RESEARCH ARTICLE

Prevalence and determinants of facility-based delivery among married adolescent girls in Northern Nigeria: A population based cross-sectional study

DOI: 10.29063/ajrh2025/v29i9.14

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Abstract

This study assessed the prevalence and determinants of facility-based delivery among married adolescent mothers in Northern Nigeria. We analysed pooled data of 2,628 adolescents aged 15 – 19 years from the NDHS 2008, NDHS 2013 and NDHS 2018. Only 18.26% of the adolescent mothers utilized health facility for delivery. Girls with secondary/higher education (aOR 1.82; 95% CI 1.15 – 2.90), girls who were of the 'rich' wealth index (aOR 1.64; 95% CI 1.13 – 2.38), girls who attended more than four antenatal visits, girls who considered distance to health facility not a big problem were more likely to deliver in a health facility. Girls who lived in rural areas (aOR 0.89; 95% CI 0.63 – 1.13) had lower odds of delivering in a health facility. Policy makers and programme managers should of importance, utilize these determinants in designing interventions and policies aimed at increasing health facility delivery for married adolescent girls in Northern Nigeria *(Afr J Reprod Health 2025; 29 [9]: 148-158)*

Keywords: Health facility delivery, Adolescents, Adolescent pregnancy, Northern Nigeria

Résumé

Cette étude a évalué la prévalence et les déterminants de l'accouchement en établissement de santé chez les mères adolescentes mariées du nord du Nigéria. Nous avons analysé les données regroupées de 2 628 adolescentes âgées de 15 à 19 ans issues des NDHS 2008, 2013 et 2018. Seules 18,26 % des mères adolescentes ont accouché en établissement de santé. Les filles ayant suivi un enseignement secondaire ou supérieur (ORa : 1,82 ; IC à 95 % : 1,15 - 2,90), celles appartenant à l'indice de richesse « riche » (ORa : 1,64 ; IC à 95 % : 1,13 - 2,38), celles ayant effectué plus de quatre consultations prénatales et celles estimant que la distance par rapport à un établissement de santé n'était pas un problème majeur étaient plus susceptibles d'accoucher en établissement de santé. Les filles vivant en zone rurale (ORa : 0,89 ; IC à 95 % : 0,63 - 1,13) présentaient une probabilité plus faible d'accoucher en établissement de santé. Les décideurs politiques et les gestionnaires de programmes devraient impérativement utiliser ces déterminants pour concevoir des interventions et des politiques visant à accroître l'accès aux soins pour les adolescentes mariées dans le nord du Nigéria. *(Afr J Reprod Health 2025; 29 [9]: 148-158).*

Mots-clés: Accès aux soins, Adolescentes, Grossesse chez les adolescentes, Nord du Nigéria

Introduction

Adolescent pregnancy is a global public health problem[1]. Every year, about 16 million adolescent girls aged 15 – 19 years and two million girls under the age of 15 give birth yearly[2]. Majority of adolescent births occur in low- and middle-income countries and nearly one-fifth of adolescents become pregnant in Africa[2,3]. Adolescent pregnancy is detrimental to the health of the mother and child[1]. [2]Maternal complications of adolescent pregnancy include anaemia, pre-eclampsia, obstetric complications including obstetric fistulas, puerperal sepsis and maternal mortality[1]. Pregnant adolescents are at increased risk for neonatal complications such as intrauterine growth retardation, prematurity, low birth weight, stillbirth and neonatal mortality[1]. Stillbirths and newborn deaths are 50% higher among infants born to adolescents compared with those born to mothers aged 20–29 years[2]. In developing countries, more than 70,000 adolescent girls die every year due to

complications from pregnancy and childbirth[3-6]
In Nigeria, 1 in 5 adolescents aged 15-19 are already mothers or pregnant with their first child, with teenage pregnancy prevalence ranging from a low of 1% in Lagos to a high of 41% in Bauchi, and the highest rates are seen in Northern Nigeria[7]. Nigeria also has the 11th highest prevalence of child marriage globally and 43% of girls in Nigeria are married before their 18th birthday[4]. In Northern Nigeria, the harmful practice of child marriage is very prevalent resulting in high rates of adolescent pregnancy and not without its concomitant health and social implications[8]. It is thus imperative to ensure safe deliveries and best health outcomes for these girls who are already disadvantaged socially and, in most cases, economically.

Assistance by properly trained health personnel working in an enabling environment is a key factor in eliminating preventable maternal and newborn deaths, thus all childbirths including those of adolescents should take place in health facilities where obstetric complications can be best treated when they arise[9]. It is important to identify the determinants of heath facility delivery among adolescent mothers in Northern Nigeria as this group form a significant percentage of adolescent pregnancies in Nigeria and are often overlooked. A study assessed the determinants of safe delivery among adolescents in Nigeria using data from the 2008 Nigeria Demographic and Health Survey (NDHS)[10]and another study examined the patterns and determinants of traditional birth attendance and skilled birth attendance among adolescent mothers in Nigeria[11].[12]To date, there is no similar study to assess facility-based delivery or skilled birth attendance carried out on data from adolescent girls in Northern Nigeria. This study will assess the prevalence and determinants of facility-based delivery among married adolescent mothers in Northern Nigeria. Findings will inform interventions and strategies to improve maternal health among this group of women.

Methods

Study design

This was a cross-sectional study that used secondary data from NDHS 2008, NDHS 2013 and NDHS 2018.

Study population and study setting

This study uses a sub-sample of adolescents 15 – 19 years with a live birth in the preceding five years of the 2008, 2013, and 2018 NDHS and living in either of the three Northern geopolitical zones of Nigeria. Nigeria comprises of six geopolitical zones – Northwest, Northeast, Northcentral, Southeast, Southsouth and Southwest[13]. Northern Nigeria comprises of the three Northern zones which have similar ethnic groups and culture[14]. The predominant ethnic group in Northern Nigeria is the Hausa ethnic group. The Northcentral zone comprises of six states (Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau) and the FCT[14]. It has a population of about 20 million people, around 11% of the total population of Nigeria[15]. The Northeast also comprises six states – Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe and has a population of about 26 million people, around 12% of the total population of the country[16]. The Northwest comprises of seven states – Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, and Zamfara and has an approximate population of 49 million people, around 23% of the total population of the country[17].

Data source

We analysed pooled data from the NDHS 2008, NDHS 2013 and NDHS 2018. Demographic and health surveys (DHS) are nationally representative surveys carried out every five years and which provide important health, nutrition and demographic indicators.
The NDHS is carried out every five years and has the objective of providing information on the basic demographic and health indicators in Nigeria. The survey collects information on awareness and use of family planning methods, fertility, breastfeeding practices, maternal and child health, nutritional status of women and children, adult and childhood mortality, domestic violence, female genital cutting, women's empowerment, awareness and behaviour regarding HIV/AIDS and other sexually transmitted infections (STIs), prevalence of malaria, disability, and other health-related issues such as smoking[7].
The 2018 NDHS used a stratified cluster sampling in two stages.

The 36 states and Federal Capital Territory were each divided into urban and rural to make 74 sampling strata. In the first stage, 1,400 census enumeration areas (EAs)/clusters were selected with probability proportional to EA size. In the second stage, 30 households were selected in each EA/cluster. Thus, 42,000 households were selected in the second stage. The 2018 NDHS included all women aged 15-49 and in the sample households. The men's survey was conducted in one-third of the sampled households and included all the men aged 15-59 years in those households. The unit of analysis in this study is adolescent girls, thus the individual recode (IR) file was used for analysis[7].

Study variables

The outcome variable for this study is Facility-based delivery. The independent variables are; age at childbirth, highest level of education, employment status, household wealth index, exposure to mass media, wanted index pregnancy, number of childbirths, number of antenatal visits, getting permission to go to health facility, distance to health facility, companionship to health facility, participates in healthcare decision, partners highest level of education, place of residence and region. How the variables were categorised/recoded is shown in Table 1. Selection of independent variables was based on literature review and review of the NDHS data for variables that could impact on health facility delivery utilization among adolescents.[12,18,19]

Data analysis

A weighted analysis of a pooled data from the NDHS 2008, NDHS 2013 and NDHS 2018 was done using Stata (17, StataCorp LLC, College Station, TX, USA). Univariate, bivariate and multivariate analysis were carried out. The univariate analysis included generation of frequencies, and proportions. Bivariate analysis consisted of Chi-square tests to test the association between independent variables and the outcome variables – institutional delivery utilization. Binary logistic regression was used to identify the determinants of institutional delivery utilization. Variables statistically significant at bivariate level at $p \leq 0.25$ were imputed in the binary logistic regression. The threshold p-value of 0.25 was used to help guide the retention of significant covariates as well as confounding ones as stricter threshold levels can fail in identifying and retaining variables known to be important.[20,21] Statistical significance of the multivariate analysis was set at a $p \leq 0.05$ and 95% CI.

Ethical considerations

The survey protocols of the 2008 NDHS, 2013 NDHS and 2018 NDHS were reviewed and approved by the ICF Institutional Review Board and the National Health Research Ethics Committee of Nigeria (NHREC).

Informed consent was obtained from all the respondents that were interviewed. We obtained permission to download the datasets from the measure DHS website (www.dhsprogram.com).

Results

The adolescents included in data analysis were 2,628.Eighteen percent of the adolescent mothers utilized health facility for delivery. Most (82.06%) of the adolescent mothers were at least 15 years or older and majority (75.19%) had no formal education. Less than half (41.06%) were employed and 45.68% were exposed to mass media. Majority (74.72%) of the girls had just one child and almost all the girls (96.38%) wanted the index pregnancy. More than half (69.06%) of the girls had less than four antenatal visits in the index pregnancy.

A fifth (19.22%) considered getting permission to go to the health facility as a big problem, 41.01% considered the distance to health facility as a big problem and 23.14% considered getting a companion to go with her to the health facility, as a big problem.

Eighteen percent participate in decisions regarding their healthcare. Most of the girls' husbands (61.16%) has no formal education. Majority of the adolescent mothers resided in rural areas (86.80%) and in the Northwest region (57.97%). (Table 2)

Table 1: Study variables and descriptions

Variables	Descriptions
Outcome Variable	
Facility-based delivery	Facility based delivery was categorized into "no" (coded as 0) when the most recent birth took place at home and "yes" (coded as 1) when the most recent birth took place at any private and public health facilities.
Independent variables	
Age at childbirth	Age at childbirth of adolescent mother was categorized as "< 15 years" and "≥ 15 years"
Highest level of education	Respondents highest level of education was coded as "no formal", "primary", "secondary education or "higher"
Employment status	Employment status was coded as "employed and "unemployed"
Household wealth index	Richer and rich were recoded as "rich". Middle was coded as "middle". Poor and Poorer were recoded as "poor"
Exposure to mass media	Mass media exposure was generated from exposure to television, radio and newspaper and was categorized as "not exposed" and "exposed".
Wanted index pregnancy	Wanted index pregnancy was coded as "wanted" if the most recent pregnancy was wanted then, and "not wanted" if the most recent pregnancy was wanted later or no more wanted.
Number of childbirths	Number of childbirths was categorized as 1, > 1
Number of antenatal visits	Number of antenatal visits was categorized as "0-3 visits" and "at least 4 visits"
Getting permission to go to health facility	Getting permission to go to health facility was coded as "a big problem" and "not a big problem"
Distance to health facility	Distance to health facility was coded as "a big problem" and "not a big problem"
Companionship to health facility	Companionship to health facility was coded as "a big problem" and "not a big problem"
Participates in healthcare decision.	Participates in healthcare decision was recoded as "participates" when respondent alone participates in decisions on her healthcare, or when respondent and partner both participate in decisions on her healthcare. Participates in healthcare decision was recoded as "does not participate" when the decision is made by partner alone, or someone else.
Partner's highest level of education.	Partner's highest level of education was coded as "no formal education", "primary", "secondary education or higher"
Place of residence	Place of residence was categorized as "rural" and "urban"
Region	Region refers to the geo-political zones and was coded as "Northcentral", "Northeast", "Northwest", "South-south", "Southwest", and "Southeast"

Table 2: Sample characteristics and prevalence of facility based delivery for adolescent mothers in Northern Nigeria.

Variables	Frequency	Percentage
Facility based delivery		
Yes	512	18.26
No	2116	81.74
Age at childbirth		
< 15 years	455	17.94
≥ 15 years	2173	82.06
Highest level of education		
No formal education	1951	75.19
Primary education	352	13.30
Secondary education and higher	325	11.52
Employment status		

Unemployed	1557	58.94
Employed	1071	41.06
Wealth index		
Poor	893	33.33
Middle	868	32.81
Rich	867	33.86
Exposure to mass media		
Not exposed	1485	54.32
Exposed	1143	45.68
Wanted index pregnancy		
Wanted	2523	96.38
Not wanted	105	3.622
Number of childbirths		
1	1956	74.72
>1	672	25.28
Number of antenatal visits		
< 4 visits	1800	69.06
At least 4 visits	828	30.94
Getting permission to go to health facility		
A big problem	509	19.22
Not a big problem	2119	80.78
Distance to health facility		
A big problem	1114	41.01
Not a big problem	1514	58.99
Companionship to health facility		
A big problem	638	23.14
Not a big problem	1990	76.86
Participates in healthcare decision.		
Participates	517	18.20
Does not participate	2111	81.80
Partner's highest level of education		
No formal education	1594	61.16
Primary education	382	15.55
Secondary education or higher	652	23.29
Place of residence		
Urban	339	13.20
Rural	2289	86.80
Region		
Northcentral	421	13.60
Northeast	906	28.42
Northwest	1301	57.97

Age at childbirth, highest level of education, employment status, household wealth index, exposure to mass media, wanted index pregnancy, number of childbirths, number of antenatal visits, getting permission to go to health facility, distance to health facility, companionship to health facility, participates in healthcare decision, partners highest level of education, place of residence and region were significantly associated with facility-based delivery at bivariate analysis.A higher proportion of girls 15 years and above (19.14%) delivered in a health facility.

A higher proportion of girls with secondary or higher education (46.69%) and those that were employed (22.30%) delivered in a health facility.

Table 3: Bivariate analysis of factors associated with facility based delivery

Variable	Health facility delivery		p-value
	No **Freq (%)**	**Yes** **Freq (%)**	
Age at childbirth			
< 15 years	383 (85.75)	72 (14.25)	<0.01
≥ 15 years	1733 (80.74)	440 (19.14)	
Highest level of education			
No formal education	1709 (87.95)	242 (12.05)	<0.01
Primary education	246 (71.28)	106 (28.72)	
Secondary education and higher	161 (53.31)	164 (46.69)	
Employment status			
Unemployed	1295 (84.55)	262 (15.45)	<0.01
Employed	821(77.70)	250 (22.30)	
Wealth index			
Poor	799 (90.19)	94 (9.91)	<0.01
Middle	741 (86.14)	127 (13.86)	
Rich	576 (69.16)	291 (30.84)	
Exposure to mass media			
Not exposed	1265 (85.99)	220 (14.01)	<0.01
Exposed	851 (76.69)	292 (23.31)	
Wanted index pregnancy			
Wanted	2048 (82.18)	475 (17.82)	<0.01
Not wanted	68 (70.14)	37 (29.86)	
Number of childbirths			
1	1545 (79.97)	411 (20.03)	<0.01
>1	571 (86.97)	101 (13.03)	
Number of antenatal visits			
< 4 visits	1609 (89.81)	191 (10.19)	<0.01
At least 4 visits	507 (63.73)	321 (36.27)	
Getting permission to go to health facility			
A big problem	452 (89.97)	57 (10.03)	<0.01
Not a big problem	1664 (79.78)	455 (20.22)	
Distance to health facility			
A big problem	972 (88.00)	142 (12.00)	<0.01
Not a big problem	1144 (77.39)	370 (22.61)	
Companionship to health facility			
A big problem	565 (88.08)	73 (11.92)	<0.01
Not a big problem	1551 (79.83)	439 (20.17)	
Participates in healthcare decision.			
Participates	369 (72.07)	148 (27.93)	<0.01
Does not participate	1747 (83.89)	364 (16.11)	
Partner's highest level of education			

No formal education	1421 (89.53)	173 (10.47)	<0.01
Primary education	307 (79.69)	75 (20.31)	
Secondary education or higher	388 (62.66)	264 (37.34)	
Place of residence			
Urban	218 (67.38)	121 (32.62)	<0.01
Rural	1898 (83.92)	391 (16.08)	
Region			
Northcentral	238 (57.20)	183 (42.80)	<0.01
Northeast	730 (81.81)	176 (18.19)	
Northwest	1148 (87.46)	153 (12.54)	

Table 4: Multivariate analysis showing determinants of facility based delivery among adolescent mothers in Northern Nigeria

Variables	**AOR (95%CI)**	**p-value**
Age at childbirth		
< 15 years	1	
≥ 15 years	1.13 (0.81 – 1.59)	0.467
Highest level of education		
No formal education	1	
Primary education	1.33 (0.91 – 1.94)	0.138
Secondary education and higher	1.82 (1.15 – 2.90)	0.011
Employment status		
Unemployed	1	
Employed	1.05 (0.81 – 1.36)	0.719
Wealth index		
Poor	1	
Middle	1.16 (0.81 – 1.66)	0.412
Rich	1.64 (1.13 – 2.38)	0.009
Exposure to mass media		
Not exposed	1	
Exposed	1.120 (0.91 – 1.58)	0.009
Wanted index pregnancy		
Wanted	1	
Not wanted	1.06 (0.60 – 1.88)	0.849
Number of childbirths		
1	1	
>1	0.48 (0.36 – 0.64)	0.849
Number of antenatal visits		
< 4 visits	1	
At least 4 visits	3.03 (2.31 – 3.96)	<0.001
Getting permission to go to health facility		
A big problem	1	
Not a big problem	1.35 (0.93 – 1.98)	0.119
Distance to health facility		
A big problem	1	
Not a big problem	1.50 (1.65 – 1.38)	0.014
Companionship to health facility		
A big problem	1	0.774
Not a big problem	0.95 (0.65 – 1.38)	

Participates in healthcare decision.		
Participates	1	
Does not participate	0.84 (0.63 – 1.13)	0.252
Partner's highest level of education		
No formal education	1	
Primary education	1.45 (0.95 -2.21)	0.084
Secondary education or higher	1.61 (1.10 – 2.35)	0.013
Place of residence		
Urban	1	
Rural	0.89 (0.63 – 1.13)	0.530
Region		
Northcentral	1	
Northeast	0.46 (0.32 – 0.66)	<0.001
Northwest	0.24 (0.17 – 0.35)	<0.001

Delivery in a health facility was highest for girls who belonged to the 'rich' wealth index (30.84%) and girls with exposure to mass media (23.31%). Girls who did not want the index pregnancy (29.86%), girls with only one child (20.03%) and girls who had at least four antenatal visits (36.27%) had higher utilization of facility-based delivery. A higher proportion of adolescent mothers who considered getting permission to go to health facility not a big problem (20.22%) and a higher proportion of adolescent mothers who considered distance to health facility, not a big problem (22.61%) delivered in a health facility. Delivery in health facility was highest for girls who participated in healthcare decisions (27.93%) and those whose husbands had at least secondary level of education (37.34%). Delivery in a health facility was also highest among girls from the Northcentral (42.80%) and those residing in Urban areas (32.62%). (Table 3)

Level of education, wealth index, number of antenatal visits, distance to health facility, partner's level of education and region were the determinants of facility-based delivery among married adolescent girls in Northern Nigeria. Girls with secondary or higher education had 82% higher odds of delivering in a health facility compared with girls with no education (aOR 1.82; 95% CI 1.15 – 2.90). Adolescent girls who were of the 'rich' wealth index had 64% higher odds of delivering in a health facility compared to those from the 'poor' wealth index (aOR 1.64; 95% CI 1.13 – 2.38). Girls who attended more than four antenatal visits were three times more likely to deliver in a health facility than those with less than four visits (aOR 3.03; 95% CI 2.31 – 3.96). Girls who considered distance to health facility not a big problem had 50% higher odds of delivering at a health facility (aOR 1.50; 95% CI 1.65 – 1.38) Adolescent mothers whose husband's had at least secondary school education had 61% higher odds of health facility delivery (aOR 1.61; 95% CI 1.10 – 2.35) than those with no education. Adolescent girls who lived in rural areas (aOR 0.89; 95% CI 0.63 – 1.13), and those who reside the Northeast (aOR 0.46; 95% CI 0.32 – 0.66) and Northwest Nigeria (aOR 0.24; 95% CI 0.17 – 0.35), had lower odds of delivering in a health facility. (Table 4)

Discussion

This study assessed the prevalence and determinants of facility-based delivery among married adolescent girls in Northern Nigeria. Less than 20% of the girls delivered in a health facility. Most of the girls had no formal education, most desired the index pregnancy, had only one child, and had less than four antenatal visits. The identified determinants of facility-based delivery were girls' level of education, husband's level of education, household wealth index, distance to health facility, number of antenatal visits and region.

Only a few married northern girls utilize health facility for delivery. As majority of births are not handled by skilled birth attendants and do not occur in a facility that has the capacity to handle complications when they arise, this can result in

poor health outcomes for mother and child. Studies conducted in Nigeria among women 15 – 49 years have shown higher utilization of facility-based delivery. Dahiru et. al. reported facility-based delivery utilisation of 37% in 2013[19] and Kawakatsu et. al. reported a facility-based delivery utilization of 40.87% in 2018[22]. This implies that use of health facility for delivery is less among adolescent mothers in Northern Nigeria than the general population of Nigerian women and this calls for increased efforts to improve facility-based delivery among this group. Rai et. al. in the study among adolescent mothers in Nigeria showed that health facility delivery is generally low among adolescents, as the study reported a prevalence of 28%. Our study shows a lower proportion of adolescent mothers in Northern Nigeria utilize facility-based delivery (18%).

Girls with at least, secondary education had higher odds of facility-based delivery. Education did play a role in influencing choice of place for delivery in this study. Educated girls are more likely to have more health literacy and thus understand the importance of delivering in a health institution. Many DHS based studies have also shown a similar relationship between mothers' level of education and utilization of health facility for delivery[18,23–28]. Our study also showed that the level of education of the girls' husbands influenced place of delivery. This finding supports those of other published studies[19,29,30]

Girls who are rich were more likely to use health facility for delivery compared to those who were poor. The rich are more able to afford orthodox healthcare which even when affordable, is often more costly than delivering at home. Also, the rich are more often educated and are more health literate. Similarly, in Ghana[23], Zambia[31], and in Ethiopia[32] the rich mothers were more likely to utilize facility-based delivery. Distance to health facility was also a determinant of health facility delivery in this study. Girls who considered distance a big problem had lesser odds of delivering in a health facility. In Northern Nigeria, health facilities are generally fewer in number than in Southern Nigeria[33]. In our study, close to half of the girls considered distance to health facility, a big problem. This may partly explain the low prevalence of health facility delivery reported. It is imperative that the Federal government and respective State governments ensure sufficient number and distribution of health facilities in Northern Nigeria, so distance to health facility is not a major impediment to seeking healthcare.

Number of antenatal visits was a determinant of facility-based delivery, as girls who attended at least four antenatal visits were more likely to utilize health facility delivery compared with those with less than four visits. This finding is consistent with other studies[25,29,34]. Girls who attend many antenatal visits are likely to be more knowledgeable about complications that can arise during delivery, and also the importance of health facility delivery. In addition, girls who attend more antenatal visits are probably those that have good health seeking behaviour.

Girls in Northeast and Northwest Nigeria were less likely to use health facility for delivery compared to those in the Northcentral region. This can be explained by a number of factors which include higher poverty rates, higher illiteracy rates, inadequate distribution of health facilities and poor health seeking behaviour in the Northwest and Northeast. Poverty rates are generally higher in Northern Nigeria with Northwest having the greatest poverty incidence and greatest poverty head count ratio, followed by the Northeast, and the Northcentral zones[35]. Similarly, literacy rates are generally lower in the Northern Nigeria with the Northwest having the least literacy rate, followed by the Northeast, and the Northcentral zones[36]. A study showed that fatalism – a belief that actions cannot alter the outcome of illness because fate has been predestined by forces beyond ones control, is more predominant in Northwest and Northeast than Northcentral Nigeria[37].

Unlike region, place of residence was not a determinant of facility-based delivery. Girls residing in rural areas are just as likely to deliver in health facilities as those residing in urban areas. This finding is contrary to that reported in a study among women of reproductive age in Nigeria[19]. and in a study among young mothers in Ghana[38]. It is thus imperative for interventions to target adolescent mothers that reside in rural areas as well as those that reside in urban areas. There was also no statistically significant association between participation in healthcare decision and facility-

based delivery utilization. This may imply that girls who participate in healthcare decisions often cannot make the right choices for themselves which could be due to being young and naive, being health illiterate or just having poor health seeking behaviour. Most girls considered getting permission to go the health facility and getting a companion to the health facility as not a big problem. This suggests that the girls get some form of support. However, this support does not influence place of delivery, possibly because those that give support do not even understand the importance of delivering in a health facility.

Strengths

This is the first study to assess the prevalence and determinants of facility-based delivery among the population of married adolescent girls in Northern Nigeria, a population that is largely understudied. It thus adds considerably to the body of literature. This study also uses large datasets representative of the population of northern Nigeria, which adds to the validity of the study findings.

Limitations

This study is however, not without limitations. Due to the cross-sectional nature of the NDHS, causal inferences cannot be drawn from this study. Also, data in the survey was collected retrospectively, so there is a possibility of recall bias. The study however provides significant contributions to knowledge because it uses nationally representative data and includes a group of women who are often understudied.

Conclusion

Prevalence of facility-based delivery among married adolescents in Northern Nigeria is very low. Girls' level of education and husband's level of education, household wealth index, distance to health facility and region were the determinants of facility-based delivery in this study. Place of residence and participation in healthcare decision were not associated with facility-based delivery. Efforts must be instituted to increase facility-based delivery utilization among married girls in Northern Nigeria, in order to improve health outcomes for this already disadvantaged group. Governments should institute measures to improve girl child education in Northern Nigeria and empower families economically. There is a need for more health facilities in Northern Nigeria which are well equipped and adequately staffed to provide skilled delivery care. Even though Northern Nigeria has lower rates of health facility delivery, the Northwest and Northcentral regions are most affected and require the most attention. Girls who live in urban as well as rural areas should be targeted for appropriate interventions.

Acknowledgement

We are grateful to the SPARKLE (Strengthening Programming for Adolescents and Youths through Resource and Knowledge Generation and Link to Evidence) project for the mentorship and oversight provided in the conduct of this study. This research was carried out under the SPARKLE Fellowship programme of the University of Medical Sciences (UNIMED), Ondo, Nigeria.

Funding

The work was supported by Strengthening Programming for Adolescents and Youths through Resource and Knowledge Generation and Link to Evidence (SPARKLE) project of the University of Medical Sciences, Ondo, Nigeria with funding from the Ford Foundation

Contribution of authors

TO conceived and designed the study, with the supervision of OOO. TO analysed the data and prepared the first draft of the manuscript. OO and TOM provided critical review of the first draft and contributed to the subsequent drafts. All authors reviewed and approved the final version of the manuscript.

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