

Prevalence and determinants of planned pregnancy among antenatal attendees in a tertiary hospital in South East Nigeria

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Abstract

Pregnancy planning has been identified as a strategy with enormous potential for improving pregnancy outcomes. Prevalence and determinants of planned pregnancy among antenatal attendees is largely unassessed in our environment.

Objective: To determine the prevalence and determinants of planned pregnancy among antenatal attendees in a tertiary hospital in South East Nigeria

Materials and Methods: A total of 387 pregnant women were interviewed with semi-structured questionnaire following consent at the antenatal clinic of ESUT Teaching hospital Parklane, Enugu. Convenient sampling method was used. Data obtained was entered into SPSS version 26 and later exported to SPSS version 27 with which it was analyzed.

Results: Prevalence of planned pregnancy was 72.6%. Marital status (COR = 5.98 ; 95% CI: 2.43–14.69; $p < 0.001$), educational status (no education/primary education { COR = 0.15 ; 95% CI: 0.04–0.65 ; $p = 0.011$ }; secondary education{ COR=0.37; 95% CI: 0.21–0.65 ; $p = 0.001$ }), Age at coitarche (COR = 0.19 ; 95% CI: 0.04–0.96 ; $p = 0.044$), history of miscarriage (COR = 0.41 ; 95% CI: 0.21–0.79 ; $p = 0.008$) and prior use of contraception (COR = 0.52 ; 95% CI:0.29–0.93; $p = 0.028$) were the variables identified to be significantly associated with planned pregnancy

Conclusion: Prevalence of planned pregnancy among the respondents was 72.6%. Being married, having tertiary education and prior use of contraception were positive predictors while previous miscarriage and age at coitarche of < 20 years were negative predictors of planned pregnancy.

Keywords: Prevalence; determinants; Planned pregnancy; antenatal attendees; Tertiary hospital

1. Introduction

Pregnancy is often associated with lots of challenges most of which if not properly handled may result in significant morbidity and or mortality for the mother and or the baby. It also places a lot of demand on the finance, physical, social, as well as mental wellbeing of the intending parents. This may explain why unintended pregnancy is more likely to be associated with adverse outcome. This appears to be so because unintended pregnancy has been reported to be associated with late booking for antenatal care, poor utilization of antenatal care services [1-4], maternal depression and anxiety [5-7] as well as smoking and drinking behaviors during pregnancy [3-8].

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Unfortunately, in Sub-Saharan Africa unintended pregnancy rate of up to 86 per 1000 women of reproductive age has been reported [9]. A reasonable percentage of unintended pregnancies are more likely to be terminated through unsafe means and in unsafe circumstances. Empirical observation in our environment suggests that much of the effort aimed at improving pregnancy outcome is directed towards improving the management of pregnant women during pregnancy, childbirth and in the immediate post-partum period. However, despite reasonable progress in these areas, poor pregnancy outcomes continue to be a problem most likely because prenatal care is often provided too late to prevent some maternal and child health complications [10]. The missing link appears related to the near total neglect for preconception care in the continuum of care especially in the developing nations of the world.

Available evidence suggests that the state of a woman's health as well as their social habits prior to conception reasonably affects their pregnancy outcome [10]. In most resource poor settings, maternal care does not start until more than half of the pregnancy has passed hence many women enter into pregnancy without having optimal health status or with habits that have serious negative health implications such as smoking, drinking alcohol, using drugs, having poor diets as well as sedentary lifestyles [10]. As such preconception care and pregnancy planning have been identified as strategies with enormous potential for improving women's reproductive outcomes, especially for those who have had unfavorable reproductive outcomes in the past [11].

It follows logical reasoning that preconception care is only possible in the setting of planned pregnancy. Unfortunately, there is paucity of data on prevalence and determinants of planned pregnancy among pregnant women in our environment. Much of the previous research works done in some other places have been directed towards assessing the prevalence, determinants as well as factors associated with unintended pregnancies [12-18]. While there is need to study unintended pregnancies to provide evidence on how best to prevent it, there is also the need to study the planned pregnancies so as to identify their determinants in order to provide policy makers with evidence to further promote pregnancy planning with its attendant benefits of improving pregnancy outcome. It is against this background that this study assessed the prevalence and determinants of planned pregnancy among antenatal attendees in Enugu State University of Science and Technology (ESUT) Teaching Hospital Parklane Enugu, Nigeria. The outcome of this study has capacity to guide policies and interventions aimed at increasing the proportion of our women that plan their pregnancy with the ultimate aim of reducing morbidities and mortalities associated with pregnancy related complications.

2. Methodology

This study was part of a bigger study on the pregnancy planning status and the determinants of the respective pregnancy planning status of antenatal clinic attendees in ESUT Teaching Hospital Parklane Enugu, Nigeria during the study period. It was a hospital based cross sectional study and it spanned from August, 2024 to July, 2025. ESUT Teaching hospital is located in the center of Enugu Metropolis. It serves as a referral center for most states in the South East Nigeria. The department of Obstetrics and Gynaecology is one of the four major departments of the hospital and antenatal clinic is one of the outpatient clinics in the department of Obstetrics and Gynaecology. The antenatal clinic attends to all categories of pregnant women and runs from 8:00 am in the morning to 4:00pm in the evening Monday to Friday of every week. Every week day (from Monday to Friday) the clinic is managed by a team of consultant Obstetrician and Gynaecologists, resident doctors, nurses and other allied health workers. The antenatal clinic is a fairly busy clinic.

The target population was pregnant women that received antenatal care at the antenatal clinic of ESUT Teaching hospital Parklane Enugu, Nigeria within the study period. Written informed consent was obtained from all the respondents and they were reassured of the confidentiality of information provided. Each of the respondents were interviewed with well-structured interviewer administered questionnaire. The questionnaire was in two parts: the first part contained questions on the respondents' sociodemographic characteristics as well as past reproductive history and family planning. The second part of the questionnaire was the London Measure of Unplanned Pregnancies (LMUP) scale [13]. This part contained six questions each with three possible response options with assigned scores of 0, 1 or 2. The scale was used to assess the intendedness of the pregnancy and the total intendedness score could be any score ranging from zero (0) to twelve (12). Depending on the intention score the pregnancies were classified into three namely unplanned (0-3), ambivalent or mistimed (4-9) and planned (10-12). The questionnaire was pretested and all ambiguity removed. Ethical clearance for the study was obtained from the ethics committee of ESUT Teaching hospital Parklane, Enugu.

Data collected were entered into excel and later exported to SPSS version 27 with which it was analyzed. Data cleaning was performed to ensure completeness and accuracy prior to analysis. Mean and standard deviation of continuous variable was calculated while categorical variables were summarized using frequencies and percentages.

An ordinal logistic regression was conducted to identify the determinants of planned pregnancy among the respondents, categorizing pregnancy intention as planned, ambivalent, or unplanned. The model was statistically significant (Chi-square = 84.503, $p < 0.001$), indicating that the independent variables, collectively improved prediction compared to a null model. Goodness-of-fit tests (Pearson $p = 1.000$; Deviance $p = 1.000$) confirmed an adequate model fit. The test of parallel lines was not significant ($p = 0.125$), showing that the proportional odds assumption was satisfied. The Nagelkerke R^2 of 0.263 indicates that the model explained approximately 26.3% of the variance in pregnancy intention.

Bivariate (unadjusted) analysis was first conducted to examine the relationship between each independent variable and pregnancy intention. Based on theoretical considerations and evidence from previous studies, all relevant variables were included in the multivariable ordinal logistic regression model regardless of their level of statistical significance at the bivariate level. Crude and adjusted odd ratios with their 95% confidence intervals were calculated.

The results of the multivariable analysis identified several factors associated with increasing likelihood of pregnancy being planned. The variables having p value of ≤ 0.05 in the multivariate analysis were considered as significant predictors (determinants) of planned pregnancy among the respondents.

3. Results

A total of 387 respondents were interviewed. The mean age of respondents was 29.84 ± 5.29 years, with ages ranging from 16 to 46 years. More than half of the respondents were 30 years and above. Majority of the respondents were married (93%), urban dwellers (87.1%), employed (81.7%) and with tertiary education (72.1%). The duration of marriage for majority (59.4%) of the respondents was less than 5 years. The rest of the sociodemographic characteristics of the respondents were as shown on Table 1.

Table 1 Respondents' sociodemographic characteristics

Respondents' characteristic	Variable	Frequency	Percentage
Age in years	< 20 years	4	1
	≥ 20 years - <30 years	180	46.5
	≥ 30 years	203	52.5
Residence	Urban	337	87.1
	Rural	50	12.9
Marital status	Not currently married	27	7
	Married	360	93
Duration of marriage	< 5 years	230	59.4
	≥ 5 years - <10 years	96	24.8
	≥ 10 years	41	10.6
	Not applicable	20	5.2
Educational status	$\leq$ Primary Education	10	2.6
	Secondary Education	98	25.3
	$\geq$ Tertiary Education	279	72.1
Employment status	Unemployed	71	18.3
	Employed	316	81.7
Husband Educational status	$\leq$ Primary Education	11	2.8
	$\geq$ Secondary/Tertiary Education	356	92.0
	Not applicable	20	5.2
Husband employment status	Unemployed	3	8

	Skilled workers, artisans	168	43.5
	Government/Private sector Employed	195	50.4
	Not applicable	20	5.2

Table 2 Respondents' Pregnancy related characteristics

Respondents' characteristics	Variable	Frequency	Percentage
Parity	<2	227	58.7
	2-4	149	38.5
	≥5	11	2.8
Gestational age at interview	≤13weeks	34	8.8
	>13weeks -26weeks	146	37.7
	>26weeks	207	53.5
Gestational age at booking	≤13weeks	166	42.9
	>13weeks -26weeks	182	47
	>26weeks	39	10.1
Last interpregnancy interval	<18months	86	22.2
	18months- 36months	133	34.4
	>36months	27	7.0
	Not applicable	141	36.4
Age at marriage	<20years	17	4.4
	≥ 20years - <30years	282	72.9
	≥30years	68	17.6
	Not applicable	20	5.2
Age at coitarche	< 20 years	104	26.9
	≥ 20years - <30years	249	64.3
	≥30years	25	6.5
	Cannot remember	9	2.3
History of termination of pregnancy	Yes	55	14.2
	No	332	85.8
History of spontaneous miscarriage	Yes	100	25.8
	No	287	74.2

Worthy of note from table 2 above is the fact that majority of the respondents were primiparous (58.7%), booked for antenatal care in first/second trimesters (89.9%), had normal last interpregnancy interval of between 18 -36 months (34.4%), and married between the ages of ≥ 20 - < 30 years (72.9%). The rest of pregnancy related characteristics of the respondents were as shown on table 2

Table 3 Respondents' Family Planning Related characteristics

Respondents' characteristics	Variable	Frequency	Percentage
Knowledge of contraception n=387	Yes	322	83.2
	No	65	16.8
Source of knowledge of contraception (Multiple responses) n=322	Spouse	19	5.9
	Church	17	5.3
	Health workers	189	58.7
	Radio	7	2.2
	Television	17	5.3
	Social media	102	31.7
	Friends	47	14.6
	Parents	3	0.9
	School	41	12.7
	Not Applicable	65	20.2
Prior use of contraception n=387	Yes	140	63.8
	No	247	36.2

Over 80% of the respondents had knowledge of contraception with health workers serving as the major source of knowledge about contraception followed by social media. However, only 63.8% of the respondents had used contraception.

Table 4 Types of contraception used by the respondents (Multiple response)

Type of contraception	Frequency (n=140)	Percentage
Barrier method	51	36.4
Oral contraceptive pills	49	35
Implants	14	10
Intrauterine contraceptive Device (IUCD)	4	2.9
Injectable contraception	13	9.3
Traditional method	1	0.7
Emergency contraception	23	16.4

The most commonly used method of contraception among the respondents was the barrier method followed by oral contraceptive pills.

Table 5 Prevalence of Planned pregnancy among the respondents

Pregnancy Intention	Frequency	Percent (%)
Planned	281	72.6
Ambivalent	88	22.7
Unplanned	18	4.7

Following assessment with the London Measure of Unplanned Pregnancy (LMUP) scale, the prevalence of planned pregnancy among the respondent was 72.6%.

Table 6 Determinants of planned pregnancy among the respondents

Variable	Category	COR (95% CI)	p-value	AOR (95% CI)	p-value
Age (years)	≥30 (Ref)	1	—	1	—
	<20	0.12 (0.02–0.76)	0.025*	0.94 (0.10–8.98)	0.957
	20–29	0.78 (0.50–1.22)	0.279	1.22 (0.66–2.24)	0.524
Residence	Rural (Ref)	1	—	1	—
	Urban	0.87 (0.44–1.71)	0.686	0.46 (0.21–1.01)	0.051
Marital status	Not married (Ref)	1	—	1	—
	Married	8.61 (3.95–18.78)	<0.001*	5.98 (2.43–14.69)	<0.001*
Educational status	≥Tertiary (Ref)	1	—	1	—
	No/Primary	0.16 (0.04–0.53)	0.003*	0.15 (0.04–0.65)	0.011*
	Secondary	0.35 (0.21–0.56)	<0.001*	0.37 (0.21–0.65)	0.001*
Employment status	Employed (Ref)	1	—	1	—
	Not employed	0.50 (0.29–0.85)	0.01*	0.83 (0.42–1.64)	0.593
Parity	≥5 (Ref)	1	—	1	—
	<2	1.88 (0.56–6.51)	0.318	2.72 (0.63–11.84)	0.182
	2–4	1.25 (0.34–4.37)	0.725	1.23 (0.30–5.04)	0.776
Gestational age at interview	>26 weeks (Ref)	1	—	1	—
	≤13 weeks	1.33 (0.53–3.33)	0.533	1.02 (0.37–2.78)	0.974
	14–26 weeks	0.74 (0.46–1.18)	0.2	0.99 (0.56–1.76)	0.97
Gestational age at booking	>26 weeks (Ref)	1	—	1	—
	≤13 weeks	1.39 (0.64–3.02)	0.405	1.34 (0.53–3.40)	0.532
	14–26 weeks	0.90 (0.42–1.90)	0.778	0.94 (0.38–2.30)	0.883
Age at coitarche	≥30 (Ref)	1	—	1	—
	<20	0.11 (0.02–0.48)	0.004*	0.19 (0.04–0.96)	0.044*
	20–29	0.29 (0.06–1.27)	0.102	0.40 (0.08–1.92)	0.253
History of termination	No (Ref)	1	—	1	—
	Yes	0.67 (0.32–1.34)	0.256	0.48 (0.22–1.08)	0.076
History of miscarriage	No (Ref)	1	—	1	—
	Yes	0.62 (0.36–1.07)	0.082	0.41 (0.21–0.79)	0.008*
Knowledge of contraception	Yes (Ref)	1	—	1	—
	No	0.48 (0.28–0.81)	0.007*	0.55 (0.28–1.11)	0.093
Prior contraceptive use	Yes (Ref)	1	—	1	—
	No	0.77 (0.48–1.22)	0.254	0.52 (0.29–0.93)	0.028*

Table 6 above shows the outcome of both bivariate (unadjusted) and multivariable (adjusted) analysis. Following bivariate analysis, age less than 20 years (COR = 0.12; 95% CI: 0.02–0.76; $p = 0.025$), marital status (COR = 8.61; 95% CI: 3.95–18.78; $p < 0.001$), educational status (no education/primary education { COR = 0.16; 95% CI: 0.04–0.53; $p = 0.003$ }; secondary education { COR = 0.35; 95% CI: 0.21–0.56; $p < 0.001$ }), employment status (COR = 0.50; 95% CI: 0.29–0.85; $p = 0.01$), Age at coitarche (COR = 0.11 ; 95% CI: 0.02–0.48; $p = 0.004$), and knowledge of contraception (COR = 0.48; 95% CI: 0.28–0.81; $p = 0.007$) were identified to be statistically significantly associated with planned pregnancy.

However, after multivariable analysis, marital status (COR = 5.98 ; 95% CI: 2.43–14.69; $p < 0.001$), educational status (no education/primary education { COR = 0.15 ; 95% CI: 0.04–0.65 ; $p = 0.011$ }; secondary education{ COR=0.37; 95% CI: 0.21–0.65 ; $p = 0.001$ }), Age at coitarche (COR = 0.19 ; 95% CI: 0.04–0.96 ; $p = 0.044$), history of miscarriage (COR = 0.41 ; 95% CI: 0.21–0.79 ; $p = 0.008$) and prior use of contraception (COR = 0.52 ; 95% CI:0.29–0.93; $p = 0.028$) were the variables identified to be statistically significantly associated with planned pregnancy but age less than 20 years (COR = 0.94; 95% CI: 0.10–8.98 ; $p = 0.957$), employment status (COR = 0.83 ; 95% CI: 0.42–1.64 ; $p = 0.593$) and knowledge of contraception (COR = 0.55 ; 95% CI: 0.28–1.11; $p = 0.093$) did not remain statistically significantly associated with planned pregnancy.

4. Discussion

Pregnancy planning and preconception care have been identified as strategies with enormous potential for improving women's reproductive outcomes, especially for those who have had unfavorable reproductive outcomes in the past [11]. Since preconception care is only possible in the setting of planned pregnancy, it means that increasing the proportion pregnant women with planned pregnancy is a crucial strategy for improving pregnancy outcomes. Prevalence and determinants of planned pregnancy among antenatal attendees is largely unassessed in our environment. It was against this background that this study was carried out to assess the prevalence and determinants of planned pregnancy among antenatal attendees in Enugu State University of Science and Technology (ESUT) Teaching Hospital Parklane Enugu, Nigeria.

The mean age of the respondents of 29.84 ± 5.29 years as found in this study is slightly higher than that reported from related studies in Ethiopia (25.25 ± 4.7 years) [14] and Ghana (25.6 ± 6.5 years) [17]. Unlike the respondents from the above related studies majority of the respondents in our study had tertiary education (72.1%) hence pursuit of education may have delayed both their time of marriage and child bearing. The immediate catchment areas of the study center are all urban and this may explain why majority of the respondents (87.1) reported they were residing in urban areas. This contrasts with report from a related study in Pakistan where majority of the respondents were rural dwellers (50.1%) [13]. Majority of the respondents (93%) were married and this is similar to reports from related studies in Ethiopia [14,16].

Following assessment with London measure of unwanted pregnancy scale, prevalence of planned pregnancy among the respondents was found to be 72.6%. Although slightly higher, it is similar to reports by Ranatunga and colleague (70.1%) [19], Black and colleagues (70.6%) [20], Aslan and colleagues (71.3%) [21] as well as Habib and colleagues (61.8%) [13]. It is however significantly higher than that reported by Kluckow and colleagues as well as McCormick and colleagues (27%) [22]. The similarity in prevalence of planned pregnancy from this study and that of Ranatunga and colleague, Black and colleagues as well Habib and Colleagues may have resulted from the fact that London measure of unwanted pregnancy scale was used for assessment of pregnancy intention across these studies. Study by Kluckow and colleague was done in Solomon Island while study by McCormick and colleagues was done in America and some years back hence differences in setting and timing may explain the lower prevalence reported from their studies.

This study showed that marital status was a strong predictor of planned pregnancy. Married women were significantly more likely to have planned pregnancies compared to unmarried women (AOR = 5.98; 95% CI: 2.43–14.69; $p < 0.001$). In other words, married women were about 6 times more likely to have planned pregnancy compared to their unmarried counterparts. This is similar to report by McCormick and colleagues [22] and corroborates reports by Mohammed and colleagues in Ethiopia [14], Ranatunga and colleagues [19], Ahinkorah [23], Sanga and colleagues [24] as well as Gebremariam and colleagues [25]. Unmarried women are more likely to have sex in exchange for money or other favors hence the increased likelihood of resulting pregnancy not being planned.

Again, this study showed that educational status was another important determinant of planned pregnancy among the respondents. Women with lower education levels were less likely to have planned pregnancies compared to those with tertiary education. Women with no or primary education were about 6.7 times less likely (85% lower odds) to have a planned pregnancy (AOR = 0.15; 95% CI: 0.04–0.65; $p = 0.011$), while those with secondary education were about 2.7 times less likely (63% lower odds) (AOR = 0.37; 95% CI: 0.21–0.65; $p = 0.001$). This finding is similar to report by

Yanikkerem and colleagues [4]. It also corroborates reports by Habib and colleagues [13], Ranatunga and colleagues [19] as well as that of Sanga and colleagues [24]. It is understandable that respondents with tertiary education are more likely to know the benefits of planned pregnancy and hence more likely to plan their pregnancy. This however contrasts with report by Wasswa and colleagues [18]. The sociocultural differences between the study setting of this study and that by Wasswa and colleagues may account for the contrast in the findings.

Another factor which was found by this study to be significantly associated with planned pregnancy is age at coitarche otherwise referred to as age at first sexual activity. Women who had first sexual activity before age 20 were about 5.3 times less likely (81% lower odds) to have a planned pregnancy compared to women who initiated sexual activity at age 30 or above (AOR = 0.19; 95% CI: 0.04–0.96; $p = 0.044$). This is corroborated by findings in the report by Kluckow and colleagues [15] as well as that by Sanga and colleagues [24]. Women who initiated sexual activity early are more likely to be involved in a number of risky sexual behaviors hence the less likelihood of resulting pregnancy being planned. Report by Wasswa and colleagues [18] however contrasts with this finding hence they reported that women who had their first sexual activity at a higher age were less likely to plan their pregnancy and were at risk of unintended pregnancy. Again, sociocultural differences in the two study settings may account for the differences in the findings.

History of spontaneous miscarriage was another factor found by this study to be significantly associated with planned pregnancy although negatively. Women who had experienced a miscarriage were about 2.4 times less likely (59% lower odds) to have a planned pregnancy (AOR = 0.41; 95% CI: 0.21–0.79; $p = 0.008$). While natural expectation is that those who had lost previous pregnancies may be more likely to plan their next pregnancy to avoid repeat pregnancy loss, it is also possible that poor disposition towards pregnancy planning as well as poor health seeking behaviors may have been part of the reasons behind their previous miscarriages. Habib and colleagues [13] reported that history of previous miscarriage or termination of pregnancy was not significantly associated with pregnancy intention after multivariate analysis. More researches may be necessary to further evaluate the relationship between history of previous miscarriage and pregnancy planning.

Prior use of contraception was another factor identified by this study as significant determinant of planned pregnancy. Women who had never used contraception were about 2 times less likely (48% lower odds) to have a planned pregnancy compared to those who had used contraception (AOR = 0.52; 95% CI: 0.29–0.93; $p = 0.028$). This is corroborated by findings in the report by Habib and colleagues [13] as well as Wasswa and colleagues [18]. It follows logical reasoning that since contraceptives are used to prevent pregnancy those who had used it previously are more likely to be better armed with both knowledge and tools to plan their pregnancy.

5. Conclusion

The prevalence of planned pregnancy among the respondents was 72.6%. This is reasonable but can be better hence more enlightenment campaign is needed to both sustain the progress made and to improve upon it. Being married, having tertiary education and prior use of contraception among the respondents were identified as significant positive predictors of planned pregnancy while history of previous miscarriage and age at coitarche of less than 20 years were identified as significant negative predictors of planned pregnancy. As such, increased investment in and promotion of female education as well as increase in enlightenment campaign to promote use of contraceptives for prevention of pregnancy will go a long way in equipping our women with capacity to plan their pregnancies and ultimately reduce morbidities and mortalities associated with unplanned pregnancy. Clinicians saddled with responsibilities of taking care of women that had miscarriage should be very intentional about educating them on the need to plan their pregnancies. Campaign to encourage our youth especially the females to delay initiation of sexual activity may positively impact on their ability to plan their pregnancies in future.

Compliance with ethical standards

Disclosure of conflict of interest

The author declares that there is no conflict of interest.

Statement of ethical approval

Ethical clearance for the study was obtained from the ethics committee of ESUT Teaching Hospital Parklane Enugu, Enugu State Nigeria.

Statement of informed consent

The author declares that written informed consent was obtained from all the respondents.

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