

Six sub-metros were randomly selected for the study. Health facilities were selected using different sampling methods. Where a sub-metro had at least two public hospital, only one was randomly selected. On the other hand we purposively selected the main referral public hospitals in sub-metros with just one hospital. In all, a total of six public facilities representing two polyclinics and four hospitals were selected.

Ethical approval was sought from the Ghana Health Service. The study focused on expectant mothers reporting for ANC in the selected health facilities. At the time of conducting the study, average ANC utilization in the polyclinics and hospitals was 101 and 198 respectively. Therefore, we randomly selected 200 women (50 in each polyclinic) and 164 women (82 in each hospital) for interview. The aggregate sample size was 363. In the sampled health facilities, exit interviews (i.e., interviewing respondents after they have completed receiving care) were employed to collect data. Exit interviews were found to be suitable since the absence of providers enabled respondents freely articulate their opinions without fear of being judged. The purpose of the study was explained to secure the consent of each participant before interviews were conducted.

To empirically assess the factors associated with ANC quality and uptake of skilled delivery services, a structured questionnaire was used. The questionnaire contained information relating to the women's socio-demographic characteristics-age, education, religion, occupation, trimester and distance from the woman's home to the health facility.

Two outcome variables were included in the questionnaire. The first outcome variable which sought to assess the quality of prenatal care was measured by the attitude of midwives; drug availability; duration of waiting hours; availability of essential medical equipment and comfort of the service environment. Considering the nature of their condition, expectant mothers would expect to be treated humanely in culturally sensitive and friendly manner during a visit to the health facility.^[18] Therefore explicit concern from health providers expressed through good interaction with expectant mothers may increase their preference for continuous uptake of antenatal services and subsequent delivery in the health facility. Further when essential medical equipment and logistics are nominally available, it offers minimal confidence for women to access care much more birthing in the health facility. Responses to item measures of the outcome variable, quality of ANC were dichotomous (1 = good if woman perceived service delivery to meet her expectation; 0 = poor if otherwise). The second outcome variable, intention to deliver in the health facility was assessed by asking the respondents whether they would be willing to deliver in the health facility based on their experience on quality of ANC in the health facilities. This outcome variable was dichotomous (1 = Yes if woman expressed willingness to deliver in the health facility; 0 = No if otherwise).

A two-part binary logistic regression was computed to determine association between the women demographic

characteristics and the outcome variables, quality of prenatal represented by model 1 and the intention to deliver in the health facility, model 2. Binary logistic regression is generally used to test the relationship between a binary dependent variable and a set of independent variables.^[34]

Chi-square (χ^2) test of independence was further used to explore possible relationships between the various independent variables and the frequency of antenatal visits. The aim was to find out whether the independent variables and frequency of antenatal visits are independent. The World Health Organization recommends at least four visits for normal pregnancies, the first of which should occur within the first trimester.^[35] In this study, the number of antenatal visits was at most nine.

Results

Descriptive statistics of the respondents are captured in Table 1. Many of the women (28.4%, 103/363) were aged between of 25 and 29. The majority, 87.9% (319/363) of the women had at least primary education. There were more Christians, 83.5% (303/363) than Muslims 16.5% (60/363). A greater number, 43.8% (159/363) of the women were self-employed. About 23% (82/363) and 18% (64/363) were respectively

Table 1: Characteristics of respondents

	n (%)
Age (years)	
15-19	50 (13.8)
20-24	85 (23.4)
25-29	103 (28.4)
30-34	70 (19.3)
35-39	55 (15.2)
Education	
None	44 (12.1)
Primary	99 (29.3)
Junior/senior high	176 (48.5)
Higher	44 (12.1)
Religion	
Christian	303 (83.5)
Muslim	60 (16.5)
Occupation	
Public sector	64 (17.6)
Private sector	82 (22.6)
Self employed	159 (43.8)
Unemployed	58 (16.0)
Trimester	
First	87 (24.0)
Second	192 (52.9)
Third	84 (23.1)
Distance to health facility (km)	
1-3	93 (25.6)
4-6	135 (37.2)
7-9	60 (16.5)
10+	76 (20.7)

employed in the private and public sectors while 16.0% (58/363) were unemployed. A Large proportion, 52.9% (192/363) of the women were in their second trimester. The average distance to the nearest health facility from the woman's home was 4.32 km. Many women across the different age sub-groups were in their second trimester [Figure 1]. Women perception about the quality of ANC was mixed. 54.4% (198/363) rated quality of ANC as good while 45.5% (165/363) indicated otherwise. An overwhelming number 71.9% (261/363) reported that they will seek skilled delivery care. Results in Table 2 show Chi-square analysis of the relationship between background characteristics of women and number of antenatal visits. Three variables, education, religion and occupation are significantly associated to antenatal visits.

To investigate the association between women characteristics and quality of ANC a binary logistic regression was computed [Table 3]. The model contained 6 independent

variables: Age, education, religion, occupation, pregnancy status and distance from woman's home to the health facility. The results show significant association between quality of ANC and women aged between 30 and 34 years ($P < 0.01$). Perceived quality of antenatal services is higher among women attaining junior/senior high education (OR = 1.52; $P < 0.01$) compared to women with higher education (OR = 1.28; $P = 0.04$). The odds of reporting quality of ANC as good was high for private sector workers (OR = 3.4; $P < 0.01$) and the unemployed (OR = 2.47). Distance is associated with perceived quality of ANC, but this increases with increasing distance to the health facility. Women living far from the health facility were more likely to perceive quality of ANC as good in contrast with those who lived closed to the health facility (OR = 2.22).

Table 3 presents results of association between women characteristics and the intention to deliver in the health facility. The relative odds of delivering in the health facility is greater for women aged between 35 and 39 years (OR = 2.13). Access to higher education increases the probability of birthing in the health facility (OR = 3.24; $P < 0.01$) reflecting greater knowledge about the importance of skilled delivery care. In addition, women with junior/senior high education were more likely to deliver in the health facility (OR = 2.49) compared to those with primary level of education (OR = 1.38). The odds of delivering in the health facility is also high for women in their third trimester (OR = 3.65) than the second trimester (OR = 2.41). Distance to the health facility is not

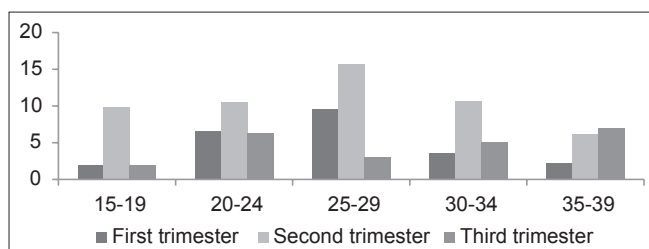


Figure 1: Variation of trimester of pregnancy by age

Table 2: Chi-square test of the relationship between the independent variables and number of antenatal visits

	Number of antenatal visit N (%)					χ^2	P value
	1-2	3-4	5-6	7-8	9+		
Age (years)							
15-19	24 (6.6)	9 (2.5)	4 (1.1)	9 (2.5)	4 (1.1)	13.067	<0.01
20-24	40 (11.0)	16 (4.4)	13 (3.6)	10 (2.8)	6 (1.7)		
25-29	38 (10.5)	25 (6.9)	21 (5.8)	11 (3.0)	8 (2.2)		
30-34	26 (7.2)	14 (3.9)	16 (4.4)	6 (1.7)	8 (2.2)		
35-39	24 (6.6)	8 (2.2)	11 (3.0)	5 (1.4)	7 (1.9)		
Education							
None	24 (6.6)	6 (1.7)	8 (2.2)	3 (0.8)	3 (0.8)	25.643	<0.01
Primary	39 (10.7)	22 (6.1)	21 (5.8)	10 (2.8)	7 (1.9)		
Junior/senior high	72 (19.8)	40 (11.0)	32 (8.8)	20 (5.5)	12 (3.3)		
Higher	17 (4.7)	4 (1.1)	4 (1.1)	8 (2.2)	11 (3.0)		
Religion							
Christian	118 (32.5)	61 (16.8)	55 (15.2)	39 (10.7)	30 (8.3)	9.257	<0.01
Muslim	34 (9.4)	11 (3.0)	10 (2.8)	2 (0.6)	3 (0.8)		
Occupation							
Public sector	33 (9.1)	7 (1.9)	9 (2.5)	3 (0.8)	12 (3.3)	22.867	<0.01
Private sector	33 (9.1)	16 (4.4)	14 (3.9)	12 (3.3)	7 (1.9)		
Self employed	64 (17.6)	35 (9.6)	27 (7.4)	23 (6.3)	10 (2.8)		
Unemployed	22 (6.1)	14 (3.9)	15 (4.1)	3 (0.8)	4 (1.1)		
Distance to health facility (km)							
1-3	35 (9.6)	18 (5.0)	22 (6.1)	12 (3.3)	6 (1.7)	9.230	0.21
4-6	55 (15.2)	28 (7.7)	19 (5.2)	18 (5.0)	15 (4.1)		
7-9	31 (8.5)	11 (3.0)	8 (2.2)	5 (1.4)	5 (1.4)		
10+	31 (8.5)	15 (4.1)	16 (4.4)	6 (1.7)	7 (1.9)		

Table 3: Logistic regression results of the relative odds of reporting quality of ANC as good and delivering in the health facility

Explanatory variables	Model 1 (quality of ANC)			Model 2 (delivering in health facility)		
	Coefficients	OR	CI (95%)	Coefficients	OR	CI (95%)
Age (years)						
15-19 [†]						
20-24	-0.231	0.793	0.291-1.160	-0.163	0.849	0.332-2.172
25-29	-0.199	0.820	0.339-1.983	-0.111	1.118	0.504-2.477
30-34	0.130**	1.931	0.455-2.847	-0.558	0.573	0.255-1.287
35-39	-0.238	0.788	0.317-1.957	2.007**	2.134	0.045-4.400
Education						
None [†]						
Primary	-0.441	0.643	0.222-1.859	0.866	1.378	0.760-7.437
Junior/senior high	0.120**	1.527	0.442-2.873	0.912*	2.588	0.914-6.776
Higher	0.246*	1.279	0.529-3.092	0.212**	3.236	0.472-6.238
Religion						
Christian [†]						
Muslim	0.278	1.321	0.673-2.594	-1.045**	0.352	0.178-1.694
Occupation						
Public sector [†]						
Private sector	1.226**	3.409	1.323-8.782	-0.747	0.474	0.192-1.168
Self employed	0.520	1.682	0.782-3.619	-0.467	0.627	0.280-1.404
Unemployed	0.905**	2.472	1.217-5.021	-0.473	0.623	0.302-1.285
Trimester of pregnancy						
First [†]						
Second	0.564	1.759	0.788-3.923	0.880*	2.411	1.091-5.329
Third	0.420	1.522	0.811-2.855	0.498**	3.645	0.828-6.268
Distance to health facility (km)						
1-3 [†]						
4-6	0.797**	2.219	1.063-4.632	0.272*	1.638	0.602-2.862
7-9	0.856**	3.353	1.187-4.665	0.494	1.513	0.793-3.385
10+	1.470**	4.351	1.723-10.990	-1.014	0.363	0.135-1.973
Constant	-0.804	0.448		-0.332	0.718	
χ^2 (16)	35.353			59.484		
Probability > χ^2	0.000			0.000		
Pseudo R^2	0.139			0.217		
Log likelihood	-364.454			-371.679		

**Significant at 1%, *Significant at 5%, [†]Reference category. ANC: Antenatal care, OR: Odds ratio

significantly associated with uptake of skilled delivery care. However, the relative odd of delivering in the health facility is higher for women living far from the health facilities studied.

Discussion

The study found that quality of ANC was perceived to be good among women aged between 30 and 34 years. A possible explanation is that as women advance in age they tend to perceive service delivery differently. Education has been shown to influence women health seeking behavior particularly, utilization of obstetric services.^[34,36,37] Association between women education and perceived quality of ANC remains obscured in the literature however. This study discovered significant association between access to education and quality of care perception.

Women with low educational status have a negative perception about the quality of ANC. In our view, is not surprising given

that reproductive health seeking behavior in Ghana is greatly impeded by low levels of women education and status.^[38] The fact that highly educated women tended to hold a positive view about the quality of ANC imply that they are likely to better understand the dynamics of healthcare delivery and that enabled them coped with service providers even if they faced problems in the care seeking process. Women working in the private sector were about three times more likely to report quality as good in contrast to the unemployed who were twice more likely to report similar episode. A woman's trimester of pregnancy does not affect perception about the quality of prenatal care. However, the odds of reporting quality of care as good was high for those in their second trimester. This may be attributed to the fact that the second trimester is normally less associated with complications and health risk comparable to the first and third. Relative stable health conditions may therefore influence service quality perception.^[14] Healthcare managers should consider improving shortfalls of service delivery to create a balance of quality perceptions across all trimesters. In

particular, attention should be paid to establishing structures that would enable women of all trimesters feel comfortable during the health seeking process.

The relative odds of reporting quality of ANC as good diminished with proximity to the health facility. For instance women living 10 km and beyond from the health facility highly reported ANC quality as good compared to those whose lived closed to the health facilities. Essentially, proximity of health facilities to users may be a key determinant of antenatal visit,^[39-44] but not quality perception. Perhaps excessive consumption of maternal services by women closer to the health facilities might have generated diminishing marginal utility of quality perception. More detail analysis using qualitative methods is needed to provide further understanding of this phenomenon. In the meantime service quality improvement is required to bridge the gap of quality perceptions between women closer and far from health facilities.

The provision of maternal health services with sufficient quality increases the chances of women delivering under the supervision of skilled providers. The reverse can however produce undesirable consequences, including for example, increases in the number of home deliveries and maternal mortalities. Maternal deaths can be prevented if women have access to quality health services so that complications can easily be managed.^[45] Therefore understanding the factors shaping facility based deliveries is important to plan appropriately for policy interventions.

In line with one of the key objective of this study which is to identify factors associated with uptake of supervised delivery services, it was discovered that the likelihood of delivering in the health facilities studied was high for women aged between 35 and 39 years. Implying that as women advances in age, they become more conscious about the relevance of receiving supervised delivery services. Younger women were more likely to deliver at home^[46] contrary to findings of an earlier study that young women have a preference for skilled delivery care.^[47] In Ghana, many women have weak social status representing loss opportunity to make independent decisions about reproductive health issues.^[48] More especially, young women who are pushed down the pecking order of many households are often constrained in terms of autonomy to take decisions concerning the choice of delivery place. Thus when decision regarding choice of facility delivery cannot be immediately agreed upon by the partner or family in the event of active labor, the only option is to deliver at home.

Consistent with previous studies, education has emerged as a significant determinant of supervised delivery.^[9,39,47,49-51] This finding further provides support for previous studies that education plays an important role in accomplishing better reproductive health outcome.^[52,53] In general, highly educated women have been demonstrated to have the power to override collective family decisions and therefore can opt

for institutional delivery services even if they face opposition from within and outside the family.^[54]

In the Ghanaian context where decision-making is mostly male dominated, education is seen as an empowerment tool against which women can contribute to decision making relating to their health and healthcare utilization. Therefore this finding reinforces the need to make girl child education paramount in national development policies. Pursuing enrolment and retention among girls in school could have both short and long-term benefits. Firstly, it increases the knowledge of women regarding reproductive health matters and secondly, it enables women overcome both family and societal factors constraining utilization of maternal health services. Occupation in its all forms is negatively associated with the intention to deliver under skilled care providers. The probability of perceiving quality of ANC as good was high for women engaged in the private sector and the unemployed. Such women expressed no strong intention to deliver in the health facility however. It is difficult to fully account for this phenomenon in this study. However private sector workers often better paid are well placed to appraise and select the optimal mix of supervised delivery services. This may not be the same for the unemployed without regular income source.

The intention to deliver in the health facility also reflects in the woman's trimester, but this is more likely to be high for women in their second and third trimesters. Given the scope of the study, it is not possible to fully explore the normative reasons behind this phenomenon. Nonetheless, the fact that pregnant women in their second and third trimester are often more accustomed to information relating to reproductive health risk and the danger of delivering at home,^[14] serve as an incentive for them to deliver in the health facility.

We found that uptake of supervised delivery services increases with decreasing distance to the health facility, corroborating findings of previous studies that physical distance influences utilization of skilled delivery services.^[55-57] In effect, women living far from the health facilities held low opinions about future intention of receiving supervised delivery services. This could be partly linked to the opportunity cost of time, cost associated with transportation, drugs, equipment and services. This finding necessitates expanding facilities coverage to the under-served backed by well-resourced maternity units to facilitate access to reproductive health services. Alternatively, the government and policy makers should consider making social interventions such the metro mass transport system free for all expectant mothers not living close to health facilities in order to alleviate household catastrophic expenditure.

Conclusion

Findings of the study indicated that not all women of the different socio-demographic backgrounds perceived quality of ANC to be good neither did all of them express intention to

deliver in the health facility. Policy implications of the study are specified supra, but it is important to stress that, the myth surrounding home deliveries may be broken when health providers offer sufficient quality of ANC and policy makers take steps to scale-up coverage of maternal care to encourage facility based deliveries.

A limitation of the study relate to the non-inclusion of income and parity which are seen as important in any analysis of maternal healthcare utilization. Future research should consider incorporating these variables to observe for possible changes. The sample size is also small considering the larger numbers of women utilizing antenatal services in the AMA. Future researchers interested in this subject matter should consider increasing the sample size.

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