"Promoting skilled institutional deliveries: Factors to consider in a free maternal health services policy environment"

PROMOTING SKILLED INSTITUTIONAL DELIVERIES: FACTORS TO CONSIDER IN A FREE MATERNAL HEALTH SERVICES POLICY ENVIRONMENT

Mahama Saaka[1], Mark Akantigse Aviisah [2]

[1]University for Development Studies, School of Medicine and Health Sciences
Tamale-Ghana
[2]University of Health and Allied Sciences, School of Public Health, Ho-Ghana

Abstract

Objective: This study investigated the prevalence and factors associated with the utilization of health facilities for child birth in a rural setting of Talensi Nabdam district of Ghana.

Material and Methods: A cross-sectional study was carried using structured questionnaire and focus group discussions. Mothers who had delivered live babies within one year prior to the survey were selected from thirty communities in the Talensi Nabdam district of Ghana where fee exemption policy for maternal health services has been implemented since 2003.

Results: Prevalence of skilled institutional delivery was 63.3 %. Logistic regression analyses showed that antenatal care attendance and parity of a mother were the predominant factors associated with the choice of delivering in a health institution. Compared to women who attended antenatal care less than 4 times, women who attended at least 4 times were 6.2 times more likely of delivering in a health institution (Adjusted odds ratio = 6.22, 95 % CI: 3.35-11.52). Compared with mothers who had 4 or more children, mothers who had one child were 6.5 times (Adjusted odds = 6.47, 95% CI [3.08, 13.60]) more likely to deliver at a health facility. Negative health system factors such as intimidation, unfriendly healthcare providers and cultural resistance to modern methods of delivery in healthcare facilities were nagging barriers that discouraged women from seeking skilled institutional delivery.

Conclusion: Even with fee exemption policy for maternal health services, many barriers still exist which if not addressed will make universal coverage of institutional delivery remains elusive in Ghana.

Keywords: Antenatal care, institutional delivery, free maternal health policy, negative health system factors, Talensi Nabdam district of Ghana

Introduction

In many developing countries including Ghana, high maternal mortality continues to be a public health problem. Despite continuing efforts to promote skilled institutional delivery, maternal mortality ratio (MMR) remains unacceptably high at

350 maternal deaths per 100,000 live births in Ghana [1, 2].

The fifth Millennium Development Goal (MDG) of United Nations (UN) seeks to improve maternal health through reduction in maternal mortality ratio by 75 % during the period 1990 through 2015 [3]. Indeed, there is compelling empirical evidence that suggests the risk of maternal death is high during labour, delivery and up to 24 hours postpartum[4-6]. Achieving good maternal health therefore requires quality reproductive health services and so skilled attendance at delivery is being promoted towards attainment of optimal maternal health.

Since 2003, the Government of Ghana has promoted access to maternal health services including prenatal care through the free maternal health policy and the establishment of Community Based Health Planning and Services (CHPS) compounds. This was done with the understanding that removal of financial and physical barriers to delivery and emergency care and improve access to and use of skilled maternal and newborn healthcare services [7]. Skilled attendance at delivery is necessary to prevent needless and avoidable maternal deaths and to ensure the survival of the newborn [8-10]. In spite of all these measures, a significant number of pregnant women still deliver at home and institutional delivery continues to remain relatively low. For example, the Talensi-Nabdam District recorded a significant proportion of home deliveries of about 39 % in 2011 though the uptake of prenatal care services was 92 %.

The exact factors that influence a woman's decision to choose between institutional delivery and delivery at home however, remain unclear. This discrepancy raises serious concern and points to the fact that most of the pregnant women that report for antenatal services within the district do not report for supervised delivery. It is important to find reasons for this low utilization of delivery services in the district. Without a good understanding of the social determinants of health and without consulting the target population directly, effective policy interventions to improve maternal health may remain elusive. To fill this knowledge gap, we conducted this study to determine factors associated with the utilization of health facilities for child birth in the Talensi Nabdam district of Ghana.

Materials and Methods
Setting
The study was conducted in a district that has pockets of peri -urban settlements but has largely a rural population. There were 20 health care institutions comprising 4 health centers, 4 health clinics and 12 CHPS compounds with only 15 midwives. Midwives attend to births and in facilities that were not allocated midwives, other health professionals (e.g. Community Health Nurses) perform the deliveries.

Study design, study population, sample size, and sampling
A cross-sectional study was carried out in conducted in February 2012.

Women who had given birth within the previous one year preceding the survey irrespective of place and outcome of delivery and who were permanent residents of the study area were selected randomly.

The required sample size was calculated based on the standard formula for one point sample estimation. The primary outcome variable used to estimate the sample size was the population proportion of supervised deliveries which was unknown and so 50 % was assumed for the district. A sample size of 171 was required to ensure that the estimated prevalence of the main outcome variable was within plus or minus 7.5 % of the true prevalence at 95% confidence level. Assuming a correction factor of 2 (the

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"design effect") for cluster sampling the sample size was increased to 342. A non response rate of 10 % and other unexpected events (e.g. damaged/ incomplete questionnaire) was factored in the sample size determination and so the final sample size was adjusted to 376. However, data was analyzed for 371 participants due to missing data on 5 questionnaires.

Using a two-stage Probability Proportionate to Population Size (PPS) sampling methodology, 376 households were randomly selected from 30 clusters. In each cluster, a list of households with eligible women in each community was prepared with the assistance of the village volunteers and community leaders. The total number of households in a cluster was divided over the cluster sample size of 12 to give the sampling interval. The first household was randomly selected by picking any number within the sample interval. Subsequent selections were made by adding the sampling interval to the selected number in order to locate the next household to visit. If the selected household did not have a target respondent, then next household was selected using the systematic sampling procedure. This was done until the sample size was obtained. A maximum of 12 to 13 post partum women were randomly selected from a cluster. Only one eligible participant was selected from each household using simple random sampling.

Data collection techniques
Both quantitative and qualitative data collection methods were used to collect information from eligible respondents. Structured questionnaire was used to collect information on the independent variables which comprised amount and timing of prenatal care utilization, educational attainment of mother, age of mother, parity, marital status, religion, ethnicity and household wealth index data. Qualitative

data were collected using Focus Groups Discussions (FGD's).

Main Outcome Measures
The main outcome measure was the percent of deliveries at health facilities. The outcome variable was place of delivery for births that occurred in the one year prior to the study. Non-facility delivery included all births that occurred outside a health facility. Principal Component Analysis (PCA) was used to determine household socioeconomic status (wealth index) from modern household assets namely, the presence of electricity, type of cooking fuel, material of the dwelling floor, source of drinking water, type of toilet facility, and possession of household items including computer, radio, television, refrigerator, bicycle, motorcycle/scooter, car/truck and mobile phone [11-14]. The categories of the constructed variable were labeled poorest, medium and least poor.

Measurement of Adequacy of Prenatal Care
The overall adequacy of prenatal care was measured using the recommended Adequacy of Prenatal Care Utilization index (APNCU) for developing countries. The APNCU index, proposed by Kotelchuck, is comprised of two parts: the month in which prenatal care is initiated and the number of visits from initiation of care until delivery [15]. This measure involves both timing and number of prenatal care visits. Consequently, ANC was considered adequate if the women started ANC within the first trimester and made at least four visits. A woman who initiated ANC later than the first trimester but made at least four visits was thus classified as having inadequate ANC. The World Health Organization (WHO) recommends that for normal pregnancies, ANC should consist of at least four visits during the course of the pregnancy, the first of which should occur within the first trimester.

Focus Groups Discussions (FGD's)

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Five Focus Groups Discussions (FGD's) were conducted to complement the findings of the household survey. A semi-structured interview guide translated into the local dialect, was used for the FGD's. In all, 20 women, 20 men and 10 health professionals took part in the FGD´s. The main theme of discussion was the role of socio-cultural and health service delivery barriers to utilization of skilled attendance at delivery in the district.

Two FGDs were conducted with women selected randomly. The researcher ensured that participants in each group were a mix of women who ever delivered at home and/or in a health facility with skilled attendants but were not part of the household survey. Each group had ten women from communities in each of the two areas in the district (Talensi and Nabdam areas). Two FGDs were equally conducted for men selected at random by volunteers in a group of ten from communities from each of the two areas. Ten health professionals were purposively selected to participate in the FGD (2 midwives, 3 SRN nurses and 5 CHOs) in the study district. Each FGD lasted between 30 and 45 minutes.

Discussants apart from the health professionals had either never been to school or stopped at the Junior High School level because of lack of money to continue or got pregnant while in school and never continued after delivering in the case of the women. All the women reported ever attending antenatal care (ANC).

All focus groups were held in the study communities. Each focus group discussion was guided by a set of questions that lasted about two hours. The proceedings were tape recorded and were later transcribed by trained research assistants according to themes. Key informant interviews were also held with healthcare providers who included two midwives, three SRN nurses and five Community Health Officers (CHOs).

Data processing and analysis
Chi-squared test was used to determine associations between predictor variables and the outcome. Where the Chi-squared test was not valid, the Fisher's exact test was used.

Both bivariate and multiple logistic regression analyses were used to examine independent predictors for utilization of health institutions for childbirth. Institutional delivery was coded as '1'and non-facility delivery was coded as '0'for data analysis. Adjusted Odds ratios (AOR) are reported together with their 95% confidence intervals (CI).

The qualitative data were analyzed using NVivo 8.0 software.

Ethical considerations
The protocol was reviewed and approved by the by School of Medicine and Health Sciences, University for Development Studies in Ghana. The Regional Director of Health Service and the Talensi Nabdam District Director of Health service were briefed about the study and permission sought to proceed. All participants were informed about the purpose of the study, the benefits and their rights to refuse or withdraw from the study. Informed consent was obtained verbally after needed information and explanation.

Results
Sample description
Table 1 shows the distribution of sample characteristics of respondents. A total of 371 women were interviewed for the survey and 39 (10.5%) were less than the age of 20 years. The mean age was 27.0 ± 6.5 years with the minimum and maximum ages of 16 and 45 years respectively. In terms of the marital status of the participants, 90.8% were married and 47.7 % were engaged in farming activities. Less than 5 % of the participants had attained high (Secondary to Tertiary) educational level. Most (71.4 %) of the women were of low household wealth index (socioeconomic status).

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Table 1: Socio demographic characteristics of respondents (n = 371)

Variable	Frequency (n)	Percentage (%)
Maternal Age		
Less than 20 years	39	10.5
20-34	276	74.4
At least 35 years	56	15.1
Occupation of respondent		
Civil/public servant	10	2.7
Food processing	20	5.4
Farming	177	47.7
Petty trading	75	20.2
Pottery/craft/seamstress	47	12.7
Unemployed	40	10.8
Student	2	.5
Marital status		
Single	23	6.2
Married	337	90.8
Divorced/separated/ widowed	11	3.0
Educational level		
No formal education	194	52.3
Low (Primary & JSS)	159	42.9
High (Secondary to Tertiary)	18	4.9
Religion		
Christianity	246	66.3
Islam	10	2.7
African Traditional Religion (ATR)	115	31.0
Household wealth index		
Low	265	71.4
Medium	87	23.5
High	19	5.1
Household size		
1-3	11	3.0
4-6	175	47.2
> 6	185	49.9
Number children per woman		
None	90	24.3
1-2	154	41.5
At least 3	127	34.2

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Utilization of antenatal and delivery services

Though 96 % of respondents attended antenatal care during the last pregnancy, 65.8 % initiated this in the first trimester. The rate of utilization of a health facility for childbirth was 63.3 % (Table 2).

Table 2: Utilization of antenatal and delivery services (n = 371)

Variable	Frequency (n)	Percentage (%)
Timing of first ANC		
First trimester	244	65.8
Second trimester	104	28.0
Third trimester	23	6.2
Frequency of ANC attendance		
None	15	4.0
1-3 times	63	17.0
At least 4 times	293	79.0
Adequacy of ANC attendance		
No	150	40.4
Yes	221	59.6
Place of delivery		
Home	136	36.7
Health facility	235	63.3
Who assisted with the delivery of index child?		
Doctor	3	0.8
Nurse/midwife	206	55.5
Community Health Officer (CHO)	29	7.8
Traditional birth attendant (TBA)	37	10.0
Relative/friend	89	24.0
Self (no one)	7	1.9
Assessment of quality of delivery services by mothers		
Poor	6	1.6
Fair	40	10.8
Good	283	76.3
Excellent	42	11.3
Level of satisfaction of services		
Highly unsatisfactory	3	0.8
Unsatisfactory	10	2.7
Fairly satisfactory	82	22.1
Satisfactory	231	62.3
Highly unsatisfactory	45	12.1

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Bivariate analyses

Socio-demographic variables including age, distance from health facility, religion and household wealth index were all significantly associated with having delivery in the health facility though not all institutional deliveries were conducted by skilled birth assistant (SBA) (Table 3). The number of antenatal visits made by the woman was associated with place of delivery. Women who made the recommended four visits were more likely to deliver in a health facility (p < 0.001), compared to their counterparts who made no visits. Christians and Moslems were more likely to have delivered in a health facility compared to their counterparts who practiced African Traditional religion (ATR). Older women, compared to younger women (Less than 20) were less likely of using a health facility for delivery.

Strong associations between place of delivery and community access to health facility and household wealth were apparent. The proportion of institutional deliveries among women living up to 1 km was significantly different from women residing at least 1 km of a health facility.

Table 3: Predictors of place of delivery (Bivariate analysis)

Factor	N	Place of delivery Home n (%)	Health Facility n (%)	Test statistic
Age (years)				
Less than 20	39	9 (23.1)	30 (76.9)	Chi-square (χ^2) = 15.9, p < 0.001
20-34	276	94 (34.1)	182 (65.9)	
35+	56	33 (58.9)	23 (41.1)	
Marital Status				
Married	337	128 (38.0)	209 (62.0)	Fisher's Exact Test = 6.6, p = 0.04
Single	23	3 (13.0)	20 (87.0)	
Divorced	11	5 (45.5)	6 (54.5)	
Education				
None	194	90 (46.4)	104 (53.6)	Fisher's Exact Test = 18.7, p < 0.001
Low	159	44 (27.7)	115 (72.3)	
High	18	2 (11.1)	16 (88.9)	
Religion				
Christianity	246	76 (30.9)	170 (69.1)	Fisher's Exact Test = 11.7, p = 0.002
Islam	10	3 (30.0)	7 (70.0)	
ATR	115	57 (49.6)	58 (50.4)	
Household wealth index				
Low	265	108 (40.8)	157 (59.2)	(χ^2) = 6.7, p = 0.01
High	106	28 (26.4)	78 (73.6)	
Distance to nearest health facility				
Up to 1 km	160	48 (30.0)	112 (70.0)	(χ^2) = 5.4, p = 0.02
More than 1 km	211	88 (41.7)	123 (58.3)	

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ANC attendance				
None	14	14 (93.3)	1 (6.7)	Fisher's Exact Test t = 48.9, p < 0.001
1-3 times	63	40 (63.5)	23 (36.5)	
At least 4 times	293	82 (28.0)	211 (72.0)	
Initiation of ANC				
First trimester	244	74 (30.3)	170 (69.7)	(χ^2) = 22.8, p < 0.001
Second trimester	104	44 (42.3)	60 (57.7)	
Third trimester	23	18 (78.3)	5 (21.7)	
Knowledge of at least 3 danger signs in pregnancy				
No	134	58 (43.3)	76 (56.7)	(χ^2) = 22.8, p < 0.001
Yes	237	78 (32.9)	159 (67.1)	
Number of children				
None	90	14 (15.6)	76 (84.4)	$\chi^2)$ = 22.8, p < 0.001
1-2	154	57 (37.0)	97 (63.0)	
At least 3	127	65 (51.2)	62 (48.8)	

Multivariate analysis

All variables which showed a significant association with choice of place for childbirth in the bivariate analysis (maternal age, marital status, maternal educational status, household wealth index, ANC attendance, and distance to health facility etc) were put in a multiple logistic regression model to assess individual variable effects on place of delivery.

Results of logistic regression analyses in Table 4 show that the number of ANC visits and the number of children a mother has have a highly significant positive relationship with the choice of delivering in a health institution. Compared to women who attended ANC less than 4 times, women who attended at least 4 times were 6.2 times more likely of delivering in a health institution (Adjusted OR = 6.22, 95 % CI: 3.35-11.52). Compared to women living more than 1 km from a health facility, women living up to 1 km from health facility were 2.0 times (AOR= 2.03, 95% CI [1.22, 3.40]) more likely to deliver at a health facility .

Economic status of women also influences their choice of birth place. A unit increase in the household wealth index of any woman resulted in an increase in the likelihood of her delivering in a health facility by 1.2 times.

Maternal knowledge score of danger signs in pregnancy was also significantly associated with choice of health facility for childbirth. A unit increase in maternal knowledge score of danger signs in pregnancy was associated with 16 % odds of delivering in a health facility (AOR= 1.16, 95% CI [1.01, 1.35]). Compared with mothers who had 4 or more children, mothers who had one child were 6.5 times (AOR= 6.47, 95% CI [3.08, 13.60]) more likely to deliver at a health facility.

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Table 4: Determinants of institutional delivery

Determinants	Wald	Sig.	Exp(B)	95% C. I. for EXP(B)	
				Lower	Upper
Household wealth index	4.86	0.027	1.18	1.02	1.38
Distance from health facility (up to 1 km)	7.34	0.007	2.03	1.22	3.40
Frequency of ANC Visits (≥ 4)	33.65	<0.001	6.22	3.35	11.52
Maternal Knowledge score of danger signs in pregnancy	3.90	0.048	1.16	1.01	1.35
No. of children a mother has (Reference: At least 4)	24.44	<0.001			
1	24.26	<0.001	6.47	3.08	13.60
2-3	1.94	0.16	1.46	0.86	2.47
Constant	32.17	<0.001	0.072		

The set of predictors accounted for 29.6 % of the variance in place of delivery (Nagel kerke R Square = 0.296).

Results from Focus Groups Discussions (FGD's)

Qualitative findings suggest that several health system factors contribute to inhibit women's ability to access and utilization of skilled care services. Factors that were identified to hinder the acceptability of institutional delivery due to the prevailing culture and health delivery practices in the study area included the following:

Negative Attitude of Health Professionals

The unethical (rude, arrogant and neglectful) attitude of some health professionals (doctors, nurses and midwives) who attend to expectant mothers is one important factor that was found to hinder the acceptance of institutional delivery in the district. This came up strongly and seriously in the FGD´s held. Women complained bitterly about the cruel, wicked and inhuman treatments meted out to them whiles in pain and struggling to give birth. This is not the usual practice in the case of home delivery (unskilled delivery) where TBAs, mother in laws or relatives give passionate care to women, helping them to manage the pain of delivery. As one woman from Datuko put it "nurses sometimes do not help women in labour. They neglect you until when the baby is coming. Sometimes you push alone until the baby blocks the vagina and if you are not lucky the child can die. But at home your mothers would help you go through everything well". This is an unpleasant experience of women with some health care professionals in the process of delivery being narrated by this woman. Another woman from Winkogo narrates her experience "my daughter was taken to the Bolga hospital to deliver and when I went to see her she had already delivered but there was another woman in labor and wailing from the pain but the nurse just neglected her". Women also reported that some health professionals shout at them and even slap some women in labour. "My friend was slapped by a nurse in the clinic that she went to deliver". This was what a woman from Tolla had to say when a question about happenings at the health facilities was posed to the group. Even health professionals

themselves admitted that the attitude of some of their colleagues leaves much to be desired and is completely unprofessional and in many cases scares away numerous women from skilled birth attendance. This is what a midwife in Tongo had to say about the attitude of some of her colleagues. "At times some of our colleagues do not exercise patience when dealing with women in labour which at times does not encourage the women to come to the health facilities for assistance. They insult and also shout on them".

Unfamiliar Delivery Practices in Health Facilities

Many women have said that a number of practices in health facilities are unfamiliar to them and they do not feel comfortable with these. For example, during home deliveries, women normally squat to give birth, whereas in health facilities they are usually asked to lie on a bed to give birth. As this woman from Tengzuk put it " at home our mothers make us squat whilst they support our waist and buttocks to help the process where as at the health facilities nurses instruct us to lie on the bed and raise our legs. Some women do not like the way of the nurses and complained that it sometimes does not make the baby come out early. Women have also indicated that when they deliver at home, they are often given hot water in the form of a local preparation of millet flour and shea butter to drink. "At home after the women delivers, she is given hot "zoom kom" and the baby is bathed very well with some local herbs by the old women but this is not the case at the health facility" This preparation is believed to facilitate the process of healing of the womb and promotes lactation. This is however not done in health facilities.

Traditional Beliefs, Perceptions and Practices: Certain traditional beliefs, perceptions and practices in some communities in the district may also contribute to the cultural resistance to institutional delivery. It is the perception in some communities that a "real woman" does not deliver at the health facility. A woman from Nyogbare explains "a" real woman" should be able to endure pain and not be "weak" so as to seek for care in the health facility". For these women, it is prestigious and a sign of luck to deliver at home. There is also a practice where ash is "blown on or stepped over" by first pregnant women early in the morning. As one woman from Awaradoone puts it "Our mothers usually have to blow ash on all first pregnancies in the community before she can announce her pregnancy i.e. let people know about it, if not it is believed she might loose the baby". Until this practice is carried out, the woman in question cannot announce the pregnancy and hence cannot assess any maternal health service. This practice is believed to prevent the woman from suffering a miscarriage and to protect the unborn child from wicked people. This probably explains why most of the women do not report early for ANC (mean gestational age at first booking for ANC was 3.33 months according to this study). There is also a perception that children who are born in the facility do not respond well to herbal treatment due to the medicines given at the facility.

It is however worth noting that discussants indicated that some of these practices, beliefs and perceptions were dying off gradually but they could not be ruled out completely in the district.

Discussion

This study was conducted to determine the prevalence and factors associated with the utilization of health facilities for child birth in a rural setting of Talensi Nabdam district of Ghana.

The rate of utilization of health facility for childbirth in the district was 63.3 %. This

rate is higher than the 2008 regional figure of 46.1 % for the Upper East where the study was carried out. Skilled attendance at delivery is an important indicator in monitoring progress towards Millennium Development Goal 5 to reduce the maternal mortality ratio by three quarters between 1990 and 2015 [16]. As of 2008, only 59 % of births in Ghana were delivered with the assistance of a health professional (i.e., doctor, nurse/midwife, community health officer/nurse) but institutional delivery was about 57% [17].

The results of this study show that institutional care seeking for child birth in the Talensi Nabdam district of Ghana is influenced by antenatal care services utilization, community access (that is, distance from health facility) , economic status, number of children a mother has and maternal knowledge of danger signs in pregnancy. This set of predictors accounted for 29.6 % of the variance in place of delivery, suggesting many other variables are responsible for this health seeking behavior that were not covered in this current study.

Distance, socioeconomic status, parity, and ANC utilization are significant predictors of place of delivery have been identified in many settings including Nepal [18].

As have been reported in many studies, several socio-demographic factors do influence a mother's choice of place for delivery. The government of Ghana, in 2003, implemented the free maternal health care policy to reduce financial barriers to access, and improve access to and use of skilled maternal and newborn healthcare services. Furthermore, provision of Community Health Planning Services (CHPS) compounds closer to where people live has received more attention in Ghana. These are some of the strategies that are expected to allow for easy access to health

facilities, yet in this study and many others, richer women tend to have greater probability of having a delivery assisted by trained personnel in health facilities [17, 19-22]. The slow progress towards attainment of maternal health care has been noted in a World Bank study which suggested that Ghana is off track to achieving the MDG 4 and 5 targets despite implementing the free maternity care policy [23].

The implication of these findings is that, there may still be a cost element that makes affordability for delivery services not being feasible or that factors other than financial status might be inhibiting access to, and utilization of health services.

This finding is consistent with other studies that report financial barrier still persists in spite of existence of free policy on maternal health services [18, 24, 25].

As demonstrated in the 2006 Lancet Maternal Survival Series, high delivery costs and distance to services are prominent barriers to care seeking was highlighted [26, 27]. Though financial barrier manifested in this study population, it was not the strongest determinant of institutional delivery. Pregnant women from the poorest households had the lowest probability to undergo skilled institutional delivery as has been reported by most studies [28-32].

The unavailability of skilled care services in many communities and the fact that some women still have to travel out of their communities to access these services were apparent barriers that need to be addressed. The proportion of institutional deliveries among women living up to 1 km was significantly different from women residing at least 1 km of a health facility.

In this study frequent ANC attendance was the strongest predictor of institutional delivery. This association may be explained by the fact that ANC offers an opportunity for providers to encourage pregnant women

to make use of skilled care at health facilities during delivery.

Prenatal care, commonly known as antenatal care (ANC) in most developing countries, is one of the key health interventions that have the potential to reduce morbidity and mortality among newborn babies and pregnant women. ANC provides an excellent opportunity to inform and educate pregnant women about pregnancy, childbirth and care of the newborn. Adequate ANC utilization is therefore expected to impact positively on pregnancy and birth outcome. Maximum benefit is however, derived if women initiate prenatal care in the first trimester of pregnancy and continue to receive care throughout pregnancy, according to recommended standards of periodicity [33].

Findings from this study are consistent with earlier studies conducted in rural northern Ghana, Kenya, and Nepal that showed that the number of ANC visits predicts health facility use for deliver [34-37]. Indeed many other studies do confirm that there is a positive association between adequate prenatal care and utilization of institutional delivery [25, 31, 38-41].

The probability of utilizing skilled institutional delivery decreased as the number of children a woman has increased. Compared with mothers who had 4 or more children, mothers who had one child were 6.2 times more likely to deliver at a health facility. This is also consistent with the finding that low parity women are more likely than high parity women to deliver at a health facility [17, 31, 42]. These results also show that older mothers were less likely to deliver at a health facility and so there is a need for policies and programs to focus on such women.

This finding is however, at variance with what was reported in an earlier in which older Ghanaian women were more likely to have a delivery assisted by trained personnel [19]. It appears there is no consistency in the correlation between maternal age and health services utilization. While some studies found that younger age increases the chances of early antenatal care, delivery assisted by trained personnel and high utilization of antenatal care services [21], others found otherwise [43], and yet others found no association in maternal care utilization and age [44, 45]. Our finding underlines the importance of educating older mothers in particular during antenatal sessions and home visits to give birth at a health facility. Programmes aiming at universal access to delivery care should therefore target vulnerable population groups such as women of older age group.

The negative attitude of older women towards health facility delivery may be explained by the fact such women in most cases were multiparious (that is, women who have given birth more than once). These women feel that they have all the knowledge needed from previous pregnancies to delivery healthy babies without seeking medical care [46, 47] (Daniels et al, 2006; Hugue et al, 2007; Rowley et al, 2004; Alexander & Korenbrot, 2002).

Additionally, it is likely that counseling on place of birth and provision of information during antenatal care could influence the women's decision. It is also possible that women seeking prenatal care had certain positive health seeking behavior that equally influences their use of institutional delivery independent of information provided at prenatal visits.

Maternal knowledge of danger signs in pregnancy was also an independent predictor of institutional delivery and that is consistent with other studies [48, 49]. Naturally, women with more knowledge about danger signs and symptoms of pregnancy are more likely to seek early prenatal care and may

thus received more education on the need to deliver in a facility. Knowledge is also an important factor that affects attitude, intention and behavior and it has been shown that knowledge relates to behavior, and behavior produces change towards service utilization [48, 50, 51].

Negative health system factors such as intimidation, unfriendly healthcare providers and cultural resistance to modern methods of delivery in healthcare facilities were barriers that discouraged women from seeking skilled institutional delivery.

Abuse of women during childbirth has long been documented throughout the world [52] but has largely been ignored. Well known violations include physical and verbal abuse, humiliation, non-consented and non-confidential care, discrimination, abandonment of care, and detention of the mother and newborn in facilities [52].

Health authorities to-date have still not devised sustainable strategies that address this type of barriers and it is about time this is taken care of seriously. Until negative attributes of the healthcare system are effectively done with, Ghana's progress towards achieving Millennium Development Goal 5 would remain difficult to attain.

It is imaginable that health providers would be hostile to their clients as have been documented in many studies that bad relational practices of healthcare provides have a negative effect on access to, and equitable use of skilled care [53-55].

Conclusions

ANC attendance of at least four times during pregnancy protects against home delivery and high level of knowledge in the dangers during pregnancy increases the patronage for institutional delivery in the Talensi Nabdam. Some socio-cultural as well as health system barriers were however reported by mothers that adversely affect choice of health institutions as a place for delivery.

Strengthening and promoting adequate ANC, ensuring easy geographical access to health services and availability of skilled maternity care services, embarking on intensive health education programs to increase knowledge on the dangers signs of pregnancy through regular community dialogue and radio, strengthening of health education and strict supervision of community health workers and elimination of abuse of women during childbirth may help improve on maximum utilization health facilities for delivery.

Policy implication of findings

Our findings highlight the fact that determinants of institutional delivery can vary and unique in context, thereby prompting the need to always identify them in order to improve maternal health. Efforts to promote skilled assistance at delivery should equally focus on demystifying some cultural perceptions as well as addressing negative attributes of the healthcare system that discourage access and use.

Therefore, health policies that seek to reduce financial barriers to institutional delivery services are necessary but insufficient to prevent home deliveries. Factors other than poor financial status continue to inhibit access to, and utilization of delivery services.

Limitations of the study

Our design was a cross sectional study and as with all such studies we cannot ascribe causations to the relationships found in the current study, and based on self-report we are not sure whether the respondents may or may not have misreported. However, because the questionnaire was anonymous we have no reason to believe that the respondents may have knowingly misreported in our survey.

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Competing interests: The authors declare that they have no competing interests.

Authors' contributions

MAA conceived the study, participated in its design and contributed significantly to the acquisition of data, whilst MS did the analysis and interpretation of data and was deeply involved in drafting the manuscript and revising it critically for important intellectual content. Both authors read and approved the final draft.

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