

## KNOWLEDGE, ATTITUDE AND PRACTICE ON BIRTH PREPAREDNESS AND COMPLICATION READINESS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE AT CHIRO ZONAL HOSPITAL EASTERN ETHIOPIA

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### ABSTRACT

#### BACKGROUND:

Birth preparedness and complication readiness is a comprehensive strategy to improve the use of skilled providers at birth, and the key intervention to decrease maternal mortality. It is also a key component of globally accepted safe motherhood programs.

#### OBJECTIVE:

To assess the knowledge, attitude and practices about birth preparedness and complication readiness among pregnant women attending antenatal care at Chiro Zonal Hospital, East Ethiopia.

#### METHODS:

Hospital based cross sectional study was conducted on a sample of 418 pregnant women. Exit interview using a pretested structured questionnaire was used to collect data from pregnant women attending antenatal care at Chiro Zonal Hospital. The collected data was cleaned, coded and analyzed using SPSS version 20 statistical package.

#### RESULT:

Twenty percent had knowledge of one key danger signs during pregnancy, child birth and postpartum and 61.2% had favorable attitudes towards birth preparedness and complication readiness. Knowledge of at least one key danger signs during pregnancy, child birth and post partum, attitudes towards birth preparedness and practice of birth preparedness were associated with birth preparedness and complication readiness.

#### CONCLUSION AND RECOMMENDATION:

Both knowledge of obstetric danger signs and birth preparedness and complication readiness were low. Enhancing women's awareness and improving the quality of labour wards would improve delivery service utilization.

**KEYWORDS:** Birth preparedness, complication readiness, antenatal care, pregnant women

## INTRODUCTION

In developing countries, 300 million women are estimated to suffer from short or long-term illnesses as a result of pregnancy and childbirth<sup>1</sup>. Though the absolute number of women dying due to complications during pregnancy and childbirth has decreased by 45%; from an estimated 523 000 in 1990 to 289 000 in 2013; the decrease was below the MGD target of 75% reduction by 2015<sup>2</sup>. Most of the causes of maternal morbidity and mortality are preventable and attributed to the three delays; delay to decide to seek care if complication occurs, delay to reach the place of care, and delay to receive appropriate care<sup>3</sup>. JHPIEGO, an international non-profit health organization affiliated with John Hopkins University, developed the birth preparedness and complication readiness matrix to address these three delays at various levels. The concept of birth preparedness and complication readiness includes recognition of danger signs, a plan for a birth attendant and place of delivery, arranging transportation, identifying a blood donor, decision-maker (in case of emergency) and saving money in case of an obstetric complication<sup>1,3</sup>. Nearly 80% of the women in sub-Saharan Africa are attending antenatal care services at least once. Despite the growing number of antenatal care visits, the number of births attended by skilled birth attendants still are still low<sup>4</sup>. In Tanzania for example, despite the antenatal care coverage rate of around 94% (one-time visit), the rate of skilled birth attendance can be as low as 30%, especially in rural areas<sup>5</sup>. As a result, The World Health Organization (WHO) proposes that all pregnant women attending Antenatal Care (ANC) should be aware of the need for skilled birth attendance as well as increasing their knowledge of how and when to access skilled birth attendants. Birth planning and emergency preparedness has been introduced as part of focused antenatal care in many African countries<sup>6</sup>. There are evidences that having a skilled birth attendant at every delivery have been found to markedly reduce maternal morbidity and mortality worldwide. Many studies conducted in sub-Saharan African countries such as Tanzania<sup>5</sup>, Ethiopia<sup>8</sup>, Uganda<sup>7</sup> and Burkina Faso<sup>3</sup> showed that women had low levels of awareness on obstetric danger signs during pregnancy, delivery and postpartum<sup>3,5</sup>.

Similarly, studies have also indicated low rates of birth preparedness among pregnant women in Kenya<sup>9</sup>, Ethiopia<sup>8,1</sup>, and Burkina Faso<sup>3</sup>. The low awareness of danger signs together with lack of preparedness contributes to the delay in seeking skilled care and ultimately the aggregated effects of all leads to high levels of maternal mortality and morbidity<sup>7</sup>. In Ethiopia, the levels of maternal mortality and morbidity are among the highest in the world. The estimated maternal mortality ratio is 412 per 100, 000 live births. Although access to health care services is improving, the country has faced challenges in increasing health care utilization. For example, the proportion of births attended by skilled health personnel (skilled birth attendant) in Ethiopia is only 28%<sup>10</sup>. Birth preparedness and complication readiness is essential to increase institutional delivery and further improve maternal health, but little is known about the current magnitude and influencing factors in Ethiopia.

## SUBJECTS AND METHOD

A hospital based cross sectional study was done in Chiro Zone, Oromia Regional State, Eastern Ethiopia on pregnant women attending ANC. Using systematic sampling method, pregnant women were selected from those who came for ANC services in the zonal hospital. Data were collected using a pre-tested structured questionnaire as an exit interview. The questions were adopted from the safe motherhood questionnaire developed by maternal and neonatal health program of JHPIEGO, the affiliate of Johns Hopkins University,<sup>11</sup> by modifying the questions according to local context and the objectives of the study. Sample size was determined by using single population proportion formula with 5% margin of error, 95% level of confidence, and prevalence of 44.7% (which was found to be the proportion of knowledge on safe delivery service utilization from South-East Ethiopia<sup>12</sup>). The overall sample size calculated with nonresponse of 10% was 418. A sampling interval of 20 was used based on the anticipation of an average of 20 clients per day. Data was collected from January to February

2014.

**Knowledge assessment:** Women who mentioned at least one key danger signs in each of the three periods (during pregnancy, delivery and postnatal period) were considered as knowledgeable<sup>7</sup>. **Attitude assessment:** women were considered as having favorable attitude towards utilization of safe delivery services, if they scored above the mean on 10 attitude questions. The mean of each question was calculated and finally the weighted mean (of all questions based on the frequency) was used for the classification of favorable verses unfavorable attitudes. For positive statements, those who chose agree were given 1 point and those who chose neutral and disagree were given zero. On the other hand, for negative statement those who chose disagree were given 1 point and those who chose, agree and neutral given zero. The overall attitude was calculated by summing up the scores as done elsewhere<sup>12</sup>. **Practice assessment:** practice was assessed using 11 practice related questions. Each of these questions were analyzed separately and then all together to determine the level of the practice of pregnant women. At the end, the result of the analysis was considered as good practice, if the total score was  $\geq 50\%$  poor practice, if it was  $< 50\%$  (12). **Birth-preparedness and complication readiness (BP/CR):** BP/CR, the dependent variable for this study, was measured using series of questions about knowledge of danger signs; plans for a birth provider; plans for transport in case of emergency; and plans for saving money in case of emergency<sup>3</sup>. The first

(knowledge of danger signs) was independently assessed by raising questions and a woman who can mentioned at least one danger sign at each of the three stages (during pregnancy, delivery and postnatal period) was considered as knowledgeable. At the end, to measure the outcome variable (BP/CR), a woman who fulfills all the four (have knowledge about danger signs, have plan for birth provider, transportation, saving money) was categorized as having good preparation (well prepared) for BP/CR. If not it was considered as not having good preparation (not prepared) for BP/CR.

The collected data were cleaned, coded and analyzed by SPSS version 20 statistical package. Factors statistically related to the outcome variable (BP/CR) were identified by running a multivariable logistic regression model.

Ethical clearance was obtained from Haramaya University College of Health and Medical Sciences Ethical Review Board. Written consent was taken from each participating pregnant woman.

## RESULT

**Socio-demographic characteristics:** There were 418 participants. 54.5% were from urban areas. The mean age of respondents was  $25 \pm 4$  years with minimum and maximum age of 15 and 45 years respectively. The majority of them were married (n=412, 98.6%, illiterate (n=71, 27.5%) housewives (n=311, 74.4%) and had a family size of two (n=164, 39.2%) (Table 1).

Table 1: Socio-demographic characteristics of ANC attendant in Chiro Hospital, eastern Ethiopia 2014

Characteristics	Classifications	Frequency	Percent
Address	Urban	228	54.5
	Rural	190	45.5
Educational level of the women	Illiterate	71	27.5
	Grade 1-4	85	14.8
	Grade 5-8	74	23.7
	Grade 9-10	75	23.2
	Grade 11-12	13	1.9
	12+	94	6.2
Occupation	Housewife	311	74.4
	Govt. employee	52	12.4
	Private employee	6	1.4
	Self-Business	49	11.7
Age of respondents	15-20	123	30.9
	21-25	144	36.2
	26-30	101	25.4
	>30	30	7.5
Family size	2	164	39.2
	2-4	140	33.5
	$\geq 5$	114	27.3
Marital status	Married	412	98.6
	Divorced	2	0.5
	Widowed	3	1

Past obstetric history: Most of the participants were primigravida (n=167, 40%), and primiporous (n=167, 40%). Twenty-nine (6.9%) participants gave history of one child loss whereas 3 (0.7%) reported two and

more child loss. Seventy-seven participants (18.4%) had experienced danger signs during pregnancy, child birth and post partum in their previous pregnancies (Table 2).

Table 2: Past obstetric history of ANC attendant in Chiro Hospital eastern Ethiopia, 2014

Variables		Frequency	Percent
Gravidity	1	167	40
	2-3	147	35.2
	>4	104	24.9
Parity	0	167	40
	1-2	146	34.9
Born alive	>3	105	25.1
	0	171	49.9
Born dead	1-2	75	17.9
	>2	172	41
Danger sign in the past (during pregnancy, child birth and post-partum)	0	386	92.3
	1	29	6.9
	≥2	3	.7
	Yes	77	18.4
	No	341	81.6

Knowledge of danger signs: 153 (36.6%), 164 (39.2%) and 127 (30.4%) had the knowledge of at least one danger signs during pregnancy, childbirth and postpartum, respectively. The most commonly known danger signs were severe vaginal bleeding during pregnancy (n=132, 31.6%), childbirth (n=144, 34.4%) and

postpartum (n=97, 23.2%). Two hundred and one (48%) of the participants relatively had good awareness of birth preparedness but only 84 (20%) respondents had knowledge of at least one key danger signs in each of the three periods (pregnancy, child birth and postpartum) combined (Table 3).

Table 3: Pregnant women who reported knowledge of the key danger signs in pregnancy, childbirth and postpartum during ANC attendant in Chiro Hospital eastern Ethiopia, 2014

Variables		Knowledge of danger sign during pregnancy		Knowledge of danger sign during labor & child birth.		knowledge of danger sign during post-partum	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Vaginal bleeding	Yes	132	31.6	144	34.4	97	23.2
	No	286	68.4	274	65.6	321	76.8
Severe headache	Yes	24	5.7	16	3.8	16	3.8
	No	398	94.3	402	96.2	402	96.2
Blurred vision	Yes	16	3.8	DNC		10	2.8
	No	402	96.2			408	97.6
Convulsion	Yes	10	2.4	8	1.9	13	3
	No	408	97.6	410	98	405	96.9
Swollen hands/face	Yes	11	2.6	DNC		18	4.3
	No	407	97.4			400	95.7
High fever	Yes	9	2.2	10	2.4	16	3.8
	No	409	97.8	408	97.6	402	96.2
Loss of consciousness	Yes	6	1.4	8	1.9	4	1
	No	412	98.6	410	98	414	99
Difficulty breathing	Yes	3	0.7	DNC		8	1.9
	No	415	99.3			410	98
Severe weakness	Yes	37	8.9	DNC		22	5.3
	No	381	91			396	94.7

Severe abdominal pain	Yes	48	11.5	DNC	DNC	
	No	370	88.5			
Accelerated/reduced fetal movement	Yes	15	3.6	DNC	DNC	
	No	403	96.4			
Water breaks without labor	Yes	24	5.7	DNC	DNC	
	No	394	94.3			
Labor lasting >12hours	Yes	DNC		DNC	DNC	
	No					
Placenta not delivered 30 minutes after delivery	Yes	DNC		DNC	DNC	
	No					
Mal-odorous vaginal discharge	Yes	DNC		DNC	35	8.4
	No				383	91.6

DNC = Do Not Collect data

Attitudes of pregnant women: The mean score for attitude questions was 9.8, and those scored above the mean were considered as having favorable attitudes. 162 participants (38.8%) had below the weighted mean, while 256 (61.2%) had above the weighted mean. 406 (97.2%) had good attitudes towards hospital delivery than home delivery. 300 (71.8%) respondents

reported that cost of transportation was higher than delivery service in hospital set up. 396 (94.7%) respondents considered that 'bad approach' of health personnel had an impact on service utilization. One hundred eight two (43.5%) respondents replied lack of privacy in labor wards had effect on service utilization, whereas, while 236 (56.5%) respondents did not care about privacy (Table 4).

Table 4: Practices of birth preparedness and complication readiness of ANC attendant in Chiro Hospital eastern Ethiopia, 2014

Characteristics	Category	Frequency	Percent
Do you identify place of delivery?	Yes	417	99.8
	No	1	0.2
Reason for home delivery	Distance of health facility	2	25
	No transportation	1	12.5
	Economic constrain	1	12.5
Saving money	Faith in TTBA's	4	50
	Yes	249	59.6
	No	169	40.4
Prepare essential items for clean delivery and post partum	Yes	244	58.4
	No	174	41.6
Identify skilled provider	Yes	243	58
	No	175	41.9
Detect of early emergency	Yes	161	38.5
	No	257	61.5
Designate decision maker	Yes	151	36
	No	267	63.9
Arrange for emergency funds	Yes	95	22.7
	No	323	77.3
Identify mode of transportation	Yes	388	92.8
	No	30	7.2
Arrange blood donors	Yes	36	8.6
	No	382	91.4
	Yes	374	89.2
Identify institutions with 24hrs EMOC services	Yes	374	89.2
	No	45	10.8

Birth preparedness practice was assessed using four practices items. Identifying skilled provider, saving money, identifying means of transportation, and preparing essential items for clean delivery and postpartum materials for their current pregnancy were done by

243 (58%), 249 (59.6%), 388 (92.8%), and 244 (58.4%) of the participants, respectively (Table 5). Generally, 56.7% (n=237/418) of the respondents practiced birth preparedness and complication readiness during the interviews.

Table 5: Factors associated with birth preparedness and complication readiness of ANC attendant in Chiro Hospital, eastern Ethiopia 2014.

Variables	BP and CR		AOR (95%CI)	P-value
	prepared	Not prepared		
Age				
15-20	6	117	1.335(.136-13.151)	.804
21-25	9	135	482(.034-6.858)	.590
26-30	13	88	565(.025-12.714)	.719
Above 30	9	41	1	
Residence				
Rural	10	180	1	
Urban	27	201	.302(.020-4.461)	.383
Gravidity				
1	18	129	2.650(.195-3.6)	.464
2-3	9	95	.672(.264-1.714)	.406
4 and above	10	157	1	
Experienced obstetric complication before				
No	26	315	1	
Yes	11	66	.384(.060-2.472)	.314
Knowledge of at least one key danger signs during pregnancy				
No	5	276	1	
Yes	32	105	.112(.003-3.802)	.224
Knowledge of at least one key danger signs during pregnancy, child birth and post-partum	4	330	1	
Not knowledgeable				
Knowledgeable	33	51	2.66(.0224-9.86)	<b>.019</b>
Prior knowledge of birth preparedness				
No	4	213	1	
Yes	33	168	.820(.108-6.213)	.848
Attitudes towards birth preparedness				
Un favorable attitudes	1	161	1	
Favorable attitudes	36	220	2.83(1.332-4.17)	<b>.001</b>
Practice of birth preparedness				
Not practiced	2	179	1	
Practiced	35	202	1.23(8.95-16.9)	<b>.001</b>

Predictors of birth preparedness and complication readiness: There were three factors associated with (on bivariate analysis having p-value <0.3) and remain independent predictors of birth preparedness and complication readiness (BP/ CR). These factors/ predictors were 'knowledge of at least one danger signs during pregnancy, child birth and postpartum', 'favorable attitudes towards birth preparedness' and 'practice of birth preparedness'. For example, those women who

had knowledge of at least one key danger signs in any of the three periods were 2.5 times more likely to be prepared for BP/CR than those who had no knowledge on any key danger signs (AOR: 2.66, 95% CI: 0.22-9.86, P = 0.02). At the same time, those pregnant women with favorable attitude had almost 3 time more likely to prepared for BP and CR than those who have unfavorable attitude (AOR: 2.83, 95% CI:1.33 - 4.17, P = 0.001) (Table 6).

Table 6: Factors associated with birth preparedness and complication readiness among ANC attendant at Chiro Hospital, eastern Ethiopia 2014.

Variables		BP and CR		AOR (95%CI)	P-value
		prepared	Not prepared		
Age	15-20	6	117	1.335(.136-13.151)	0.804
	21-25	9	135	0.482(0.034-6.858)	0.590
	26-30	13	88	0.565(0.025-12.714)	0.719
	Above 30	9	41	1	
Residence	Rural	10	180	1	
	Urban	27	201	0.302(0.020-4.461)	0.383
Gravidity	1	18	129	2.650(0.195-3.6)	0.464
	2-3	9	95	0.672(0.264-1.714)	0.406
	4 and above	10	157	1	
Experienced obstetric complication before	No	26	315	1	
	Yes	11	66	0.384(.060-2.472)	0.314
Knowledge of at least one key danger signs during pregnancy	No	5	276	1	
	Yes	32	105	0.112(0.003-3.802)	0.224
Knowledge of at least one key danger signs during pregnancy, child birth and post partum	Not knowledgeable	4	330	1	
	Knowledgeable	33	51	2.66(.0224-9.86)	<b>0.019</b>
Prior knowledge of birth preparedness	No	4	213	1	
	Yes	33	168	0.820(0.108-6.213)	0.848
Attitudes towards birth preparedness	Unfavorable attitudes	1	161	1	
	Favorable attitudes	36	220	2.83(1.332-4.17)	<b>0.001</b>
Practice of birth preparedness	Not practiced	2	179	1	
	Practiced	35	202	1.23(8.95-16.9)	<b>0.001</b>

## DISCUSSION

About 57% of respondents practiced birth preparedness and complication readiness while 43.3% of respondents did not practiced birth preparedness and complication readiness. This is higher than a study done in rural Uganda and South-Western Uganda where about 35% of the respondents were classified as “well birth prepared”<sup>7,14</sup>. This discrepancy might be due to the recent main focus by the government on improving service delivery in maternal health especially on enhancing institutional deliveries among pregnant women. This study has shown that knowledge of pregnant women who knew at least one key danger sign during pregnancy, child birth and postpartum, attitude and practice about BP and CR have shown a statistical significance association with the outcome variable. But there was no statistically significant association between ‘knowledge of at least one key danger signs at specific periods (pregnancy, child birth or postpartum)’ and birth preparedness and complication readiness. This is similar to the study done in rural Uganda<sup>7</sup>. Thirty three percent of women knew at least one key danger sign during pregnancy, 38% during delivery and 28.5% during post-partum. This is much lower than study done in rural Uganda where 52% of women knew at least one key danger sign during pregnancy, 72% during delivery and 72% during postpartum<sup>7</sup>, but higher than the study done in northern Ethiopia<sup>8</sup> and rural Tanzania<sup>5</sup>. The difference could be due to the difference in effort of educational programs provided at different places. The most commonly identified danger signs during pregnancy, delivery and post-partum periods were sever vaginal bleeding, which accounts 31.6%, 34.4% and 23.2%. Similar findings were found in northern Ethiopia<sup>8</sup>, rural Uganda<sup>7</sup>, Ghana<sup>6</sup> and southwest Nigeria<sup>13</sup>. This similarity might be due to the similarity of health information emphasis at different health facilities.

Pregnant women who showed favorable attitude attitudes towards birth preparedness and complication readiness were 61.2%. This is similar to the study done in Arsi Zone, South-East Ethiopia<sup>12</sup>. This similarity might be due to the improvement of delivery service in the country and the recent moment of making the delivery service free of charge at a national

level. In this study, attitude is one of the factors affecting birth preparedness and complication readiness (AOR 2.8, 95% CI: 1.33-4.17). This finding is similar to a study done in Arsi Zone<sup>12</sup> which depicted similar favorable attitudes on some issues. For example, 97.2% of ANC attendants showed favorable attitudes towards hospital delivery than home delivery. On the other hand, a study done in southern Ethiopia found that the majority of the respondents (87.9% intension was to deliver at home<sup>1</sup>. About 44% of pregnant women responded that the lack of privacy in labor ward affected their delivery service utilization which is similar to the response of women in Arsi Zone where 40.0% of them agreed to the statement “Giving birth on the delivery bed of labor ward was very shameful”<sup>12</sup>. Because of the fact that lack of privacy affect delivery service utilization might be due to cultural influence in which, most of the time laboring women has been given birth in home or isolated place and they do not want to expose themselves.

Of the four birth preparedness practices; 58% of the respondents had identified skilled provider, 59.6% saved money, 92.8% identified means of transport, and 99.8% decided the place of delivery. Even though these findings are similar to the in rural Uganda<sup>7</sup>, they are higher than the finding in Adigrat Town, Northern Ethiopia<sup>8</sup>. The difference might be due to differences in local health delivery system, availability of roads and program effort by Ministry of Health and collaborating stakeholders.

## CONCLUSION AND RECOMMENDATION

Knowledge is an important factor that affects attitude, intension and behaviour. Knowledge relates to behaviour, and behaviour produces change towards service utilization. The more knowledge they have about dangerous signs of pregnancy and delivery the more they go for antenatal and delivery services. Knowledge is strong predictor of maternity service utilization; those having good knowledge about danger signs of pregnancy and delivery are more likely using skilled delivery services. It is expected that a better-informed individual is better



placed to make reasonable decisions. A strong positive association that has been also shown to exist between qualities of care obtained during pregnancy and the use of skilled delivery care<sup>5</sup>. Knowledge of obstetric danger signs and birth preparedness and complication readiness in the study area were found to be low. Our study showed low awareness of knowledge of obstetric danger signs and birth preparedness and complication readiness among ANC follow up of pregnant women in the hospital. Study also demonstrated strong association between knowledge of dangers signs during the three periods, attitude towards birth preparedness and complication readiness and practice of birth preparedness. So, effort to increase knowledge of obstetric danger signs and birth

preparedness and complication readiness should focus on antenatal care services and giving regular health education in health facilities and outreach to the communities.

## COMPETING INTERESTS

The authors declare that they have no competing interests.

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## REFERENCES

1. Hailu M, Gebremariam A, Alemseged F, Deribe K: Birth Preparedness and Complication Readiness among Pregnant Women in Southern Ethiopia. PLoS ONE 2011, 6(6): e21432. doi:10.1371/journal.pone.0021432
2. WHO: World health statistics 2015. Geneva Switzerland. [http://apps.who.int/iris/bitstream/10665/170250/1/9789240694439\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/170250/1/9789240694439_eng.pdf). Accessed 20 March 2017. Moran AC, Sangli G, Dineen R, Rawlins B, Yaméogo M, Baya B: Birth-Preparedness for Maternal Health: Findings from Koupéla District, Burkina Faso. J Health Popul Nutr 2006, 24 (4): 489-497. ISSN 1606-0997
3. Kakaire O, Kaye DK, Osinde MO: Male involvement in birth preparedness and complication readiness for emergency obstetric referrals in rural Uganda. Reproductive Health 2011, 8:12. Doi:10.1186/1742-4755-8-12
4. Pembe AB, Urassa DP, Carlstedt A, Lindmark G, Nyström L, Darj E: Rural Tanzanian women's awareness of danger signs of obstetric Complications. BMC Pregnancy and Childbirth 2009, 9:12 doi:10.1186/1471-2393-9-12.
5. Udofia EA, Obed SA, Calys-Tagoe BN, Nimo KP. Birth and Emergency Planning: A Cross Sectional Survey of Postnatal Women at Korle Bu Teaching Hospital, Accra, Ghana. Afr J Reprod Health 2013; 17[1]: 27-40
6. Kabakyenga J, Östergren PO, Turyakira E, Pettersson KO: Knowledge of obstetric danger signs and birth preparedness practices among women in rural Uganda. Reproductive Health 2011; 8:33. Doi:10.1186/1742-4755-8-33
7. Hiluf M, Fantahun M: Birth preparedness and complication readiness among women in Adigrat town, north Ethiopia. Ethiop. J. Health Dev. 2007;22(1):14-20
8. Mutiso SM, Qureshi Z, Kinuthia J: Birth preparedness among antenatal clients. East Afr Med J 2008, 85(6):275-283. doi:10.1371/journal.pone.0021432
9. Central Statistical Agency (CSA) [Ethiopia] and ICF: Ethiopia Demographic and Health Survey 2016: Key Indicators Report. Addis Ababa, Ethiopia, and Rockville, Maryland, USA. CSA and ICF 2016. [www.DHSprogram.com](http://www.DHSprogram.com). Accessed on: March 20, 2017.
10. JHPIEGO: Monitoring birth preparedness and complication readiness: tools and Indicators for maternal and newborn health. Baltimore: JHPIEGO; 2004. <http://www.jhpiego.org/files/BPCRtoolkit.pdf>. Accessed: 12 May 2017
11. Abera M, Gebremariam A, Belachew T: Predictors of Safe Delivery Service Utilization in Arsi Zone, South-East Ethiopia. Ethiop J Health S 2011, 21(Suppl 1): 95-106.
12. Ekabua JE, Ekabua, KJ, Odusolu P, Agan, TU, Iklaki, CU, Etokidem AJ: Awareness of Birth Preparedness and Complication Readiness in South eastern Nigeria. International Scholarly Research 2011, Volume 2011:doi.org/10.5402/2011/560641
13. Kabakyenga JK, Östergren PO, Turyakira E, Pettersson KO: Influence of Birth Preparedness, Decision-Making on Location of Birth and Assistance by Skilled Birth Attendants among Women in South-Western Uganda. PLoS ONE, 7(4): e35747. doi:10.1371/journal.pone.0035747
14. Abebe F, Berhane Y, Girma B: Factors associated with home delivery in Bahir Dar, Ethiopia. BMC Research Notes 2012, 5:653. Doi:10.1186/1756-0500-5-653