

Determinants of Birth Preparedness and Complication Readiness Among Pregnant Woman Attending Antenatal Care at Dilchora Referral Hospital, Dire Dawa City, East Ethiopia

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Abstract

Background: Almost all maternal deaths (99%) occur in developing countries and more than half of this deaths occur in sub-Saharan Africa. Evidence indicates that promoting Birth preparedness and complication readiness has important role in tackling maternal mortality.

Methods: A Facility-based cross-sectional study was conducted from March 9, 2015 to July 12, 2015 among mothers who attend Antenatal care at Dilchora Referral Hospital. A systematic random sampling technique was used to select a sample of 405 participants. Bivariate and multivariate analysis was performed to check associations and control confounding.

Results: Proportion of women who were well prepared for birth and ready for complications was found to be 54.7%. Attending tertiary level education and being knowledgeable on obstetric danger signs were found to be significantly associated with birth preparedness and complication readiness.

Conclusion: Proportion of women who were well prepared for birth and ready for complications was still found to be low. Improving awareness of women both at community and institutional level and reinforcing counseling on obstetric danger signs at Antenatal Care is recommended to increase level of birth preparedness and complication readiness.

Keywords: Birth preparedness and complication readiness; Dire dawa city; East Ethiopia

Abbreviations: ANC: Antenatal Care; BP/CR: Birth Preparedness and Complication Readiness; HEWs: Health Extension Workers

Introduction

Worldwide 800 women die every day due to pregnancy or child birth related complications. Almost all maternal deaths (99%) occur in developing countries and more than half of this deaths occur in sub-Saharan Africa [1].

Ethiopia, being one of the countries with highest maternal mortality in the world, is striving hard in reducing maternal mortality. The recent report on maternal mortality showed that, the country has reduced the ratio by 60%. In the last five years, substantial effort has been made in the health service in order to address the demand of pregnant and delivering women to avert morbidity and mortality associated with pregnancy and child birth. Even though there is substantial reduction in maternal mortality; still Ethiopia is one of the countries with excess of maternal deaths [2-4].

Birth preparedness is a comprehensive strategy to improve the use of skilled providers at birth and the key intervention to decrease maternal mortality. Birth preparedness and complication readiness (BP/CR) strategy encourage women to be informed of danger signs of obstetric complications and emergencies, choose a preferred birth place and attendant at birth, make advance arrangement with the attendant at birth, arrange for transport to skilled care site in case of emergence, saving or arranging alternative funds for costs of skilled and emergency care, finding a companion to be with the woman at birth or to accompany her to emergency care and identifying blood donor in order to facilitate swift decision-making and reduce delays in reaching care once a problem arises. Responsibilities for BP/CR must

be shared among all safe motherhood stakeholders, since coordinated effort is needed to reduce the delays that contribute to maternal and newborn deaths [5].

In Ethiopia direct obstetric complication accounts for 85% of the deaths. It includes abortion 32%, obstructed labor 22%, sepsis 12%, hemorrhage 10% and hypertension 9%, primarily due to frequency of adolescent pregnancy combined with neglected prolonged labor [4,6,7]. Most of these deaths are preventable when there is access to adequate reproductive health services, equipment, Supplies and skilled healthcare workers [8,9]. Too often, however, their access to care is impeded by delays; delays in deciding to seek care, delays in reaching care and delays in receiving care. These delays have many causes; including logistic and financial concerns, unsupportive policies and gaps in services, as well as inadequate community and family awareness and knowledge about obstetric complication issues [6].

Evidence from developing countries like Ethiopia [10], Bangladesh [11], and Burkina Faso [12] showed that counseling given during birth preparedness and complication readiness helpful in improving

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institutional deliver utilizations, while other studies conducted in Nepal [13], Burkina Faso [14] and India [15] showed BP/CR plan improves preventive behaviors, improves knowledge of mothers about danger- signs, and leads to improvement in care-seeking during obstetric emergency.

Despite the fact that birth preparedness and complication readiness is essential for further improvement of maternal and child health little is known about the current magnitude and associated factors in Ethiopia in general and in Dire Dawa in particular. This study, therefore, aimed to fill this gap by assessing the current status and factors associated with birth preparedness and complication readiness among pregnant women attending ANC at Dilchora referral hospital, Dire Dawa city, Ethiopia.

Methods

This study was conducted at Dilchora Referral Hospital which is found in Dire Dawa city administration council and located 501 km to East of Addis Ababa. The hospital is serving an estimated 2 million population found in Dire Dawa City administration and nearby Oromiya and Somali regions having total beds of 268 distributed in medical, pediatrics, surgical, gynecology and obstetrics ward. Monthly, an estimated 582 clients visits antenatal clinic found in the hospital. In addition, monthly an estimated 194 clients visit the clinic for ANC four or more. Institution based cross-sectional study was conducted from March 9, 2015 to July 12, 2015. Using single proportion formula ($n = Z^2 pq / d^2$), sample size was determined by considering the following assumptions; proportion of women practiced birth preparedness and complication readiness of 50% (because no study was conducted in the areas), 95% level of confidence ($Z = 1.96$); 5% marginal error ($d = 0.05$), and Non response rate of 5%. Thus, the final sample size required was 405 participants. To select participants, systematic random sampling methods was used, after case review of the previous four months of ANC four, were identified and found to be 828. The interval was determined ($828/405$) and found to be 2. Hence, every two mother was selected to be included in the study. Only women who came to the hospital for ANC-4 (fourth visit) or more were included in the study.

Data on socio-demographic factors, obstetric factors, and knowledge and practice regarding birth preparedness and complication readiness were collected using a pre-tested and structured questionnaire. Data were collected through face-to-face interviews after training both data collectors and supervisors.

Data were entered into Epi Info version 3.5.1 and exported to SPSS version 20.0 software package for analysis. The results were presented in the form of tables, and text using frequencies and summary statistics such as mean, standard deviation, and percentage to describe the study population in relation to relevant variables. The data were analyzed using logistic regression to determine the effect of various factors on the outcome variable and to control confounding. Most of the variables were fitted to the bivariate logistic regression. Then all variables having a p value ≤ 0.2 in the bivariate analysis were further entered into multivariate logistic regression model. Variables having p value ≤ 0.05 in the multivariate analysis were taken as significant predictors. Crude and adjusted odds ratios with their 95% confidence intervals were calculated.

A woman was considered as prepared for birth and its complication if she reported that she identified place of delivery, skilled birth attendant, blood donor and means of transport to place of child birth or for the time of obstetric emergencies ahead of childbirth and saved money that can be used during emergency. Then those women

who followed at least three of the five BP/CR components were considered as "prepared for birth and its complication". Similarly, a woman was considered knowledgeable on obstetric danger signs if she spontaneously mentioned three or more obstetric danger signs i.e. at least one ante partum danger sign (vaginal bleeding, swollen hand and face, blurring of vision), one intrapartum danger signs (severe vaginal bleeding, prolonged labor of >12 hr, retained placenta), and one postpartum danger signs (severe vaginal bleeding, foul smelling vaginal discharge, high fever).

Ethical clearance was obtained from Institutional Research Ethics Review Committee of Haramaya University, college of Health and Medical sciences. A formal letter of cooperation was written to Dire Dawa Health bureau and Dilchora referral Hospital. After explaining the purpose of the study, voluntary verbal consent was obtained from each study participant. Participants were informed that participation was on voluntary basis and they can withdraw at any time if they are not comfortable about the questionnaire. Personal identifiers were not included so that participants' confidentiality was assured.

Result

Socio-demographic characteristics of the respondents

Of all 405 pregnant women sampled, 391 were included in the analysis giving a response rate of 96.5%. The mean age of the mothers was 27.19 years ($SD \pm 5.12$ years). A majority, 339 (86.7%) of the women were in age group of 20-34, 306 (78.3%) were from urban, 372 (95.1%) were married, 215 (55.0%) were Orthodox by religion, 231 (59.1%) were Oromo by ethnicity and 251 (64.2%) were house wife by occupation. About a third, 128 (32.7%) of the women and a fourth, 101 (25.8%) of their partner didn't attended any formal education.

Regarding to media exposure at their home, majority, 348 (89.0%) of mothers have Radio/ TV at their home, and only 9 (2.3%) of the women can't get access to health service within 10 kilometers (Table 1).

Obstetric characteristics of the respondents

Of all participants, a majority, 269 (68.8%) were multiparous, and 73 (18.7%) of them were reported to have experienced still birth. Concerning ANC follow up, the majority, 365 (93.4%) of the respondents have 4 ANC visits, but 149 (38.5%) of the respondents were not accompanied by their partner during their ANC visits. In addition, almost all women 389 (99.5%) reported to had received counseling regarding HIV during their ANC visits. The majority of the respondents make their health care decision either by themselves, 140 (35.8%) or with their partners 238 (60.9%).

Of all respondents, 86 (22.0%) were reported to have experienced health problems during pregnancy, and majority of them sought health assistance from Health care provider, 67 (77.9%), followed by Health Extension Workers 11 (12.8%) (Table 2).

Characteristics of the respondent with regard to BPCR

In this study, the majority 292 (74.7%) of the respondents heard about BP/CR, the primary source of information being health professionals 244 (46.8%) followed by HEWs 148 (28.4%). Regarding knowledge on obstetric danger signs, 229 (58.6%), 200 (51.0%), and 186 (47.6%) of the respondents were found to be knowledgeable on obstetric danger signs during pregnancy, labor/childbirth and postpartum respectively.

All most all, 383(98.0%) respondents reported to identified their place of delivery, only 11 (2.8%) were intended to deliver at their home.

variables	Frequency (Number (%))
Maternal age	
17-19 years	17(4.3)
20-34	339(86.7)
≥35years	35(9.0)
Place of Residence	
Rural	85(21.7)
Urban	306(78.3)
Marital Status	
Married	372(95.1)
Single/Divorced/Widowed	19(4.9)
Religion	
Orthodox	215(55.0)
Muslim	150(38.5)
Protestant	26(6.6)
Ethnicity	
Oromo	231(59.1)
Amhara	108(27.6)
Somali	38(9.7)
Other/Gurage/Tigrea/	14(3.6)
Occupation	
Housewife	251(64.2)
Government Employee	64(16.4)
Private worker	76(19.4)
Maternal Education	
No formal education	128(32.7)
Primary education	105(59.6)
Secondary education	75(19.2)
Tertiary education	83(21.2)
Partner's Education	
No formal Education	101(25.8)
Primary Education	52(13.3)
Secondary Education	113(28.9)
Tertiary Education	125(32.0)
Have media at their house	
Yes	348(89.0)
No	43(11.0)
Distance from nearby health facility	
≤ 10 km	382(97.7)
> 10 km	9(2.3)

Table 1: Socio-demographic characteristics of the women attending ANC at Dilchora Hospital (n=391), Dire Dawa city, East Ethiopia, July 12, 2015.

Three fourth of the women, 296 (75.7%) were identified their skilled birth attendant. In addition 250 (63.9%), 118 (30.2%) and 347 (88.7%) of the respondents were already saved money, identified blood donor and means of transportation respectively. Overall, more than half 214 (54.7%) of the respondents were already prepared for birth and became ready for its complications (Table 3).

Factors associated with birth preparedness and complication readiness

On bivariate analysis, factors found to be significantly associated with BP/CR practices were; place of residence, maternal educational status, partners educational status, having radio/TV, and maternal knowledge of obstetric danger signs were found to be associated. From these variables; maternal educational status and maternal knowledge on obstetric danger signs were significantly and independently associated with BP/CR practices in multiple logistic regression analysis.

In this study, women with tertiary level education were 2.5 times (AOR=2.51, 95% CI= 1.05, 6.0) more likely to get prepared for birth

and its complication. Similarly, those women who were knowledgeable on obstetric danger signs were 3.4 times (AOR= 3.36, 95% CI=2.13, 5.31) more likely to be prepared for BP/CR compared to those who were not knowledgeable (Table 4).

Discussion

This facility based cross-sectional study has attempted to identify the magnitude and determinants of BP/CR among women attending ANC at Dilchora Referral hospital. In this study, the proportion of women who were well prepared for birth and ready for complications was found to be 54.7%. This finding is relatively consistent with studies conducted in Chamwino, Tanzania (58.2%) [16] and rural India (62.4%) [17]. This finding is higher than other Ethiopian studies conducted in Arsi (16.5%) and southern Ethiopia (17%) [18,19]. This difference might be due to the fact that this study was conducted in urban setting with populations who has better access and awareness to health information including BP/CR knowledge as evidenced by another Ethiopian study [20]. The other possible explanation for higher level of BP/CR in this study might be due to the setting of the study, which is health facility based study. Due to this people who interviewed might have better awareness about birth preparedness, as they were already aware the advantages of ANC follow up.

In this study 58.6%, 51% and 47.6% of the respondents were knowledgeable on obstetric danger signs of pregnancy, labor/ child birth and postnatal periods respectively. This finding is higher than that of other Ethiopian study [20] which showed 30.4%, 41.3% and 37.7% of the women as knowledgeable on obstetric danger signs during pregnancy, child birth and postpartum period respectively. This might be due to the increased awareness of the community regarding birth preparedness and complication readiness with active involvement of

Variables	Frequency (%)
Parity	
primi	122(31.2)
1-4	232(59.3)
5 and above	37(9.5)
Frequency of ANC	
4 visits	365(93.4)
Above 4 visits	26(6.6)
Male partner accompanying at any of ANC Visits	
Yes	242(61.9)
No	149(38.5)
Counseled at ANC for HIV	
Yes	389(99.5)
No	2(0.5)
History of stillbirth	
Yes	73(18.7)
No	318(81.3)
Experienced health problem during pregnancy	
Yes	86(22.0)
No	305(78.0)
Place where they sought health assistance(n=86)	
Health care provider/excluding HEWs	67(77.9)
Health Extension worker	11(12.8)
Traditional Birth attendant	8(9.3)
Decision Maker about woman's health care	
The woman only	140(35.8)
The woman and her husband	238(60.9)
Her husband only	13(3.3)

Table 2: Obstetric characteristics of women attending ANC at Dilchora hospital (N=391), Dire Dawa city, East Ethiopia, July 12, 2015.

Variables	Frequency (Number (%))
Heard about BPCR	
Yes	292(74.7)
No	99(25.3)
Knowledgeable about danger signs during pregnancy	
Yes	229(58.6)
No	162(41.4)
Knowledgeable on danger signs during labor and child birth	
Yes	200(51.0)
No	191(49.0)
knowledgeable about danger signs during postpartum	
Yes	186(47.6)
No	205(52.4)
Knowledgeable on overall obstetric danger signs and pregnancy	
Yes	160(40.9)
No	231(59.1)
Identified place of delivery	
Yes	383(98.0)
No	8(2.0)
Place of delivery identified	
Home	11(2.8)
Health facility	380(97.2)
Identified skilled birth attendant	
Yes	296(75.7)
No	95(24.3)
Saved money	
Yes	250(63.9)
No	141(36.1)
Identified blood donor	
Yes	118(30.2)
No	273(69.8)
Identified means of transport to place of delivery	
Yes	347(88.7)
No	44(11.3)
Overall all BP/CR	
Yes	214(54.7)
No	177(45.3)

Table 3: Characteristics of the respondent with regard to birth preparedness and complication readiness among women attending ANC at Dilchora Referral Hospital (N=391), Dire Dawa city, East Ethiopia, July 12, 2015.

health extension workers in educating the community with time.

In this study, only maternal education and maternal knowledge on obstetric danger signs were found to have significant association with BP/CR on multivariate analysis.

Women who attended tertiary level education were 2.5 times more likely to get prepared for birth and its complication. This finding is consistent with studies from India [21], Nigeria [22], Tanzania [16] and Ethiopia [18]. This might be due to the fact that educated women can better understand the importance of planning for birth, and adhering to counseling provided at ANC. In addition, educated women might have better empowerment, and employment opportunity that enable them to decide on their own health, and cover their own health expense.

Similarly, those women who were knowledgeable on obstetric danger signs were 3.4 times more likely to be prepared for BP/CR compared to those who were not knowledgeable. This finding is consistent with the study from Tanzania [16,23], and Ethiopia [18]. The reason for this might be mothers who are knowledgeable on obstetric danger signs may have fear that the problem might happen

to them which intern prompt them to seek support and advice from health professional.

Limitations

Since the study is facility based, it might not indicate the true rate of BP/CR practice in the community. It is also difficult to establish a temporal relationship as the study design was cross-sectional. Despite these limitations, the findings from this study will contribute to the understanding of the factors associated with BP/CR practice in the study area

Conclusion

Even though the finding of this study is relatively higher than many of the studies conducted in Ethiopia, the proportion of women who were well prepared for birth and ready for complications was still found to be low. Attending tertiary level education and having knowledge on obstetric danger signs were found to have an association with being well prepared for birth and its complication. Improving awareness of women both at community and institutional level and reinforcing counseling on obstetric danger signs at ANC is recommended to increase level of birth preparedness and complication readiness.

Authors' Contributions

AM designed the study, performed the statistical analysis

Variable	BPCR status		COR(95% CI)	AOR(95% CI)
	Has BPCR Number (%)	No BPCR Number (%)		
Residence				
Rural	34(40.0)	51(60.0)	1	
Urban	180(58.8)	126(41.2)	2.14(1.31, 3.50)	1.27(0.66, 2.42)
Maternal Educational status				
No formal Education	52(40.6)	76(59.4)	1	
Primary Education	58(55.2)	47(44.8)	1.80(1.07, 3.04)	1.40(0.69, 2.86)
Secondary Education	43(57.3)	32(42.7)	1.96(1.10, 3.50)	1.39(0.63, 3.06)
Tertiary Education	61(73.5)	22(26.5)	4.05(2.22, 7.40)	2.51(1.05, 6.00)
Partners educational status				
No formal Education	42(41.6)	59(58.4)	1	
Primary Education	22(42.30)	30(57.7)	1.03(0.52, 2.03)	0.69(0.30, 1.56)
Secondary Education	61(54.0)	52(46.0)	1.65(0.96, 2.83)	0.95(0.44, 2.03)
Tertiary Education	89(71.2)	36(28.8)	3.47(2.00, 6.04)	1.32(0.56, 3.12)
Availability of Radio/TV				
Yes	200(57.5)	148(42.5)	2.8(1.43, 5.48)	1.43(0.65, 3.14)
No	14(32.6)	29(67.4)	1	
Knowledgeable on obstetric danger signs				
Yes	117(73.1)	43(26.9)	3.76 (2.43, 5.82)	3.36(2.13, 5.31)
No	97(42.0)	134(58.0)	1	

Table 4: Bivariate and Multivariate analysis of factors associated with BP/CR Practice among women attending ANC at Dilchora Referral Hospital, Dire Dawa city, East Ethiopia, July 12, 2015.

and drafted the manuscript. AA participated in the study design, implementation of the study, and contributed to the draft manuscript. All authors contributed to the data analysis, read and approved the final manuscript.

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