

Original Research Article

## **Birth Preparedness and Complication Readiness and Associated Factors among Mothers Attending Antenatal Care at Chiro District Health Centers, West Hararge, Ethiopia**

**Ashenafi Habtamu Regesu<sup>1</sup>, Alemu Tuji Oda<sup>2</sup>, Muhammedawel Kaso Adem<sup>3</sup>, Mekiya Kebirhussein Wako<sup>4</sup>**

<sup>1</sup>Arsi University, College of Health Science, Department of Public Health, Asella, Ethiopia, Master of Public Health, Lecturer,

<sup>2</sup>JSI, USAID/TRANSFORM Primary Health Care, Oromia, Ethiopia, Master of Public Health,

<sup>3</sup>Arsi University, College of Health Sciences, Department of Public Health, Asella, Ethiopia, Master of Public Health, Assistant Professor,

<sup>4</sup>Alberta Children Hospital /Rotary Palm House/, Canada,

Corresponding Author: Ashenafi Habtamu Regesu

### **ABSTRACT**

**Back ground:** Birth Preparedness and Complication Readiness (BP/CR) is a comprehensive package aimed at promoting access to skilled maternal health services. However, the existing studies indicate that BP/CR in developing countries is less than 50%.

**Objectives:** To assess BP/CR and associated factors among mothers attending ANC in Chiro District Health Centers, Ethiopia, 2016.

**Methods:** Descriptive cross-sectional study design was conducted on 303 ANC visitors from July 24 to August 25, 2016. Descriptive statistics was used to summarize the data by using SPSS version 20 and multiple logistic regressions was used to identify the association with 95% confidence interval at p- value of 0.05.

**Results:** BP/CR among ANC visitors was 42.9%. BP/CR was significantly associated with mother's school attendance, mother's occupation, ANC visit for last pregnancy before the current pregnancy, danger sign knowledge during pregnancy, labor and child birth and source of information.

**Conclusion:** This study identified only 42.9% of the mothers were knowledgeable on BP/CR. Mother's school attendance, ANC services and early identification of key dangers sign are statistically associated with BP/CR. Therefore, there should be enhanced education, promotion of ANC and counseling of mothers by health workers to improve their knowledge on danger signs and ANC follow up.

**Key words:** Birth preparedness and complication readiness, pregnant mothers, danger and antenatal care

### **INTRODUCTION**

The global maternal mortality is unacceptably high. The rate of maternal mortality varies significantly across the world and every year some 287, 000 women

die of complications during pregnancy or childbirth globally. [1-4]

In many societies in the world, cultural beliefs and lack of awareness inhibit preparation in advance for delivery and expected baby. 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, these delays can cause maternal death. [5,6]

Improving maternal health has received recognition at the global level as evidenced by the inclusion of reducing maternal mortality in the Sustainable Development Goals (SDGs). According to SDG 3 target 3.1 it is targeted to reduce maternal mortality ratio to less than 70/100,000 life birth by 2030. [7,8] Since it is not possible to predict which women will experience life-threatening obstetric complications that lead to maternal mortality, receiving care from a skilled provider during childbirth has been identified as the single most important intervention in safe motherhood. [8-13]

For some complications including; severe hemorrhage, a few hours matter to save life, while for others hours or even days may be tolerable but with the prognosis getting worse as time elapses. As complication readiness is vital to survival, it needs quick action. [9,13-15]

Birth preparedness and complication readiness package is among the best strategies recommended by safe motherhood initiatives to promote the timely use of skilled attendant, by addressing the three delays during labor and childbirth, BP/CR include many elements, including: knowledge of danger signs, save money, plan for where to give birth, plan for a skilled birth attendant, plan for transportation, a birth companion and identification of compatible blood donors in case of emergency, [12] however, the existing studies indicate that BP/CR in most developing countries is less than 50%. [9,12,16]

BP/CR is an integral component of focused antenatal care which involves planning with the key stakeholders [3,16] and this approach is strongly recommended by Ethiopian government as component of

focused ANC to alleviate the lingering maternal health problem. [17]

Therefore this study is conceptualized to generate baseline data for the indicator-Percent ANC visitors who are knowledgeable about birth preparedness and complication readiness plan in Chiro Woreda Health Centers.

In addition to that this study contribute to policy by documenting good practices and help policy makers to pick and apply lessons learned to ensure a successful strategy to fight maternal mortality and encourage focused ANC, which is compulsory if we have to achieve the national motto of “Zero Maternal Mortality”.

## MATERIALS AND METHODS

### Design and setting

Health Facility based descriptive cross-sectional study design supported by qualitative key informant interview was conducted from July 24 to August 25, 2016. The study was conducted in Chiro Woreda Health Centers. Chiro Woreda is one of the 16 Woreda found in West Hararge Zone at 326km distance from Addis Ababa the capital city of Ethiopia. This Woreda has 1 urban and 39 rural kebeles and 215,353 total populations based on 2007 National population and housing census. From this total population an estimated of 7476 pregnancy was found in 2016. ANC first visit coverage of 2016 was 105%. Skilled birth attendant coverage was 10%, 34.5% and 39% for the year 2014, 2015 and 2016 respectively. [18,19]

### Population

#### Source population

Source populations for quantitative data were all pregnant women found in Chiro Woreda in 2016 and family members of women who were currently pregnant & HEWs in Chiro Woreda for key informant.

#### Study population

The study populations were pregnant women who have visited Chiro Woreda health centers for antenatal care service during the data collection period.

## Sample size determination

We estimated a sample size of 303 women using single population proportion formula, assuming a 23.3% prevalence rate from the study conducted in Jimma Zone, [20] 0.05 margin of error, and factoring for 10% non-response.

## Sampling procedure

Quantitative data were collected from all health centers using systematic random sampling method with k value of 2 and the total sample size was proportionally allocated to health centers. The first sample was selected by simple random sampling lottery method. For qualitative data, key informants were selected purposively.

## Data collection

Data were collected through structured interview questionnaire for quantitative and interview guide for qualitative. The questionnaire was adapted from JHPIEGO Maternal and Neonatal health Program of 2004 [12] and different related literatures. [20,21] Furthermore, it was pre-tested before the actual data collection period and two days training has been provided to data collectors and supervisor.

## Data management and analysis

Quantitative data was entered and cleaned using Epi Info version 3.5 and exported to SPSS version 20.0 for analysis. Bivariate and multivariate logistic regression was performed and explanatory variables which had statistically association at  $p \leq 0.25$  were entered into final regression analysis. On multivariate logistic regression, Adjusted Odds Ratio along with 95% Confidence interval was used declare the statistically significant variables at  $p \leq 0.05$ . All key informant data were transcribed word by word.

## Ethical consideration

Ethical clearance and approval was obtained from Oromia Regional Health Bureau. Verbal informed consent was obtained from study participants after they are informed about the objective of the study, confidentiality of the information

obtained during interview and right to refuse to participate in the study. To ensure confidentiality, anonymous recording and coding of questionnaire were implemented.

## RESULTS

### Socio-demographic characteristics

A total of 303 pregnant women participated in the study with response rate was 100%. About sixty two percent of the mother's age group ranges between 20-29 years and mean age of the respondents was 26.4 ( $SD \pm 5.8$ ) years. Majority of the ethnic group was Oromo (90.8%) and Muslim accounted for 78.9% (Table 1).

**Table 1: Socio-demographic characteristics of respondents, Chiro Woreda, West Hararge, Ethiopia, August, 2016 (n=303)**

Variable	Frequency	Percentage
<b>Age</b>		
15-19	27	8.9
20-24	96	31.7
25-29	93	30.7
30-34	46	15.2
35-39	30	9.9
40-44	11	3.6
45-49	0	0
<b>Ethnicity</b>		
Oromo	275	90.8
Amhara	24	7.9
Somali	4	1.3
<b>Religion</b>		
Muslim	239	78.9
Orthodox Christian	63	20.8
Wakefata	1	0.3
<b>Marital status</b>		
Single	6	2
Married/in Union	295	97.4
Divorced	1	0.3
Widowed	1	0.3
Separated		
<b>Have you ever attended school?</b>		
Yes	161	53.1
No	142	46.9
<b>Mothers educational level</b>		
Grade 1-4	88	54.7
Grade 5-8	59	36.6
Grade 9-10	12	7.5
Grade 12+	2	1.2
<b>Mother's current Occupation</b>		
House wife/farmer	289	95.4
Government employee	4	1.3
Private employee	6	2
Merchant	2	0.7
Student	2	0.7
<b>Husband educational level</b>		
Grade 1-4	85	28.1
Grade 5-8	82	27.1
Grade 9-10	29	9.6
Grade 11-12	8	2.6
Grade 12+	3	1
No schooling	96	31.7
<b>Husband current occupation</b>		
Farmer	289	95.4
Government employee	6	2
Private employee	2	0.7
Merchant	6	2

### Past obstetric history

Most of the mothers (53.5%) had less or equal to 3 pregnancies, whereas only 8.9% of mothers had greater than 6 pregnancies. Primigravida accounts about 19.8% of the respondents. Most of the respondents (62.5%) have 1-3 alive children. Majority (63%) of the pregnant mothers had ANC service from health facility during the last pregnancy, of which 35.6% received three visits (*Table 2*).

**Table 2: Past obstetric history of the pregnant women attending ANC service at Chiro Woreda HCs, West Hararge, Ethiopia, August, 2016 (n= 303)**

Variables	Frequency	Percentage
<b>Number of pregnancies</b>		
1-3	162	53.5
4-6	114	37.6
>6	27	8.9
<b>Number alive children (n=240)</b>		
1-3	150	62.5
4-6	76	31.7
>6	14	5.8
<b>Any pregnancies ended in abortion</b>		
Yes	24	7.9
No	279	92.1
<b>Any pregnancies ended in stillbirth</b>		
Yes	16	5.3
No	287	94.7
<b>ANC for last pregnancy</b>		
Yes	191	63
No	112	37
<b>Number of ANC visits for the last pregnancy (n=191)</b>		
Only Once	22	11.5
Only Twice	67	35.1
Only three times	68	35.6
Four and above	34	17.8
<b>Place of ANC visit for last pregnancy</b>		
Hospital	4	1.3
Health center	142	46.9
Health post	100	33
<b>Place of last delivery (n= 243)</b>		
Hospital	8	3.3
Health center	121	49.8
Health post	5	2.1
Home	109	44.9
<b>Last delivery attended by</b>		
Health worker	129	53.1
HEW	5	2.1
Family member	109	44.9

### Knowledge of danger signs during pregnancy, labor and post-partum period

Majority (80.2%) of the pregnant mothers heard the occurrence of problems related to pregnancy and child birth and 77.9%, 34.3% and 31.4% of Pregnant mothers identify vaginal bleeding, swollen hands/face and blurred vision as key danger

signs during pregnancy respectively. Only 13.5% of the mothers responded to all the three key danger signs and considered as knowledgeable during pregnancy (*Table 3*).

### Knowledge of birth preparedness and complication readiness

Majorities (89.4%) of the pregnant women have heard about BP/CR and the major source of information was health extension workers which accounted for 76.4%. Among the key points a mother can do for birth preparedness, 50.5%, 78.2%, 17.8%, 57.1% and 21.1% were able to identify mode of transportation, save money, identify blood donor, identify place of delivery, and identify skilled provider respectively. This result was supported by key informant interview as stated by one of the study participants;

*"Only preparing of essential items like cloths and blade at home to care for newborn baby is enough since I also experience nothing by doing so".*

*Grandmothers of 43 years, Muslim region and found in Wachu Gile Health Center*

Finally, among the mothers included in the study 42.9% of them considered as knowledgeable for birth preparedness and complication readiness as they replied to three or more of the key points of birth preparedness and complication readiness.

### Obstetric service utilization plan of current pregnancy

Among the pregnant mothers included in the study 62.7% of them have planned to have four and above ANC visit and 95.7% of the respondents have planned place of delivery for their current pregnancy, of which 84.8% of them to be at health center and 7.2% at hospital. On the other hand 5.2 % pregnant mothers have planned to deliver their current pregnancy at home. This finding was also supported by key informant participants;

*One of the pregnant mother husband said "most of our pregnant mothers are not happy to give birth at health facility, because of the unpleasant health worker*

*approach and position of delivery was not comfortable to mothers”.*

*Pregnant mothers husband, 46 years old, Muslim religion and Beka Health Center.*

**Table 3: Knowledge of Danger Signs during pregnancy, labor and post-partum period among respondents of Chiro Woreda, West Hararge zone, Ethiopia, August, 2016 (n= 303)**

Variable	Frequency	Percentage
<b>Unforeseen problems related to pregnancy or child birth</b>		
Yes	243	80.2
No	14	4.6
I don't know	46	15.2
<b>Danger sign during pregnancy</b>		
Bleeding	236	77.9
Swollen hands/face	104	34.3
Blurred vision	95	31.4
Convulsions	87	28.7
Severe headache	117	38.6
High fever	64	21.1
Loss of consciousness	88	29
Difficulty breathing	35	11.6
Don't know any	24	7.9
Knowledgeable on Key danger signs of pregnancy	41	13.5
<b>Danger signs during labor and child birth</b>		
Severe Bleeding	235	76.9
Convulsions	94	31.1
Labor lasting >12 hours	111	36.6
Placenta not delivered within 30 minutes	85	28.1
Severe headache	107	35.3
Blurred vision	83	27.4
High fever	69	22.8
Loss of consciousness	85	28.1
Don't know any	30	9.9
Knowledgeable on Key danger signs of labor and child birth	17	5.6
<b>Danger signs during the first 2 days after birth</b>		
Severe Bleeding	182	60.1
High fever	69	22.8
Foul-smelling vaginal discharge	34	11.2
Severe headache	101	33.3
Blurred vision	82	27.1
Convulsions	104	34.3
Difficulty breathing	39	12.9
Sever weakness	76	22.1
Don't know any	32	18.8
Knowledgeable on key danger signs of postpartum period	11	3.6

### **Factors associated with birth preparedness and complication readiness**

In the bivariate logistic regression analysis, BP/CR was significantly associated with marital status, mother's school attendance, mother's occupation, husband school attendance, ANC visit for the last pregnancy, place of birth for the last pregnancy, history of abortion, interval between pregnancy, number of pregnancy, danger sign knowledge during pregnancy, danger sign knowledge during labor and child birth, danger sign knowledge during postpartum and source of information.

However, in the multivariate logistic regression analysis, BP/CR was significantly associated with mother's school attendance, mother's occupation,

ANC visit for the last pregnancy, place of birth for the last pregnancy, danger sign knowledge during pregnancy, labor and child birth and sources of information.

Accordingly, mothers who attend school were 0.62 times more likely knowledgeable on birth preparedness and complication readiness (AOR=0.62, 95% CI: 0.37, 0.99) when compared to mothers who didn't attend school. Mother's occupation also has association with preparation for birth and its complication. Mothers who employed to any organizations were 0.08 times more likely knowledgeable on BP/CR when compared to house wife/farmer (AOR=0.08, 95% CI: 0.01, 0.73).

**Table 4: Association of selected variables with birth preparedness and complication readiness among pregnant mothers of Chiro Woreda, West Hararge, Ethiopia, 2016 (n= 303)**

Variables	BP/CR knowledge					
	Not Knowledgeable	Knowledgeable	COR (95% CI)	P-Value	AOR(95%CI)	P-Value
<b>Marital status</b>						
Married	171(58%)	124(42%)	1.99(0.53, 7.57)	0.31	2.14(0.52, 1.99)	0.28
Single	1(16.7%)	5(83.3%)				
<b>Mother school attendance</b>						
School attended	82(51%)	79(49%)	0.58(0.37, 0.92)	0.02	0.62(0.37, 0.99)	0.04
No school attendance	91(64.1%)	51(35.9%)				
<b>Mother' occupation</b>						
House wife/farmer	171(59.2%)	118(40.8%)				
Employed	2(14.3%)	12(85.7%)	0.12(0.03, 0.52)	0.005	0.08(0.01, 0.73)	0.025
<b>Husband school attendance</b>						
School attended	118(57%)	89(43%)	1.01(0.62, 1.65)	0.96	0.85(0.54, 1.35)	0.49
No school attendance	55(57.3%)	41(42.7%)				
<b>ANC visit for the last pregnancy</b>						
Yes	94(49.2%)	97(50.8%)	2.47(1.51, 4.06)	0.00	3.03(1.15, 8.01)	0.025
No	79(70.5%)	33(29.5%)				
<b>Birth place of last delivery</b>						
Hospital/HC	48(36.6%)	83(63.4%)	7.49(4.14, 13.56)	0.00	5.84(2.96, 11.55)	0.00
HP/at home	91(81.3%)	21(18.7%)				
<b>History of abortion</b>						
Abortion encountered	18(64.3%)	6(35.3%)	0.42(0.16, 1.00)	0.72	1.83(0.62, 5.43)	0.25
Abortion not encountered	155(86.6%)	24(13.4%)				
<b>Interval between pregnancies</b>						
≤ 23 months	40(43.5%)	52(56.5%)	2.5(1.47, 4.25)	0.001	1.05(1.02, 1.08)	0.00
≥ 24 months	100(65.9%)	52(34.1%)				
<b>Number of pregnancies</b>						
1-3	91(56.2%)	71(43.8%)				
4-6	63(55.3%)	51(44.7%)	0.54(0.22, 1.30)	0.17	0.68(0.27, 1.70)	0.41
>6	19(70.4%)	8(29.6%)	0.52(0.21, 1.28)	0.16	0.57(0.23, 1.43)	0.23
<b>Danger sign knowledge during pregnancy</b>						
Knowledgeable	4(9.7%)	37(90.3%)	16.81(5.81, 48.62)	0.00	12.21(4.01, 37.16)	0.00
Not knowledgeable	169(64.5%)	93(35.5%)				
<b>Danger sign knowledge during labor and child birth</b>						
Knowledgeable	5(29.4%)	12(70.6%)	3.42(1.17, 9.96)	0.02	3.37(1.15, 9.91)	0.03
Not knowledgeable	168(58.3%)	118(41.7%)				
<b>DS knowledge during post-partum</b>						
Knowledgeable	3(27.3%)	8(72.7%)	3.72(0.97, 14.29)	0.56	4.05(1.01, 16.28)	0.048
Not knowledgeable	170(58.2%)	122(41.8%)				
<b>Source of information for BP/CR</b>						
Health worker	32(40%)	48(60%)	0.18(0.08, 0.39)	0.00	0.17(0.08, 0.41)	0.00
HEW	85(41.9%)	118(58.1%)	0.05(0.02, 0.12)	0.00	0.05(0.02, 0.12)	0.00
Media	5(20.8%)	19(79.2%)	0.22(0.06, 0.85)	0.02	0.22(0.06, 0.87)	0.03
Mothers	37(62.7%)	22(37.3%)				

## DISCUSSION

Birth Preparedness and Complication Readiness is to help pregnant mothers to have an advanced planning and preparation to seek ANC service and skilled birth attendants timely throughout pregnancy, child birth and after delivery. [12] Accordingly, this study identified only 42.9% of mothers were knowledgeable on birth preparedness and complication readiness. This result is in consistence with the existing studies finding of most of the developing countries which indicated less than 50% (16, 22, 23), but higher than the

study conducted in Ghana, 2014 (23%), [23] Kenya, 2014 (20.3%) [24] and also higher than studies in Southern Ethiopia, 2011 (17%) [25] and Jimma Zone, 2015 (23.3%). [20] The possible explanation behind this discrepancy can be due to the case that birth preparedness and complication readiness is relatively a recent strategy and attentions given by Health Extension Program in Ethiopia.

Since occurrences of complications during pregnancy and childbirth are unpredictable, every woman needs to be aware of the key danger signs of obstetric

complications during pregnancy, delivery and postpartum. This knowledge will ultimately empower them and their families to make prompt decisions to seek care from skilled birth attendants. [3,16] This study finding revealed that 13.5% of mothers were considered as knowledgeable about key danger signs during pregnancy. This finding is found to be almost consistent with 14.8% of the study conducted in Tanzania, 2012, [26] but lower than the study result of Addis Ababa health centers, 2011 (42%). [21] Mothers considered as knowledgeable on key dander signs during labor and child birth were 5.6%, which is a little bit higher than 3.7% of Jimma zone 2015 finding, but lower than Addis Ababa, 2011 (17.2%). [21] This may be explained by the fact that the study conducted in Addis Ababa included pregnant women who attended second and above ANC visit.

Educated and employed women with minimum income can empower to be economically strong and decision making ability; these help them to have good maternal and child health service. [27] Mother's school attendance and occupational status were among the factors affected birth preparedness and complication readiness in this study and supported by other similar study conducted in other African countries and also in Ethiopia. [20-24] This could be justified as educated and employed women have better access for information and position in the household that could lead enhanced decision making power with regard to health seeking behavior.

This study also revealed that knowledge of key danger signs during pregnancy and child birth were identified as factors affecting mother's preparation to birth and its complication. Similar findings have also been reported in prior studies in Ethiopia and others. [20,21,27]

According to the result of this study mothers who attend ANC service for the last pregnancy from health facility were three times knowledgeable for BP/CR when compared to mothers who didn't attend

ANC service (AOR=3.03, CI; 1.15-8.01). This is consistent with the study of Adigrat, North Ethiopia 2007. [22]

### **Limitations**

In this study only demand side perspective of birth preparedness and complication readiness was addressed. Pregnant women attended ANC visit in private health facilities were not included in the study. Therefore, interpretation of the findings requires consideration of these limitations.

### **CONCLUSION**

This study indicated lower birth preparedness and complication readiness among mothers attending Antenatal Care at Chiro Woreda Health Centers. Mother's school attendance, Mother's occupation, ANC visit for the last pregnancy, place of birth for the last pregnancy, Danger Sign Knowledge during pregnancy, labor and child birth and sources of information were identified as factors affecting BP/CR among mothers attending Antenatal Care at Chiro Woreda Health Centers. In the mean time we recommend, Chiro Woreda Health Office and West Harerghe Zonal Health Department should encourage comprehensive health education and counseling of mothers to improve their knowledge on Danger Signs and BP/CR. Furthermore, Zonal Education Department and Social Service Office need to work on women education and empowering them for employment.

### **Conflict of interest**

All authors declare no conflict of interest.

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