PATTERN AND DETERMINANTS OF OBSTETRIC COMPLICATIONS AMONG WOMEN DELIVERED AT YUSUF DAN-TSOHO MEMORIAL HOSPITAL TUDUN-WADA, KADUNA.

Ramatu A,[1] Yohanna S.[2]

[1]Yusuf Dan-Tsoho Memorial General Hospital, Tudun-Wada, Kaduna.
[2]Bingham University Teaching Hospital, Jos.
Corresponding author's e-mail: rasabubakar72@gmail.com 08028284605; 07060623020

ABSTRACT

Despite global decrease in maternal mortality ratio from 1990 to 2010, annually approximately 9.5 million women around the world suffer from pregnancy-related complications, and over 300,000 die. Majority are in sub-Saharan Africa. A Nigerian woman is 500 times more likely to die in child birth than her European counterpart. There is a marked variation in the maternal mortality ratio between geo-political zones of Nigeria with more in the Northern zones compared with the southern zones. Kaduna State has unacceptably high maternal mortality rates and burden profile.

The study aimed to contribute towards improving the outcome of pregnancy by determining the pattern and determinants of obstetric complications among women who delivered at Yusuf Dan-Tsoho Memorial Hospital (YDMH), Tudun-Wada, Kaduna.

Methods: It is a cross-sectional study conducted in the Obstetrics and Gynaecology Department of Yusuf Dantsoho Memorial General Hospital, Tudun-Wada, Kaduna from February to April 2014. Two hundred and six women who delivered during the study period irrespective of their booking status and consented to participate in the study were recruited consecutively. A questionnaire containing sections on socio-demographic characteristics, family characteristics, pattern of obstetric complications and factors influencing antenatal care service utilization was administered. Relevant physical examination and laboratory investigations were also carried out.

Results:

Majority of the participants were Hausas (74.8%), Muslims (94.7%), married (99.0%), unemployed (45.1%) and within the age group of 20-29 years (58.7%). Most were from monogamous family set up (62.1%) and had secondary education (44.2%). Twenty five percent of the participants were unbooked, 29% booked elsewhere and 46% were booked. One hundred and thirty seven (66.5%) of the study participants had one or more obstetric complications. Prolonged/obstructed labour was the commonest (27.7%), followed by post-partum haemorrhage (23.4%). Pre-eclamsia and eclampsia accounted for 18.2% and sepsis 5.8%. Post partum haemorrhage was significantly associated with the age group of 20-29 years and Pre-eclampsia/eclampsia was significantly associated with illiteracy. The number of antenatal care visits also significantly predicted the likelihood of obstetric complications. Binomial logistic regression analysis predicted that the more the number of antenatal care visits the less likely the occurrence of obstetric complications, with 4 or more visits reducing obstetric complications 14 times

Conclusion and recommendations: Maternal morbidity is still high in the study area. This was significantly associated with inadequate utilization of antenatal care services. Booking status did not significantly influence obstetric complications. Level of education and women in the middle childbearing age (20-29) were found to significantly affect some of the obstetric complications. It is therefore recommended that maternal health education on the importance of utilization of maternal health care services using the WHO recommendation, female education and empowerment should be emphasized.

INTRODUCTION:

An obstetric complication is defined as an acute condition arising from a direct cause of maternal death such as bleeding, post partum sepsis, complications of abortion, pre-eclampsia or eclampsia, ectopic pregnancy and ruptured uterus, or indirect causes such as anaemia, malaria and tuberculosis.[1]

The World Health Organization (WHO) has recently standardized the definition of life threatening severe acute obstetric complications under the concept of Near Miss, which is "a woman who nearly died but survived a complication that occurred during pregnancy, child birth or within 42 days of termination of pregnancy".[2] According to the WHO, "a maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.[3] Maternal mortality ratio is defined as the number of maternal deaths per 100,000 live births.[3] The WHO has also identified the major causes of maternal death. They include: severe haemorrhage (25%), infections (13%), unsafe abortion (13%), eclampsia (12%), obstructed labour (8%), and other direct causes (8%).[4] Similar to the major causes of maternal mortality, haemorrhage, hypertensive disorders of pregnancy, obstructed labour, complications of induced abortion and sepsis are the leading severe obstetric complications in developing countries.[5]

Globally, the total number of maternal deaths decreased from 543,000 in 1990 to 287,000 in 2010. Likewise, the global maternal mortality ratio (MMR) declined from 400 maternal deaths per 100,000 live births in 1990 to 210 in 2010, representing an average annual decline of 3.1%.[6] The progress is notable but the annual rate of decline is less than what is needed to achieve the Millennium Development Goal (MDG) target of reducing the maternal mortality

ratio by 75% between 1990 and 2015.[7,8] This will require an annual decline of 5.5%.[7]

In Nigeria, the number of women dying during pregnancy remains very high. The 2006 census estimated that there were about 65 million females in Nigeria out of which 30 million are of reproductive age (15-49 years). Each year about 6 million women become pregnant and 5 million of these result in child birth.[8] Available data indicate that 59,000 women die yearly as a result of complications in child birth.[9] A Nigerian woman is 500 times more likely to die in child birth than her European counterpart. There is a marked variation in the maternal mortality ratio between geo-political zones: 165 in the South West compared with 1549 in the North-East. There is also a variation between urban and rural areas.[10] Kaduna State has unacceptably high maternal mortality rates and burden profile. The maternal mortality ratio was 980 maternal deaths per 100,000 live births in 2008.[11] The majority of maternal deaths and severe obstetric complications are clustered around labour and delivery.[12]

In the light of the current maternal mortality situation in Nigeria, this study sought to identify the pattern of obstetric complications and also identify the underlying determinants of these complications.

METHODOLOGY:

The study was carried out at the Obstetrics and Gynaecology Department of Yusuf Dantsoho Memorial Hospital (YDMH), Tudun Wada, Kaduna. The hospital is a general hospital located in Kaduna South Local Government Area of Kaduna State. The Local Government Area has a population of 402,731 people.[8] It is predominantly populated by the Hausa-Fulani most of whom are Muslim farmers and traders.

The convenient non-probability sampling method was used. Participants were recruited as they came to deliver in the labour ward irrespective of their booking status from February to April 2014. A total of 206 participants were recruited. Permission to recruit participants at YDMH Tudun-Wada was obtained from the management of the hospital. Ethical clearance was obtained from the Health Research Ethics Committee of Ahmadu Bello University Teaching Hospital, Zaria. All participants were recruited voluntarily as they came in after signing the informed consent form.

Participants were interviewed by the researcher. The data included socio-demographic characteristics of the participant, family characteristics, pattern of obstetric complications which included obstetric history and the index pregnancy, factors influencing antenatal care services utilization and relevant physical examination such as blood pressure, height and weight as well as laboratory investigations which included packed cell volume, blood group and genotype.

Data were analyzed using EPI – INFO statistical package (3.5.3 January 2011 version). Test of significance with Chi – Square was done on: pattern of obstetric complications and socio-demographic characteristics of the study participants, pattern of obstetric complications and pattern of utilization of ANC among the study participants. Finally logistic regression analysis of determinants of obstetric complications was done to determine those determinants that have strong association with the complications.

RESULTS

Complete data was available for all the 206 participants and all were analyzed. Ninety five of them were booked and attended ANC, while 111 were unbooked.

Table 1 outlines the socio-demographic characteristics of the participants. Majority of the participants were Hausas (74.8%), Muslims (94.7%), married (99.0%), unemployed (45.1%) and within the age group of 20-29 years (58.7%). Most were from monogamous family set up (62.1%) and had secondary education (44.2%).

Table 1: Socio-demographic characteristics of the study participants N= 206

Parameters	Booked n = 95	Un-booked n = 52	Booked Elsewhere n = 59	Total N=206	χ^2	p value	Df
	No. %	No. %	No. %	No. %			
Age-group (years)					1.513	0.631	6
15-19	12 (12.6%)	10 (19.2%)	7 (11.9%)	29 (14.1%)			
20- 29	58 (61.1%)	30 (57.7%)	33 (55.9%)	121 (58.7%)			
30-39	21 (22.1%)	11 (21.2%)	17 (28.8%)	49 (23.8%)			
	4 (4.2%)	1 (1.9%)	2 (3.4%)	7 (3.4%)			
Ethnic group						0.398	
Yoruba	*5 (5.3%)	3 (5.8%)	4 (6.8%)	12 (5.8%)			
Igbo	0 (0.0%)	0 (0.0%)	3 (5.1%)	3 (1.5%)			
Hausa	70 (73.6%)	43 (82.7%)	41 (69.5%)	154 (74.8%)			
Others	20 (21.1%)	6 (11.5%)	11 (18.6%)	37 (17.9%)			
Religion						0.835	
Islam	*89 (93.7%)	51 (98.1%)	55 (93.2%)	195 (94.7%)			
Christianity	6 (6.3%)	1 (1.9%)	4 (6.8%)	11 (5.3%)			
Marital status						0.556	
Married	*94 (98.9%)	52 (100%)	58 (98.3%)	204 (99.0%)			
Single	0 (0.0%)	0 (0.0%)	1 (1.7%)	1 (0.5%)			
Separated	1 (1.1%)	0 (0.0%)	0 (0.0%)	1 (0.5%)			
Highest educational Status					1.751	0.604	8
None	8 (8.4%)	6 (11.5%)	6 (10.2%)	20 (9.7%)			
Primary	24 (25.3%)	10 (19.3%)	16 (27.1%)	50 (24.3%)			
Secondary	39 (41.1%)	27 (51.9%)	25 (42.4%)	91 (44.2%)			
Tertiary	12 (12.6%)	4 (7.7%)	5 (8.5%)	21 (10.2%)			
Qur'anic	12 (12.6%)	5 (9.6%)	7 (11.8%)	24 (11.6%)			
Occupational Status					2.084	0.507	6
Unemployed	45 (47.4%)	23 (44.2%)	25 (42.4%)	93 (45.1%)			
Unskilled labor	29 (30.5%)	18 (34.6%)	26 (44.1%)	73 (35.4%)			
Skilled labor	14 (14.7%)	10 (19.3%)	3 (5.1%)	27 (13.2%)			
Professional	7 (7.4%)	1 (1.9%)	5 (8.4%)	13 (6.3%)			
Husband's highest educational status					2.148	0.519	8
None	3 (3.2%)	2 (3.8%)	2 (3.4%)	7 (3.4%)			
Primary	7 (7.4%)	6 (11.5%)	8 (13.6%)	21 (10.2%)			
Secondary	33 (34.7%)	19 (36.6%)	20 (33.9%)	72 (35.0%)			
Tertiary	41 (43.2%)	19 (36.6%)	19 (32.2%)	79 (38.3%)			
Qur'anic	11 (11.5%)	6 (11.5%)	10 (16.9%)	27 (13.1%)			
Type of family					1.353	0.245	2
Monoganous	65 (68.4%)	21 (40.4%)	42 (71.2%)	128 (62.1%)			
Polygamous	30 (31.6%)	31 (59.6%)	17 (28.8%)	78 (37.9%)			

Note: * = Fisher's Exact Test used because the expected cells values are less than 5 and some observed cells are 0.

Table 2 shows the pattern of utilization of antenatal care services among the study participants. Among the booked participants, thirty four (35.8%) participants booked in the first trimester, 54 (56.8%) participants booked in the second trimester while 6 (6.3%) participants booked in the third trimester. One of the participants (1.1%) could not remember when she booked.

Eighteen (18.9%) of the booked participants had only one visit during their antenatal care period. Fifty six (58.9%) had 2 visits, 12 (12.6%) had 3 visits and 9 (9.5%) had four visits or more during their antenatal care period.

Table 2: Pattern of utilization of antenatal care services among the booked participants N=95

	Booked	
	No.	**%**
Timing of the booking		
1st trimester	34	35.8
2nd trimester	54	56.8
3rd trimester	6	6.3
Not sure	1	1.1
Number of visits to antenatal clinic		
1 visit	18	18.9
2 visits	56	58.9
3 visits	12	12.6
⩾ 4 visits	9	9.6

Table 3 outlines factors influencing the utilization of antenatal care services among the study participants. Eighty three participants (40.3%) assessed it to be adequate. One hundred and ten (53.4%) of the participants assessed their monthly family income to be fair and 13 (6.3%) assessed the family income to be inadequate or poor. Fourty five (21.8%) participants assessed the distance to be close. One hundred and fourteen (55.4%) participants assessed the distance to the nearest facility to be moderate (5-10km) while fourty seven (22.8%) of the participants assessed the closest health facility to be far (> 10km) from them. Eighty nine (43.2%) participants assessed transport to be readily available. Ninety seven (47.1%) of the participants assessed it to be often available. Only 20 (9.7%) participants said transportation was not available, or was poor.

Other factors for not utilizing antenatal care services by the un-booked participants included: antenatal care considered to be unnecessary in 12 (23.1%) of them. The high cost of health services was the reason given by 10 (19.2%) of them, while "Hospital protocols and long waiting time" was the reason given by 8 (15.4%) of them. Eleven (21.2%) of the participants did not have reason for not utilizing antenatal care services.

Table 3: Factors influencing the utilization of antenatal care services among study participants N=206.

Family income	**No.**	**%**
Adequate	83	(40.3%)
Fair	110	(53.4%)
Inadequate	13	(6.3%)
Distance from health facility		
Close (< 5km)	45	(21.8%)
Moderate (5-10km)	114	(55.4%)
Far (> 10km)	47	(22.8%)
Availability of transportation		
Readily available	89	(43.2%)
Often available	97	(47.1%)
Poor or not available	20	(9.7%)
Other factors (among unbooked)		
Inadequate time	4	(7.7%)
Antenatal care not necessary	12	(23.1%)
Attitude of health workers	2	(3.8%)
Cost of health services	10	(19.2%)
Fear of caesarian section	5	(9.6%)
Hospital protocols and long waiting time	8	(15.4%)
No reason	11	(21.2%)

As shown in table 4, 137 (66.5%) of the study participants had complications. Thirty eight (27.7%) of them had prolonged/obstructed labour, 25 (18.2%) had severe pre-eclampsia/eclampsia, 8 (5.8%) had sepsis, and 32 (23.3%) had Post-partum haemorrhage (PPH). Pregnancy Induced Hypertension (PIH) was present in 8 (3.9%) participants, while Antepartum Haemorrhages (APH) occurred in 6 (2.9%) of the women. Some of the participants encountered more than one complication.

Table 4: Pattern (types) of obstetric complications among the study participants N=137

Parameter	Booked n=63		Unbooked n=60		Booked elsewhere n = 11		Total N=137		χ^2	p value	Df
	No.	%	No.	(%)	No.	%	No.	%			
Maternal complication											
Prolonged/obstructed labour	18	(13.1%)	18	(13.1%)	2	(1.5%)	38	(27.7%)	0.181	**0.670**	2
PPH	14	(10.2%)	15	(10.9%)	3	(2.2%)	32	(23.3%)	0.346	**0.556**	2
Severe pre-eclampsia/ eclampsia	11	(8.0%)	12	(8.7%)	2	(1.5%)	25	(18.2%)	0.007	**0.933**	2
Cervical tear	10	(7.3%)	3	(2.2%)	3	(2.2%)	16	(11.7%)	1.353	**0.245**	2
*Sepsis	4	(2.9%)	4	(2.9%)	0	(0.0%)	8	(5.8%)		**0.649**	
*PIH	3	(2.2%)	5	(3.6%)	0	(0.0%)	8	(5.8%)		**0.636**	
Retained placenta	4	(2.9%)	2	(1.5%)	1	(0.7%)	7	(5.1%)	0.222	**0.638**	2

Note: * = Fisher's Exact Test Used because the expected cells values are less than 5 and the observed cells are 0.

There was a significant relationship between each complication and number of visits during antenatal care service (p value < 0.05). This is depicted in table 5.

Table 5: Relationship between the Pattern of Obstetric Complications and Pattern of Utilization of ANC Services among the Study Participants N=137

Parameter	Prolonged/ obstructed labour		Post Partum Haemorrhage		Severe pre-eclampsia/ eclampsia		Cervical tear		Sepsis		PIH		Retained placenta	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
0 visit	20	(25.7%)	18	23.1%	14	17.9%	6	7.7%	4	5.1%	5	4.5%	3	3.8%
1 visit	7	38.9%	5	35.7%	9	81.8%	2	20.0%	0	0.0%	3	100%	2	50.0%
Visits	5	27.8%	4	28.6%	1	9.1%	6	60.0%	3	75.0%	0	0.0%	2	50.0%
3 visits	4	22.2%	3	21.4%	1	9.1%	1	10.0%	1	25.0%	0	0.0%	0	0.0%
≥ 4 visits	2	11.1%	2	14.3%	0	0.0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%
Total	**38**	**27.7%**	**32**	**23.4%**	**25**	**18.2%**	**16**	**11.7%**	**8**	**5.8%**	**8**	**3.9%**	**7**	**5.1%**
χ^2	**12.3**		**9.6**		**7.1**		**5.78**		**8.5**		**6.4**		**4.2**	
p value	**0.016**		**0.024**		**0.038**		**0.030**		**0.036**		**0.012**		**0.014**	
Df	**4**		**4**		**4**		**4**		**4**		**4**		**4**	

Binomial logistic regression was used to predict the probability of each complication (outcome/dependent variables) based on the number of visits (measurable/independent variables). Four or more antenatal clinic visits was 14 times more likely to prevent obstetric complications than only one visit. This is shown in table 6 below:

Table 6: Binomial logistic regression showing the relationship between number of antenatal clinic visits and obstetric complications.

No of Visit(s)	B	SE	Wald	df	p value	95% C.I for Exp (B)	
						Lower	Upper
0 Visit	2.491	0.011	0.006	1	1.257	1.213	3.943
1 Visit	1.951	0.031	0.075	1	0.703	0.513	2.755
2 Visits	0.064	0.042	8.953	1	0.041	0.039	1.061
3 Visits	1.328	0.610	11.239	1	0.017	0.558	2.186
⩾4 Visits	0.882	0.138	14.247	1	0.003	0.113	1.843
Constant	-2.301	5.116	1.346	1	0.329		

DISCUSSION:

Similar to the global report of common obstetric complications,[5] the findings in this study indicated that the leading obstetric complications were prolonged/obstructed labour, obstetric haemorrhages, hypertensive disorders in pregnancy and sepsis. However, it was observed that the pattern of the complications was not consistent with the global pattern, which showed obstetric haemorrhage to be the most common (25%) followed by infection (13%), eclampsia (12%) and obstructed labour (8%). In this study, prolonged/obstructed labour was the commonest obstetric complication encountered in 27.7% of the women. This was followed by obstetric haemorrhage (Post-partum haemorrhage) accounting for 23.4%. Pre-eclamsia and eclampsia were the next common complications accounting for 18.2% and sepsis accounted for 5.8%.

The picture in this study was similar to the findings of Lamina and Oladipo in Sagamu,[13] in which prolonged/obstructed labour, postpartum haemorrhage and severe pregnancy-induced hypertension/eclampsia were the leading obstetric emergencies. However, the objective of the study was to determine the pattern of obstetric emergencies and its influence on maternal and perinatal outcomes. Similar findings were also obtained by Nwobodo in North-Western Nigeria in 2006.[14]

The findings by Bibi et-al in Pakistan, revealed that hypertensive disorders of pregnancy were the leading cause of maternal illness responsible for half of all obstetric Intensive Care Unit (ICU) admissions. Puerperal sepsis was the second most common diagnosis (17%) and obstetric haemorrhage was responsible for ICU transfer in 13% of women.[15] The Pakistan study was a review of the case series and was mainly on the severe acute complications that were transferred to the ICU.

The pattern of the maternal complications in Ilesha by Owolabi et-al differed from the pattern of the complications in this study. Anaemia was the most common complication in about 218 (24.4%) of the women in their study. This was followed by antepartum haemorrhage 58 (6.5%) while pre-eclampsia/eclampsia was the least 33 (3.7%).[16] The study in Ilesha was mainly on singleton pregnancies.

The occurrence of prolonged/obstructed labour in this study despite the fact that they delivered in the hospital could be due to the fact that most Hausa people prefer to deliver at home irrespective of their booking status but when they perceive that there might be a problem (such as when labour is prolong) they come to the hospital for urgent intervention. This could be compounded by relatively high prevalence of teenage pregnancy in the study area.

In this study, majority of the women booked in the second trimester and had only 2 antenatal clinic visits during the pregnancy. Only 29.5% of the respondents came for antenatal booking within the WHO recommended first trimester. The late booking found in this study 61 (64.2%) is lower than the 83.1% found in Abakaliki, South-East, Nigeria.[17] In contrast, the findings by Olayinka et-al in Osun revealed that 57.1% of the participants booked in the first trimester and attended antenatal clinic regularly in accordance with the WHO recommendation.[18] The Osun study was community based.

The late booking in this study could be a reflection of the Hausa preference for home delivery which is believed to be better than hospital delivery and that antenatal care is only meant to certify that the pregnant woman is healthy. Therefore only one visit could suffice once a woman is healthy.

Only 21.8% of the study participants had their residence close to the health facility. In most of them, the distance was moderate (5-10 km). This is contrary to the WHO recommendation of having a health facility within a 5 kilometer walking radius. Most literature indicates that there is a positive relationship between distance and utilization of the health facility in general. The findings by Olayinka et-al in Ife, Osun state, Nigeria revealed a very strong association between distance and attendance of antenatal care. The reason could be due to the fact that many pregnant women find it distressing to walk long distances or take two or more buses in an effort to get antenatal care on appointment days. The study was community based and a probability sampling technique was used. [18]

Majority (54%) of the participants in this study assessed the family monthly income to be fair. Some participants opined that antenatal care was not necessary for them and the cost of antenatal care was a barrier to the utilization of antenatal care services. Ifenne and Utoo in Makurdi, found lack of transport, financial constraints, and the wrong perception of the right time to book for antenatal care among some of the reasons provided for late booking.[19] This is similar to the findings in Ife, where majority of the respondents indicated that affordability of antenatal care services, schedule of the services, lack of knowledge about the existing services in antenatal care and husband's non- acceptance of the services were among the reasons given for not utilizing antenatal care services. These studies may be a

reflection of the negative effect of ignorance, poverty and backwardness in infrastructural development prevalent in developing countries.

Maternal age between 20-29 years was found to be significantly associated with post-partum haemorrhage in this study. Many studies indicated that adverse maternal outcomes requiring emergency obstetric care generally increased with age.[20-22] The high prevalence of obstetric haemorrhage among the 20-29 years age group in this study could be due to high parity. High parity in this age group is because people marry early in the study area.

Low level of women' education was significantly associated with pre-eclampsia and eclampsia in this study. In a population based cohort study in Rotterdam, Netherland, women with low educational level were more likely to develop pre-eclampsia.[23] In Accra, Ghana a cross-sectional study by Dinglas et-al showed significant association between the level of education and symptoms of pre-eclampsia. Mothers with no education were about seven times more likely to have all the symptoms of pre-eclampsia than those with formal education.[24] The study was community based and involved both previous and current pregnancy unlike this study that involved only current pregnancy.

There was no significant association between booking status and all the major obstetric complications in this study. Several studies had indicated that maternal complications are highly associated with non utilization of antenatal care services as in Ilesha[16] Sagamu,[25] and Calabar.[26]

The difference in the findings could be attributable to the fact that majority of those that booked in this study, booked late and had only two antenatal visits or less. Number of visits was found to significantly influence obstetric complications in this study. The binomial logistic regression analysis predicted that the more the number of visits, the fewer the complications. Four or more antenatal care visits was 14 times more likely to prevent obstetric complications than only one visit. This finding was similar to the retrospective cohort study by Hogue in Durban, South Africa which showed that antenatal care visits was a vital predictor of delivery complications. Those women who did not have any antenatal clinic visits experienced delivery complications about 1.8 times more than those who had four or more antenatal care visits.[27]

Timely and adequate antenatal care is generally acknowledged to be an effective method of preventing adverse outcomes in pregnant women and their babies. Thus early initiation of antenatal care is widely believed to improve maternal and fetal health. The booking visit offers the clinician the opportunity to assess the health status of the expectant mother. Early detection of disorders that predate the pregnancy or could be aggravated by the pregnancy is crucial to preventive, therapeutic and counseling services. The antenatal policy in Nigeria follows the latest WHO approach to promote safe pregnancies recommending at least 4 visits for women without complication.[140] Despite this recommendation, this study showed that non utilization of antenatal care services and late booking are common in the study area. This is supported by the findings in Abakaliki by Onoh et-al,[17] in Lagos by Adewunmi et- al,[28] and in Makurdi by Ifenne and Utto.[19]

CONCLUSION:

This study has shown that maternal morbidity is still high in the study area. Majority of the participants were within the age group of 20-29 years. Most were Hausas, Muslims and with secondary education. Prolonged/obstructed labour was the commonest obstetric complication followed by post-partum haemorrhage and then severe pre-eclampsia/eclampsia. Post-partum haemorrhage was significantly higher in the age group of 20-29 years and those with no formal education had significantly higher prevalence of severe pre-eclampsia/eclampsia.

Booking status did not significantly affect the pattern of obstetric complications in this study as majority of the participants booked late. There was a significant positive relationship between the number of antenatal care visits and obstetric complications. Factors that influenced utilization of antenatal care services were mainly monthly family income, distance to the closest health facility and availability of means of transportation. It is therefore, recommended that: There should be greater efforts toward maternal education, and public health enlightenment campaigns that will enable more women to utilize maternal health care services including delivery care. The use of Focused antenatal care model should be sustained as well as measures to encourage early initiation of antenatal care services with subsequent adequate number of visits. There is need for better equipped antenatal care centers to be located within trekable distance in communities to ensure better access and utilization.

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