RESEARCH

Prevalence and determinants of skilled birth attendance among young women aged 15–24 years in Northern Nigeria: evidence from multiple indicator cluster survey 2011 to 2021

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Abstract

Background Childbirth among adolescents and young mothers has been linked to various complications, including perinatal mortality, preterm births, low birth weight, and infections, which collectively contribute to the high burden of neonatal and maternal mortality. Despite some progress, the prevalence of skilled birth attendance, proven to improve maternal and newborn health outcomes, remains consistently low in Northern Nigeria. This study assessed the prevalence and determinants of Skilled Birth Attendance (SBA) among young women ages 15–24 years in Northern Nigeria.

Methods This pooled cross-sectional study included 6,461 young women aged 15–24 years from 2011, 2016 and 2021 multiple indicator cluster surveys in Nigeria. We used a binary logistic regression model to assess the factors associated with skilled birth attendance at 95% confidence intervals (CIs) with computed adjusted odds ratios (aORs).

Results The prevalence of skilled birth attendance among young women in Northern Nigeria increased from 25.6% in 2011 to 33.1% in 2021. Women who were atleast 18 years of age at first marriage had 2.48 higher odds of SBA (aOR 2.48, 95% CI = 1.54–4.00) compared those less than 18 years of age at first marriage after controlling for confounders. Young women from rich household wealth quintile were more likely to utilize SBA (aOR 1.84, 95% CI = 1.11–3.14) compared to young women from poor household wealth quintile. In terms of education, those women who had secondary (aOR = 2.52, 95% CI = 1.77–3.56) and higher education (aOR = 10.01, 95% CI = 2.21–49.31) had higher odds of SBA compared to those with no education. Individual women with media exposure had 59% higher likelihood (aOR = 1.59, 95% CI = 1.16–2.19), women who attended 4 or more antenatal care visits during their last pregnancy demonstrated 2.28 times higher odds (aOR = 2.28, 95% CI = 1.67–3.09), while those who reported no intention for their last pregnancy were 37% less likely (aOR = 0.63, 95% CI = 0.42–0.96) to utilize SBA.

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Conclusion A slight increase in the prevalence of skilled birth attendance was observed over the 10-year period. For a significant boost in skilled birth attendance among young women in Northern Nigeria, particular attention needs to be paid to girls' child education, delay in marriage, economic empowerment of young women, and strategic ways of leveraging trained community health workers (CHIPs) to bring reproductive healthcare close to young women living in rural areas.

Keywords Stillbirth attendance, Determinants, Prevalence, Young women, Northern Nigeria

Introduction

There has been significant progress recorded in various countries towards reducing maternal morbidity and mortality [1]. Despite this progress, the use of maternal and child healthcare services in Nigeria has been suboptimal, and a consequent slow progress in reaching the targets set by the Federal Ministry of Health for reducing maternal and child deaths [2, 3]. One in twenty-two women in Nigeria are at risk of dying owing to pregnancy, childbirth, or during the post-delivery period, and this is much higher than in developed nations, and keeps Nigeria's maternal mortality ratio (MMR) as 814/100,000 live births [4].

Poor referral systems, haemorrhage, pregnancy-induced hypertension, suboptimal infrastructure, shortage of healthcare staff, and late healthcare-seeking have been associated with the high MMR in different countries including Nigeria [5]. Only about 30% of childbirths in Nigeria occur in healthcare facilities and are attended to by skilled health workers including midwives, nurses, and doctors [6]. Notably, about half of these deaths occur in women who have been referred from 'mission delivery homes' and from traditional birth attendants (TBAs) [5]. The brain-drain of healthcare workers to developed economies for better opportunities to work with 'standard equipment' to build competencies and for better pay, has resulted in an alarming shortage of healthcare staff within health facilities in low-and-middle-income countries [7].

In Nigeria, a significant number of pregnant women undergo childbirth at home without the presence of skilled health professionals (nurses, midwives, and/or doctors) [8]. One key indicator to estimate progress in achieving the Sustainable Development Goals (SDGs) is the uptake of Skilled Birth Attendance (SBA), defined as the management of labour/delivery by a certified healthcare worker (nurses, midwives, and/or doctors), to adequately identify and manage birth-related complications and to quickly proffer referrals for specialized care when needed [9]. Although complications with childbirth are not predictable, they are preventable/manageable with the intervention of SBA in healthcare settings. Evidence exists that the patronage of healthcare facilities and utilization of SBA during delivery can reduce obstetric complications and consequently, maternal deaths [10].

As per the United Nations definition of 'youths' as people between the ages of 15–24 years, mothers represented in this category are classified as vulnerable, especially in the Northern regions of Nigeria, owing to several factors including increased likelihood of health issues (like HIV and other sexually transmitted infections), socio-economic inequities (lower education levels, under-employment and unemployment) and unplanned/unintended pregnancies [11, 12]. Several studies have documented an increased risk of obstetric complications among adolescent and young mothers (15–24 years), as deliveries among this category of mothers are linked with perinatal mortality, pre-term births, low birth weight, and infections which contribute to the high burden of MMR and neonatal mortality in Nigeria [12, 13].

Reducing the burden of maternal and child deaths is a major target of the SDGs, which are even more prioritized in Nigeria owing to the poor maternal, newborn, and child health figures in the country [14]. Globally, of the 1.6 million maternal death risks projected, 33.3% of this figure is projected to be contributed from Nigeria [14]. To ensure attaining the SDGs, reduction in maternal deaths in Nigeria must be reduced to less than 15.1% by 2030 [12]. Improved patronage of healthcare facilities SBA during delivery would contribute to realizing the SDGs as they are proven to be relevant in preventing, identifying, and managing obstetric complications, especially among adolescent and young mothers. Disparities in the MMR based on subnational levels have been observed over time. For instance, the southern regions of Nigeria have a lower MMR (365/100,000 live births) than the northern regions of the country (709/100,000 live births) [1]. Previous studies have documented consistently lower levels of ANC services utilization and SBA during deliveries in Northern Nigeria in comparison with the South-Western and South-Eastern regions of the nation [15–17].

The predictors of healthcare facility patronage for delivery in Nigeria have been examined by several studies, reporting an association between the preferred place of delivery and demographic factors such as educational status, religion, urban-rural residence, and age of the mother [8, 15, 16]. However, until now, existing studies in Nigeria have focused on assessing the factors associated with health facility delivery for all reproductive-age women (15–49 years), and no study has examined the

determinants of healthcare facility delivery among young mothers between the ages of 15–24 years in the northern regions of Nigeria. Hence, this analysis sought to assess the prevalence and determinants of Skilled Birth Attendance among women ages 15–24 years in Northern Nigeria using evidence from the Multiple Indicator Cluster Surveys between 2011 and 2021 in Nigeria.

Data sources

Data from the 2011, 2016/17, and 2021/22 Multiple Indicator Cluster Survey (MICS), a nationally representative, cross-sectional descriptive survey that covers the entire population residing in the six geopolitical zones in the country, were used for the analysis. This study employs a two-stage sampling method to generate a population-based sample. In the first stage of both surveys, 40 clusters/EAs in 2011 and 60 clusters/EAs in 2016 and 2021 were selected in accordance with the probability proportional to the size of the Enumerated Areas (EAs). The second stage of the survey methodically selected 20, 16, and 20 households from each cluster or enumeration area, respectively.

Interviews with women aged 15–49 years were used to collect information for this study. With a response rate of over 91% in each of the survey rounds, 30,791 (2011), 34,376 (2016), and 38,806 (2021) respondents were interviewed successfully. The combined study data were derived from the 2011, 2016, and 2021 (n=103,973) rounds of the MICS in Nigeria provided information on health, education, and child protection for children and women. The MICS is a five-year interval nationwide survey with a representative sample of women. Of the 103,973 women interviewed, 6,461 met the inclusion criteria for this study of being between the ages of 15 to 24 years and having given birth in the last two years.

The sampling, pretesting, and general methodology of 2011, 2016, 2021 MICS have been published elsewhere [17–19]. Through the global MICS programme, UNICEF and WHO BMGF provided technical and financial assistance to the National Bureau of Statistics, which implemented the survey with support from other agencies.

Dependent variable

The main outcome variable, skilled birth attendance, was derived from responses to the question, "Who assisted with the delivery?" with answers categorized as either health personnel or other people. Health personnel in the study included doctors, nurses, nurse/midwives, and auxiliary midwives, while other people consisted of traditional birth attendants, community health workers, friends, relatives, and those who received no assistance. Skilled birth attendance refers to assistance provided during childbirth by an auxiliary midwife, nurse/midwife, or doctor.

Independent variables

This study considered thirteen explanatory variables based on their availability in the dataset and their association with skilled delivery in previous research [20–23]. The variables included maternal age (less than 19, 20 to 24 years), education (no education, primary, secondary, or higher), wealth status (poor, middle, rich), marital status (currently married/formerly married/never married), place of residence (rural or urban), parity (1, 2, 3,4 or more), antenatal care (ANC) attendance (less than 4, 4 or more), type of ANC provider (none, not trained medically, trained medically), prior health service utilization (no, yes), exposure to mass media (no, yes), and age at first marriage (less than 18, 18, or more).

Statistical analysis

The authors carried out descriptive and multivariate analyses, initially adjusting for disproportionate sampling and non-response using sample weighting. In the descriptive analysis, Pearson's chi-square test was used to ascertain the association between the outcome variable and independent variables within their respective categories. Study variables that met the bivariate analysis level p-value threshold of less than 0.05 were taken into consideration for the model. Finally, a binary logistic regression model was employed to evaluate factors associated with skilled birth attendance, with adjusted odds ratios (aORs) computed at 95% confidence intervals (CIs). All study data were analyzed using IBM SPSS version 25.

Ethical approval

The dataset used for this research are freely available in the public domain and can be downloaded from https://mics.unicef.org/surveys. To ensure confidentiality, certain features that might have allowed study participants to be identified were excluded. However, the Global MICS program permitted the authors to use the datasets as secondary studies. Prior to the survey, approval for the MICS project was obtained from the National Health Research Ethics Committee of Nigeria and ICF Ethics Committee.

Results

Trend of skilled birth attendance among young women aged 15–24 years in Northern Nigeria: 2011–2021

Figure 1 presents a pictorial view of the trend of skilled birth attendance among young women aged 15–24 years in Northern Nigeria. Generally, it was found that the prevalence of skilled birth attendance increased from 25.6% in 2011 to 33.1% in 2021 as shown in Fig. 1.
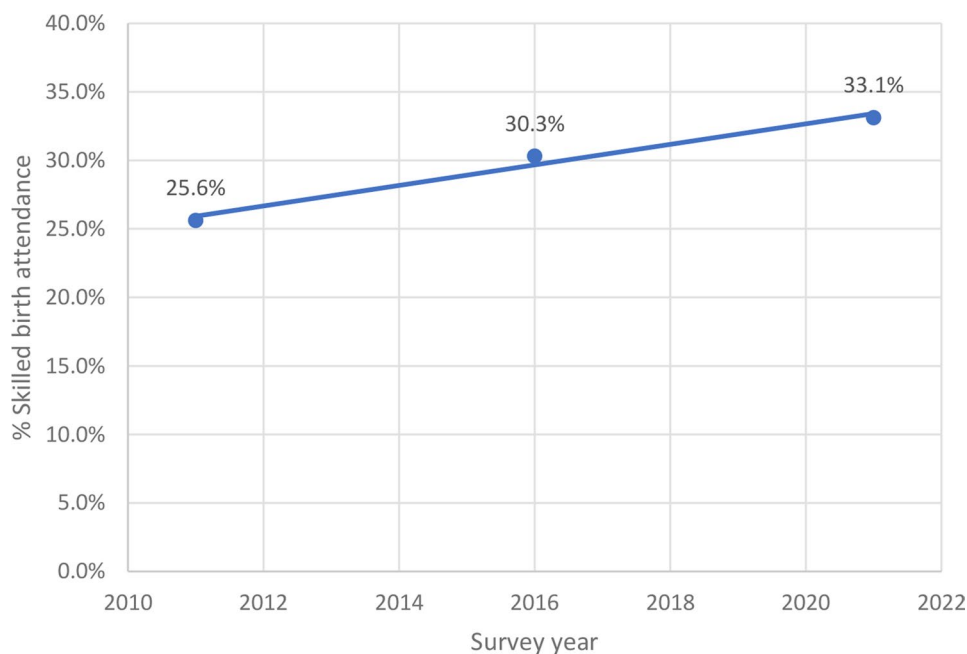
Fig. 1 Trend of Skilled Birth Attendance from 2011 to 2021 among Young Women aged 15–24 years in Northern Nigeria

Selected characteristics of women aged 15–24 years in Northern Nigeria: 2011–2021

Descriptive statistics

Sociodemographic characteristics of the participants are presented in Table 1. A total of 6,461 young women met the inclusion criteria for this study: less than 27% were aged 19 years and below, while more than half (73.5%) were between the ages of 20 and 24 years. The majority of the respondents had their first marriage at less than 18 years of age (88.4%), and 81.9% resided in rural areas. Of the participants, 17.1% had no educational qualifications, 31.4% had secondary education, and 13.6% had higher education. Additionally, 63.0% of the respondents belonged to the poorest category of the household wealth quintile, 19.8% were in the middle quintile, and 17.2% were in the rich quintile. Most participants (95.8%) were married. A higher proportion of respondents (67.1%) were exposed to the media. More than half (61.0%) of the respondents had at least 2 children. Less than one-quarter (30.4%) reported that their partner or husband had other wives. Most women (87.5%) wanted their last pregnancy. Of.0 of the respon, 67.0%dents claimed to had have four or more ANC v, isits and 5ders were trained medically.

Table 2 shows the association between young women's sociodemographic characteristics and skilled birth attendance. A higher proportion 31.0% of women aged group 20–24 years old reported using skilled birth attendance compared to those in the age groups ≤19 years (26.9%) ($p<0.001$). Age at first marriage was found to be significantly associated with skilled birth attendance, with more

young women who married at the age of 18 years or more (60.7%) compared to the young women less than 18 years (25.3%) ($p<0.001$). Young women who resided in urban areas reported higher skilled birth attendance (53.1%) than those residing in rural areas (24.8%) ($p<0.001$). Young women with at least a secondary education reported a higher rate of skilled birth attendance (52.5%) than women with no education (18.8%) ($p<0.001$). The socioeconomic status of the respondents was significantly associated with skilled birth attendance; the majority of the respondents in the richest quintile (64.1%) reported the use of antenatal care ($p<0.001$). Young women who were currently married reported skilled birth attendance at a lower rate (28.9%), compared to those who were formerly married (48.8%) and those who never married (57.1%) ($p>0.001$). Young women who were exposed to media such as television, radio, and newspapers reported a higher rate of skilled birth attendance (34.9%) than those who were not exposed (24.4%) ($p<0.001$). Young women who had only one child (38.4%) reported a higher rate of skilled birth attendance than young women who were multiparous (20.7%) ($p<0.001$). Respondents who reported that their husbands or partners had no other wives had a higher rate of utilization of antenatal care services ($p<0.001$). Young women who had four or more ANC visits (50.1%) reported skilled birth attendance at a higher rate compared to those who had fewer than four visits (33.2%). In addition, young women whose ANC providers were trained medically, such as a doctor, nurse, or midwife (48.1%), reported skilled birth attendance at a higher rate compared to those whose ANC providers

Table 1 Socio-demographic characteristics of weighted sample population (MICS 2011–2021)

	2011	2016	2021	Pooled 2011–2021
	n (%)	*n* (%)	*n* (%)	*n* (%)
Women age				
15–19	452(25.2%)	757(27.6%)	503(26.1%)	1712(26.5%)
20–24	1340(74.8%)	1984(72.4%)	1425(73.9%)	4749(73.5%)
Mean (±SD)	19.3.1±2.6	19.0±2.8	19.0±2.7	19.0±2.7
Age at first marriage				
Less than 18 years	1548(88.1%)	2426(89.9%)	1649(86.7%)	5623(88.4%)
18 years and more	210(11.9%)	274(10.1%)	253(13.3%)	737(11.6%)
Place of residence				
Urban	302(16.9%)	514(18.8%)	351(18.2%)	1167(18.1%)
Rural	1490(83.1%)	2227(81.2%)	1577(81.8%)	5294(81.9%)
Level of education				
No education	0(0.0%)	0(0.0%)	1102(57.2%)	1102(17.1%)
Primary	1197(66.8%)	950(34.6%)	303(15.9%)	2450(37.9%)
Secondary	595(33.2%)	953(34.8%)	481(24.9%)	2029(31.4%)
Higher	0(0.0%)	839(30.6%)	42(2.2%)	881(13.6%)
Marital status				
Never married	34(1.9%)	39(1.4%)	25(1.3%)	98(1.5%)
Married/Living with partner	1709(95.4%)	2627(95.9%)	1853(96.2%)	6189(95.8%)
Formerly married	48(2.7%)	39(1.4%)	49(2.5%)	170(2.6%)
Husband has more partners				
No	1147(67.4%)	1827(69.7%)	1330(71.7%)	4304(69.6%)
Yes	555(32.6%)	796(30.3%)	525(28.3%)	1876(30.4%)
Household wealth index				
Poor	1212(67.6%)	1566(57.1%)	1295(67.2%)	4073(63.0%)
Middle	313(17.5%)	641(23.4%)	328(17.0%)	1282(19.8%)
Rich	268(14.9%)	534(19.5%)	305(15.8%)	1107(17.2%)
Exposure to media				
No		292(10.7%)	1246(64.6%)	1538(32.9%)
Yes		2449(89.3%)	682(35.4%)	3131(67.1%)
Intention of the last pregnancy				
Wanted at that time	1573(91.6%)	2366(86.4%)	1639(85.4%)	5578(87.5%)
Not wanted at that time	145(8.4%)	373(13.6%)	281(14.6%)	799(12.5%)
Desire for more children				
More children	130(89.7%)	307(82.3%)	258(91.5%)	695(86.9%)
No more children	15(10.3%)	66(17.7%)	24(8.5%)	105(13.1%)
Number of children ever born				
1	676(37.7%)	1059(38.6%)	782(40.6%)	2517(39.0%)
2	471(26.3%)	850(31.0%)	629(32.6%)	1950(30.2%)
3	380(21.2%)	560(20.4%)	336(17.4%)	1276(19.8%)
4 or more	264(14.7%)	272(9.9%)	181(9.4%)	717(11.1%)
Number of ANC visits during the last pregnancy				
Less than 4	264(28.9%)	611(37.2%)	402(30.5%)	1277(33.0%)
4 or more	648(71.1%)	1033(62.8%)	917(69.5%)	2598(67.0%)
Type of ANC provider				
Not trained medically (TBA, CHW, Others)	825(48.9%)	1051(39.8%)	788(42.0%)	2664(42.9%)
Trained medically (Doctor, Nurse, Midwife)	861(51.1%)	1593(60.2%)	1086(58.0%)	3540(57.1%)
Prior health service utilization (proxy: has immunization card)				
No	473(54.0%)	624(55.0%)	1028(53.4%)	2125(54.0%)
Yes	403(46.0%)	510(45.0%)	897(46.6%)	1810(46.0%)

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Table 2 Bivariate and multivariate analyses of skill birth attendance among young women of reproductive age (15–24) in Northern Nigeria (MICS 2011–2021) (weighted sample)

Variables	Skilled Birth Attendance		Chi-square test	Binary Logistic Regression
	NSBA (%)	SBA (%)	P value	AOR (95%CI)
Women age			0.002*	
15–19	1233(73.1%)	453(26.9%)		1
20–24	3249(69.0%)	1458(31.0%)		1.13 (0.80–1.59)
Age at first marriage			<0.001*	
Less than 18 years	4149(74.7%)	1408(25.3%)		1
18 years and more	288(39.3%)	444(60.7%)		2.48 (1.54-4.00)*
Place of residence			<0.001*	
Urban	544(46.9%)	616(53.1%)		1
Rural	3937(75.2%)	1295(24.8%)		0.68 (0.44–1.04)
Level of education			0.001*	
No education	895(81.2%)	207(18.8%)		1
Primary	1970(82.1%)	430(17.9%)		0.94 (0.65–1.35)
Secondary	952(47.5%)	1054(52.5%)		2.52 (1.79–3.56)*
Higher	662(75.1%)	219(24.9%)		10.01(2.21–45.39)*
Marital status			<0.001*	
Never married	42(42.9%)	56(57.1%)		1
Married/Living with partner	4350(71.1%)	1770(28.9%)		0.33 (0.10–1.11)
Formerly married	87(51.2%)	83(48.8%)		0.63 (0.16–2.53)
Husband has more partners			0.001*	
No	2875(67.4%)	1388(32.6%)		1
Yes	2875(79.4%)	380(20.6%)		1.66(1.19–2.31)*
Wealth index			<0.001*	
Poor	3288(81.8%)	734(18.2%)		1
Middle	798(62.8%)	473(37.2%)		1.09 (0.76–1.56)
Rich	395(78.3%)	704(64.1%)		1.84 (1.11–3.04)*
Exposure to media			<0.001*	
No	1162(75.6%)	376(24.4%)		1
Yes	2035(65.1%)	1093(34.9%)		1.59 (1.16–2.19)*
Intention of the last pregnancy			0.006*	
Wanted at that time	3936(70.6%)	1636(29.4%)		1
Not wanted at that time	526(65.9%)	272(34.1%)		0.63 (0.42–0.96)*
Desire for more children			0.433	
More children	454(65.3%)	241(34.7%)		
No more children	72(69.2%)	32(30.8%)		
Number of children ever born				
1	1527(61.6%)	952(38.4%)	0.001*	1
2	1412(72.8%)	528(27.2%)		0.69 (0.49–0.97)*
3	980(77.5%)	285(22.5%)		0.74 (0.49–1.12)
4 or more	561(79.3%)	146(20.7%)		0.65 (0.38–1.11)
Number of ANC visits during the last pregnancy			<0.001*	
Less than 4	853(66.8%)	424(33.2%)		1
4 or more	1295(49.9%)	1301(50.1%)		2.28 (1.67–3.09)*
Type of ANC provider			<0.001*	
Not trained medically (TBA, CHW, Others)	2646(99.3%)	18(0.7%)		1
Trained medically (Doctor, Nurse, Midwife)	1835(51.9%)	1703(48.1%)		71 (20.51-251.24)*
Prior health service utilization (proxy: has immunization card)			<0.001*	
No	1651(79.7%)	421(20.3%)		1
Yes	1187(66.1%)	608(33.9%)		1.23 (0.93–1.64)

Sources MICS 2011, 2016, 2021, *p* < 0.05 were statistically significant, AOR = Adjusted Odd Ratio, CI = Confidence Interval, 1 = Reference Category. – Excluded variables

were not trained medically, such as a traditional birth attendant, CHW, and others. (0.7%) (*p* < 0.001).

A multivariate analysis was conducted, as shown in Table 2. Variables in the bivariate analysis that were statistically significant (*p* < 0.05) were further considered in the multiple logistic regression models of adjusted odds ratios.

As shown in Table 2, the model shows that young women who had their first marriage at 18 years and above had higher odds [aOR = 2.48, 95% CI = 1.54–4.01] of using skilled birth attendance compared to those who had their first marriage below the age of 18. Furthermore, there were higher odds of skilled birth attendance among young women with secondary and higher levels of education [aOR = 2.52, 95% CI = 1.77–3.56], [aOR = 10.01, 95% CI = 2.21–49.31] compared to those with no education. Women whose husbands had more partners had higher odds [aOR = 1.66, 95% CI = 1.19–2.31] of delivery through skilled birth attendance compared to otherwise.

In addition, those in the rich quintile had significantly higher odds [aOR 1.84, 95% CI = 1.11–3.14] of skilled birth attendance than those in the poor quintile. Young women who were exposed to media such as television, radio, and newspapers had higher odds [aOR 1.59, 95% CI = 1.16–3.14] of skilled birth attendance than those who were not exposed to media. In addition, young women who did not intend to last pregnancy had lower odds [aOR 0.63, 95% CI = 0.42–0.96] of skilled birth attendance compared to others. Young women with at least two births [aOR 0.69, 95% CI = 0.49–0.97] had lower odds of skilled birth attendance compared to those with one birth only. Young women who had four or more ANC visits [aOR 2.28, 95% CI = 1.67–3.09] had higher odds of skilled birth attendance compared to those who had fewer than four ANC visits. Young women whose ANC providers were trained medically [aOR 71.0, 95% CI = 20.51-251.24] had higher odds of skilled birth attendance compared to those whose ANC providers were not trained medically.

Discussion
Data gathered from the survey show that across 2011–2021, there was an increase in skilled birth attendance among young mothers, from 25.6 to 33.1%. Generally, the low levels of skilled birth attendance could be attributed to the fact that the studies were conducted in Northern Nigeria, which has more rural areas than urban settlements [24]. Generally, rural areas have a dearth of skilled healthcare services, and the available few might be suboptimal [25].

The increase in skilled birth attendance noticed over the years can be attributed to the spread of healthcare infrastructural development in Nigeria over the decade, which has seen more healthcare facilities situated in remote areas [10].

Socio-demographic characteristics of the weighted sample population
The results of the survey showed that out of the 103,973 respondents who were interviewed, 6,461 met the inclusion criteria. Although a good number of them (73.5%) were aged between 20 and 24 years, approximately 27% of them were aged 19 years and below.

The majority of study respondents (88.4%) had their first marriage at less than 18 years. This could in part, be accountable for the low levels of skilled birth attendance recorded (25.6-33.1%), as female youngsters and adolescents have limited knowledge about the importance of skilled healthcare in child delivery [26]. In addition to this, low education rates among the respondents could also be another constituent factor to the low skilled birth attendance rate, as only 13.6% of the respondents could manage a tertiary education. However, the most significant contributor to low levels of skilled birth attendance is the place of residence. Healthcare service accessibility is heavily dependent on residential areas, as urban settlements have greater access to skilled healthcare in contrast to rural areas [27]. Approximately 81.9% of the study respondents resided in rural areas, and this notably affected their access to quality healthcare services. This is because, aside from the fact that healthcare facilities are more rampant in urban areas than in rural areas, there tends to be a limited number of quality healthcare outfits in rural areas [28, 29]. Hence, the available few might be overpopulated and overpriced, which further culminates in reduced access to quality healthcare for rural residents.

Bivariate and multivariate analyses of skill birth attendance among young women of reproductive age (15–24) in Northern Nigeria
The model generated from the data shows that the respondents who had their first marriage at 18 years and above had a higher tendency to use skilled birth attendance than their counterparts who had their first marriage at age 18 and below. This is justifiable, given the fact that exposure and maturity generally come with age [30]. Due to their enlightenment of the cases of others, older women tend to be better braced and prepared for child delivery than younger women. Hence, they understand the need for skilled healthcare in childbearing, especially during the first childbirth. Furthermore, young women below the age of 18 years might be considered minors by their husbands and may not have a will of their own [31]. This becomes problematic in cases where their husbands do not think skilled healthcare is necessary for childbirth, as the woman would never get it even if she demands it.

Analyses of the survey data also showed that women who attained secondary education and tertiary education had higher odds of delivery through skilled birth attendance compared to those with primary education and

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uneducated ones. This can be justified by the assertion that the level of education one receives is likely commensurate with their acceptance of skilled healthcare services [32]. This is because they understand the importance of quality healthcare more, and the risks associated with improper handling of childbirth, more than the less educated ones. Analyses of the survey data also showed that women whose husbands had more partners had a higher chance of receiving skilled birth attendance than those whose husbands did not. Generally, in the African tradition, it takes a wealthy man to have more than one wife [33]. Therefore, it is safe to assume that women whose husbands have more partners would get skilled birth attendants because their husbands would have to afford it. Additionally, her co-wives, who understand the need for skilled handling of childbirth, play a vital part in persuading their husbands to provide such for them.

Women in the rich quintile were also observed to have a higher chance of receiving skilled birth attendance, much more significantly than those in the poor quintile. Subscription to skilled birth attendance comes at no cheap cost, and hence, this might limit its accessibility to individuals of every social class [23]. Hence, a greater number of individuals accessing skilled birth attendance would belong to the rich class, while those in the poor quintile would settle for cheaper and more sub-standard options that suit their means. These findings are in congruence with those of a study conducted in Ghana [34] which showed that mothers from rich backgrounds had higher odds of accessing skilled birth attendance than mothers from poor backgrounds.

Results from the analysis showed that women who were exposed to media such as television, radio, and newspapers had higher odds of skilled birth attendance compared to those not exposed to any form of media. This is because the media provides some form of enlightenment on the essence of skilled birth attendance, and those not exposed to mass media may have very little knowledge of its practice [35]. Secondly, individuals who access the mass media are mostly literate persons, which implies that the respondents not to it could be uneducated, which also means they have little knowledge of skilled birth attendance. Consistent with this finding are previous studies in Nigeria which have demonstrated that education of mothers, awareness of and access to ANC information, occupation and previous place of delivery were important predictors of SBA utilization [8, 33].

According to the results, young women with no intention of pregnancy had a lower chance of skilled birth attendance. This could be because the pregnancy was unplanned and might have occurred when the couple did not have enough money to source skilled birth attendance. In addition, results from the analyses also showed that young women who had at least two births had lower odds of skilled birth attendance than young women who had one birth only. This is justifiable given that primigravida tends to present complicated cases of childbirth in comparison to a multiparous woman [36]. ANC was another factor that was found to influence the odds of skilled birth attendance, as the results showed that women who had four more ANC visits had higher tendencies of skilled birth attendance. Due to professional counsel received from health experts, women who visit the ANC tend to subscribe to skilled birth attendance in a bid to avoid childbirth complications [22]. Hence, a higher frequency of these visits would generally increase the chances of using skilled birth attendance. Moreover, the quality of ANC service received also affects the tendency of women to opt for skilled birth attendants [37]. Results showed that young women whose ANC providers were trained medically had higher odds of skilled birth attendance than those whose ANC providers were not. This statistic is consistent with findings by Mohammed et al. (2022) in Ethiopia, which showed that women who had a higher quality of ANC service were 20% more likely to use skilled birth attendants than those who received low-quality ANC service [38]. This is because medically trained health personnel offer more professional and in-depth enlightenment to patients, unlike healthcare staff who have little or no medical training [39].

Limitations

The study findings did not address culture as an influencer of the uptake of skilled birth attendance. Typically, culture is a highly influential factor in the life decisions of Africans, especially those involving modernization. In some African climes, skilled birth attendance is not supported because of the belief that it erodes their pre-established traditional way of child delivery and tampers with their culture. This knowledge gap ought to be filled by subsequent literature on this topic. Furthermore, religious beliefs, which can affect the uptake of modern healthcare procedures, were not considered.

Conclusion

This study evaluated the uptake of skilled birth attendance among young women of reproductive age (aged 18–24) in Northern Nigeria from, to 2011–2021. Findings from the study showed that over a 10 years period, there was a slight increase in skilled birth attendance from 25.6 to 33.1%. Selected determinants were associated with the increase observed: older age group, education, exposure to media, and improvement in wealth status. For a significant improvement to be seen with respect to use of skilled birth attendants among young adults, we recommend the improvement in girl child education to a minimum of secondary school education be enforced by government. In addition, because most residents in

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Northern Nigeria live in rural areas, primary health care services could be brought to them through the engagement of trained community health workers (CHIPs) that will serve as linkages to skilled birth attendants. Furthermore, community enlightenment for a behavioral change in the importance of good child education, delay in age of marriage, exposure to educational materials through media, and economic empowerment of young women will greatly assist in the improvement of the sexual and reproductive health of young women.

Declarations

Ethics and consent
This study was a secondary data analysis of the NDHS, which is publicly available, and approval was granted for its use. Written consent was obtained from the mothers/caregivers (signed or thumb-printed) and data were recorded anonymously at the time of data collection. All methods were performed in accordance with the relevant guidelines and regulations.

Competing interests
The authors declare no competing interests.

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