
1001 - 3000	201	24.2
>3000	104	12.5

Table 2. Knowledge of obstetric danger signs during pregnancy, delivery and postpartum period among pregnant mothers attending ANC in selected Health facilities, Illubabor Zone South West, Ethiopia April 2015 G,C.

Knowledge of obstetric Danger signs	n	%
During pregnancy		
Vaginal Bleeding (n=566)	367	64.7
Gush of Blood from Vagina (n=566)	77	13.6
Swelling of hand/face (n=566)	203	35.9
Blurred Vision (n=566)	103	18.2
Severe Headache (n=566)	256	45.2
Convulsion (566)	101	17.8
During Delivery		
Excessive Vaginal Bleeding (n=462)	323	69.9
Preterm Labor (n=462)	52	11.3
Prolonged Labor (462)	137	29.7
Convulsion (n=462)	58	12.6
Severe Headache (n=462)	84	18.2
Retained Placenta (n=462)	94	20.3
Postpartum period		
Vaginal Bleeding (n=390)	321	82.3
Convulsion after child Birth (n=390)	53	13.6
High fever (n=388)	48	12.4

to be more knowledgeable about obstetric danger signs during delivery than primiparas [COR = 3.29, 95% CI ((3.16, 3.50)]. Pregnant mothers who attended ANC at Health Center and Hospital were 2 times and 2.5 times more likely to be knowledgeable about Obstetric danger signs during pregnancy than those who attended at Health Post [COR = 2.31, 95% CI ((2.14,2.66)], [COR = 2.46, 95% CI ((2.28,2.74)].

Mothers who have given their last birth at Health facilities were 2.3 times and 2.5 times more knowledgeable about obstetric danger signs during pregnancy and delivery than those who delivered at home [COR = 2.33, 95% CI ((1.58,3.42)], [COR = 2.39, 95% CI ((1.52,3.74)] respectively. Mothers who were attended by skilled professionals during their last birth were 3.5 times and 1.6 times more to be knowledgeable about Obstetric danger signs during pregnancy and delivery than those who were attended by unskilled professionals [COR = 3.45, 95% CI ((3.32,3.67)], [COR = 1.58, 95% CI (1.39,1.88)] respectively. Mothers who were satisfied by the care providers counseling during ANC visit were 3 times and 1.6 times more to be knowledgeable about obstetric danger signs during pregnancy and delivery than those who were attended by unskilled professionals [COR = 3.23, 95% CI ((3.14,3.38)], [COR = 2.21, 95% CI ((1.11, 2.42)],

Table 3. Danger signs experienced in last pregnancy, delivery or postpartum period by pregnant mothers attending ANC in selected Health facilities, Illubabor Zone South West, Ethiopia April, 2015.

Danger signs Experienced	n	%
During Pregnancy		
Vaginal Bleeding	85	21.6
Gush of Blood from Vagina	34	8.7
Swelling of hand/face	43	11.0
Blurred Vision	28	7.2
Severe Headache	78	19.9
Convulsion	20	5.1
During delivery		
Excessive Vaginal Bleeding	91	25.6
Preterm Labor	13	3.7
Prolonged Labor	58	16.3
Convulsion	18	5.1
Severe Headache	52	14.6
Retained Placenta	13	3.7
Postpartum period		
Vaginal Bleeding	92	30.4
Convulsion after child birth	48	15.8
High fever	27	9.0

Table 4. Overall Knowledge of Obstetric danger signs among pregnant mothers attending ANC in selected Health facilities, Illubabor Zone South West, Ethiopia April 2015.

Knowledge Level	Number	Percent
Knowledge of key danger signs during pregnancy		
Not Knowledgeable	522	62.8
Knowledgeable	309	37.2
Knowledge of key danger signs during Labor and Delivery		
Not Knowledgeable	637	76.7
Knowledgeable	194	23.3
Knowledge of key danger signs during postpartum period		
Not Knowledgeable	801	96.4
Knowledgeable	30	3.6

respectively.

The independent variable, age was statistically significant for the knowledge of obstetric danger signs during the three phases. Mothers between the age of 30 – 34 and above 35 yrs were 1.52 and 1.42 more likely to be knowledgeable during pregnancy than those below the age of 30 years (AOR= 1.52 and 95% CI = 1.28-1.99) and (AOR = 1.42 and 95% CI = 1.20-1.86), respectively. Mothers between the ages of 30 - 34 were 1. 24 times more likely to be knowledgeable during delivery than those below the age of 30 years and above 35 years (AOR= 1.24 and 95% CI = 1.11 - 1.52). Similarly, Mothers between the ages of 20 – 24 were 1.42 times more likely to be knowledgeable during postpartum than

those in other age group (AOR= 1.42 and 95% CI = 1.18-1.98).

Mothers with Higher education were 1.46 times and 1.24 time more likely to know obstetric danger signs during pregnancy child birth than those with who cannot read and write and with primary education, (AOR = 1.46 and 95% CI = 1.24-1.91) respectively. Similarly Mothers with secondary education were 2.46 times more likely to know obstetric danger signs during postpartum than their counter parts, (AOR = 2.36 and 95% CI = 2.18 - 2.72).

The other strong predictor of knowledge about the danger signs of pregnancy and childbirth was place of delivery. Mothers who previously gave birth in health institutions were about 3.48 times (more likely to be knowledgeable about the danger signs of childbirth and period after delivery as compared to those who gave birth at home AOR = 3.48 and 95% CI: 3.26 -3.94), (AOR =2.43 and 95% CI: 2.23 - 2.83) respectively. Mothers who were satisfied with the service they received were about 3.23, 2.21 and 4.32 times more likely to be knowledgeable about the danger signs of pregnancy, childbirth and period after delivery as compared to those who who were not satisfied (AOR = 3.23 and 95%CI: 3.14 -3.38), (AOR = 2.21 and 95% CI: 1.11 - 2.42, AOR =4.32 and 95% CI: 1.13 - 4.79), respectively (Table 5).

DISCUSSION

Knowledge of danger signs of obstetric complications during pregnancy, labour and postnatal period is the first essential step for appropriate and timely referral. More than one-third 309 (37.3%) of the respondents were knowledgeable about obstetric danger signs during pregnancy and during postpartum period. This finding is consistent with the study conducted in Aleta Wondo in which 30.9% of respondents mentioned at least two danger signs of pregnancy (Hailu et al., 2010). Out of the women under the study 194(23.3%) were knowledgeable about danger signs during childbirth. But the finding of this study was higher than the study conducted in rural Tanzania in which the percentage of women who knew at least three danger sign related to pregnancy was 6.9% (Pembe et al., 2009). This difference could be resulted from the variation in educational level of respondents and accessibility of information in these two study settings. Similarly, it is higher than the findings from study conducted in rural Uganda in which 19% mothers had knowledge of 3 or more key danger signs during pregnancy (Kabakyenga et al., 2011). These differences in knowledge level could again be due to a difference in socio-demographic, cultural, and health interventions as well as methodological difference. Additionally, 30(3.6%) were knowledgeable about danger signs during postpartum period which is consistent with similar study conducted in rural Tanzania in which the percentage of

women who knew at least three danger sign related to the period after delivery was 3.3% (Pembe et al., 2009).

Level of education showed strong statistical association with the mentioning of at least two danger signs of pregnancy. Mothers with Higher education were 1.46 times and 1.24 time more likely to be knowledgeable about obstetric danger signs during pregnancy and child birth than those with no formal education. This is comparable with reports from Tigray region (Hailu and Berhe, 2014). This might be related to the fact that educated women have better power to make their own decision in matters related to their health.

The other strong predictor of knowledge of women about danger signs of labor and childbirth was place of last delivery. Mothers who delivered in Health institutions were 3.5 times and 2.4 times more likely to have higher knowledge about the danger signs of pregnancy and labor and delivery than those who gave birth at home. Similar with other study conducted in Tsegedie District, Tigray Region (Hailu and Berhe, 2014).

Discussion of the women on their health services utilization with their husband affects their level of knowledge about obstetrics danger signs. Mothers who discussed their health service utilization were knowledgeable as compared to those who had no discussion. This can be due to the shared responsibility of the husbands to take any action at any time of the health related matters of the mothers. This study revealed that mothers who were satisfied with the service they received were about 3.23, 2.21 and 4.32 times more likely to be knowledgeable about the danger signs of pregnancy, childbirth and period after delivery as compared to those who were not satisfied. This could be due to hospitality, health worker skills, good infrastructure that could have resulted better attention to the health education given and better knowledge of the danger signs but other similar studies did not show any significant association between level of satisfaction and knowledge of obstetric danger signs. These differences could be attributed to the methodological approach of the different studies in assessing the different factors which needs further study.

Readers shall take into consideration the following limitations when interpreting the finding of this study. First, the cross sectional nature of the data had made it impossible to reach at the causal relation between the different independent variables and knowledge of women about obstetric danger signs. Second, the source of data for this study was based on the self-report of respondents, and provided no validation of obtaining information with any objective source such as health facility cards. But it is logical to assume that biases are less likely in delivery related events as compared to sensitive issues such as sexual behavior and drug abuse, and respondents were informed about the importance of giving accurate responses and also assured the

Table 5. Factors associated with knowledge of key obstetric danger signs during pregnancy, delivery and postpartum among pregnant women attending ANC in selected Health Facilities in Illubabor Zone, south West Ethiopia.

Characteristics	During pregnancy AOR	During Delivery AOR	Postpartum period AOR
Age			
15 - 24	1.00	1.00	1.00
25 - 29	0.68(0.42,1.13)	0.83(0.47,1.50)	**1.42(1.18,1.98)**
30 - 34	**1.52(1.28,1.99)**	**1.24(1.11,1.52)**	0.42(0.15,1.18)
≥35	**1.42(1.20,1.86)**	0.60(0.23,1.48)	0.31(0.11,0.88)
Marital Status			
In marital Union	**	**	0.42(0.15,1.09)
Not in Union			1.00
Education of the Mother			
No formal Education	1.00	1.00	1.00
Primary	0.99(0.58,1.70)	0.69(0.36,1.34)	1.57(0.82,3.03)
Secondary	**1.46(1.24,1.91)**	**1.41(1.18,1.89)**	1.17(0.57,2.40)
Higher	1.09(0.48,2.48)	1.43(0.55,3.75)	**2.36(2.18,2.72)**
Education of the Husband			
No formal Education	**	**	1.00
Primary			0.96(0.36,2.52)
Secondary			0.86(0.31,2.35)
Higher			0.38,0.13,1.07)
Income			
<500	1.00	1.00	1.00
501 - 1000	0.87(0.48,1.56)	0.49(0.23,1.05)	0.87(0.33,2.24)
1001 - 3000	0.93(0.48,1.79)	1.33(0.15,1.74)	0.90(0.31,2.59)
>3000	1.38(0.17,1.73)	1.10(1.04,1.25)	2.32(0.12,2.92)
Parity			
Nullipara		1.00	
2- 3	**	1.52(0.87,2.66)	**
≥4		0.59(0.25,1.35)	
ANC Provider			
Nurse/Midwife	0.26(0.08,2.90)	0.13(0.03,1.49)	**
Physician	0.73(0.40,1.31)	0.37(0.18,2.78)	
HEW	1.00	1.00	
Place of last Delivery			
Home	1.00	1.00	1.00
Health Facility	0.62(0.36,1.05)	**3.48(3.26,3.94)**	**2.43(2.23,2.83)**
Delivery Attendant			
Skilled	**	**	2.43(1.01,5.84)
Unskilled			1.00
Mode of Delivery			
SVD	1.00	1.00	1.00

Table 5 cont'd

Assisted Vaginal Delivery	0.21(0.32,1.71)	1.14(0.17,1.89)	0.67(0.37,1.18)
C/S	0.70(0.32,1.57)	0.47(0.21,1.08)	0.71(0.26,1.94)
Discussion about ANC with Husbands			
Yes	**3.32(3.16,3.66)**	0.61(0.36,1.01)	0.55(0.25,1.23)
No	1.00	1.00	1.00
Satisfaction with Service			
Yes	**1.22(1.16,1.43)**	**1.12(1.05,1.29)**	**1.26(1.09,1.74)**
No	1.00	1.00	1.00

The bolded values are the variables in the final model. **Indicating the p-value of the variable considered in that specific cell was greater than 0.3 which was not a candidate for multiple logistic regression.

confidentiality of their responses.

Conclusion

According to the result of this study, age, high level of education, place of last delivery discussion with husband about ANC service and satisfaction with the service provided were the predictors of knowledge of the mothers about obstetric danger signs during pregnancy, labor and post-partum period. These factors pointed the need for a plan to increase the knowledge of the reproductive age group mothers about obstetric danger signs. This information will help the services providers for improving the quality of maternal health care services. Thus, provision of information, education, and also, communication targeting women, family and the general community on danger signs of pregnancy and childbirth was recommended.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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