The Determinants of Hospital Delivery among Booked Parturient in a Tertiary Health Facility in South-South Region of Nigeria: Situation Analysis of the Niger Delta University Teaching Hospital

A. O. Addah[1*] and E. M. Ikeanyi[1]

[1]Department of Obstetrics and Gynacology, Niger Delta University, Amassoma, Nigeria.

Authors' contributions

This work was carried out in collaboration between both authors. Author AOA designed the study, performed the statistical analysis, wrote the first draft. Author EMI wrote the protocol, managed the literature searches and edited the first draft. Authors AOA and EMI managed the analyses of the study. Both authors read and approved the final manuscript.

| Original Research Article | |

ABSTRACT

Objective: To determine the hospital delivery rate and identify the associated factors for hospital delivery among booked parturients at the Niger Delta University Teaching Hospital.
To determine the behavioural pattern of participants who delivered in NDUTH during the antenatal period and in labour.
Methodology: This was a descriptive, retrospective cross-sectional study carried out at The Niger Delta University Teaching Hospital (NDUTH), Nigeria. Four hundred and one participants were enlisted for the study.
Results: The hospital delivery rate was 28.9% while the mean antenatal visits were 6.05 (S.D

Corresponding author: Email: draddah@yahoo.com;

3.36). Factors related to hospital delivery: Age-the youngest group, for instance, are more unlikely to deliver in a hospital (OR =0.09, 95% CI 0.01-0.067, P = 0.019). Education- The least educated were unlikely to deliver in hospital, (OR = 0.04, 95% CI 0.1-0.34, P =0.003) while those with secondary education were 34 times more likely to deliver in hospital (OR = 0.34; 95% CI 0.2-0.57, P = 0.000) compared those with tertiary education as the reference group. Antenatal care- the participants with the least ANC sessions, have the lowest odd of hospital delivery (OR = 0,19, 95 % CI 0.08-0.44, P = 0.000). Other participants characteristics like religion, marital status, occupation and parity were found not to be statistically significant in the prediction of hospital delivery. The mean antenatal visits by participants was 6.05 (S.D3.36), gestational age at booking was 23.08 (S.D 6.50), 26% visited TBAs. Prelabour rupture of fetal membranes at home- 37.9% (n=116), while 75% (n=44) of those who ruptured membranes at home presented within 12 hours to the hospital. The degree of cervical dilatation on admission to hospital: 42.2% in latent phase and 33.6% in the early phase of active lour.
Conclusion: This study concluded that antenatal care attendance impacted on the prospect of hospital delivery. Encouraging antenatal care uptake and attendance will improve the participants access to their physicians throughout pregnancy, delivery by skilled providers with the improvement of women's health at the end of pregnancy.

Keywords: Antenatal care/attendance; skilled providers; health facility delivery; advocacy; TBAs; skilled attendants at child birth.

1. INTRODUCTION

The issue of maternal mortality has plagued Nigeria and some countries in the world, especially sub-Saharan African countries for decades with no apparent solution proffered. Every day, approximately 830 women die from preventable causes related to pregnancy and childbirth globally [1]. Ninety-nine per cent (99%) of all maternal deaths occur in developing countries, most of them in sub-Saharan Africa [1]. When viewed critically, maternal death is one of the most preventable deaths in human existence [1-4].

Since the introduction of prophylactic care in pregnancy later to be known as antenatal care in Europe in the 18th century and developed in the 19th century, there has been a dramatic improvement in maternal and fetal outcomes globally especially in developed countries [5,6]. However, outcomes of antenatal care vary from one country to the other and from region to region depending on the degree of efficiency of execution and not necessarily the degree of participation. For instance, The United Arab Emirates (UAE) has an antenatal coverage of 100% and an MMR of 10/100,000 live births [7], Ukraine 96% antenatal care coverage and an MMR of 24/100,000 live births [8], Ghana 97% coverage with an MMR of 319/100,000 live births [9] and Nigeria had 61% coverage and an MMR of 814/100,000 live births [10]. A well-executed antenatal care service is a functional four-pronged relationship between the Caregiver, the

antenatal care participants, health facilities and healthcare providers for women's health. A break in this chain of relationship promotes an inefficient health care delivery system with high maternal mortality and morbidity. The hallmark of antenatal care is that at the end of pregnancy, both mother and child are alive and healthy. The benefits of antenatal care are only realizable if the prospective mother registers for antenatal care deliver in a health facility and by skilled birth attendants. This part of the chain is often broken in the sub-Saharan Africa region as registered antenatal attendees do not always return to the health facility where they received antenatal care in the index pregnancy for delivery. In the Nigerian Demographic and Health survey 2013, 61% of Nigeria women had antenatal care from a skilled provider, but only 36% of them delivered in health facilities [10].

In Nigeria, it is commonplace to find women who defaulted from antenatal care at the point of delivery to be in labour in unorthodox centres run by quacks, traditional birth attendants and in Charismatic Churches. However, if delivery proves difficult in these centres or complications to arise, these women would present as emergencies in the centre they registered for care in the index pregnancy [11-15]. Secondly, we recorded high maternal mortalities in the sub-Saharan Africa region because policy formulators while planning strategies to reduce maternal mortality do not take into consideration antenatal subjects. Women are not dying because of untreatable diseases in Africa but rather, they are

dying because societies have yet to make the decision that their lives are worth saving [16]. If health facilities abound and antenatal subjects are not utilizing them when in labour, then it means antenatal participants in the sub-Saharan region have not come to the full realization that a skilled birth attendant at childbirth saves lives. Basically, this health-seeking behaviour occurs because the physiology and the complications that could arise during pregnancy is poorly understood by the antenatal participant [17]. Health seeking behaviour of antenatal subjects has contributed largely to the huge maternal mortality ratio in the sub-region. Our objectives in this study, at the Niger Delta University Teaching Hospital, is to examine those factors exhibited in the behavioural pattern of antenatal participants that are antithetical to the utilization of health facilities for childbirth and how it affects the antenatal outcome.

2. METHODOLOGY

2.1 Study Setting

The study was conducted in the Niger Delta University Teaching Hospital, situated in Okolobiri, South-South region of Nigeria. The Hospital caters for the health needs of people from the adjoining Rivers, Delta, Abia and Imo states.

2.2 Study Design

The study was a retrospective, descriptive, cross-sectional study. This study was conceptualized with the aim of determining the hospital delivery rate, whether the antenatal care had any impact on participants positive pregnancy experience at the end of pregnancy. To compare our results with other centres in Nigeria. How was the health seeking behavioral pattern of those who delivered in hospital with regards to visits to unorthodox antenatal places like the traditional birth attendance and churches, To know if there was time delay at home before presentation to the hospital while in labor, judged by the degree of cervical dilatation on admission and if fetal membranes ruptured at home, how long did it take them to present to the hospital for assessment and delivery.

2.3 Antenatal Protocol

The conventional form of antenatal care protocol is still practised at 'the Niger Delta University Teaching Hospital, Okolobiri. as in most tertiary hospitals in Nigeria [18]. By this protocol, the antenatal participant is given four weekly appointments if her gestational age is under 28 weeks, fortnightly if she is 28-36 weeks pregnant and weekly appointments at 36 weeks till delivery. This protocol follows WHO recommendations that for a woman to have a positive pregnancy experience, she needs a minimum of 8 antenatal visits to be able to access her physician throughout the pregnancy [19]. Antenatal participants receive health education talks at every visit, which covers various topics including what to expect in pregnancy, labour and the puerperium. Lectures are also given on medical diseases including the ones that are peculiar to pregnancy. Labour preparedness, and personal hygiene among others are also thought during the antenatal period.

2.4 Sampling

A representative sample of 401 participants whose medical records were completely filled was retrieved from the hospital archives and enrolled for the study.

2.5 Eligibility

All the antenatal participants who had antenatal care within the study period and whose medical records were completely filled were entered for the study.

2.6 Sample Size Calculation

A prevalence rate of 57.1% in a study about service utilisation at the University of Port-Harcourt Teaching Hospital, amongst antenatal participants in a similar study was applied in calculating the sample size (20):

$$n = pq / (e/1.96)^2$$

Where

n = sample size
P = prevalence rate = 57.1% = 0.571
q = 1 − p = 1 − 0.571 = 0.429
e = margin of sampling error tolerated at 95% confidence interval = 5% = 0.05

Hence, $n = 0.571 \times 0.429 / (0.05/1.96)^2$

$$n = 0.244959/(0.05/1.96)^2$$

n=0.244959/0.000651

n =0.244959/0.000651

n= 376

At the end of retrieving the hospital files of women who registered and attended antenatal care within the study period, a total of 414 folders were retrieved and apart from the original sample size of 329 files, 25 other files were properly filled. The addition of these 25 participants' files to the 329 from calculated sample gave a total of 401 subjects' files that were used for the study.

2.7 Data Collection

The information sought from participants' medical records included the place of delivery, the socio-demographic characteristics of participants, the number of times they attended antenatal clinics in the index pregnancy, the patronage of traditional birth attendants, and the delay at home (if any) before presentation to the hospital when there is prelabour rupture of fetal membranes. The degree of cervical dilatation on admission in labour as a means of predicting the time delay at home before leaving for the hospital.

2.8 Data Analysis

The Data generated from the medical records of participants was entered directly into IBM SPSS version 20 which was also used for analysis. Data analysed includes the demographics of participants, ANC and delivery related variables. Variables were presented in simple percentages, means and tables with P value set at $< .05$. Some variables were re-categorized to assist the interpretation of the findings while carrying out the regression analysis (Table 1).

A binary logistic regression was done to examine the association between delivery in the hospital and a range of participants' characteristics. Delivery in the hospital was coded as 1 and otherwise was coded as 0. A bivariate analysis was first done to examine how each independent variable influenced the outcome variable and subsequently, a multivariate analysis was conducted to control for possible interaction among the set of explanatory variables that were significant during the bivariate analysis.

For participants who had ruptured membranes at home before the presentation, if they reported within 12 hours of membrane rupture they were regarded as having good behaviour in labour and those that reported after 12 hours were considered as having poor behaviour in labour. Association between this contextualization of behaviour and pregnancy-related variables, like parity, TBA visits during ANC and number of ANC visit was tested.

Table 1. Participants' characteristics tested in the regression analysis

Participants' characterristics	Variable type	Note
Age of participants	Discrete	(12 – 19 yrs) – 1, (20 – 25 yrs) – 2, (26 – 30 yrs) – 3, (31 – 34 yrs) – 4 , (35 – 39 yrs) – 5, (>40 yrs) – 6
Marital status of participants	Categorical	Single – 1, Married–2; Divorced/Separated – 3
Religion of participants	Categorical	Catholics – 1, Protestants – 2, Pentecostal – 3, Jehovah Witness – 4, Muslims – 5, Atheists – 6.
Education attainment of participants	Categorical	No formal education – 1, Primary – 2, Secondary – 3, Tertiary – 4.
Employment status of participants	Categorical	Unemployed – 1; Artisan – 2; Trader – 3; Civil Servant – 4; Business Woman – 5; Professional – 6.
Parity of participant	Categorical	Nulliparous – 1, Multiparous – 2, Grand multiparous – 3.
Gestational age at booking	Continuous	
ANC Visits	Discrete	(1 – 3 Visits) – 1, (4 – 6 Visits) – 2, (7 – 9 Visits) – 3, (10 – 12 Visits) – 4.
Traditional birth attendant	Binary	Yes – 1, No – 0

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3. RESULTS

3.1 Sociodemographic Data

A total of 401 subjects were enrolled for the study. The mean age for the study group was 28.16 ± 5.86. Seventy-three (18.2%) were Catholics, 206 (51.4) were Pentecostals, 84 (20.9) were single, 315 (78.6%) were married, 22 (5.5%) had no formal education, 223 (55.6%) had secondary education and 83 (20.7%) had tertiary education. One hundred and thirty-four (33.4%) were Primigravidae, 101 (25.2%) had delivered once, 62 (12.5%) had delivered twice. The mean parity was 3.0.

3.2 Hospital Delivery Rate

The mean antenatal visits were 6.05 ± 3.36 with a range of 1-12 visits. Out of the antenatal population that registered for care at the centre, 116 (28.9%) turned up for delivery at the centre in the index pregnancy.

Binary logistic regression was performed to identify the determinants of hospital delivery in the Niger Delta University Teaching Hospital among the predictor variables (Table 2). The results of logistic regression models that depicted the relationship between delivery in the facility and a range of participants' characteristics are shown in Table 3. A test of the full model against a constant only model was statistically significant, indicating that the correlates as a group reliably distinguish between participants who will likely deliver in the hospital and those who will not (chi-square = 100.98, p < .001 with df = 16). The Hosmer-Lemeshow test accepts the goodness-of-fit hypothesis (p-value = 0.688) and the model makes the correct classifications 77.8 % of the time.

Table 2. Sociodemographic and parity of participants in the study

Characteristics	Frequency (n= 401)	Percent (%)
Age group		
12 – 19	18	4.5
20 – 25	112	27.9
26 – 30	142	35.4
31 – 34	66	16.5
35 – 39	53	13.2
40 and above	9	2.2
Religion		
Catholics	73	18.2
Prostestants	69	17.2
Pentecostal	206	51.4
Jehovah witnesses	44	11.0
Muslims	8	2.0
Marital status		
Single	84	20.9
Married	315	78.6
Divorced/separated	2	0.5
Education status		
No formal education	22	5.5
Primary education	70	17.5
Secondary education	225	56.1
Pfost-secondary education	84	20.9
Occupation		
Unemployed	165	41.1
Artisan	24	6.0
Trader	64	16.0
Civil Servant	64	16.0
Business woman	71	17.7
Professional	13	3.2
Parity		
Nulliparity	145	36.2
Multiparous	251	62.6
Grand multiparous	5	1.2

Age of Participants was found to be significant in predicting the likelihood of a woman returning to the facility for delivery. For instance, the youngest age group in the study (OR = 0.09, 95%CI: 0.01 – 0.67; p = .019) is most unlikely to return to the hospital for delivery when compared to the reference age group of 40 years and above. The level of education of participants also impacts significantly on the odds of having hospital delivery, while the least educated group had only a 4% likelihood of having hospital delivery (OR =0.04; 95%CI: 0.01 -0.34; p = .003), the participants with secondary education had 34% chance (OR = 0.34; 95CI%: 0.20 – 0.57; p = .000) when compared with the participants with tertiary education as the reference group.

While occupation appeared as a significant predictor of facility-based delivery in the bivariate analysis, its effect became insignificant in the multivariate analysis. Lastly, the number of ANC sessions the participants attended, also influenced the likelihood of having a hospital delivery, Participants with the least number of ANC visits have the least odd of having hospital delivery (OR = 0.19; 95CI%: 0.08 – 0.44; p = 0.000). Other variables shown in Table 2 were not found to be statistically significant in predicting hospital delivery among participants, hence their non-inclusion in the multivariate regression analysis.

3.3 The Behavioural Pattern of Participants during the Antenatal Period

The mean gestational age at booking was 23.08 ± 6.50. One hundred and five participants (26.2%), visited the traditional birth attendants (TBA's), during the antenatal period.

Table 4 shows the gestational age at booking for antenatal care and the patronage of the traditional birth attendants.

3.4 Behavioural Pattern of Participants in Labour

Out of 116 participants who delivered at the NDUTH in the index pregnancy, 44(37.9%), ruptured their fetal membranes before presentation to the hospital. Thirty-three (75%), N = 44, ruptured their fetal membranes less than 12 hours before presentation to the hospital. Forty-nine participants (42.2%), were in a latent phase of labour on admission to the labour ward. Table 5 shows membranes rupture at home, how long membranes ruptured and the degree of

cervical dilatation at home before presentation to the hospital.

The test of association between antenatal care attendance and delivery at the facility (NDUTH) shows a very strong statistically significant positive relationship (X^2 = 58.244, df 11, P = .000). Results of other association tested in the study as shown in Table 6, reveals that the pregnancy-related parameters tested to explain behavioural patterns in labour have no significant relationship with the behavioural pattern exhibited by the participants (p >.05).

The total number of babies delivered in the just concluded pregnancies were 119 babies (115 singletons and two sets of twins). There was only one perinatal death. The perinatal mortality was 8.62 deaths/1000 total births. There was no maternal death.

4. DISCUSSION

In the study, 28.9% of booked antenatal subjects returned to the Niger Delta University Teachin g Hospital facility where they had antenatal care for childbirth in the index pregnancy. These results are comparable with the Nigerian Demographic and Health Survey where only 61% of women aged 15-49 years who had a live birth during the 5 years preceding the survey received antenatal care and only 36% had health institutional delivery [10]. Our results are also similar to the reviews of the 'barriers to safe motherhood in Nigeria where the utilization of health services for delivery increased from 30% to 37% over a 13 year period [21]. However, our results differ from work done in Port-Harcourt where the hospital delivery rate was 57% [20]. This discrepancy may have been due to the fact that Poort-Harcourt is a cosmopolitan city with easy accessibility to well-established transport system and health facilities compared to Okolobiri, which is a suburban town. Our results in this study and that of the Nigeria national study obtained from 'The Nigerian Demographic and Health Survey, 2013 [10] are at variance with those in recent Demographic and Health Surveys of Ghana in West Africa where 97% pregnant women received antennal care and 73% delivered in a health facility [9], Kenya in East Africa where 96% received antenatal care and 61% delivered in a health facility [22] and in Zimbabwe in Southern Africa where antenatal attendance was 93% and 77% delivered in a health facility [23] respectively. These variations in antenatal care attendance and utilization of hospital facilities for

Table 3. Determinants of hospital delivery in Niger Delta University Teaching Hospital

Independent variable – reference or baseline group	Bivariate analysis			Multivariate analysis		p-value
	B	OR (95% CI)	p-Value	B	OR (95% CI)	
Age of respondent – (40 and above)						
12 – 19	-2.36	0.09 (0.01 – 0.67)	0.019	-2.30	0.10 (0.01 – 0.95)	0.045
20 – 25	-1.58	0.21 (0.05 – 0.83)	0.027	-1.90	0.15 (0.03 – 0.79)	0.025
26 – 30	-1.02	0.36 (0.09 – 1.40)	0.141	-1.38	0.25 (0.05 – 1.28)	0.097
31 – 34	-1.20	0.30 (0.07 – 1.24)	0.097	-1.9	0.15 (0.03 – 0.80)	0.027
35 – 39	-0.41	0.66 (0.16 – 2.74)	0.570	-0.47	0.62 (0.12 -3.35)	0.582
Education level of respondent – (Tertiary education)						
No formal education	-3.14	0.04 (0.01 – 0.34)	0.003	-3.79	0.02 (0.00 – 0.20)	0.001
Primary education	-1.89	0.15 (0.07 – 0.34)	0.000	-1.73	0.18 (0.07 – 0.45)	0.000
Secondary education	-1.08	0.34 (0.20 – 0.57)	0.000	-1.00	0.37 (0.20 – 0.70)	0.002
Occupation –(professional)						
Unemployed	-1.95	0.14 (0.04 – 0.49)	0.002	-1.08	0.34 (0.08 – 1.44)	0.14
Artisan	-1.70	0.18 (0.04 – 0.80)	0.024	-0.60	0.55 (0.10 – 3.04)	0.50
Trader	-1.53	0.22 (0.06 – 0.79)	0.020	-0.45	0.64 (0.14 – 2.92)	0.56
Civil servant	-1.46	0.23 (0.06 – 0.84)	0.026	-1.41	0.24 (0.06 – 1.06)	0.060
Business woman	-2.0	0.14 (0.04 – 0.51)	0.030	-1.36	0.27 (0.06 – 1.15)	0.075
ANC visit – (10– 12 Visits)						
1 – 3 Visits	-1.68	0.19 (0.08 – 0.44)	0.000	-1.67	0.19 (0.07 – 0.48)	0.000
4 – 6 Visits	-0.90	0.41 (0.18 – 0.93)	0.033	-0.81	0.44 (0.18 – 1.10)	0.078
7 – 9 Visits	0.25	1.29 (0.55 – 3.02)	0.565	0.31	1.37 (0.53 – 3.50)	0.515
Constant				3.28	26.69	0.004

Table 4. Behavioural pattern of the participant during ANC

Characteristics	Frequency (N = 401)	Percent (%)
Gestational age at booking		
4 – 8 weeks	26	6.5
9 – 13 weeks	44	11.0
14 – 18 weeks	61	15.2
19 – 23 weeks	83	20.7
24 – 28 weeks	97	24.2
29 – 33 weeks	53	13.2
34 – 38 weeks	31	7.7
39 – 44 weeks	15	0.7
antenatal visit by respondents		
1 – 3 visits	168	41.9
4 – 6 Visits	127	31.7
7 – 9 Visits	77	19.2
10 – 12 Visits	29	7.2
Receiving TBA Care while having hospital-based ANC		
Had TBA Care	105	26.2
No TBA Care	296	73.3

Table 5. Behavioural pattern of participants in labour

Variable	Frequency	Per cent (%)
Membrane ruptured at home	**(N = 116)**	
Yes	44	37.9
No	72	62.1
How long membrane ruptured	**(N = 44)**	
<12 hours	33	75.0
12 – 24 hours	7	15.9
25 – 48 hours	1	2.3
>72 hours	3	6.8
Cervical dilatation on admission for labour	**(N = 116)**	
<3 cm	49	42.2
4 – 6 cm	39	33.6
7 – 9 cm	19	16.4
10	9	7.6

Table 6. Test of association between behaviour in labour and pregnancy-related variables

Characteristics	Chi square (X^2)	Df	pValue
Association between ANC Visit and Hospital Delivery	58.24	11	0.000
Association between TBA Visit during ANC and behaviour with a ruptured membrane	1.55	1	0.213
Association between the number of ANC Visits and behaviour with a ruptured membrane	3.15	3	0.368
Association between TBA Visit during ANC with cervical dilatation at a presentation in labour	2.76	3	0.430
Association between Parity of participants with behaviour with a ruptured membrane	0.036	1	0.849
Association between Parity of participants with cervical dilatation	23.43	20	0.268

child birth may be due to the diverse socio-cultural interpretations of pregnancy that exist in the sub-Saharan Africa region [3]. Culture and social status change peoples' perceptions and decision making process concerning health issues.

The utilisation of skilled birth attendants and health institutional delivery is one of the major indicators for MDG-5 and has been suggested to reduce maternal mortality by 50% [24]. The unanswered question in Nigeria is: what will make a woman who registered and attended antenatal care to walk away from the facility when in labour? The obvious answer is that most of our antenatal population, have a poor understanding of the dynamics of pregnancy and what behavioural attitude on their part that could jeopardise safe delivery [17]. Most of the successive programmes by WHO, its affiliate agencies and national bodies failed to reduce maternal mortality in some African countries because adequate attention has not been paid to advocacy (health education) while formulating these policies [25]. If health infrastructures are developed, skilled professionals are trained, but the antenatal subjects are unaware that health institutional delivery saves lives, then most of these programmes are bound to fail [24,26]. These among other factors constitute huge gaps in the execution of antenatal health care programmes in sub-Saharan Africa. Advocacy on what is pregnancy and the benefits derived from the well-executed antenatal health programs should be taught in antenatal clinics, communities, churches and mosques [24,26]. Improving the socio-economic status of women and families would also enhance the utilization of health facilities for delivery in areas where fees are paid for services.

The demographic characteristics and other pregnancy-related variables of antenatal care participants in this study like age, religion, parity, education, marital status, education, occupation, and the gestational age at booking for antenatal care as independent variables were tested against the dependent variable – Delivery in hospital in a binary logistic regression. It was found that there was a significant association between the predictor variables, age and education and delivery in a hospital with exception marital status, occupation, parity and gestational age at booking.

In the study, the participants in the least age group were teenagers and are most unlikely to have a health facility delivery. This may be due to the fact that as teenagers they may find it difficult to take reproductive health decisions and can also be easily influenced by peers and parents. However, health facility delivery increases as the maternal age advances.. This result was similar to a six-country study done in Africa, where

maternal age influences the decision to deliver in a health facility [27]. These similarities may have arisen from the impact of regional and cultural uniqueness between Nigerian culture and these African countries.

Most of our study subjects booked late for antenatal care. The mean gestational age at booking for antenatal care was 23.08 ± 6 amongst study participants. The earliest time recommended by the World Health Organisation to register for antenal care is within the first 12 weeks of pregnancy. Early contacts of antenatal mothers with health care providers would enable them to complete the new World Health Organisation's 8 scheduled visits which are known to reduce maternal mortality by 8/100,000 live births [19]. Gestational age at booking was not associated with delivery in hospital in our study and it was not included in the model of regression analysis.

Education impacts positively on health facility utilization (P < .000). Women with secondary education were 34 times more likely to deliver in a health facility compared to a reference group with post secondary education. The influence that women education and empowerment has on right decision making on reproductive health issues cannot be over emphasised.

Cross tabulation between antenatal care attendance and delivery at the Niger Delta University Teaching Hospital was statistically significant. (X^2 = 56.44, df 11, P< .000). The positive impact of well executed antenatal care since its inception on reducing maternal/perinatal morbidity/mortality is well established [5,6].

We also examined the health seeking behavioural practices of the participants who delivered at NDUTH in the index pregnancy. The delivery of a pregnant woman in a health facility and by skilled attendants saves lives. However, there are still other determinants that could jeopardize antenatal outcomes. The time delay at home while in labour before going to the hospital for delivery judged by the degree of cervical dilatation on admission, pre labour rupture of membranes and the time that elapsed before presentation to the hospital and patronage of traditional birth attendants. Table 6, reveals that the pregnancy-related parameters tested to explain behavioural patterns in labour have no significant relationship with the behavioural pattern exhibited by the participants (p >.05), except the association between

antenatal care attendance and delivery in the NDUTH.

Maternal and perinatal outcomes in the study were favourable as there was no maternal death and perinatal mortality was 8.62/1000 total births which are lower than that obtained from the national average published in the Nigeria Demographic and health survey [10].

5. CONCLUSION

The educational status of the antenatal participant in the study was associated with delivery in the centre where they registered for care. Education of the girl child and women empowerment will allow antenatal participants to take sound decisions on reproductive health issues, including the use of health facility for delivery.

7. LIMITATIONS TO THE STUDY

The conceptualization and design of this study was retrospective. Other important determinants that will prevent an antenatal participant from the utilization of health facilities like distance from health facilities, multiple registrations in antenatal centres, costs, husband consent were not studied. These limitations arose because these variables were not recorded in the medical records of participants.

CONSENT

It is not applicable.

ETHICAL APPROVAL

This study was approved by the ethical committee of the Niger Delta University Teaching Hospital, Okolobiri, Nigeria.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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