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Original Research Article

MATERNAL BEHAVIOURAL FACTORS ANTITHETICAL TO GOOD ANTENATAL OUTCOME: THE NIGER DELTA UNIVERSITY TEACHING HOSPITAL EXPERIENCE

ABSTRACT

Objective

-To determine the number of booked antenatal subjects who return to the Niger Delta University Teaching Hospital for child birth in the index pregnancy.

-To evaluate the impact of antenatal clinic attendance on the likelihood of health facility delivery.

-To assess how social demographic factors impacted on the likelihood of hospital delivery.

-To assess the degree of TBAs patronage by antenatal subjects, an issue that has hampered favourable antenatal outcome in sub-Saharan Africa region.

-To test antenatal subjects health seeking behavior with duration (home delay) of labour at home before presentation to hospital, judged by duration of fetal membrane rupture and degree of cervical dilation on admission in labour.

Methodology.

This was a descriptive, retrospective cross-sectional study carried out at The Niger Delta University Teaching Hospital (NDUTH), Okolobiri in the South South geopolitical zone of Nigeria. The study subjects were the women who registered for antenatal care in the Niger Delta University Teaching Hospital, Okolobiri from January to December 2016.

Results

Four hundred and one (401) subjects who registered for antenatal care at the centre for antenatal care within the study period at The Niger Delta University Teaching Hospital (NDUTH) were enrolled for the study. The mean age for the study group was 28.16 ± 5.86 with a range of 12-45 years. Seventy-three (18.2%) were Catholics, 206 (51.4) were Pentecostals. 223 (55.6%) had secondary education and 83 (20.7%) had tertiary education. Two hundred and twenty-three (55.6%) had secondary education and 83 (20.7%) had tertiary education. 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, only 116 (28.9%) turn up for delivery at the centre. A binary logistic regression performed showed there was association between subject's demographic characteristics and delivery in hospital. $X^2 = 66.455$, Df 7, $P < .000$. Cross tabulation between antenatal care attendance and delivery at NDUTH, was statistically

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significant. X^2 = 56.44, df 11, P< .000. An antenatal registered patient was 56.4 4 times more likely to deliver at the NDUTH than outside.

Cross tabulation between cervical dilatation and parity on admission to hospital for childbirth at NDUTH (N=116) was not statistically significant. (X^2) =23.437,Df 20, P<.268.

The perinatal motality was 8.62 deaths/1000 total births. There was no maternal death.

Conclusion

There are still gaps in the execution of antenatal health care in Nigeria as in some sub-Saharan African countries. It is recommended that health care providers and policy makers should take into context antenatal subjects understanding of pregnancy,the importance of child birth in health facilities and by skilled attendants when formulating antenatal health care delivery policies.

Key words: Antenatal care/attendance, Skilled providers, Health facility delivery, Advocacy, TBAs, skilled attendants at child birth.

INTRODUCTION

There is no issue that has dogged world health and that of Nigeria in particular for decades with no apparent solution proffered is maternal mortality. Every day, approximately 830 women die from preventable causes related to pregnancy and childbirth globally (1). Ninety-nine percent (99%) of all maternal deaths occur in developing countries most of them in sub-Saharan Africa. When viewed critically, maternal death is one of the most preventable deaths in human existence (1, 2, 3, 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 a MMR of 10/100,000 live births (7), Ukraine 96% antenatal care coverage and a MMR of 24/100,000 live births (8), Ghana 97% coverage with a MMR of 319/100,000 live births (9) and Nigeria had 61% coverage and a MMR of 814/100,000 live births (10). A well executed antenatal care service is a functional four-pronged relationship between the Caregivers, the antenatal subjects, health facilities and providers of women's health. Providers of women's health do not provide only infrastructure in terms of health facilities but things needed to make these centres functional. Any break in this chain of relationship will end up as an inefficient health care delivery system as it often occurs in sub-Saharan African Countries with resulting high maternal mortality and morbidity. The antenatal subject is the chief beneficiary of this

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whole arrangement and she can only reap the benefits if she registers for care and presents herself to the health facility where she registered for care when in labour. This part of the chain is often broken in sub-Saharan Africa as healthcare providers are always in health facilities to receive women in labour but who paradoxically has turn their attention to unorthodox health care providers elsewhere (11). Sixty-one percent (61%) of Nigeria women had antenatal care from a skilled provider, but only 36% of them delivered in health facilities (10). Most often, these defaulters in labour in the sub-Saharan region will end up with traditional birth attendants, quacks, Charismatic Churches or even labour at home only to come back later to the health facility where they register for care as dire obstetric emergencies (12, 13, 14, 15).

Secondly, we record high maternal mortalities in sub- Saharan Africa countries because the antenatal subjects themselves are not taken into consideration by policy formulators while planning strategies to reduce maternal mortality. Mahmoud Fathalla, past president of the International Federation of Obstetricians and Gynaecologists and former Chair of the WHO Advisory Committee on Health Research, said and I quote: "Women are not dying because of untreatable diseases. They are dying because societies have yet to make the decision that their lives are worth saving (13). If health facilities abound and antenatal subjects are not utilizing them when in labour, then it means antenatal subjects in the sub-Saharan region have not come to the full realization that a skilled birth attendant at birth saves live. Basically, this health seeking behavior occurs because the understanding of the antenatal subjects about pregnancy and delivery is poor. Health Planners should not think of only how to improve infrastructure, provide health personnel, drugs but on how to carry advocacy to the door steps of the antennal subjects. The health seeking behavior of antenatal subjects in the sub-Saharan African countries 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 subjects that are antithetical to good antenatal outcome. The objectives include the following:

-To know the percentage of registered antenatal subjects at the Niger Delta University Teaching Hospital who came back to the facility to deliver when in labour. To compare our results with national figures, other researchers in the geopolitical zone, nationally and international.

-To evaluate how their socio-demographics characteristics interacted with antenatal outcome;

-To evaluate the influence of the number of antenatal attendance on the likelihood of hospital delivery

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-How long it took them to present themselves to hospital (first delay), when in labour , cervical dilatation before presentation, if membranes ruptured before presentation, what was the duration.

-Were there visits to TBAs during the antenatal period or in labour.

The complications (both natural and acquired e.g complications arising from abdominal massage) at presentation in labour.

-The level of patronage of unorthodox centres while in labour before coming to the hospital to deliver.

Methodology

This was a descriptive, retrospective cross-sectional study carried out at The Niger Delta University Teaching Hospital, Okolobiri in the South- South geopolitical zone of Nigeria. The Hospital caters for the health needs of people from the adjoining Rivers, Delta, Abia and Imo states. Apart from rendering clinical services, it also trains medical personnel and conduct research.

The study subjects were the women who registered for antenatal care in the Niger Delta University Teaching Hospital, Okolobiri from January to December 2016. The hospital number of subjects were retrieved from the antenatal clinic, and labour ward and registers. Their hospital files were afterwards retrieved from the Hospital medical records.

Eligibility.

All subjects who had antenatal care within the said period were enlisted for the study. There were no exclusion criteria.

Sample size

Sample size was calculated using a prevalence rate of 31% in a study service utilization study at the University of Jos, Jos. hospital delivery rate was 31%.[14]

The Calculation of Sample Size.

A prevalence rate of 31 % service delivery utilisation amongst antenatal subjects in a similar study done at the University of Jos Teaching Hospital, Jos, Nigeria [14] was applied in calculating the sample size, using the formula:

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

Where n = sample size

P = prevalence rate = 31%
q = 100 – p = 100 – 31% = 69%
e = margin of sampling error tolerated at 95% confidence interval = 5%

Hence, $n = 31 \times 69 / (5/1.96)^2$
$n = 2139/(5/1.96)^2$
328.6

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At the end of retrieving the Hospital files of women who registered and attended antenatal care within the study period, we retrieved additional valid 72 files. Adding these 72 subjects to 329 from calculated sample size added up to a total of 401 subjects that was used for the study.

Results

Atotal of 401 subjects were enrolled for the study. **T**he mean age for the study group was 28.16 ± 5.86 with a range of 12-45 years. 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 2.48 ± 1.24.

Table 1. Demographic characteristics of subjects.

Age	Frequency	Percent
Twelve-Nineteen	18	4.5
Twenty-Twenty five	112	27.9
Twenty six-Thirty	143	35.7
Thirty one-Thirty four	66	16.5
Thirty Five-Thirty nine	53	13.2
Forty years and above	9	2.2
Total	401	100.0

Religion	Frequency	Percent
Catholic	73	18.2
Protestants	69	17.2
Pentecostal	206	51.4
Jehovah's Witness	44	11.0
Muslim	8	2.0
Total	401	100.0

Marital status	Frequency	Percent
Single	84	20.9
Married	315	78.6
Divorced/Separated	2 .	5
Total	401	100.0

Educatio	Frequency	Percent
No formal education	22	5.5
Primary	69	17.2
Secondary	223	55.6
Tertiary	83	20.7
5.00	4	1.0
Total	401	100.0

Parity	Frequency	Percent
None	134	33.4
Once	101	25.2
Twice	62	15.5
Thrice	34	8.5

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Four times	36	9.0
Five or more times	34	8.5
Total	401	100.0

The mean antenatal visits were 6.05 ± 3.36 with a range of 1-12 visits. The antenatal visits start dwindling gradually from the first visit to the 7visit and thereafter there was a sharp decline to the 12th visits. Out of the antenatal population that registered for care at the centre, only 116 (28.9%) turned up for delivery at the centre. See table 2 for the pattern of antenatal visits.

Table 2: How many times attended ANC

	Frequency	Percent	Valid Percent	Cumulative Percent
1.00	66	16.5	16.5	16.5
2.00	47	11.7	11.7	28.2
3.00	55	13.7	13.7	41.9
4.00	44	11.0	11.0	52.9
5.00	41	10.2	10.2	63.1
6.00	42	10.5	10.5	73.6
7.00	33	8.2	8.2	81.8
8.00	25	6.2	6.2	88.0
9.00	19	4.7	4.7	92.8
10.00	13	3.2	3.2	96.0
11.00	7	1.7	1.7	97.8
12.00	9	2.2	2.2	100.0
Total	401	100.0	100.0	

A total of 116 (28.9 %) of registered antenatal care subjects came back to the hospital for delivery. See Table 3 for those who delivered at The Niger Delta University Hospital.

A binary logistic regression was performed to see the association between the dependent variable – delivery in the Niger Delta University Teaching Hospital (YES or NO) and the independent predictor variables, age, religion, education, parity and gestational age at booking on the likelihood of a booked antenatal subject delivering in the hospital.

The logistic regression model was statistically significant: X2(4) = 66.455, Df 7, P < .000. The model explained 21.8% (Nagelkerke R^2) of the variance in delivery in NDUTH and correctly classified 74.6% of all cases. Age, P<0.56 and Gestational age at booking P, < .223 did not contribute to the model. Education impacted positively on the likelihood of a booked antenatal subject delivering in the Niger Delta University Teaching Hospital (NDUTH). Women with tertiary education were 43 times more likely to deliver in hospital compared with those who had secondary and primary education. Women with secondary education were 13.9 times more likely to deliver in hospital compared with subjects who had primary education. Religion, P <0.12, Parity, < .005, were associated with delivery in hospital.

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In the cross tabulation between antenatal care attendance and delivery at NDUTH, there was strong association. The count and expected counts for various groups were close. The adjusted residuals were positive in seven groups meaning there were more women who delivered in the hospital than expected for those groups adjusted for sample size. Five groups have negative values meaning fewer women delivered inside the hospital than expected adjusted for sample size. The Pearson Chi square and the likely hood ratio were very close, but the P-Value showed statistically significant values meaning there was strong association between variables thereby rejecting the null hypothesis (Ho). Group seven contributed most to the Chi -square statistics while group 4 contributed the least.

Chi square Tests results of cross tabulation between antenatal care attendance and delivery at NDUTH

Chi-Square Tests

	Value	Df	Asymp. Of Sig-.2 sided)
Pearson Chi-Square	58.244[a]	11	.000
Likelihood Ratio	56.438	11	.000

X^2 = 56.44, df 11, P< .000. An antenatal registered patient is 56.4 4 times more likely to deliver to deliver at the NDUTH than outside.

Subjects handling of other determinants related to good antenatal outcome

Table 3. Gestational age at booking (in weeks) and visits to TBAs

Gestation at booking (Weeks)	Frequency	Percent
4 -8	26	6.5
9 -13	44	11.0
14 – 18	61	15.2
19-23	83	20.7
24-28	97	24.2
29-33	53	13.2
34 -38	31	7.7
39 -44	15	.7
Total	401	100.0

Mean gestational age at booking was 23.08 +6.50 weeks

Visits to traditional birth attendance

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Visited TBA	Frequency	Percent
Yes	105	26.2
No	296	73.8
Total	401	100.0

Table 4. Behavioural pattern of subjects towards utilization of hospital services in labour

Membranes ruptured at home	Frequency	Percent
Yes	44	11.0
No	357	89.0
Total	401	100.0

How long membranes ruptured	Frequency	Percent
Hours	33	8.2
One day	7	1.7
Two days	1	.2
Four days	1	.2
Seven days or more	2	.5
Not applicable	357	89.0
Total	401	100.0

Cervical dilatation on admission	Frequency	Percent
Zero-three	53	13.2
four-six	39	9.7
Seven –nine	19	4.7
Ten	9	2.2
Not applicable	281	70.1
Total	401	100.0

Cross tabulation between cervical dilatation and parity on admission to hospital, 53 (45.7%) of those who delivered in NDUTH (N=116) were in latent phase and 63 (54.3%) were in active labour. Ninety-two subjects (79.3%) were either in latent phase or in the first phase of active labour. There was no statistical significance between parity and the degree of cervical dilatation on admission into the labour ward of NDUTH (Pearson Chi Square test (X^2) =23.437,Df 20, P<.268.

The total number of babies delivered in the just concluded pregnancies were119 babies -115 singletons and two set of twins. There was only one perinatal death. The perinatal motality was 8.62 deaths/1000 total births. There was no maternal death.

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Discussion

In our study, only 28.9% of booked antenatal subjects returned to the Niger Delta University Teaching Hospital facility where they have antenatal care for delivery. These results are comparable with the Nigerian Demographic and Health Surveys where only 61% of women aged 15-49 years who had a live birth during the 5 year preceding the survey received antenatal care and only 36 % had health institutional delivery (10). Our results are similar to work done in Jos (17) in which only 33% had health facility delivery and also 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 13year period (18). Our results in this study and that of Nigeria obtained from 'The Nigerian Demographic and Health Survey(2013) 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 (19) and in Zimbabwe in Southern Africa where antenatal attendance was 93% and 77% delivered in a health facility (20) respectively. One thing evident from our study and the results of the Nigerian Demographic and Health Survey (9) is that there is low antenatal care coverage and use of health facilities for delivery. The utilisation of skilled birth attendants and health Institutional delivery is one of the major indictors for MDG-5 and has been suggested to reduce maternal mortality by 50% (22). 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 populations, a substantial fraction of educated ones inclusive, have poor understanding of the dynamics of pregnancy and what behavioural attitude on their part that could jeopadise safe delivery. 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. 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. 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 well executed antennal health programmes should be thought in antenatal clinics, communities, churches and mosques.

The demographic characteristics of subjects in this study: age, religion, parity, education and a 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 were significant association between these predictor factors and delivery in hospital except age and gestational age at booking.

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In our study, as the subject ages by a year, so the odds of delivering in hospital decreases by 1.2 times to delivering outside (p < 0.56). This result was at variance with a six country study done in Africa where maternal age influences the decision to deliver in a health facilities (23). These variations may have arisen from the impact of regional and cultural differences (between Nigeria and these countries) exerted on the heath seeking behavioral pattern of the would-be mother to deliver in a health facility.

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 subjects. The earliest time recommended by the World Health Organisation to register for antennal 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 is known to reduce maternal mortality by 8/100,000 live births (24). Gestational age at booking was not associated with delivery in hospital in our study model (P < .253).

Religion is one of the barriers that impacts negatively on the utilisation of health institutions for delivery (P< .12). Half of our study subjects were of Pentecostal religion that harbours radical views against hospital delivery. In two studies in South-South, Nigeria, 43% and 50% respectively of registered antenatal subjects studied delivered in Churches. (25, 26, 27). It is generally believed by some antenatal subjects that they need 'spiritual support' against perceived enemies. In our study, religion was not associated with delivery in hospital.

Education impacts positively on health care utilization (P < .000). Women with tertiary education were 43 times more likely than women who had secondary education to deliver in NDUTH where they registered for care. Likewise women with secondary education were 7.7 times more likely to deliver in a health facility compared to those with only primary education. Education does not only improve the antenatal mother's understanding of reproductive health issues but also make right decisions.

Parity of subjects in our study was associated with the decision to deliver in the Niger Delta University Teaching Hospital (P<.005). A woman that had a positive pregnancy experience in the last concluded pregnancy is likely to return to that health facility where she delivered previously if pregnant again.

Cross tabulation between antenatal care attendance and delivery at the Niger Delta University Teaching Hospital was analysed in our study. The likelihood of an antenatal registered subject to deliver in the health facility is 56.4 times more than to deliver in an outside facility (X2 = 56.44, df 11, P< .000). The positive impact of antenatal care since its inception on favourable pregnancy outcome if well executed is in not in doubt in reducing maternal and perinatal morbidity.

Almost a third of the subjects in the study visited Traditional Birth Attendants (TBAs) in the course of the antenatal care period. The issue of TBAs, an unskilled, uneducated group of women who lives amongst communities including pregnant women participating in antenatal health care delivery has contributed enormously to the martanal/perinatal mortality and morbidity in sub-Saharan African countries. In the 1090s, there were strong arguments in favour of training traditional birth attendants to alleviate the dearth of skilled attendants in the sub-region. The results were counter- productive, especially managing severe cases they were suppose to refer. (28) Currently, TBAs are banned from health care delivery in most of sub-Saharan African countries, yet antenatal subjects clandestinely patronize them as in our study.

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We also studied some behavioural heath seeking pattern of subjects in labour that could result in increased morbidity/mortality including: if membranes ruptured at home, how long did it take them to report to hospital and how far were they in labour judging from cervical dilatation on admission in labour?

It is not unusual for fetal membranes to rupture before the onset of labour in term pregnancies and without warning signs. The incidence of premature rupture of fetal membranes (PROM) in our study was 11%. This is almost in agreement with the incidence of PROM of 5-10 % of all pregnancies quoted by FIGO (29). If the fetal membranes ruptured at home, and the antennal subject did not present herself early to a health facility for delivery may result in high risks of infections leading to increased maternal/perinatal morbidity and mortality. Seventy-five (75%) of subjects (n= 44) in our study who had PROM presented early (within hours) to the health facility for assessment. This is a commendable act as risk of infection is likely to commence after 18 hours of membranes rupture (29).The remaining 25% of study subjects with PROM presented late for assessment, with high risk of infection. The current opinion worldwide is to induce labour immediately after PROM if cervix is favourable or to commence cervical ripening followed by induction of labour if the cervix is not favourable.

The degree of cervical dilatation on admission is a prediction of how long a paturient has been laboring either at home, in Churches or with TBAs with exclusion of other confounding variables like precipitate labour. Multiparous women with previous positive experience with home deliveries are most likely to present to hospital in advanced active phase labour or at full cervical dilatation when the hope of home delivery seems difficult. (30). Majority of subjects in our study who delivered at NDUTH presented in the first phase of active labour allowing skill attendants the opportunity and time to manage their labours. Health education, previous positive experience of hospital delivery coupled with their educational status must have impacted on this antenatal outcome. Crosstabulation beween parity and the degree of cervical dilatation on admission in labour was not statistically significant (X^2=23.437,Df 20, P<.268).

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

Conclusion.

Ignorance of subjects on the role played by antenatal care and skilled attendants at the point of childbirth in reducing maternal/perinatal mortality has made them to walk into substandard care. The power of knowledge in understanding reproductive health issues cannot be over emphasized. Advocacy on antenatal health education should be carried beyond health institutions to communities, churches, mosques and the media for understanding the dynamics of safe pregnancy and childbirth.

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