



## **Pattern of Antenatal Care Services Utilization in a Mission Hospital in Ogbomoso South-west Nigeria**

**Olufemi Timothy Awotunde<sup>1</sup>, Isaac Olusayo Amole<sup>1\*</sup>,  
Stephen Adesope Adesina<sup>1</sup>, Adenike Adeniran<sup>1</sup>, David Akintayo OlaOlorun<sup>1</sup>,  
Adewumi Ojeniyi Durodola<sup>1</sup> and Titilope Abisola Awotunde<sup>2</sup>**

<sup>1</sup>*Department of Family Medicine, Bowen University Teaching Hospital, Ogbomoso, Nigeria.*

<sup>2</sup>*School of Nursing, Bowen University Teaching Hospital, Ogbomoso, Nigeria.*

### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author OTA designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors IOA, SAA and AA managed the analyses of the study. Authors DAOO, AOD and TAA managed the literature searches. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/JAMPS/2019/v21i230127

#### Editor(s):

(1) Dr. Julius Olugbenga Soyinka, Department of Pharmaceutical Chemistry, Obafemi Awolowo University, Ile-Ife, Nigeria.

#### Reviewers:

(1) Sahar Mohamed, Ain Shams University, Egypt.

(2) Giuseppe Gregori, Local Health Unit, Italy.

Complete Peer review History: <http://www.sdiarticle3.com/review-history/50811>

**Original Research Article**

**Received 21 May 2019**

**Accepted 12 August 2019**

**Published 20 August 2019**

## **ABSTRACT**

**Aim:** To examine the pattern of antenatal care services (ANC) 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±5.3. Maternity service use was associated significantly with ANC attendance. Other factors associated with antenatal care attendance included: University educational status ( $p < .001$ ), civil servant ( $p < .001$ ) christianity ( $p = 0.006$ ), residing in Ogbomoso ( $p < .001$ ), class 1 social status ( $p < .001$ ) and being told by doctor ( $p = 0.033$ ).

**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.*

## 1. 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 [1,2]. 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 fetus. Appropriate antenatal care has proven to be of great value in the prevention of such catastrophes.

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

These factor include limited financial means [8], husband's decision [9], lack of transport or distance to a health facility, lack of satisfaction

with the quality of care [10], high user changes [11] affiliation with a certain religious group [6], maternal age, educational level [12] and presence of morbid conditions in pregnancy.

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

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

This study examined 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. It is hoped that the findings will be helpful in designing appropriate reproductive health programs and services to improve both antenatal and maternity care use in the hospital.

### 1.1 Study Area

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

Ogbomoso has two degree-awarding institutions of higher learning, Ladoke Akintola University

and the Nigerian Baptist Theological Seminary. It is predominantly a Christian dominated town with several churches most of which are of the Baptist denomination. Other religious groups are made up of Muslims and traditional religion adherents.

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

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

## 2. METHODOLOGY

The study was a cross-sectional prospective study 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. The hospital is a 200-bed mission hospital which renders primary, secondary and some tertiary health care services. It is a referral centre for other hospitals in Ogbomoso and environs. The study involved consecutive recruitment of pregnant women that came for antenatal care at Baptist Medical Centre, Ogbomoso.

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

The pretested questionnaire was used to obtain the following information: sociodemographic characteristics, family type whether they were from monogamous, polygamous or single parent family; place of abode whether within or outside Ogbomoso; parity whether they were nullipara, primipara, multipara or grandmultipara; religion whether Christian, muslim or traditional religion; booking gestational age in weeks, women who booked before or at the 16<sup>th</sup> were regarded as early bookers, others were late bookers; reason for booking; number of antenatal care visits whether <4 or > or = 4 was extracted from the antenatal records of the women. Those who

made fewer than 4 visits were regarded as poor attenders while those who made 4 or more visits were regarded as good attenders; and maternity care use by each attendee was determined. The standard occupational classification system designed by the Office of population Census and Surveys, London (OPCS 1991) [14] and modified for Nigeria [15,16] was used to classify respondents into socio-economic classes 1 to 3 as follows: Class 1 = Skilled worker e.g. professionals and managerial officers and retirees of this cadre; Class 2 = Unskilled workers e.g. Artisans and traders; Class 3 = Dependants. e.g. Retirees of class 2, those not on pensions, house wives of class 2 cadre, students.

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 and a p-value of < 0.05 was set as the level of statistical significance.

## 3. RESULTS

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

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

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

Traders followed by civil servants formed the highest number of attendees 187(42.3%) and 121(27.4%) respectively. A large proportion of the attendees were Christians 357(80.8%), eighty five (19.2%) were Muslim and there were no traditional religion adherents. Most of the attendees 331(74.9%) were domiciled within Ogbomoso town, however, 111(25.1%) attended from outside the town. The results revealed that 394(89.1%) of the attendees booked late for antenatal care while only 48(10.9%) were early bookers. The commonest reason given by

attendees for booking at the time they did was “just right to book.” 352 (79.6%). Other reasons were: “had booked elsewhere but desires to continue ANC here”, 27(6.1%); “advised by a doctor to book,” 23(5.2%).

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

Almost half of the attendees 210(47.5%) had good attendance though most of them 292 (66.1%) booked in the second trimester. A very small number 32(7.2%) booked in the first trimester. Of the 442 ANC attendees, 262(59.3%) made use of the hospital’s maternity services while 180(40.7%) delivered elsewhere with unknown pregnancy outcome (Table 1).

**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>	
Ogbomosho	331(74.9)
Outside Ogbomosho	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)

Variables	Frequency (%)
<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)

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).

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).

#### 4. DISCUSSION

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.

The mean age of ANC attendees was  $29.2 \pm 5.3$  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.

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.

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

Variables	ANC attendance		P-value
	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>			< .001
No Formal Education	20(87.0)	3(13.0)	
Primary	56(64.4)	31(35.6)	
Secondary	94(61.8)	58(38.2)	
<b>Post Secondary lower than university</b>	39(34.8)	73(65.2)	
University	23(33.8)	45(66.2)	
<b>Family Type</b>			0.66
Monogamous	177(48.8)	186(51.2)	
Polygamous	51(73.9)	18(26.1)	
Single Parent	4(40.0)	4(40.0)	
<b>Religion</b>			0.006
Christianity	176(49.3)	181(50.7)	
Islam	17(56.7)	29(34.1)	
<b>Occupation</b>			0.03
Artisan	30(54.5)	25(45.5)	
Trading	120(64.2)	67(35.8)	
Civil servant	37(30.6)	84(69.4)	
Student	13(43.3)	17(56.7)	
Farming	20(83.3)	4(16.7)	
Unemployed	12(48.0)	13(52.0)	
<b>Parity</b>			0.40
Nullipara	67(51.5)	63(48.5)	
Primipara	47(46.5)	54(53.5)	
Multipara	106(55.2)	106(55.2)	
Grandmultip	12(63.2)	7(36.8)	
<b>Age group</b>			0.374
≤20	7(63.6)	4(36.4)	
20 – 34	192(53.5)	167(46.5)	
≥ 31	33(45.8)	39(54.2)	
<b>Domicile</b>			0.01
Ogbomoso	156(47.1)	175(52.9)	
Outside Ogbomoso	76(68.5)	35(31.5)	
<b>Booking Status</b>			0.175
Early bookers	24(50.0)	24(50.0)	
Late bookers	208(52.8)	186(47.2)	
<b>Social Class</b>			< .001
Class 1	69(37.1)	117(62.9)	
Class 2	158(64.5)	87(35.5)	
Class 3	5(45.5)	6(54.5)	
<b>Booking Gestational Age</b>			0.057
1 <sup>st</sup> Trimester	15(46.9)	17(53.1)	
2 <sup>nd</sup> Trimester	144(49.3)	148(50.7)	
3 <sup>rd</sup> Trimester	73(61.9)	45(38.1)	

Variables	ANC attendance		P-value
	Poor attendance N (%)	Good attendance N (%)	
<b>Reasons for booking</b>			0.05
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)	
To continue ANC	20(74.1)	7(25.9)	
No money until now	6(85.7)	6(85.7)	
Just right to book	175(49.7)	177(50.3)	
<b>Maternity Use</b>			< .001
Delivered in BMC	52(19.8)	210(80.2)	
Delivered outside	180(100.0)	0(0.0)	

Table 3. Association between sociodemographic characteristics and booking pattern

Variables	Booking Early Bookers N(%)	Pattern Late Bookers N(%)	p-value
<b>Marital Status</b>			0.930
Single	1(10.0)	9(90.0)	
Married	47(10.9)	385(89.1)	
<b>Educational Status</b>			0.384
No Formal Education	1(4.3)	22(95.7)	
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>			0.974
Monogamous	40(11.0)	323(89.0)	
Polygamous	7(10.1)	62(89.9)	
Single Parent	1(10.0)	9(90.0)	
<b>Religion</b>			0.633
Christianity	40(11.2)	317(88.8)	
Islam	8(9.4)	77(90.6)	
<b>Occupation</b>			0.949
Artisan	4(7.3)	51(92.7)	
Trading	20(10.7)	167(89.3)	
Civil servant	15(12.4)	106(87.6)	
Student	3(10.0)	27(90.0)	
Farming	3(12.0)	22(88.0)	
Unemployed	3(12.5)	21(87.5)	
<b>Parity</b>			0.473
Nullipara	17(13.1)	113(86.9)	
Primipara	12(11.9)	89(88.1)	
Multipara	16(8.3)	176(91.7)	
Grandmultip	3(15.8)	16(84.2)	
<b>Age group</b>			0.374
≤20	2(18.2)	9(81.8)	
20 – 34	40(11.1)	319(88.9)	
≥ 31	6(8.3)	66(91.7)	
<b>Domicile</b>			0.493
Ogbomoso	34(10.3)	297(89.7)	
Outside Ogbomoso	14(12.6)	97(87.4)	
<b>Social Class</b>			0.44
Class 1	20(10.8)	166(89.2)	
Class 2	27(11.0)	218(89.0)	
Class 3	1(9.1)	10(2.3)	

Variables	Booking Early Bookers N(%)	Pattern Late Bookers N(%)	p-value
<b>Booking Gestational Age</b>			< .001
1 <sup>st</sup> Trimester	32(100.0)	0(0.0)	
2 <sup>nd</sup> Trimester	16(5.5)	276(94.5)	
3 <sup>rd</sup> Trimester	0(0.0)	118(100.0)	
<b>Reasons for booking</b>			0.032
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)	
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>			0.166
Delivered in BMC	24(9.2)	238(90.8)	
Delivered outside	24(13.3)	156(86.7)	

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.

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

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

In the same vein, the social class of attendees was significantly related to their attendance status. Rowe et al reported similar findings [26]. The lower the socio-economic level, the more likely a woman is to receive inadequate antenatal care. With an increasing cost of healthcare and rate of unemployment, the future looks bleak for the low social class individuals. Thus, this makes a case for expansion of the National Health

Insurance Scheme to cover the informal sector at the grassroot.

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

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

Considering the relationship between the reason for the commencement of antenatal care and attendance status, it was shown that having a reason for booking was not statistically related to attendance status. It is worth observing that majority of the women, 352 (79.6%) Just felt it was the right time to book. This indicates a large gap in health education given to women on antenatal care.

Women could introduce wrong judgment in determining the right time to book. In Gharoro's study in Benin, Nigeria [9], 41.5% of the patients came when they felt it was the right time to book.

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

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

The study revealed that age of attendees, parity and marital status did not have any significant relationship with attendance status and time of initiation of antenatal care. Non-randomization of the subjects and the hospital-based nature of the study placed limitations on the results.

## 5. CONCLUSION

This study has unveiled educational status, occupation, social status, place of domicile, religion and need for maternity service use as factors associated with ANC utilization in the Baptist Medical Centre Ogbomoso. There is a need to improve maternity service utilization by improving early and adequate uptake of antenatal care services through provision of appropriate information in the community on antenatal care and its benefits. Furthermore, with the increasing cost of healthcare and rise in unemployment rate, the future is bleak for the low social class antenatal care seekers. There is thus, a need for expansion in the coverage of National Health Insurance Scheme to Ogbomoso community level. Effective interventions to improve ANC utilization will in turn influence maternity care use. This will

eventually lead to a reduction in the high maternal and child health indices characteristic of developing nations.

## CONSENT

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

## ETHICAL APPROVAL

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

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Bruun Nielsen B, Hedegaard M, Haraksingh Thilsted S, Joseph A, Liljestrand J. Does antenatal care influence postpartum health behaviour? Evidence from a community based crosssectional study in rural Tamil Nadu, South India. *BJOG: An International Journal of Obstetrics & Gynaecology*. 1998;105(7): 697-703.
2. Carroli G, Rooney C, Villar J. How effective is antenatal care in preventing maternal mortality and serious morbidity? An overview of the evidence. *Paediatric and perinatal Epidemiology*. 2001;15(s1): 1-42.
3. Ekabua J, Ekabua K, Njoku C. Proposed framework for making focused antenatal care services accessible: A review of the Nigerian setting. *ISRN Obstetrics and Gynecology*; 2011.
4. Nigenda G, Langer A, Kuchaisit C, Romero M, Rojas G, Al-Osimy M, et al. Womens' opinions on antenatal care in developing countries: Results of a study in Cuba, Thailand, Saudi Arabia and Argentina. *BMC Public Health*. 2003;3(1):17.

5. Munjanja SP, Lindmark G, Nyström L. Randomised controlled trial of a reduced-visits programme of antenatal care in Harare, Zimbabwe. *The Lancet*. 1996; 348(9024):364-9.
6. Dairo M, Owoyokun K. Factors affecting the utilization of antenatal care services in Ibadan, Nigeria. *Benin Journal of Postgraduate Medicine*. 2010;12(1).
7. Tshimanga M, Makunike B, Wellington M. Does time of initiation of antenatal care influence content and adequacy of antenatal care or foetal outcome in low obstetric risk women in harare, Zimbabwe? *Central African Journal of Medicine*. 1998; 44(3):55-60.
8. Simkhada B, Teijlingen ERv, Porter M, Simkhada P. Factors affecting the utilization of antenatal care in developing countries: Systematic review of the literature. *Journal of Advanced Nursing*. 2008;61(3):244-60.
9. Gharoro EP, Igbafe A. Antenatal care: Some characteristics of the booking visit in a major teaching hospital in the developing world. *Medical Science Monitor*. 2000; 6(3):519-22.
10. Mwaniki P, Kabiru E, Mbugua G. Utilisation of antenatal and maternity services by mothers seeking child welfare services in Mbeere District, Eastern Province, Kenya. *East African Medical Journal*. 2002;79(4): 184-7.
11. Högberg U, Larsson N. User charges for antenatal care and ultrasound-an unwillingness to pay. *Acta Obstetrica et Gynecologica Scandinavica*. 1999;78(5): 398-402.
12. Babalola S, Fatusi A. Determinants of use of maternal health services in Nigeria-looking beyond individual and household factors. *BMC Pregnancy and Childbirth*. 2009;9(1):43.
13. Brown CA, Sohani SB, Khan K, Lilford R, Mukhwana W. Antenatal care and perinatal outcomes in Kwale district, Kenya. *BMC Pregnancy and Childbirth*. 2008;8(1):2.
14. The Office for National Statistics. Standard occupational classification 2010: The national statistics socio-economic classification. Hampshire, UK: Palgrave Macmillan. 2010;3.
15. Akinboboye BO, Shaba OP, Akeredolu PA, Oderinu OH. Sociodemographic determinants of usage of complete dentures in a Nigerian teaching hospital: A pilot study. *European Journal of Prosthodontics*. 2013; 1(2):37.
16. Ibiyemi O, Taiwo JO. Some socio-demographic attributes as covariates in tooth wear among males in a rural community in Nigeria. *Ethiopian journal of health sciences*. 2012;22(3).
17. Raatikainen K, Heiskanen N, Heinonen S. Under-attending free antenatal care is associated with adverse pregnancy outcomes. *BMC Public Health*. 2007;7(1): 268.
18. Okunlola M, Ayinde O, Owonikoko K, Omigbodun A. Factors influencing gestational age at antenatal booking at the University College Hospital, Ibadan, Nigeria. *Journal of Obstetrics & Gynecology*. 2006;26(3):195-7.
19. Kupek E, Petrou S, Vause S, Maresh M. Clinical, provider and sociodemographic predictors of late initiation of antenatal care in England and Wales. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2002;109(3):265-73.
20. Alderliesten M, Vrijkotte T, Van Der Wal M, Bonsel G. Late start of antenatal care among ethnic minorities in a large cohort of pregnant women. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2007; 114(10):1232-9.
21. Kabir M, Iliyasu Z, Abubakar I, Sani A. Determinants of utilization of antenatal care services in Kumbotso village, Northern Nigeria. *Tropical doctor*. 2005; 35(2):110.
22. Furuta M, Salway S. Women's position within the household as a determinant of maternal health care use in Nepal. *International Family Planning Perspectives*. 2006;17-27.
23. Navaneetham K, Dharmalingam A. Utilization of maternal health care services in Southern India. *Social Science & Medicine*. 2002;55(10):1849-69.
24. Matsumura M, Gubhaju B. Women's Status, Household Structure and the Utilization of Maternal Health Services in Nepal: Even primary-level education can significantly increase the chances of a woman using maternal health care from a modern health facility. *Asia-Pacific Population Journal*. 2001;16(1):23-44.

25. Magadi MA, Madise NJ, Rodrigues RN. Frequency and timing of antenatal care in Kenya: explaining the variations between women of different communities. *Social Science & Medicine*. 2000;51(4): 551-61.
26. Rowe RE, Garcia J. Social class, ethnicity and attendance for antenatal care in the United Kingdom: A systematic review. *Journal of Public Health*. 2003;25(2):113-9.
27. Etuk SJ, Ekanem AD. Socio-demographic and reproductive characteristics of women who default from orthodox obstetric care in Calabar, Nigeria. *International Journal of Gynecology & Obstetrics*. 2001;73(1):57-60.

© 2019 Awotunde et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*  
<http://www.sdiarticle3.com/review-history/50811>