Original article

Birth Preparedness and Complication Readiness among women in Adigrat town, north Ethiopia

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Abstract

Background: Avoidable mortality and morbidity remains a formidable challenge in many developing countries like Ethiopia. Pregnancy related complications can not be reliably predicted and it is necessary to design strategies to overcome those problems when they arise.

Objective: To assess knowledge and practices with respect to birth preparedness and complication readiness and factors associated with their practices among women who gave birth in the last 12 months preceding the survey in Adigrat Town, Tigray Regional State, Ethiopia.

Method: A cross-sectional community-based study was conducted in September and October 2006. A total of 538 women who gave birth in the last 12 months preceding the survey were randomly selected for interview.

Results: Data were obtained from 534 mothers, yielding a response rate 99.3%. Taking into account place of delivery identification, means of transportation and saving money, about 22% of the respondents were prepared for birth and its complications. In multivariate analysis, preparation for birth and its complication was higher among literate mothers (OR= 2.11, 95% CI= 1.17, 3.80), married women (OR= 5.69, 95% CI= 1.67, 19.38), women with parity range of 2 to 4 (OR= 2.53, 95% CI= 1.17, 5.44), women with history of still birth (OR= 4.41, 95% CI= 1.68, 11.59) and those who were advised about birth preparedness during their antenatal care follow up (OR= 2.65, 95% CI= 1.66, 4.23).

Conclusion: The study identified poor comprehensive knowledge and practices of preparation for birth and its complication in the area. Community education about preparation for birth and its complication and empowerment of women through expansion of educational opportunities are important steps in improving birth preparedness and consequently the effects of pregnancy related complications. Antenatal care clinics should give due emphasis to preparation for birth and its complication and provide information and education to all pregnant women. [*Ethiop.J.Health Dev.* 2007;22(1):14-20]

Introduction

The birth of a baby is a major reason for celebration around the world. Societies expect women to bear children and honor women for their role as mothers. Yet in most of the world, pregnancy and childbirth is a perilous journey (1). World Health Organization (WHO) estimated that 529,000 women die annually from maternal causes. Ninety-nine percent of these deaths occur in the less developed countries. The situation is most dire for women in Sub-Saharan Africa, where one of every 16 women dies of pregnancy related causes during her lifetime, compared with only 1 in 2,800 women in developed regions (2).

Every pregnant woman faces the risk of sudden, unpredictable complications that could end in death or injury to herself or to her infant. Pregnancy related complications can not be reliably predicted (3). Hence, it is necessary to employ strategies to overcome such problems as they arise.

Lack of advance planning for use of a skilled birth attendant for normal births, and particularly inadequate preparation for rapid action in the event of obstetric complications, are well documented factors contributing to delay in receiving skilled obstetric care.

Birth Preparedness and Complication Readiness (BP/CR) is a strategy to promote utilization of skilled maternal and neonatal care timely, based on the theory that preparing for childbirth and being ready for complications reduces delays in obtaining this care (4). In a skilled care approach, birth preparedness includes identifying a skilled provider and making the necessary plans to receive skilled care for all births. Complication readiness *(emergency funds, transport, blood donor and designated decision-maker)* receive greater emphasis in emergency obstetric care programs (4). Birth preparedness has been globally endorsed as an essential component of safe motherhood programs to reduce delays for care (4).

In many societies in the world, cultural beliefs and lack of awareness inhibit preparation in advance for delivery and expected baby. Since no action is taken prior to the delivery, the family tries to act only when labor begins. The majority of pregnant women and their families do not know how to recognize the danger signs of complications. 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 (5).

For some of the complications like severe hemorrhage, a few minutes matter to save life, while for others hours or

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even days may be tolerable but with the prognosis getting worse as time elapses (6, 7).

In Ethiopia, only 6% of the deliveries are attended by health professionals. This situation well explains the maternal mortality ratio of 673 per 100,000 live births, which is one of the highest in the world (8). Studies revealed that hemorrhage, hypertensive disorders and ruptured uterus were among the causes of maternal deaths (9-11).

Despite the great potential of Birth Preparedness and Complication Readiness in reducing the maternal and newborn deaths its status is not well known in most of sub-Saharan Africa. Therefore, this paper aims to assess knowledge and practices with respect to birth preparedness and complication readiness and factors associated with their practices among women who gave birth in the last 12 months preceding the survey in Adigrat Town, Tigray, Ethiopia.

Methods

A cross-sectional community-based study was conducted in September and October 2006 among women who gave birth in the last 12 months preceding the survey in Adigrat Town of Tigray Region. Adigrat Town is located 120 kms north of Mekelle, the capital city of the Tigray Administrative Regional State found 783 kms north of Addis Ababa. The town is divided into 4 administrative localities. Each locality is further sub-divided into 3-6 sub-localities. By 2006 or its population was estimated to be 65,237 (12). It has one governmental hospital, one health center as well as eight private clinics.

The 18 sub-localities were listed and 11 sub-localities were selected randomly. Census was conducted in the selected sub-localities. The eligible population was identified and a sampling frame which enlists all eligible study subjects was prepared. Then study participants were selected from the sampling frame using simple random sampling proportional to size of each sub-locality.

The sample size was calculated using a two proportions formula to allow comparisons using literacy as a factor. Accordingly, a total of 538 women selected as a sample based on a confidence level of 95%, a power of 80%, a 50% proportion of birth preparedness in literate women and a 35% for illiterate women with 1:3 ratio of illiterate to literate and a non-response rate of 10%.

A pre-tested structured questionnaire was employed to obtain the relevant information. Eight trained nurses who were fluent in the local language collected the data. Ethical clearance was obtained from the Medical Faculty of Addis Ababa University. Permission to carryout the study was obtained from the local Health Bureau. Individual informed verbal consent was obtained from each respondent after explaining the objective and procedures of the study. All responses were kept confidential.

A woman was considered as prepared for birth and its complication if she reported that she or her family identified place of delivery, saved money and identified a means of transport to place of childbirth or for the time of obstetric emergencies ahead of childbirth

Data were cleaned, entered in to a computer and analyzed using SPSS version 11 statistical software. Statistical tests such as chi-square tests, and measures of association (odds ratio (OR) with 95% confidence interval (CI)) were used as deemed necessary. Binary logistic regression analysis was performed to control potential confounding factors.

Results

Socio-demographic characteristics

Five hundred thirty four women were included in the study, yielding a response rate 99.3%. About 49% of the respondents were between the ages of 25 and 34 years with median age of 26 years. Majority (89.9%) of the women were married. Most (75.1%) of the respondents were housewives. About 70% of the respondents had attended formal education (Table 1).

One hundred fifty nine (29.8%) women were pregnant for the first time and 16.7% were pregnant for more than four times. Twenty three (4.3%) respondents had the history of still birth.

Experiences of respondents related to the index pregnancy, delivery and post partum period

The majority (94.4%) of the respondents have attended antenatal care (ANC) at least once in their lifetime. Of the total, about 63% respondents started their follow up while the pregnancy was between 4 and 6 months and 21.2% respondents had first ANC visit by a skilled care provider in the first three months of pregnancy. About 73% of the total respondents had 4 or more visits.

Three hundred forty seven (65.0%) women gave birth in health institutions whereas 35.0% delivered at home. Three hundred ninety eight (74.5%) women gave birth at a place where they planned ahead.

Knowledge of respondents about danger signs *during pregnancy*

Relatively a small proportion 58 (10.9%), 12 (2.2%) and 28 (5.2%) of the respondents spontaneously mentioned vaginal bleeding, blurred vision and swollen hands/face as danger signs during pregnancy, respectively. Only 82 (15.4%) spontaneously mentioned at least one key danger sign, 14 (2.6%) mentioned at least two key danger signs and 2 (0.4%) mentioned all three key danger signs.

Table 1: Socio-demographic characteristics of the respondents, Adigrat Town, Sep.-Oct. 2006, (n= 534).

Variables	Frequency	Percent
Age in years		
15-24	208	39.0
25-34	263	49.2
35-44	63	11.8
Marital status		
Single	33	6.2
Married	480	89.9
Widowed	7	1.3
Divorced	14	2.6
Occupation		
Housewife	401	75.1
Some job	97	18.1
Student	33	6.2
Other	3	0.6
Educational status		
Illiterate	138	25.8
Read & write	25	4.7
Grade 1-8	233	43.6
Secondary & above	138	25.8
Respondents' monthly income		
<100	461	86.3
100-300	33	6.2
>300	32	6.0
Don't know	8	1.5
Family size		
1-3	156	29.2
4-6	298	55.8
>=7	80	15.0

Knowledge on danger signs during labor/childbirth

Eighty eight (16.5%), 59 (11%), 38 (7.1%) and three (0.6%), of the respondents spontaneously mentioned severe vaginal bleeding, prolonged labor, retained placenta and convulsions as danger signs during labor and childbirth, respectively.

One hundred twenty seven (23.8%) respondents spontaneously mentioned at least one key danger sign, 39 (7.3%) mentioned at least two key danger signs while 21 (3.9%) cited at least three key danger signs. Only one (0.2%) respondent named all four key danger signs.

Knowledge on danger signs during post partum period.

Eighty nine (16.7%), six (1.1%) and eight (1.5%) of the respondents spontaneously mentioned severe vaginal bleeding, high fever, and foul smelling vaginal discharge as danger signs during post partum period, respectively. Only 92 (17.2%) of the study participants spontaneously mentioned at least one key danger sign, nine (1.7%) mentioned at least two key danger signs and two (0.4%) mentioned all three key danger signs.

Knowledge of respondents about preparation for birth and its complication

One hundred forty (26.2%), 154 (28.8%), 42 (7.9%) and 54 (10.1%) spontaneously identified and mentioned place of delivery, saving money, skilled provider and means of transportation, respectively. Considering both unprompted and prompted responses, identifying place of delivery, saving money, identifying skilled provider and identifying a mode of transportation were mentioned by 86.9%, 83.7%, 40.4% and 40.8% of the respondents, respectively (Table 2).

Practices of respondents regarding preparation for birth and complication

Majority (85.8%) of the respondents reported that they made some arrangement for the birth of their baby. Of those 209 (39.1%) reported spontaneously that they identified place of delivery, 190 (35.6%) saved money, 56 (10.5%) identified skilled provider and 17 (3.2%) identified a mode of transportation. Considering both unprompted and prompted responses, place of delivery selection (77%) and saving money (69%) were the most commonly identified components of birth preparedness and complications readiness (Table 3). One hundred eighteen (22.1%) of the total respondents reported that they identified place of delivery, saved money and identified a means of transport ahead of childbirth.

Factors associated with preparation for birth and complication

Maternal education was a strong predictor in preparation for birth and complication. Literate mothers were about two times more likely to be prepared for birth and complication than illiterate women (OR= 2.25, 95% CI= 1.31, 3.88). Marital status was another factor that was

Table 2: **Knowledge of respondents about preparation for birth and its complication, Adigrat Town, Sep.-Oct. 2006**

Variables	Unprompted (n=534) N (%)	Prompted (n=534) N (%)	Total (n=534) N (%)
Identify place of delivery	140(26.2)	324(60.7)	464(86.9)
Saving money	154(28.8)	293(54.9)	447(83.7)
Preparing essential items for clean delivery and post partum period	319(59.7)	176(33.0)	495(92.7)
Identify skilled provider	42(7.9)	174(32.6)	216(40.4)
Awareness on the signs of an emergency	31(5.8)	185(34.6)	216(40.4)
Designating decision maker on her behalf	35(6.6)	156(29.2)	191(35.8)
Arranging a way for communication	22(4.1)	144(27.0)	166(31.1)
Arranging emergency funds	24(4.5)	153(28.7)	177(33.1)
Identify a mode of transportation	54(10.1)	164(30.7)	218(40.8)
Arranging blood donors	20(3.7)	127(23.8)	147(27.5)
Identifying the nearest institution that has 24 hour functioning emergency obstetric care services	64(12.0)	201(37.6)	265(49.6)
Voluntary counseling and testing during pregnancy	64(12.0)	311(58.2)	375(70.2)
Preparing flour for porridge	107(20.0)		107(20.0)

*Multiple responses were allowed

Table 3: **Practices of respondents on preparation for birth/complication, Adigrat Town, Sep.-Oct. 2006**

Variables	Unprompted (n=534N (%)	Prompted (n=534) N (%)	Total (n=534) N (%)
Identify place of delivery	209(39.1)	206(38.6)	415(77.7)
Save money	190(35.6)	178(33.3)	368(68.9)
Prepare essential items for clean delivery and post partum	296(55.4)	135(25.3)	431(80.7)
Identify skilled provider	56(10.5)	130(24.3)	186(34.8)
Early detection of signs of an emergency	14(2.6)	120(22.5)	134(25.1)
Designate decision maker	12(2.2)	118(22.1)	130(24.3)
Identify a way for communication	13(2.4)	96(18.0)	109(20.4)
Identify emergency funds	10(1.9)	108(20.2)	118(22,1)
Identify a mode of transportation	17(3.2)	115(21.5)	132(24.7)
Identify blood donors	4(0.7)	90(16.9)	94(17.6)
Identify institution with 24 hour functioning emergency obstetric care services	35(6.6)	163(30.5)	198(37.1)
Voluntary counseling and testing	59(11.0)	232(43.4)	291(54.4)

*Multiple responses were allowed

strongly associated with Birth Preparedness and Complications Readiness. Married women were more likely to be prepared for birth/complication than non-married (OR= 5.36, 95% CI= 1.64, 17.49).

There was a statistically significant association between parity and preparation for birth and its complication. Women with parity range of 2 to 4 were more likely to prepare for birth and its complication than grand multiparas (more than 4 deliveries) and primiparous women (first time delivery). Women who had history of still birth were also more likely to prepare for birth and its complication than those who did not have still birth (OR= 2.87, 95% CI= 1.23, 6.73).

Advice given on preparation for birth and its complication during ANC follow up was also significantly associated with preparation for birth/complication. Women who were advised about where to give birth and arrangements for money and transportation during their ANC follow up were more likely to be prepared for birth and its complication than those that were not given such advice.(OR= 2.50, 95% CI= 1.62, 3.88) (Table 4).

Discussion

Evidence suggests that ANC is more effective when received earlier in the pregnancy (4, 13). In this study 21.2% of the respondents had first ANC visit by a skilled provider in the first three months of pregnancy. This is lower compared to the Ethiopian Demographic and Health Survey (EDHS) 2005 result (32.4%) for women residing in urban areas (8). It is also low compared to the ANC utilization in that area. This could be because mothers did not know the need for early utilization of ANC or may not want to be identified too early as pregnant.

Currently, a minimum of four ANC visits for a woman is recommended by WHO. A study showed that women who receive four ANC visits with effective interventions

are as likely to have good outcomes as women who receive more visits (13). In this study, most (73.2%) of the respondents had four or more visits. This is higher than reports of Ethiopian DHS 2005 for women residing in urban areas (55%) and similar with a study finding (75.1%) in Nepal (14).

Table 4: **Association of selected socio-demographic and obstetric factors of respondents with preparation for birth and its complication, Adigrat Town, Sep.-Oct. 2006, (n=534).**

Variables	Prepared for birth and its complication		Crude	Adjusted
	Yes N (%)	No N (%)	OR (95%:CI)	OR (95%:CI)
Maternal education				
Literate	100(84.7)	296(71.2)	**2.25(1.31,3.88)**	**2.11(1.17,3.80)**
Illiterate	18(15.3)	120(28.8)	1.00	1.00
Marital status				
Married	115(97.5)	365(87.7)	**5.36(1.64,17.49)**	**5.69(1.67,19.38)**
Non-married	3(2.5)	51(12.3)	1.00	1.00
Parity				
1	32(27.1)	127(30.5)	**2.24(1.02,4.94)**	1.78(0.77,4.10)
2-4	77(65.3)	209(50.2)	**3.28(1.57,6.84)**	**2.53(1.17,5.44)**
>=5	9(7.6)	80(19.2)	1.00	1.00
History of still birth				
Yes	10(8.5)	13(3.1)	**2.87(1.23,6.73)**	**4.41(1.68,11.59)**
No	108(91.5)	403(96.9)	1.00	1.00
Know at least 2 key danger signs for pregnancy				
Yes	41(34.7)	100(24.0)	**1.68(1.08,2.61)**	1.30(0.77,2.19)
No	77(65.3)	316(76.0)	1.00	1.00
Know at least 2 key danger signs for post partum				
Yes	27(22.9)	49(11.8)	**2.22(1.32,3.75)**	1.69(0.91,3.11)
No	91(77.1)	367(88.2)	1.00	1.00
Advised to prepare for birth and its complication on ANC				
Yes	47(39.8)	87(20.9)	**2.50(1.62,3.88)**	**2.65(1.66,4.23)**
No	71(60.2)	329(79.1)	1.00	1.00

About 65% of the deliveries were attended by health professional which is higher compared to Ethiopian DHS 2005 result for Tigray Region (6%). This could be because the DHS report for the region includes the rural areas where deliveries attended by health professionals are very low. But this estimate is lower than that of Addis Ababa (78.8%).

An important aspect of assessing birth preparedness and its complication readiness is measuring spontaneous knowledge of essential danger signs of obstetric and newborn complications. Knowledge of the danger signs of obstetric complications is the first step in the appropriate and timely referral for essential obstetric care (3, 4). The spontaneous knowledge of respondents about key danger signs is very low compared to other studies (3,15,16) which indicates the poor awareness of women and a possible high chance of poor outcome of pregnancy. This could be attributed to presence or absence of relevant intervention to promote Birth Preparedness and Complications Readiness, utilization of health care services and information given during ANC visits.

About 78% of the respondents reported that they identified place of delivery ahead of childbirth. Place of delivery identification is very important especially in this setting where the main means to get a skilled provider is to deliver at health institutions.

Lack of money and transportation is a barrier to seeking care as well as identifying and reaching medical facilities (17). The money saved by woman or her family can pay for health services and supplies, vital for transport, or other costs such as loss of work. Likewise, if a woman can afford to pay for these costs, she is more likely to seek care (3). In the present study, 68.9% of the respondents saved money for childbirth which is higher compared to a baseline study in Nepal (35%) and lower than the follow up study at which 81.4% of currently pregnant women said they had financial plans for delivery (14).

Even when money is available, it can be difficult to secure transport at the last minute after a complication has occurred. Arranging transport ahead of time reduces the delay in seeking and reaching services (16). In this study, 24.7% of the respondents have identified

transportation ahead of childbirth which is higher compared to a study in Nepal (1.5% in a baseline and 13.9% in a follow up) (14).

One hundred eighteen (22.1%) of the respondents were prepared for birth and its complications in a comprehensive way. This is low as every pregnant woman should get prepared for childbirth/complication.

Literate mothers were more likely to be prepared for birth/complication than illiterate (AOR= 2.11, 95% CI= 1.17, 3.80). This might be related to the fact that educated women have better power to make their own decision in matters related to their health and the expected expenses.

Married women were more likely to be prepared for birth and its complication than non-married (AOR= 5.69, 95% CI= 1.67, 19.38). This could be because, married women may have wanted and planned pregnancies which enables them to demand better service and get prepared. Another explanation could be that those who are not married may not want to be known as pregnant where the culture discourages having pregnancy without being married. Women with parity 2 to 4 were more likely to be prepared for birth/complication than grand multiparas (more than four deliveries) and primipara (first deliveries). This may be related to over confidence about the experience of childbirth by the grand multipara and lack the knowledge and experience for birth preparedness by the primiparous women..

Women with history of still birth were more likely to be prepared for birth and its complication than those who did not have history of still birth (AOR= 4.41, 95% CI= 1.68, 11.59). This could be due to the reason that those women anticipate serious complications based on their previous experiences.

Mothers who received advise about where to give birth and arrangements for money and transportation during ANC follow up were more likely to prepare for birth and its complication than their counterparts (AOR=2.65, 95% CI= 1.66, 4.23). This finding while indicating a benefit of ANC shows that birth preparedness and complications readiness has not been promoted in all ANC sessions.

Thus, community-based education about preparation for birth and its complication and empowerment of women by expanding educational opportunities are important factors in enhancing birth preparedness and hence reducing the effect of pregnancy related complications. Antenatal care clinics should give due emphasis to preparation for birth/complication and provide information and education to all pregnant women.

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