

**PATTERN OF ANTENATAL CARE SERVICES UTILIZATION IN A MISSION HOSPITAL  
IN OGBOMOSO SOUTH-WEST NIGERIA.**

**ABSTRACT**

**Aim:** To examine the pattern of antenatal care services utilization in Baptist Medical Centre, Ogbomoso, a mission hospital with a focus on individual, family, religious and socio-economic factors affecting ANC utilisation.

**Study Design:** The study was a cross-sectional prospective study

**Place and duration of the study:** The study was conducted among antenatal care seekers who attended antenatal care at the Baptist Medical Centre, Ogbomoso (now Bowen University Teaching Hospital) between August 1, 2002 and May 31, 2003.

**Methodology:** The pretested questionnaire was used to obtain the following information: sociodemographic characteristics, family type, parity and booking gestational age in weeks. Analysis was done using SPSS 16. Proportions were determined and statistics presented in tables. Chi-square test was done to determine the association between variables

**Results:** A total of 442 pregnant women were recruited for the study. The age range of attendees was 13 – 48 years with a mean age of  $29.2 \pm 5.3$ . Maternity service use was associated significantly with ANC attendance. Other factors associated with antenatal care attendance included: family type ( $p < .001$ ), educational status ( $p < .001$ ), occupation ( $p < .001$ ) Religion ( $p = 0.006$ ), place of domicile ( $p < .001$ ), Social status ( $p < .001$ ) and having a reason for antenatal care attendance ( $p = 0.033$ ).

**Conclusion:** The study unveiled educational status, occupation, social status, place of domicile, religion and need for maternity service use as factors positively associated with ANC utilization in the Baptist Medical Centre Ogbomoso.

**Keywords-** *Antenatal Care Services, Utilization, Mission Hospital, Ogbomoso, Nigeria.*

**INTRODUCTION**

Antenatal care is accepted as an important component of primary health care and is defined as every aspect of care from screening to intensive life support provided to any woman while pregnant and up to delivery (1). Antenatal care as an essential primary health care screening tool could be provided by family physicians, obstetrician and gynaecologists and midwives. Its utilization varies between developed and developing nations. The clinical effectiveness of family physician / general practitioner managed care is similar to that of obstetrician / gynaecologist led shared care for low risk pregnancy (2). The need to supervise obstetric patients throughout pregnancy rather than only when ill or in labour cannot be over-emphasized (3). As a result of careful evaluation of the pregnant patient at frequent intervals throughout the period of gestation, abnormalities can be detected and addressed before difficulties arise (3). All too often, a woman might book for antenatal care but fail to keep follow-up appointments thereafter, when next seen by the physician, the woman might be in the throes of an eclamptic fit or suffering severe chills and high fever from malaria or pyelonephritis, or worse still, trying to expel a large but dead foetus.

49 Appropriate antenatal care has proven to be of great value in the prevention of such  
50 catastrophes.

51 The adequacy of antenatal care involves both adequacy of utilization of the services and  
52 adequacy of content (4). Lack of access to antenatal care or skilled attendants at delivery  
53 are associated strongly with high maternal or fetal mortality and morbidity indices (5). At  
54 least 40% of women in developing countries receive no antenatal care during pregnancy  
55 and only about 31% deliver with the assistance of a skilled attendant (5). Many women do  
56 not have access to these life saving services, not only in areas where they are non- existent,  
57 but even in areas where they exist because availability does not necessarily guarantee  
58 utilization (6). A number of socio-economic, socio-demographic, cultural and religious  
59 factors influence it positively and negatively (7).

60 These factor include limited financial means(8), husband's decision(9), lack of transport or  
61 distance to a health facility, lack of satisfaction with the quality of care(10), high user  
62 changes(11) affiliation with a certain religious group(6), maternal age, educational level(12)  
63 and presence of morbid conditions in pregnancy.

64 It is therefore important that in any intervention strategy that aims to improve antenatal care  
65 utilization, these factors are considered and incorporated into the planning processes.

66 Utilization of maternal health services is associated with improved maternal and neonatal  
67 health outcomes(13). Considering global and national interests in the Sustainable  
68 Development Goals and Nigeria's high level of maternal mortality, understanding the factors  
69 affecting antenatal care use is crucial. Studies on the use of antenatal care services have  
70 largely overlooked contextual factors. However, examining barriers and facilitating factors in  
71 utilisation of antenatal care services is an important first step towards identifying appropriate  
72 interventions to introduce in a study area to increase use of skilled delivery(8)

73 This study examined the pattern of antenatal care services utilization in Baptist Medical  
74 Centre, Ogbomoso, a mission hospital with a focus on individual, family, religious and socio-  
75 economic factors affecting ANC utilisation. It is hoped that the findings will be helpful in  
76 designing appropriate reproductive health programs and services to improve both antenatal  
77 and maternity care use in the hospital.

#### 78 **Study area**

79 Ogbomoso is an ancient city in Oyo State, Southwestern Nigeria, founded in the mid 17<sup>th</sup>  
80 century. It has a population of estimated at around 1,200,000 in 2005. Majority of the people  
81 are of the Yoruba ethnic group who are involved in trading and farming.

82 Ogbomoso has two degree-awarding institutions of higher learning, Ladoke Akintola  
83 University and the Nigerian Baptist Theological Seminary. It is predominantly a Christian  
84 dominated town with several churches most of which are of the Baptist denomination. Other  
85 religious groups are made up of Muslims and traditional religion adherents.

86 The town boasts of two tertiary health institutions, Bowen University Teaching Hospital and  
87 Ladoke Akintola University Teaching Hospital. It has a secondary level Government State  
88 Hospital, several private health facilities, primary health centres, mission delivery homes and  
89 traditional birth attendant centres.

90 Ogbomoso area is made up of five local government areas (LGA) with two of these located  
91 within the city itself; namely Ogbomoso North and Ogbomoso South Local Government  
92 Areas.

#### 93 **METHODOLOGY**

94 The study was a cross-sectional prospective study conducted among antenatal care  
95 seekers who attended antenatal care at the Baptist Medical Centre, Ogbomoso (now Bowen  
96 University Teaching Hospital) between August 1, 2002 and May 31, 2003. The hospital is a  
97 200-bed mission hospital which renders primary, secondary and some tertiary health care  
98 services. It is a referral centre for other hospitals in Ogbomoso and environs. The study

99 involved consecutive recruitment of pregnant women that came for antenatal care at Baptist  
100 Medical Centre, Ogbomoso.

101 Inclusion criteria include pregnant women who presented with amenorrhoea and were  
102 confirmed pregnant by clinical examination, pregnancy test or ultrasound. Abdominopelvic  
103 ultrasonography was also used to confirm date due to disparity in gestational age (GA) and  
104 uterine size.

105 The pretested questionnaire was used to obtain the following information: sociodemographic  
106 characteristics, family type whether they were from monogamous, polygamous or single  
107 parent family; place of abode whether within or outside Ogbomoso; parity whether they were  
108 nullipara, primipara, multipara or grandmultipara; religion whether Christian, moslem or  
109 traditional religion; booking gestational age in weeks, women who booked before or at the  
110 16<sup>th</sup> were regarded as early bookers, others were late bookers; reason for booking; number  
111 of antenatal care visits whether <4 or > or = 4 was extracted from the antenatal records of  
112 the women. Those who made fewer than 4 visits were regarded as poor attenders while  
113 those who made 4 or more visits were regarded as good attenders; and maternity care use  
114 by each attendee was determined. The standard occupational classification system  
115 designed by the Office of population Census and Surveys, London (OPCS 1991)(14) and  
116 modified for Nigeria(15, 16) was used to classify respondents into socio-economic classes  
117 1 to 3 as follows: Class 1 = Skilled worker e.g. professionals and managerial officers and  
118 retirees of this cadre; Class 2 = Unskilled workers e.g. Artisans and traders; Class 3 =  
119 Dependants. e.g. Retirees of class 2, those not on pensions, house wives of class 2 cadre,  
120 students.

121 Analysis was done using SPSS 16. Proportions were determined and statistics presented in  
122 tables. Chi-square test was done to determine the association between variables and a p-  
123 value of < 0.05 was set as the level of statistical significance

## 124 **RESULTS**

125 A total of 442 pregnant women were recruited for the study. Of these, only 262 (59.3%)  
126 made use of maternity services. The mean age of attendees was 29.2 ± 5.3. The age range  
127 of attendees was 13 – 48 years; with majority (359, 81.2%) falling within the age range 20 –  
128 34 years. Only 11(2.5%) of the women were adolescents.

129 An inverse proportion between parity and number of attendees was displayed in a steep  
130 decline from nulliparity to parity of 5 and above. Primipara constituted the highest frequency,  
131 130(29.4%) of the attendees.

132 An overwhelming majority of the pregnant women, 363(82.1%) were of monogamous family  
133 type. Of the attendees, 419(94.7%) had formal education with the highest percentage  
134 (34.4%) being secondary school leavers.

135 Traders followed by civil servants formed the highest number of attendees 187(42.3%) and  
136 121(27.4%) respectively. A large proportion of the attendees were Christians 357(80.8%),  
137 eighty five (19.2%) were Muslim and there were no traditional religion adherents. Most of the  
138 attendees 331(74.9%) were domiciled within Ogbomoso town, however, 111(25.1%)  
139 attended from outside the town. The results revealed that 394(89.1%) of the attendees  
140 booked late for antenatal care while only 48(10.9%) were early bookers. The commonest  
141 reason given by attendees for booking at the time they did was “just right to book.”  
142 352(79.6%). Other reasons were: “had booked elsewhere but desires to continue ANC here”,  
143 27(6.1%); “advised by a doctor to book,” 23(5.2%).

144 Tabulation of social class indicated that 431(97.5%) of the attendees belonged to social  
145 classes 1 and 2.

146 Almost half of the attendees 210(47.5%) had good attendance though most of them 292  
147 (66.1%) booked in the second trimester. A very small number 32(7.2%) booked in the first

148 trimester. Of the 442 ANC attendees, 262(59.3%) made use of the hospital's maternity  
 149 services while 180(40.7%) delivered elsewhere with unknown pregnancy outcome. (Table 1)

150 **Table 1: Sociodemographic Characteristics**

<b>VARIABLES</b>	<b>FREQUENCY (%)</b>
<b>Age group</b>	
<20	11 (2.5)
20 – 34	359 (81.2)
≥35	72 (16.3)
<b>Mean Age = 29.18 ± 5.31</b>	
<b>Educational Status</b>	
No Formal Education	23(5.0)
Primary	87(19.7)
Secondary	157(34.4)
Post Secondary lower than university	112(25.3)
University	68(15.4)
<b>Marital Status</b>	
Single	19(2.3)
Married	432(97.7)
<b>Domicile</b>	
Ogbomoso	331(74.9)
Outside Ogbomoso	111(25.1)
<b>Family Type</b>	
Monogamous	363(82.1)
Polygamous	69(15.6)
Single Parent	10(2.3)
<b>Religion</b>	
Christianity	357(80.8)
Islam	85(19.2)
<b>Occupation</b>	
Artisan	55(12.4)
Trading	187(42.3)
Civil servant	121(27.4)
Student	30(6.8)
Farming	24(5.4)
Unemployed	25(5.7)
<b>Booking Gestational Age</b>	
1 <sup>st</sup> Trimester	32(7.2)
2 <sup>nd</sup> Trimester	292(66.1)
3 <sup>rd</sup> Trimester	118(26.7)
<b>Social Class</b>	
Class 1	186(42.1)
Class 2	245(55.4)
Class 3	11(2.5)
<b>ANC Attendance Status</b>	
Good Attendance	210(47.5)
Poor Attendance	232(52.5)
<b>Booking Status</b>	
Early bookers	48(10.9)
Late bookers	394(89.1)

<b>Maternity Use</b>	
Delivered in BMC	262(59.3)
Delivered Outside	180(40.7)
<b>Parity</b>	
0	130(29.4)
1	101(22.9)
2	87(19.7)
3	69(15.6)
4	36(8.1)
5	13(2.9)
6	6(1.4)
<b>Reasons for booking</b>	
Told by doctor	23 (5.2)
Told by husband	12(2.7)
Told by others	20(4.5)
To continue ANC	27(6.1)
No money until now	8(1.8)
Just right to book	352(79.6)

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The attendees who had university education had the highest proportion of attendees (73, 65.2%) who had good ANC attendance while the attendees with no formal education had the highest proportion of attendees (20, 87.0%) who had poor ANC attendance ( $p < .001$ ). The attendees who were Christians had the highest proportion of attendees (181, 50.7%) who had good ANC attendance while the Muslims (56, 65.9%) had poor ANC attendance ( $p=0.006$ ). Civil servants had the highest proportion of subjects (84, 69.4%) who had good ANC attendance while farmers had the highest proportion of subjects (20, 83.3%) with poor ANC attendance. Attendees from Ogbomoso had highest proportion of attendees (175, 52.9%) who had good ANC attendance while attendees from outside ogbomoso had highest proportion of subject (76, 68.5%) who had poor attendance ( $p < .001$ ). The attendees who belonged to social class 1 had the highest proportion of attendees (117, 62.9%) who had good ANC attendance while those who belonged to social class 2 (158, 64.5%) had poor ANC attendance. The association between the marital status, family type, parity, age group, booking gestational age and ANC attendance were not statistically significant. (Table 2)

**Table 2: Association between sociodemographic characteristics and ANC attendance**

VARIABLES value	ANC ATTENDANCE		p-
	Poor Attendance N(%)	Good Attendance N(%)	
<b>Marital Status</b>			
Single	4(40.0)	6(60.0)	0.640
Married	228(52.8)	204(47.2)	
<b>Educational Status</b>			
No Formal Education	20(87.0)	3(13.0)	58(38.2)
Primary	56(64.4)	31(35.6)	
Secondary		94(61.8)	
< .001			

Post Secondary lower than university	39(34.8)	73(65.2)	
University	23(33.8)	45(66.2)	
<b>Family Type</b>			
Monogamous	177(48.8)	186(51.2)	
Polygamous		51(73.9)	18(26.1)
0.66			
Single Parent	4(40.0)	6(60.0)	
<b>Religion</b>			
Christianity		176(49.3)	181(50.7)
0.006			
Islam	56(65.9)	29(34.1)	
<b>Occupation</b>			
Artisan	30(54.5)	25(45.5)	
Trading	120(64.2)	67(35.8)	
Civil servant	37(30.6)	84(69.4)	0.03
Student	13(43.3)	17(56.7)	
Farming	20(83.3)	4(16.7)	
Unemployed	12(48.0)	13(52.0)	
<b>Parity</b>			
Nullipara	67(51.5)	63(48.5)	
Primipara		47(46.5)	54(53.5)
0.40			
Multipara	106(55.2)	86(44.8)	
Grandmultip	12(63.2)	7(36.8)	
<b>Age group</b>			
≤20	7(63.6)	4(36.4)	
20 – 34		192(53.5)	167(46.5)
0.374			
≥ 31	33(45.8)	39(54.2)	
<b>Domicile</b>			
Ogbomoso		156(47.1)	175(52.9)
< .001			
Outside Ogbomoso	76(68.5)	35(31.5)	
<b>Booking Status</b>			
Early bookers	24(50.0)	24(50.0)	0.175
Late bookers	208(52.8)	186(47.2)	
<b>Social Class</b>			
Class 1	69(37.1)	117(62.9)	
Class 2	158(64.5)	87(35.5)	< .001
Class 3	5(45.5)	6(54.5)	
<b>Booking Gestational Age</b>			
1 <sup>st</sup> Trimester	15(46.9)	17(53.1)	
2 <sup>nd</sup> Trimester	144(49.3)	148(50.7)	0.057
3 <sup>rd</sup> Trimester	73(61.9)	45(38.1)	
<b>Reasons for booking</b>			
Told by doctor	11(47.8)	12(52.2)	
Told by husband	9(69.2)	4(30.8)	
Told by others	11(55.0)	9(45.0)	0.05
To continue ANC	20(74.1)	7(25.9)	

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No money until now	6(85.7)	1(14.3)	
Just right to book	175(49.7)	177(50.3)	
<b>Maternity Use</b>			
Delivered in BMC	52(19.8)	210(80.2)	< .001
Delivered outside	180(100.0)	0(0.0)	

It was also noted that marital status, educational status, family type, religion, occupation, parity, age group, domicile, social class and maternity use did not have any statistically significant association with booking pattern of the subjects. (Table 3)

**Table 3: Association between sociodemographic characteristics and booking pattern**

VARIABLES	BOOKING PATTERN		p-value
	Early Bookers N(%)	Late Bookers N(%)	
<b>Marital Status</b>			
Single	1(10.0)	9(90.0)	0.930
Married	47(10.9)	385(89.1)	
<b>Educational Status</b>			
No Formal Education	1(4.3)	22(95.7)	0.384
Primary	9(10.3)	78(89.7)	
Secondary	13(8.6)	139(9.4)	
Post Secondary lower than university	14(12.5)	98(87.5)	
University	11(16.2)	57(83.8)	
<b>Family Type</b>			
Monogamous	40(11.0)	323(89.0)	62(89.9)
Polygamous		7(10.1)	
Single Parent	1(10.0)	9(90.0)	0.974
<b>Religion</b>			
Christianity		40(11.2)	317(88.8)
Islam	8(9.4)	77(90.6)	0.633
<b>Occupation</b>			
Artisan	4(7.3)	51(92.7)	106(87.6)
Trading	20(10.7)	167(89.3)	
Civil servant		15(12.4)	
Student	3(10.0)	27(90.0)	
Farming	3(12.0)	22(88.0)	0.949
Unemployed	3(12.5)	21(87.5)	
<b>Parity</b>			
Nullipara	17(13.1)	113(86.9)	89(88.1)
Primipara		12(11.9)	
Multipara	16(8.3)	176(91.7)	
Grandmultip	3(15.8)	16(84.2)	
<b>Age group</b>			

≤20	2(18.2)	9(81.8)	
20 – 34		40(11.1)	319(88.9)
0.374			
≥ 31	6(8.3)	66(91.7)	
<b>Domicile</b>			
Ogbomoso	34(10.3)	297(89.7)	0.493
Outside Ogbomoso	14(12.6)	97(87.4)	
<b>Social Class</b>			
Class 1	20(10.8)	166(89.2)	
Class 2	27(11.0)	218(89.0)	0.44
Class 3	1(9.1)	10(2.3)	
<b>Booking Gestational Age</b>			
1 <sup>st</sup> Trimester	32(100.0)	0(0.0)	
2 <sup>nd</sup> Trimester	16(5.5)	276(94.5)	< .001
3 <sup>rd</sup> Trimester	0(0.0)	118(100.0)	
<b>Reasons for booking</b>			
Told by doctor	6(26.1)	17(73.9)	
Told by husband	0(0.0)	13(100.0)	
Told by others	4(20.0)	16(80.0)	0.032
To continue ANC	0(0.0)	27(100.0)	
No money until now	1(14.3)	6(85.7)	
Just right to book	37(10.5)	315(89.5)	
<b>Maternity Use</b>			
Delivered in BMC	24(9.2)	238(90.8)	0.166
Delivered outside	24(13.3)	156(86.7)	

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## DISCUSSION

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Antenatal care finds justification in the opportunity it affords in ensuring good maternal and fetal outcome of pregnancy (2). Women at risk of pregnancy-related complications are in need of both early recognition and continuing attention throughout the period of pregnancy. Thus factors related to antenatal care attendance status whether poor or good and time of initiation of antenatal care whether early or late need close scrutiny.

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The mean age of ANC attendees was 29.2±5.3 years and most of the women fell within the acceptable age range of 20 – 34 years. The low proportion of women in both extremes of reproductive life in this study is significant because of the high risk features associated with these groups. A previous study observed similar findings (17). There was no significant relationship between attendance status and maternal age.

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Information on parity showed that the women who came to book were predominantly nulliparous. This is similar to previous findings (18-20). The relatively high frequency of the nulliparous 130 (29.4%) possibly reflects the importance accorded first pregnancies in this community. Such women are told to book early and are actually accompanied to the hospital by an older female. Subsequent pregnancies usually attract less attention. However, there was no significant association between attendance status or time of initiation of antenatal care with parity.

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Attendance of pregnant women was statistically related to their family type. The married constituted 97.7% of the population and most them, 82.2% were in monogamous relationship. The observed trend could suggest that monogamy affords a woman more attention, care and security compared to polygamy.

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202 Educational status of attendees is a factor observed to influence attendance significantly.  
203 Several studies (21-25) reported a positive relationship between degree of utilization of  
204 antenatal care and maternal education. This highlights the fact that female education is very  
205 important in reproductive healthcare. Women with minimal or no formal education are still  
206 within the grip of harmful cultural practices and beliefs. These in turn exert a strong influence  
207 on a woman's perception of pregnancy and its care.

208 There was a statistical relationship between attendance and occupation. The largest  
209 proportion of attendees was traders 187(42.3%). This may not be unconnected with the fact  
210 that trading is one of the commonest occupations in the study area being a semi-urban  
211 locality. Also, trading may allow a woman take time off work and also afford financial support  
212 for payment of needed services.

213 In the same vein, the social class of attendees was significantly related to their attendance  
214 status. Rowe et al reported similar findings(26). The lower the socio-economic level, the  
215 more likely a woman is to receive inadequate antenatal care. With an increasing cost of  
216 healthcare and rate of unemployment, the future looks bleak for the low social class  
217 individuals. Thus, this makes a case for expansion of the National Health Insurance Scheme  
218 to cover the informal sector at the grassroots.

219 Religion was also found to be a significant factor guiding utilization of antenatal care in this  
220 study. Dairo et al in Ibadan reported, however, that belonging to certain religions group  
221 proved to be the strongest explanatory factor for not attending ANC facility(6).The finding in  
222 this present study, however, may be due to the fact that religious bodies and organizations  
223 could be a strong factor in mobilizing and sensitizing their members on the usefulness of  
224 orthodox healthcare services. It is also interesting that there were no traditional religion  
225 adherents in the study group. Furthermore, though the hospital is a Christian institution,  
226 Muslim pregnant women, 85 (19.1%) also utilized its services.

227 The place of domicile of the pregnant women was also statistically related to their  
228 attendance status. Distance from health facility could be a factor limiting its utilization as  
229 shown by Mwaniki(10) in his study in Kenya. Most of the attendees in the present study, 333  
230 (75%) lived within Ogbomoso and this may have been responsible for the good attendance.

231 Considering the relationship between the reason for the commencement of antenatal care  
232 and attendance status, it was shown that having a reason for booking was not statistically  
233 related to attendance status. It is worth observing that majority of the women, 352 (79.6%)  
234 Just felt it was the right time to book. This indicates a large gap in health education given to  
235 women on antenatal care. Women could introduce wrong judgment in determining the right  
236 time to book. In Gharoro's study in Benin, Nigeria(9), 41.5% of the patients came when they  
237 felt it was the right time to book.

238 Maternity care use was found to be significantly related to attendance status. Some of the  
239 women actually came to book in order to access maternity service in the hospital. An  
240 examination of the distribution of maternity care use by attendees showed that 40.7%  
241 defaulted. The remaining 59.3% made use of the maternity services in the hospital and had  
242 known pregnancy outcomes. Etuk in Calabar found a close default rate of 43.5% (27).  
243 Although the present study did not investigate the place of delivery of women who defaulted,  
244 the possible places may include personal homes, mission houses, traditional birth attendant  
245 homes or some other hospitals.

246 The maternal and perinatal outcomes of pregnancies that are booked for antenatal care but  
247 delivered under the supervision of untrained attendants have been found to be significantly  
248 worse than those delivered in orthodox health facilities(27).

249 The study revealed that age of attendees, parity and marital status did not have any  
250 significant relationship with attendance status and time of initiation of antenatal care. Non-

251 randomization of the subjects and the hospital-based nature of the study placed limitations  
252 on the results.

### 253 **CONCLUSION**

254 This study has unveiled educational status, occupation, social status, place of domicile,  
255 religion and need for maternity service use as factors associated with ANC utilization in the  
256 Baptist Medical Centre Ogbomoso. There is a need to improve maternity service utilization  
257 by improving early and adequate uptake of antenatal care services through provision of  
258 appropriate information in the community on antenatal care and its benefits. Furthermore,  
259 with the increasing cost of healthcare and rise in unemployment rate, the future is bleak for  
260 the low social class antenatal care seekers. There is thus, a need for expansion in the  
261 coverage of National Health Insurance Scheme to Ogbomoso community level. Effective  
262 interventions to improve ANC utilization will in turn influence maternity care use. This will  
263 eventually lead to a reduction in the high maternal and child health indices characteristic of  
264 developing nations.

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### 266 **CONFLICT OF INTEREST**

267 There was no conflict of interest

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### 269 **CONSENT**

270 We declare that 'written informed consent was obtained from the patients for publication of  
271 this study. A copy of the written consent is available for review by the Editorial office/Chief  
272 Editor/Editorial Board members of this journal.

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### 274 **ETHICAL APPROVAL**

275 We hereby declare that the study has been examined and approved by the appropriate  
276 ethics committee and have therefore been performed in accordance with the ethical  
277 standards laid down in the 1964 Declaration of Helsinki.

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### 279 **REFERENCES**

280 1. Bruun Nielsen B, Hedegaard M, Haraksingh Thilsted S, Joseph A, Liljestrang J. Does  
281 antenatal care influence postpartum health behaviour? Evidence from a community based  
282 crosssectional study in rural Tamil Nadu, South India. *BJOG: An International Journal of*  
283 *Obstetrics & Gynaecology*. 1998;105(7):697-703.

284 2. Carroli G, Rooney C, Villar J. How effective is antenatal care in preventing maternal  
285 mortality and serious morbidity? An overview of the evidence. *Paediatric and perinatal*  
286 *Epidemiology*. 2001;15(s1):1-42.

287 3. Ekabua J, Ekabua K, Njoku C. Proposed framework for making focused antenatal  
288 care services accessible: a review of the Nigerian setting. *ISRN obstetrics and gynecology*.  
289 2011;2011.

290 4. Nigenda G, Langer A, Kuchaisit C, Romero M, Rojas G, Al-Osimy M, et al. Womens'  
291 opinions on antenatal care in developing countries: results of a study in Cuba, Thailand,  
292 Saudi Arabia and Argentina. *BMC Public health*. 2003;3(1):17.

293 5. Munjanja SP, Lindmark G, Nyström L. Randomised controlled trial of a reduced-visits  
294 programme of antenatal care in Harare, Zimbabwe. *The Lancet*. 1996;348(9024):364-9.

295 6. Dairo M, Owoyokun K. Factors affecting the utilization of antenatal care services in  
296 Ibadan, Nigeria. *Benin Journal of Postgraduate Medicine*. 2010;12(1).

297 7. Tshimanga M, Makunike B, Wellington M. Does time of initiation of antenatal care  
298 influence content and adequacy of antenatal care or foetal outcome in low obstetric risk  
299 women in harare, zimbabwe? *Central african journal of medicine*. 1998;44(3):55-60.

- 300 8. Simkhada B, Teijlingen ERv, Porter M, Simkhada P. Factors affecting the utilization  
301 of antenatal care in developing countries: systematic review of the literature. *Journal of*  
302 *advanced nursing*. 2008;61(3):244-60.
- 303 9. Gharoro EP, Igbafe A. Antenatal care: some characteristics of the booking visit in a  
304 major teaching hospital in the developing world. *Medical Science Monitor*. 2000;6(3):519-22.
- 305 10. Mwaniki P, Kabiru E, Mbugua G. Utilisation of antenatal and maternity services by  
306 mothers seeking child welfare services in Mbeere District, Eastern Province, Kenya. *East*  
307 *African Medical Journal*. 2002;79(4):184-7.
- 308 11. Högberg U, Larsson N. User charges for antenatal care and ultrasound-an  
309 unwillingness to pay. *Acta obstetrica et gynecologica Scandinavica*. 1999;78(5):398-402.
- 310 12. Babalola S, Fatusi A. Determinants of use of maternal health services in Nigeria-  
311 looking beyond individual and household factors. *BMC Pregnancy and childbirth*.  
312 2009;9(1):43.
- 313 13. Brown CA, Sohani SB, Khan K, Lilford R, Mukhwana W. Antenatal care and perinatal  
314 outcomes in Kwale district, Kenya. *BMC pregnancy and childbirth*. 2008;8(1):2.
- 315 14. The Office for National Statistics. Standard occupational classification 2010, Vol. 3:  
316 the national statistics socio-economic classification. Hampshire, UK: Palgrave Macmillan;  
317 2010.
- 318 15. Akinboboye BO, Shaba OP, Akeredolu PA, Oderinu OH. Sociodemographic  
319 determinants of usage of complete dentures in a Nigerian teaching hospital: A pilot study.  
320 *European Journal of Prosthodontics*. 2013;1(2):37.
- 321 16. Ibiyemi O, Taiwo JO. Some socio-demographic attributes as covariates in tooth wear  
322 among males in a rural community in Nigeria. *Ethiopian journal of health sciences*.  
323 2012;22(3).
- 324 17. Raatikainen K, Heiskanen N, Heinonen S. Under-attending free antenatal care is  
325 associated with adverse pregnancy outcomes. *BMC public health*. 2007;7(1):268.
- 326 18. Okunlola M, Ayinde O, Owonikoko K, Omigbodun A. Factors influencing gestational  
327 age at antenatal booking at the University College Hospital, Ibadan, Nigeria. *Journal of*  
328 *Obstetrics & Gynecology*. 2006;26(3):195-7.
- 329 19. Kupek E, Petrou S, Vause S, Maresh M. Clinical, provider and sociodemographic  
330 predictors of late initiation of antenatal care in England and Wales. *BJOG: An International*  
331 *Journal of Obstetrics & Gynaecology*. 2002;109(3):265-73.
- 332 20. Alderliesten M, Vrijkotte T, Van Der Wal M, Bonsel G. Late start of antenatal care  
333 among ethnic minorities in a large cohort of pregnant women. *BJOG: An International*  
334 *Journal of Obstetrics & Gynaecology*. 2007;114(10):1232-9.
- 335 21. Kabir M, Iliyasu Z, Abubakar I, Sani A. Determinants of utilization of antenatal care  
336 services in Kumbotso village, Northern Nigeria. *Tropical doctor*. 2005;35(2):110-.
- 337 22. Furuta M, Salway S. Women's position within the household as a determinant of  
338 maternal health care use in Nepal. *International family planning perspectives*. 2006:17-27.
- 339 23. Navaneetham K, Dharmalingam A. Utilization of maternal health care services in  
340 Southern India. *Social science & medicine*. 2002;55(10):1849-69.
- 341 24. Matsumura M, Gubhaju B. Women's Status, Household Structure and the Utilization  
342 of Maternal Health Services in Nepal: Even primary-level education can significantly  
343 increase the chances of a woman using maternal health care from a modern health facility.  
344 *Asia-Pacific Population Journal*. 2001;16(1):23-44.
- 345 25. Magadi MA, Madise NJ, Rodrigues RN. Frequency and timing of antenatal care in  
346 Kenya: explaining the variations between women of different communities. *Social science &*  
347 *medicine*. 2000;51(4):551-61.
- 348 26. Rowe RE, Garcia J. Social class, ethnicity and attendance for antenatal care in the  
349 United Kingdom: a systematic review. *Journal of Public Health*. 2003;25(2):113-9.

350 27. Etuk SJ, Ekanem AD. Socio-demographic and reproductive characteristics of women  
351 who default from orthodox obstetric care in Calabar, Nigeria. International Journal of  
352 Gynecology & Obstetrics. 2001;73(1):57-60.  
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354  
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