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Determinants of Delayed Antenatal Initiation among Pregnant Women in Northern Nigeria

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Abstract

Delayed initiation of antenatal care (ANC) is associated with increased maternal mortality and pregnancy-related complications. This study examines the prevalence and predictors of delayed antenatal care (ANC) among women in Northern Nigeria, utilizing data from the 2018 Nigeria Demographic and Health Survey (NDHS), specifically the women's individual recode. Data analysis was conducted using Stata 14.0 at univariate, bivariate, and multivariate levels.

Univariate analysis revealed that 81.54% of pregnant women delayed initiating ANC beyond the first trimester. Bivariate analysis using Pearson's chi-square (χ^2) test identified significant relationships between delayed ANC and several predictors: women's education level [$\chi^2=148.88$, $p<0.05$], religion [$\chi^2=341.23$, $p<0.05$], wealth index [$\chi^2=60.42$, $p<0.05$], partner's education [$\chi^2=76.28$, $p<0.05$], region [$\chi^2=345.79$, $p<0.05$], and husband's desire for more children [$\chi^2=75.50$, $p=0.05$].

Multivariate logistic regression revealed that women with lower educational levels had higher odds of delayed ANC (OR = 0.76). Regional differences were notable: women in the Northeast (OR=1.56) and Northwest (OR=2.18) were more likely to delay ANC than those in North Central. Additionally, husbands desiring more children were associated with delayed ANC (OR=1.48).

The findings underscore the need for targeted interventions, including community-based health education and improved maternal healthcare access. Raising awareness on the importance of early ANC aligns with Sustainable Development Goal 3, which aims to ensure healthy lives and promote well-being for all at all ages, thereby contributing to reductions in maternal and child mortality

Keywords: Delayed, Antenatal Care, Pregnant Women, Northern Nigeria

1. INTRODUCTION

Antenatal care (ANC) plays a vital role in maternal healthcare, aiming to safeguard the health of both the expectant mother and her unborn child throughout pregnancy. Initiating ANC in the first trimester is particularly important, as it enables early detection and management of complications that may arise during pregnancy. Despite its significance, many women in developing regions—especially in Northern Nigeria—tend to delay their first ANC visit (WHO, 2016).

In Northern Nigeria, the rate of ANC attendance is notably lower than the national average, with rural communities being most affected. Although some women do seek antenatal services, a considerable number still choose to give birth at home, even when aware of the potential dangers. Contributing factors to the underutilization of ANC include poverty, limited education, and inadequate access to healthcare facilities (Emmanuel et al., 2024).

Pregnancy also presents an important opportunity to encourage healthy behavior and develop parenting abilities, further underscoring the value of ANC. Although there has been limited detailed research on the best time to begin ANC, evidence suggests that women who delay or entirely skip ANC are at greater risk for negative pregnancy outcomes (Alfred et al., 2020). Some studies have linked late ANC initiation to increased maternal mortality. Delayed ANC prevents women from receiving necessary care early on, hindering the prompt identification and treatment of complications (Bayisa et al., 2024).

Expanding access to maternal care during pregnancy, childbirth, and the postnatal period could significantly reduce both maternal and neonatal deaths. As such, ANC should be initiated as early as possible, whether at a hospital, health center, or through home visits by healthcare providers. This allows for adequate time to identify risk factors and conduct timely screenings and referrals when necessary (Adugnaw et al., 2022).

The 2016 WHO guidelines on antenatal care (ANC) for a positive pregnancy experience revised the recommended minimum number of ANC visits from four to eight, emphasizing that the first contact should occur within the first 12 weeks of pregnancy. This updated ANC framework not only increases the number of recommended visits but also underscores the importance of reaching women who delay starting ANC to help them complete the full schedule of eight visits.

Globally, around 330,000 women die each year due to pregnancy-related complications, with 99% of these fatalities occurring in developing regions of Africa and Asia. Notably, about 75% of these deaths are considered preventable. Effective prevention relies on a seamless continuum of care that ensures access to high-quality services before conception, throughout pregnancy, during delivery, and after birth. Crucially, the availability of support systems to help pregnant women access these services, especially during emergencies, plays a key role in reducing maternal and neonatal mortality (WHO, 2016).

This research aims to assess the determinants of delayed antenatal care initiation among pregnant women in Northern Nigeria. The respective objectives are to: determine the prevalence of delayed antenatal care initiation among pregnant women; identify the socio-demographic factors associated with delayed ANC initiation; investigate the socio-cultural factors associated with delayed ANC initiation.

Study Area

Nigeria, situated in West Africa, lies between latitudes 4°16' and 13°53' North and longitudes 2°40' and 14°04' East. The country stretches from the Gulf of Guinea in the south to the edge of the Sahara Desert in the north. This study targets a specific group of respondents: pregnant women aged 15 to 49 residing in Northern Nigeria. The data for this demographic was sourced from the 2018 Nigeria Demographic and Health Survey (NDHS).

2. METHODOLOGY

The 2018 NDHS is a national sample survey that provides up-to-date information on demographic and health indicators. The sample was selected using a stratified, two-stage cluster design, with enumeration areas (EAS) as the sampling units for the first stage. The target groups were women aged 15-49 in randomly selected households across Nigeria. A representative sample of approximately 42,000 households was selected for the survey. All women of reproductive age (15-49), either permanent residents of the households in the 2018 NDHS

sample or visitors present in the households on the night before the survey (Defacto enumeration), were eligible to be interviewed, with an inclusion criterion of those who are currently pregnant. The sample size of women aged 15-49 years used was 17,287. The NDHS dataset from 2018 women/individual recode was processed and analyzed using the Stata application package (Stata14.0). The data processing will be necessary before the proper analysis to measure the variables in this study accurately, so as to make the analysis well-presented and easily interpretable.

Univariate analysis was carried out using tables of frequency distribution to describe the background characteristics of the respondents, and the bivariate analysis was done using the Pearson Chi-square (χ^2) test to show the association between predictors and delayed ANC visitation with other socio-demographic characteristics that are categorical variables in the datasets. Furthermore, binary logistic regression is used in the multivariate analysis to identify the strength of association and examine the influence of predictors on delayed ANC in Northern part of Nigeria because the binary logistics is recorded < 12 weeks and > weeks in which < 12 weeks is recorded as 0 and > 12 weeks is recorded as 1.

3. RESULTS AND DISCUSSION

Table 1: Univariate Analysis of Delayed ANC and Other Predictors

Variables	Frequency	Percentage (%)
Timely ANC Initiation	1,734	18.46
Delayed ANC Initiation	7,662	81.54
Total	9,396	100.00
Respondent Current Age		
15-19	966	5.59
20-34	10,005	57.88
35-49	6,316	36.53
Total	17,287	100.00
Level of Education		
No Education	11,244	65.04
Primary	2,387	13.81
Secondary	2,815	16.28
Higher	841	4.87
Total	17287	100.00
Religions		
Christian	3,081	17.82
Islam	14,141	81.80
Traditionalist	65	0.38
Total	17,287	100.00
Wealth Index		
Poorest	5,226	30.23
Poorer	4,937	28.56
Middle	3,478	20.12
Richer	2,262	13.09
Richest	1,384	8.01
Total	17,287	100.00
Place of Residence		
Urban	4,564	26.40
Rural	12,723	73.60
Total	17,287	100.00
Partner's Age		
Less than 25	261	1.51
25-34	3,805	22.01
35-44	5,696	32.95
45 +	7,525	45.53
Total	17,287	100.00

Partner's level of Education		
Primary or less	11,119	64.32
Secondary and above	6,168	35.68
Total	17,287	100.00
Parity: Number of living Children		
1-2	5,705	33.00
3-4	5,161	29.85
5 +	6,422	37.15
Total	17,287	100.00
Respondent Occupation		
Professional/Tech/Managerial	546	4.69
Sales/Services	8,312	71.46
Agric/Unskilled/Others	2,774	23.85
Total	11,632	100.00
Partner's Occupation		
Not working	760	4.39
Professional/Tech/Admin workers	1,896	10.97
Service Workers	6,073	35.13
Agric/Production Worker	8,444	48.85
Others	114	0.66
Total	17,287	100.00
Region		
North Central	3,795	21.95
North East	4,495	26.00
North West	8,997	52.05
Total	17,287	100.00
Husband's Desire for Children		
Sameness	4,958	28.76
Want More	9,735	56.49
Want Fewer	746	4.33
Uninformed	1,798	10.43
Total	17237	100.00

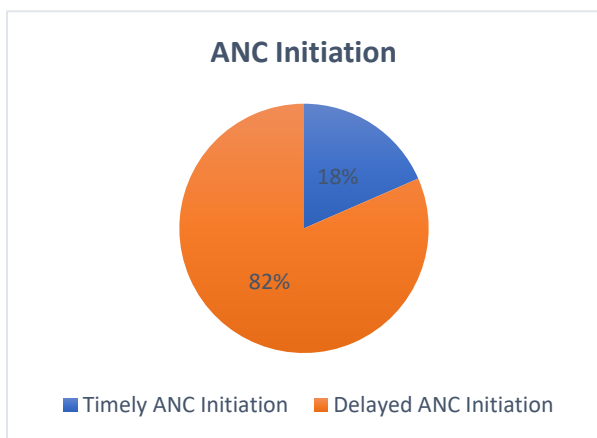


Figure 1: ANC Initiation

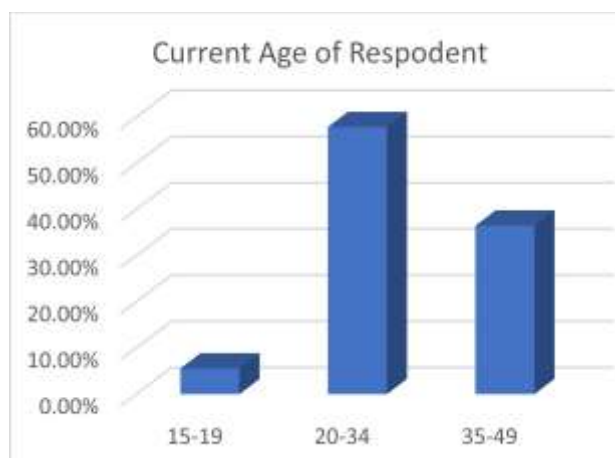


Figure 2: Age of the respondent

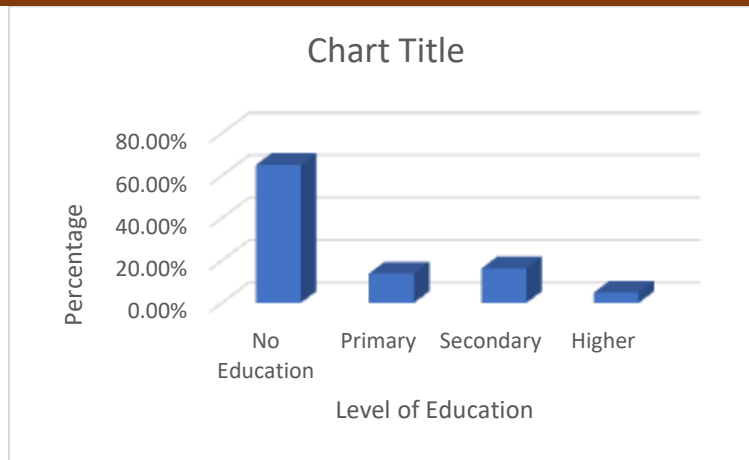


Figure 3: Level of Education

Table 1 presents the univariate analysis which indicates that 81.54 % of the Pregnant women in the Northern area delayed antenatal care initiation which indicates women of age 15-49 who were pregnant at that period does not attend antenatal care before 12 weeks of pregnancy while only 18.46 % of the pregnant women attended antenatal care at 12 weeks of pregnancy. The analysis also reveals that 65.04 % of the women (15-49) had no formal education, which implies that most of the women in the Northern part of Nigeria had no formal education, which had contributed to the delayed antenatal care visit.

Table 2 presents bivariate analysis, which reveals that level of education, religion, wealth index, parity (Number of living children), respondent’s occupation and region are also part of the predictors for delayed ANC with χ^2 , p-value (148.8775, 0.000), (341.23, 0.0000); (60.42, 0.0000); (53.67, 0.0000); (96.59, 0.0000); and (345.79; 0.0000) respectively. Hence, there is a statistically significant association between the aforementioned predictors and delayed ANC.

65 % and 4334% of the women who delayed ANC in the study area had no education, and most of the women who delayed ANC were Muslim, with 6409. and the women who could not afford the payment of ANC were large in number, with 1826 poorest and 2028 poorer. The women from the North West have the highest percentage of delayed antenatal care (4143; 52.05 %), and most of the women who engage in sales and services delayed ANC, according to the data analysis.

There is statistically significant different between the delayed antenatal care and other predictors like Partner’s Age ($\chi^2 = 10.40$; p-value 0.047); Partner’s level of Education ($\chi^2 = 76.28$; p-value 0.0000), it was deduced that most of their Partners only had primary or no education (4270) which also contributed to delayed antenatal care. Husband's desire for children ($\chi^2 = 75.50$; p-value 0.000) also acts as a strong predictor for delayed antenatal care, with 56 % (4366) of husbands desiring more children.

Table 2: Bivariate Analysis of Delayed ANC Socio-demographic Characteristics and Other Predictors

Variables	Timely ANC	Delayed ANC	Statistics: χ^2 , (P-value at 95 % CI)
Age			
15-19	114.4	499.8	1.0205, (0.6860)
20-34	1208	5256	
35-39	411.7	1906	
Level of Education			
No Education	732.2	4344	148.8775, (< 0.05)
Primary	313.7	1219	

Secondary	505.4	1671	
Higher	183.1	4273	
Religions			
Christian	611.1	1224	
Islam	1120	6409	341.2294, (< 0.05)
Traditionalist	3.38	28.63	
Wealth Index			
Poorest	329.1	1826	
Poorer	477.5	2028	
Middle	422.5	1813	60.4197, (< 0.05)
Richer	251.7	1280	
Richest	254.7	714.9	
Place of Residence			
Urban	510.8	2465	4.9745, (0.1800)
Rural	1224	5176	
Partner's Age			
< 25	38.45	126.7	
25-34	493.7	1981	10.4041, (0.0474)
35-44	674.4	3008	
45 +	527.8	2549	
Partner's level of Education			
Primary or less	767.9	4270	76.2847, (< 0.05)
Secondary & above	966.6	3392	
Parity			
1-2	756.4	2747	
3-4	529.8	2301	53.6667, (< 0.05)
5+	448.3	2614	
Mother's Occupation			
Professional/Tech	83.7	238.2	
Sales/Services	824.4	3964	96.5850, (< 0.05)
Agric/Unskilled/Others	395.2	985.2	
Partner's Occupation			
Not working	47.78	197.1	
Professionals	246.6	946.7	10.7791, (0.1395)
Services	668.4	3260	
Agric/Others	724	43.72	
Region			
North Central	650.2	1430	
North East	492.2	2088	345.7914, (< 0.05)
Northwest	592.1	4143	
Husband's desire for Children			
Sameness	647.9	2238	
Want more	812.8	4366	75.5033, (< 0.05)
Want fewer	91.68	325.1	
Uninformed	148.5	722.7	

Table 3: Multivariate Analysis on Predictors of Delayed Antenatal Care

Delayed ANC	Odd Ratio	p>/t/	95 % CI
Level of education			
No Education (RG)	1.000		
Primary	0.73	0.003	0.60-0.90
Secondary	0.66	0.000	0.54-0.80
Higher	0.41	0.000	0.29-0.57
Region			
North Central (RG)	1.000		1.25-1.94
North east	1.56	0.0000	1.25-1.94
North west	2.18	0.0000	1.74-2.72
Partner's Education			
Primary or Less (RG)	1.000		
Secondary & above	0.68	0.0000	0.59-0.79
Husband's Desire for Children			
Sameness (RG)	1.000		
Want more	1.48	0.0000	1.27-1.73
Want fewer	1.08	0.55	0.83-1.40
Uninformed	1.42	0.000	1.12-1.80

RG: Reference Group

The Multivariate analysis using binary logistic revealed that women with low education tend to delay antenatal care beyond the first trimester with an odds ratio (OR) of 0.76. Also, pregnant women from the Northeast and North West are more likely to delay antenatal care than the women from the North Central with OR 1.56 and 2.18, respectively. The multivariate analysis also shows that husbands who desire more children tend to delay antenatal care with an OR 1.48.

4. CONCLUSION AND RECOMMENDATION

Conclusion

The result of the analysis reveals that the level of education of the pregnant women is one of the factors that contributed to delayed antenatal initiation, and other factors such as wealth index, regions, partners' education and husband's desire for more children were found to have contributed to delayed antenatal care in Northern Nigeria.

Recommendation

Based on the results from this study, it is therefore recommended that:

- Health education on the timing and importance of attending antenatal care early should be done in communities where women and other people who influence pregnant women's decisions to attend antenatal care live, so that they get this information even before they conceive. This can be done through the media, places of worship, schools, and community gatherings;
- Community-based health education programs are needed to correct the misconception about antenatal care. The campaign for male involvement in issues of reproductive health, such as antenatal care, should be sustained so that they will get to know why it is important that their wives should book early for antenatal care.

- Promoting education, public health enlightenment, reduction in poverty, and modification of certain cultural practices could be helpful in mitigating hindrances resulting from these factors, thereby contributing towards the improvement in maternal and child health.
- There is a need for transitioning from the traditional approach of ANC to the Focused Antenatal Care (FANC) model recommended by WHO because some pregnant women are booked late due to the frequent antenatal care follow-up schedule.
- Efforts should also be made to promote maternal education to empower women to care for themselves during pregnancy.

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