



Original Article:

Socio Demographic Factors Determining the Adequacy of Antenatal Care among Pregnant Women Visiting Ekiti State Primary Health Centers.

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Citation

Ajayi IO, Osakinle DC. Socio Demographic Factors Determining the Adequacy of Antenatal Care among Pregnant Women Visiting Ekiti State Primary Health Centers. *Online J Health Allied Scs.* 2013;12(2):4. Available at URL: <http://www.ojhas.org/issue46/2013-2-4.html>

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Submitted: Jun 10, 2013; Accepted: Jul 5, 2013; Published: Aug 25, 2013

Abstract: A cross sectional study was conducted in Primary Health Centers among pregnant women to elucidate adequacy of antenatal care across different socio demographic variables. Four hundred respondents were proportionately selected from 18 primary health centers using simple random sampling. Exit interviews were conducted using the adapted antenatal care exit interview form of the Safe Motherhood Needs Assessment package. Data was analyzed using descriptive statistics and Chi square test. Adequacy of antenatal care in this study was measured by the single adequacy indicators which are duration of pregnancy at entry into antenatal care and number of antenatal visits; which are particularly suitable for developing countries. Age of respondents, means of transportation to the PHCs, occupation, location and level of education of the respondents were found to be determinants of whether the pregnant women attended their first antenatal visit in the first trimester, similarly, age of the respondents was a predictor of whether the women made up to four antenatal visits by their third trimester. Occupation and level of education were determinants of whether or not the pregnant women made their first antenatal visits at the first trimester. More respondents who were not working and those who were unskilled workers made their first antenatal visit at the first trimester compared to those who were skilled workers; work place policies and the fact that antenatal booking are made on weekdays and at work hours may hinder or be discouraging to the working class mothers.

Key Words: Antenatal care; Pregnancy; Motherhood Needs Assessment; Ekiti, Nigeria.

Introduction:

Over the years, antenatal care utilization has remained low in Nigeria. This under utilization varies from region to region and from state to state.(1) Inequity exists between old and

young, rural and urban whilst poor and less educated women may not benefit from ANC services or may drop out due to access barriers and low quality services. Evidence has shown that maternal deaths could be reduced by promoting the availability, access and utilization of basic and comprehensive emergency obstetric care services for women with complications of pregnancy and childbirth.(2)

Effects of age, parity and level of education on ANC utilization has been consistently the same from various studies; younger women (<20) use antenatal services better than older women, primiparas register early for antenatal care than women with more than one child alive. Women with secondary education are 2-3 times more likely to have antenatal care than women with no education, have more frequent visits and use health facilities for delivery.(3,4) Husband's education level has also been shown to be a strong predictor of ANC utilization.(5)

Timing and presentation of the women at the antenatal clinics showed that a lot of women present late. In sub-Saharan Africa, most women present for antenatal care in the second trimester and a relatively substantial proportion present only in the third trimester.(5) This late presentation defeats the first goal of focused antenatal care which is early detection and treatment of underlying conditions; because underlying medical conditions are worsened or aggravated in pregnancy, these conditions are often missed and not managed appropriately when women present late in the antenatal clinics.(5)

Factors that predict antenatal care utilization also determines the choice of place for delivery and whether or not a skilled attendant will be present at delivery. Evidence has also shown that maternal deaths could be reduced by promoting the availability, access and utilization of basic and comprehensive emergency obstetric care services for women with complications of pregnancy and childbirth(1); antenatal

care visits give a premise for the introduction of such services to the pregnant women. Antenatal care underscores actions that have been proven to improve maternal and neonatal health while de-emphasizing the interventions not known to be beneficial, at the same time, informing the pregnant women of potential danger signs and ways to respond to the signs appropriately(6), hence it is inappropriate for women not to present early for antenatal care or not to have the recommended number of minimum visits; it defeats the holistic goals of focused antenatal care. This study set out to elucidate the socio demographic variables influencing the optimization of antenatal care service in selected primary health centres in Ekiti state which the government had made free.

Methods

The study design was cross-sectional and quantitative data collection methods were used to gather data. Eighteen PHCs were selected using simple random sampling (two PHCs were randomly picked each from the four and five local government areas in rural and urban areas respectively). Free health service in the PHCs was in place at the time of this study, a minimum sample size of 400 was determined using formula for single proportion. Proportional allocation was used to determine the number of pregnant women selected in the PHCs. Ethical approval and permission were obtained from Ekiti State Ministry of Health. Study population included pregnant women visiting the antenatal clinics in PHCs for at least the first time. Exclusion criterion included pregnant women referred from rural area to urban area or vice versa to eliminate recall bias. Exit interview was conducted in Yorubalanguage (the local language of the study area) to ensure comprehensibility. Antenatal care exit interview questionnaire of the Safe Motherhood Needs Assessment package was adapted and used to obtain information on services received by the pregnant women and their responses were validated with their maternity cards.

Analysis

Data entry and analysis were done using SPSS version 15- software. Univariate analysis was used to determine the frequencies and proportions of the general characteristics of the study population, bivariate analysis- Chi-Square, was used to show the relationship between the covariates and the dependent variables. Multivariate analysis- Logistic regression was used to determine significant predictors of the outcome variables. Level of significance was set at 5%. This study measured “adequacy” using the single adequacy indicators which are duration of pregnancy at entry into antenatal care and number of antenatal visits (7); (proportions whose first visit was in the first trimester and proportions that had four visits or more at the third trimester).

Result

Socio-demographic characteristics of respondents

Mean age of the respondents was 27.5 ± 5.7 years, majority 231 (57.8%) belong to the age group 20-29 years, followed by 134 (33.5%) in age group 30-39years; teenagers (15-19)years were 25 (6.2%) while women aged 40 years or more were the least 10 (2.5%) (Table 1.1)

Many of the respondents 318 (79.5%) were Christians, 76 (19.0 %) were Muslims while only 6 (1.5%) belonged to the traditional religion. One hundred and forty nine, (37.2%) had secondary education, 132 (33.0%) had tertiary education, 71(17.8%) had primary education and 48 (12.0%) had no formal education at all. Most 379 (94.8%) were married at the time of the study while 14(3.5%) were single, 6 (1.5%) were separated, and only 1 (0.2%) was legally divorced. A little over half of the respondents 205 (51.2%) had skilled occupation, 106(26.0%) had unskilled occupation and 89 (22.0%) were not working at all. (Table 1.1)

Variables	Frequency	Percentage
Religion		
Christianity	318	79.5
Islam	76	19.0
Traditional	6	1.5
Age		
15-19	25	6.2
20-29	231	57.8
30-39	134	33.5
40+	10	2.5
Marital status		
Married	379	94.8
Single	14	3.5
Separated	6	1.5
Divorced	1	.2
Level of education		
None	48	12.0
Primary	71	17.8
Secondary	149	37.2
Tertiary	132	33.0
Occupation		
Skilled	205	51.2
Unskilled	106	26.5
Not working	89	22.2

Variable	Frequency	Percentage
No of children alive		
None	118	29.5
Between1-4	228	57.0
Above 4	54	13.5
Gestational age(at the time of survey)		
First Trimester	35	8.8
Second trimester	199	49.8
Third trimester	160	40
Don't know	6	1.5
No of antenatal visits		
Once	58	14.5
Twice	82	20.5
3- 4	155	38.8
> 5	86	21.5
many/ can't count	19	4.8
Means of Transportation to the clinic		
Walked/treked	231	58.0
Commercial	101	25.4
Private	66	16.6
Where else do you receive ANC		
None	247	61.8
Traditional/ native doctors	38	9.5
Mission houses	68	17.0
Private hospitals	16	4.0
SHC/THC	31	7.8

Pregnancy related characteristics

Almost half 199 (49.8%) of the women were in their second trimester at the time of this study while 160 (40.0%) were in their third trimester and 35 (8.8%) were in their first trimester. With regards to parity, 228 (57.0%) of the women had one to four children and 54 (13.5%) had more than four children while 118 (29.5%) of the women had never given birth. Over half of the women 231 (58.0%) trekked to the

PHCs for antenatal care while 101 (25.4%) and 66 (16.6%) used commercial and private vehicles respectively. (Table 1.2) Concerning the number of antenatal visits the women had at the time of this study, 155 (38.8%) had more than five visits, 86 (21.5%) had between three and four visits, 82 (20.5%) came for ANC twice, 58 (14.5%) have had only one visit, with the least being 4.8% representing those that had forgotten the number of visits they had. A higher proportion 247 (61.8%) did not register in other facilities apart from their PHCs, 68 (17.0%) received care in faith homes or mission homes, 38 (9.5%) received care from traditional care givers (*alagbo*; herbalists), 31 (7.8%) received care at secondary or tertiary health centres, and 16 (4.0%) received care from private hospitals.

Adequacy of antenatal care; first indicator (first presentation at the first trimester)

Greater proportion 128 (64.0%) of respondents in the rural areas had their first antenatal visits at the first trimester compared to urban residents 90 (45.0%), (p=0.07) (Table 2)

Table 2: Association between socio demographic characteristics and having adequate antenatal care; First visit in first trimester						
Sociodemographic variables	First visit in first trimester		Total n(100)	χ ²	df	P-value
	Yes n(%)	No n(%)				
Location						
Urban	90(45.0)	110 (55.0)	200(50)	3.361	1	0.067
Rural	128(64.0)	72 (36.0)	200(50)			
Parity						
None	46 (39.0)	72(61.0)	118(29.5)	4.538	2	0.103
Between 1-4	87 (38.2)	141(61.8)	228(57.0)			
Above 4	29(53.7)	25 (46.3)	54(13.5)			
Occupation						
Not working	50 (56.2)	39 (43.8)	89(22.2)	13.695	2	0.001
Skilled	68 (33.2)	137(66.8)	205(51.2)			
Unskilled	44 (41.5)	62 (58.5)	106(26.5)			
Religion						
Christianity	127(39.9)	191(60.1)	318(79.5)	0.204	1	0.652
Others	35 (42.7)	47 (57.3)	82(20.5)			
Means of transportation						
Walked	87(37.7)	144(62.3)	231(58.0)	9.363	2	0.009
Commercial means	37(36.6)	64 (63.4)	101(25.4)			
Private means	38(57.6)	28(42.4)	66(16.6)			
Marital status						
Married	150(39.6)	229(60.4)	379(94.8)	2.548	1	0.110
Single	12(57.1)	9 (42.9)	21(5.2)			
Age						
15-19	12 (48.0)	13(52.0)	25(6.2)	1.188	3	0.756
20-29	89 (38.5)	142 (61.5)	231(57.8)			
30-39	57(42.5)	77 (57.5)	134(33.5)			
> 40	4(40.0)	6(60.0)	10(2.5)			
Level of education						
None	17 (35.4)	31(64.6)	48(12.0)	9.331	3	0.025
Primary	35 (49.3)	36(50.7)	71(17.8)			
Secondary	48 (32.2)	101(67.8)	149(37.2)			
Tertiary	62(47.0)	70 (53.0)	132(33.0)			
Where else do you receive ANC						
TBAs	20(52.6)	18(47.4)	38(9.5)	7.386	4	0.117
Mission	33(48.5)	35(51.5)	68(17.0)			
SHC/THC	14(45.2)	17(54.8)	31(7.8)			
None	91(36.8)	156(63.5)	247(61.8)			
Private HC	4(25.0)	12(75.0)	16(4.0)			

A higher proportion 29 (53.7%) of those who had above four children made their first antenatal visit in the first trimester compared to those without children 46 (39.0%) and those who had between one to four number of children, 87 (38.2)

(p=0.103). A statistically insignificant relationships existed between marital status and whether or not the first antenatal visit was made in the first trimester; more single respondents 12 (57.1%) had their first antenatal visits in the first trimester than married women 150 (39.6%) (p=0.110). A lower proportion of Christian respondents 127 (39.9%) made their first antenatal visits at the first trimester compared to respondent of other religions 35(42.7%) (p=0.652).

Exploring the relationship between other places where the respondents received antenatal care and whether or not they had their first antenatal visits at the first trimester; of those that had their first visit in the first trimester, a higher proportion 20 (52.6%) were those that received care from traditional care givers, 33 (48.5%) of those who received care from mission/faith homes, and 14 (45.2%) of those that registered in secondary or tertiary health centers did the same compared to those that did not register in any other place 91 (36.8%) and those who registered in private hospitals 4 (25.0%).(p= 0.117).

With regards to age, majority of those whose first visits were in their first trimester were the teenage mothers 12 (48.0%), 57 (42.5%) of those in age group 30-39 years did the same, and 4 (40.0%) of the respondents aged above 40years also had their first visit in the first trimester compared to the respondents in the age group 20-29 where 89 (38.5%) of them had their first visit in the first trimester. (p=0.756). However age, marital status religion, parity, where else the respondents received care and location were not found to be significantly associated with early antenatal visits.

A larger proportion of pregnant women who were not working 50 (56.2%) and those who were unskilled workers 44 (41.5%) made their first antenatal visits at the first trimester compared to those who were skilled workers 68 (33.2%), chance was an unlikely explanation of the relationship between the type of occupation and whether or not the first antenatal visit was made in first trimester.(p=0.001), significant differences were noticed at the various levels of educational attainment, 35 (49.3%) respondents with primary education as the highest level attained and 62 (47.0%) respondents with tertiary education were the majority who had their first visits at the first trimester followed by those with no education at all 17 (35.4%) which was slightly higher than the proportion with secondary education 48 (32.2%) (p=0.025). Comparing the means of transportation to the PHCs; a significantly larger proportion of those who used private means 38 (57.6%) had their first visits at the first trimester compared to those who walked 87 (37.7%) and those who used commercial means 37 (36.6%), means of transportation was associated with whether or not the respondents had their first antenatal visit in first trimester.(Table 2)

Adequacy of antenatal care; second indicator (proportion who had up to four visits by the third trimester)

The second indicator to measure adequacy of antenatal care is whether or not the respondents at the third trimester had a minimum of four recommended visits. (Table 3). Age was found to be associated with whether or not the pregnant mothers had up to four visits by their third trimesters; of those who had these recommended number of visits, 49 (74.2%) of them belonged to age group 30-39, 57 (67.9%) were aged between 20-29 years compared to those belonging to age group 15-19 and those aged above 40 years. (p= 0.861). All the 10 (100%) who registered in secondary or tertiary health centers had the recommended number of visits, 11 (84.6%) of the respondents who received care from traditional homes, 25 (73.5%) of those who received care from mission/faith homes had the recommended number of visits compared to 59 (64.1%) of those who didn't receive care in other places apart from their PHCs and 4 (36.4%) of those who received care from private hospitals. (p=0.014)

Table 3: Association between socio demographic characteristics and having adequate antenatal care by third trimester						
Sociodemographic variables	4 visits or more	No n(%)	Total n(100)	χ^2	df	P-value
	Yes n(%)					
Age						
15-19	2(40)	3(60)	5(3.1)	0.031	1	0.861**
20-29	57(67.9)	27(32.1)	84(52.5)			
30-39	49(74.2)	17(25.8)	66(41.2)			
> 40	1(20)	4(80)	5(3.1)			
Marital status						
Married	105(68.2)	49(31.8)	154(96.2)	0.006	1	0.938
Single	4(66.7)	2(33.3)	6(3.8)			
Transportation						
Walked	61(69.3)	27(30.7)	88(55.7)	0.464	2	0.793
Commercial means	30(63.8)	17(36.2)	47(29.7)			
Private means	16(69.6)	7(30.4)	23(14.6)			
Location						
Urban	61(70.1)	26(29.9)	87(54.4)	0.348	1	0.555
Rural	48(65.8)	25(34.2)	73(45.6)			
Level of Education						
None	11(73.3)	4(26.7)	15(9.4)	2.818	3	0.421
Primary	26(78.8)	7(21.2)	33(20.6)			
Secondary	37(62.7)	22(37.3)	59(36.9)			
Tertiary	35(66.0)	18(34.0)	53(33.1)			
Parity						
None	28(73.7)	10(26.3)	38(23.8)	1.728	2	0.421
Between 1-4	63(64.3)	35(35.7)	98(61.2)			
Above 4	18(75.0)	6(25.0)	24(15.0)			
Occupation						
Not working	18(69.2)	8(30.8)	26(16.2)	1.999	2	0.368
Skilled	66(71.7)	26(28.3)	92(57.5)			
Unskilled	25(59.5)	17(40.5)	42(26.2)			
Where else do you receive antenatal care						
None	59(64.1)	33(35.9)	92(57.5)	12.550	4	0.014
Traditional care givers	11(84.6)	2(15.4)	13(8.1)			
Mission houses	25(73.5)	9(26.5)				
Private hospitals	4(36.4)	7(63.6)	34(21.2)			
SHC/THC	10(100)	0(0)	10(6.2)			
Religion						
Christianity	84 (66.7)	42(33.3)	126(78.8)	0.581	1	0.446
Others	25 (73.5)	9 (26.5)	34(21.2)			

** being value for linear by linear association which is the exact test used here.
Value in bold indicates values significant at $p < 0.005$

Married respondents who had four or more ANC visits were slightly higher in proportion 105 (68.2%) than the single respondents 4 (66.7%) ($p=0.938$). There was little or no difference in the proportion of those who walked 61 (69.3%), those who used private means of transportation 16 (69.6%) compared to those that used commercial means 30 (63.8%) with regards to having four visits or more at the third trimester ($p=0.793$). More urban respondents 61 (70.1%) had four visits or more at the third trimester compared to rural respondents 48 (65.8%), ($p=0.938$). A higher proportion of those whose highest educational level was primary education 26 (78.8%) and those with no education at all 11 (73.3%) had the recommended number of visits compared to those with tertiary education 35 (66.0%) and secondary education 37 (62.7%) ($p=0.79$)

Respondents with more than four children constitute the highest proportion 18 (75.0%) of those that had four ANC visits at third trimester, 28 (73.7%) of those who did the same were respondents with no children compared to 63 (64.3%) of respondents that had between 1 and 4 number of children. ($p=0.421$). Fewer Christian respondents 84 (66.7%) compared to other religions 25 (73.5%) had four or more recommended visits ($p=0.446$)

Logistic regression results

With regards to the association between whether or not the respondents made their first antenatal visits in their first trimester and location; urban residents were more likely to have their first antenatal visits in the first trimester compared to rural residents, $OR=1.01$, $95\%CI=0.64-1.60$. (Table 4)

Table 4: Logistic regression showing the odds of association between whether the first antenatal visit of the respondent was in first trimester with some socio-demographic factors			
Varibale	Odds Ratio	95% Confidence Interval	P-Value
Location			
Urban	1.013	0.64-1.60	0.935
Rural(REF)			
Parity			
None	0.442	0.21-0.93	0.032
Between 1-4	0.537	0.28-1.03	0.063
Above 4(REF)			
Means of transportation to the facility			
Walked	0.40	0.21-0.77	0.006
Commercial means	0.40	0.20-0.80	0.010
Private means(REF)			
Level of Education			
None	0.54	0.22-1.31	0.173
Primary	1.27	0.59-2.73	0.540
Secondary	0.68	0.36-1.27	0.227
Tertiary(REF)			
Occupation			
Unskilled	0.554	0.313-0.979	0.040
Skilled	0.387	0.233-0.645	0.000
Not working(REF)			

(Ref): Reference group

Respondents with no children were about 2.3 times less likely to have their first antenatal visits at the first trimester compared to those with children above 4; this result was statistically significant. ($OR=0.44$, $95\% CI=0.21-0.93$). Respondents who walked to their PHCs were about 2.5 times significantly less likely to have their first antenatal visits in their first trimester. ($OR=0.4$, $95\% CI=0.21-0.77$). A statistically significant difference existed between those who used commercial means to come to the hospital and those that used private means of transportation; those that used commercial transportation were about 2.5 times less likely to have their first ANC visits at the first trimester compared to the respondents who used private means. ($OR=0.4$, $95\%CI=0.20-0.80$).

The different levels of education showed that respondents with no education at all were about 1.9 times less likely to have their first antenatal visit at the first trimester compared to those with tertiary education. ($OR=0.5$, $95\%CI=0.22-1.31$), those whose highest educational attainment was primary education were only about 1.3 times more likely to have their first antenatal visit at the first trimester ($OR=1.3$, $95\%CI=0.36-1.27$), similarly, those with secondary education only were almost 1.5 times less likely to have their first antenatal visit at the first trimester compared to those with tertiary education. ($OR=0.68$, $95\% CI=0.59-2.73$.)

There was a significant association between the different types of occupation the respondents are engaged in and whether or not they made their first visit at the first trimester. Unskilled workers were 1.8 times less likely to have their first antenatal visit at the first trimester compared to those not working ($OR= 0.6$, $95\%CI= 0.31-0.98$) similarly, the skilled workers were 2.6 times less likely to have their first antenatal visit at the first trimester compared to those not working ($OR= 0.39$, $95\%CI=0.23-0.66$).

Table 5; Exploring the odds of association between the second indicator of adequacy of antenatal care (having four or more visits); age of the respondents and whether or not they were receiving care from other places were found to be insignificantly associated with whether or not the respondents had the four or more recommended visits at the third trimester. Respondents in their third trimester, who did not receive care anywhere else apart from the PHCs were about 1.5 times less likely to have had 4 or more visits compared to those receiving care in other places. (OR=0.7,95%CI =0.33-1.34), the odds of having four or more recommended visits at the third trimester was about 3.5 times more in respondents belonging to age group 20-29 years compared to the teenage mothers (OR= 3.48, 95%CI=0.54-22.43,).

Table 5: Logistic regression showing the odds of association between respondents who had four visits or more recommended visits at the third trimester with some selected socio-demographic characteristics.			
Variable	Odds Ratio	95% Confidence Interval	P-Value
Where else do you receive antenatal care			
None	0.66	0.33-1.34	0.250
Other places (REF)			
Age			
15-19(REF)	3.48	0.54-22.43	0.190
20-29	4.66	0.71-30.78	0.110
30-39	0.44	0.03 -7.63	0.574
Greater than 40			
REF= Reference categories			

Discussion

Indicators for monitoring antenatal care program (both utilization and coverage) include proportions of pregnant women that received antenatal care from a skilled provider at least once and proportion that had four visits.(8) However, it was measured by the single adequacy indicators which are duration of pregnancy at entry into antenatal care and number of antenatal visits; these indicators are particularly suitable for developing countries.(7) Considering the first index, occupation, and level of education were determinants of whether or not the pregnant women made their first antenatal visits at the first trimester. It is beneficial for pregnant women to present for their first antenatal visit in the first trimester because the first goal of focused antenatal care which is early detection and treatment of underlying medical conditions respondents would be easily achieved.

Respondents with tertiary education and primary education alone had their first antenatal visits in the first trimester compared to those with secondary education and no education at all, this finding could point out to the fact that universal primary education will go a long way to improve utilization of antenatal care and it is supported by the findings of a study by Nigerian academy of science where it was reported that utilization of antenatal care got better with increased level of educational attainment (9). More respondents who were not working and those who were unskilled workers made their first antenatal visit at the first trimester compared to those who were skilled workers; work place policies and the fact that antenatal booking are made on weekdays and at work hours may hinder early bookings of the working class mothers. Level of education and occupation are socio-demographic characteristics that influenced early bookings for antenatal care in this study and this was contrary to some findings (10) where these characteristics were not associated.

The second indicator considered only women in the third trimester because they are expected to have had the minimum

recommended number of visits by that gestational period. Teenage mothers and mothers aged above 40 years had less than four visits, these age groups have been found to poorly utilize antenatal care, (11). Surprisingly, respondents who received care from traditional homes and faith homes reported four or more recommended visits in the government health centres, this perhaps is as a result of various outreaches targeted at educating the TBAs and community members to embrace modern medical care with regards to maternal and child health, the TBAs as well as “traditional doctors” now ensure that their clients register and attend antenatal services in the government hospitals(12), however, those who received care from private hospitals were the least likely group to have the recommended number of antenatal visits to the PHCs(13), possibly because clients of private hospitals feel comfortable with the level of competence of their health care providers since more often than not the private medical practitioners also work in the government facilities.

Conclusion and Recommendations

Establishing specific youth friendly health centers in Ekiti state is perhaps a sure way to encourage adequate antenatal care for teenage mothers, similarly extra efforts should be intensified to ensure that people belonging to these age groups are specially attended while emphasizing to them the importance of having adequate antenatal care, since it has been discovered that mothers in these age groups utilize antenatal care poorly.

Allowing antenatal bookings to be possible on weekends may increase the chances of early presentation at the health facilities especially for the working class mothers. More importantly, it is certain that a lot of pregnant women seek traditional care, some completely neglect orthodox medicine even delivering their babies in the absence of skilled attendants, however, so much trainings and campaigns have been put in place to ensure that traditional birth attendants can recognize danger signs, they are trained to ascertain that their clients go through medical examinations prior to their being booked for antenatal in such homes; this is evident in the study area and efforts should be put to sustain this step.

Pregnant women who were transported to the health facilities with private means had better adequate antenatal care than those who worked and used commercial means, and also those who also registered in private hospitals didn't present fully in the government PHCs, reasons for these have not been fully understood, but what is certain is that a higher proportion of the respondents registered in the PHCs without registering in other places, this speaks volumes, they are satisfied with the service rendered, maternal deaths are negligible, its affordable and closer home and it is of an acceptable standard to their clients. These good attributes should be maintained by consistent evaluation by appropriate authority.

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