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# Patterns and determinants of breastfeeding practices among rural women in Sokoto State, Nigeria

Nneka Christina Okafoagu, Oche Mansur Oche, Mansur Olayinka Raji, Ben O. Onankpa, Ismail Raji

## ABSTRACT

**Aims:** Breastfeeding is the best way of providing ideal food for the health, growth and cognitive development of infants. The World Health Organization (WHO) has reported early initiation of exclusive breastfeeding facilitates biological and emotional development of the child. This study aimed to assess the patterns and determinants of breastfeeding practices among rural women in Sokoto State, Nigeria. **Method:** Using a descriptive cross-sectional study, 322 mothers of children 6–24 months were recruited through a multi-stage sampling method. Data was collected using a pretested

structured questionnaire and analyzed using IBM SPSS version 20. Chi square was used to test associations followed by binary logistic regression to determine the predictors. The level of significance was set at  $p < 0.05$ . Ethical approval was obtained from the Sokoto State Ethical Committee. **Results:** The mean ages of the children and mothers were  $16.3 \pm 5.9$  months and  $27.4 \pm 7.1$  years respectively. Majority (95.3%) of the mothers was married; 68.3% had no formal western education and 77.3% were full time housewives. All the children were breastfed. Only 14% did not give colostrum; 57.8% initiated breastfeeding within one hour after birth and 77.9% gave pre-lacteal feeds. Exclusive breastfeeding at six months was 17.1%. Factors influencing breastfeeding practices were found to be maternal occupation (OR = 4.806), parity (OR = 0.227), family setting (OR = 0.484) and health education sessions received during ANC (OR = 2.157). **Conclusion:** The practice of early initiation of breastfeeding and the practice of exclusive breastfeeding is low and is influenced by biological, economic and health system factors. Future community mobilization plans need to be strengthened in order to address identified gaps.

**Keywords:** Breastfeeding, Determinants, Rural, Sokoto

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## INTRODUCTION

Breast milk is the best gift given to a child from a mother [1]. Breastfeeding is an integral part of the reproductive process, the natural and ideal way of feeding the infant and a unique biological and emotional basis for child development [2]. Experts recommend that children should be breastfed within one hour of birth, exclusively breastfed for the first six months and feeding of colostrum should be promoted and pre-lacteal feeds discouraged [3]. Breastfeeding on demand, that is, as often as the infant wants, day and night, at least eight times in 24 hours will provide more milk as suckling stimulates milk production [3]. In developing countries, breastfed children are at least six times more likely to survive in the early months of life than non-breastfed children. If breastfeeding is well practiced, it could prevent the death of 1 million children each year [4]. The Nigerian Demographic and Health Survey (NDHS) 2013 showed that 17% of babies were breastfed exclusively [5]. Furthermore, of those ever breastfed, only 40.8% of the babies were put on breast milk within an hour after birth as recommended by WHO. This scenario was further compounded by the fact that 91.2% of the babies have received pre-lacteal feeds within the first six months of life despite the fact that such a practice was discouraged by the WHO more than a decade ago [3]. Although breastfeeding is universal in Nigeria, breastfeeding practices are not satisfactory as various socio-demographic factors influence these practices [6]. In Sokoto State, 87% of the population lives in rural areas and these areas present unique challenges with regards to child health and survival and are characterized by poor environmental and living conditions and tend to have poor indices [6]. In line with this, infants born to mothers that reside in rural areas may be exposed to suboptimal breastfeeding practices. This study aimed to assess the patterns and determinants of breastfeeding practices among rural women in Sokoto State.

## MATERIALS AND METHODS

The study was carried out in Sokoto State in the North Western part of Nigeria. The State has 23 Local Government Areas and three senatorial districts namely Sokoto East, Sokoto South and Sokoto North [7]. The total population was 3,696,999 based on the 2006 general census with an estimated population of 4,602,298 projected for 2013 [8]. It was a descriptive cross-sectional study design. The study population comprised

of women of reproductive age group (15–49 years old) with children aged 6–24 months. Using a proportion of women practicing exclusive breastfeeding of 78.7% from a previous study [9], 322 mothers of children aged 6–24 months were recruited for the study. A multi-stage sampling technique was used to select the respondents from the three senatorial districts viz; Sokoto North, Sokoto South and Sokoto East. Using a simple random sampling technique (balloting), 1 rural LGA was selected from each senatorial district after a line-listing of all the LGAs in the districts was done. A simple random sampling technique (balloting) was used to select 1 ward from each selected LGA after a line-listing of all the wards in each selected LGA was done. One settlement was chosen from each selected ward using a simple random sampling (balloting). The house-holds to be recruited for the study were selected through systematic sampling technique. In each selected household, an eligible woman with a child 6–24 months was identified and interviewed. If there was no child 6–24 months in a selected household, the immediate house satisfying the criterion was included. If the eligible woman had more than one child 6–24 months old and where there were two or eligible mother-child pairs in a selected house, then a simple random sampling using balloting was used to determine the mother-child pair to be interviewed.

Data was collected on socio-demographic characteristics and breastfeeding practices using a structured interviewer administered questionnaire. The instrument was adapted from published articles [10, 11] and was translated to Hausa (the local language in the communities) and back translated to English by two different scholars. The questionnaire was administered to the women in Hausa language by the research assistants who were trained on the objectives of the study, data tools and interpersonal communication. It was used to obtain information on the child feeding patterns. To determine the socio-economic differences, the data was used to construct an SES Index (a combination of the occupation and educational status of the respondents and spouses) using the method proposed by Oyedele to classify households into five classes (I–V) [12]. The mean of the four scores (two for the household head – man and two for the wife) to the nearest whole number, was the social class for that household (class I–V). Social economic status index I–V for every household was subsequently recoded to two variables: upper social class (class I–III) and lower social class (class IV–V) [13].

Univariate, bivariate and multivariate analyses were carried out using IBM SPSS version 20. Chi square was used to test associations between predictor and outcome variables followed by binary and multiple logistic regressions to determine the predictors. The study examined two [2] major child feeding practices as primary outcomes: Timely initiation of breastfeeding and exclusive breastfeeding at six months. Binary logistic regression using forced entry was used to compute the

determinants of appropriate child nutrition practices. The output of the regression analysis was presented as odds ratio (OR) with 95% confidence intervals. Results were presented in tables and charts. The level of significance was set at  $p < 0.05$ . Ethical approval was obtained from the Sokoto State Ethical Committee and informed consent was obtained from the participants.

## RESULTS

All 322 questionnaires were completely filled, returned and analyzed after validation (giving a response rate of 100%). The mean age of the children was  $16.3 \pm 5.9$  months. There were less males 155 (48.1%) than females 167 (51.9%) (Table 1). The mean age of the mothers was  $27.4 \pm 7.1$  years. Most 307 (95.3%) of the mothers were married with only one being single (0.3%). Majority 226 (70.2%) had no western education and 255 (79.2%) were unemployed 320 (99.4%). Majority of the families 194 (60.2%) were monogamous in nature with an average family size of  $8.2 \pm 6.5$ . Most of the families 223 (69.3%) belonged to the lower class while a small percentage 99 (30.7%) belonged to the upper class. Majority 258 (80.1%) of the mothers attended antenatal care (ANC), 110 (42.6%) of them had less than 4 ANC visits and most 192 (74.4%) were educated on breastfeeding during the ANC (Table 2).

All mothers breastfed their last child. Only 45 (14%) of the mothers did not give colostrum. Reasons given for not feeding colostrum included; not good for baby (13.3%), dirty milk (37.8%) and culture (42.2%). Of the 322 respondents, 186 (57.8%) initiated breastfeeding within one hour after birth while 136 (42.2%) initiated breastfeeding later than one hour after birth. Reasons given for late initiation of breastfeeding included breast milk not available 70 (51.5%); mother sick 24 (17.6%); child was sick 14 (10.3%); had cesarean section 6 (4.4%) and others 22 (16.2%) to include cultural beliefs of giving rubutu (washings on Quranic inscription on a slate) first at birth.

Table 1: Age and sex characteristics of index child

Variables	Frequency
<b>Age distribution of Children (in months)</b>	<b>(n = 322)</b>
6–12	105 (32.6%)
13–18	75 (23.3%)
19–24	142 (44.1%)
<b>Sex distribution of Children</b>	
Males	155 (48.1%)
Females	167 (51.9%)

Table 2: Sociodemographic characteristics of respondents

Variables	Frequency
<b>Age distribution of Mothers (in years)</b>	<b>(n = 322)</b>
15–19	38 (11.8%)
20–24	73 (22.7%)
25–29	79 (24.5%)
30–34	74 (23.0%)
35+	58 (18.0%)
<b>Mothers' educational level</b>	
None/Quranic	226 (70.2%)
Primary level	46 (14.3%)
Secondary level	40 (12.4%)
Tertiary level	10 (3.1%)
<b>Mothers' occupation</b>	
Unemployed/full time housewives	255 (79.2%)
Civil servant	1 (0.3%)
Trader	58 (18.0%)
Others	8 (2.5%)
<b>Fathers' educational status</b>	
None	4 (1.2%)
Quranic only	94 (29.2%)
Primary level	52 (16.2%)
Secondary level	77 (23.9%)
Tertiary level	95 (29.5%)
<b>Fathers' occupation</b>	
Unemployed	9 (2.8%)
Farmer	85 (26.4%)
Trader	95 (29.5%)
Civil servant	86 (26.7%)
Others	47 (14.6%)
<b>Type of family setting</b>	
Monogamous	194 (60.2%)
Polygamous	128 (39.8%)
<b>Socioeconomic status</b>	
Upper class	99 (30.7%)
Lower class	223 (69.3%)

Majority 251 (77.9%) of the mothers gave pre-lacteal feeds to their children and the reasons for this were that the mother was sick (9.6%); breast milk was not sufficient (19.1%); breast milk was not available (27.9%) and no reason (24.7%). The pre-lacteal feeds given included water (53.8%), cow milk (18.7%), pap (2.8%) and others (24.7%) to include rubutu (washings of Quranic inscription on a slate). Most of the mothers 277 (86.0%) breastfed their children on demand and only 12 (3.7%) breastfed greater than eight times a day. The prevalence

Table 3: Respondents' breastfeeding practices

Variables	Frequency
<b>Gave colostrum</b>	<b>(n = 322)</b>
Yes	277 (86.0%)
No	45 (14.0%)
<b>Initiation of breastfeeding</b>	
Within one hour	186 (57.8%)
>1 hour	136 (42.2%)
<b>Gave pre-lacteal feeds</b>	
Yes	251 (77.9%)
No	71 (22.1%)
<b>Exclusive breastfeeding</b>	
At 6 months	55 (17.1%)
< 6 months	267 (82.9%)
<b>Frequency of breastfeeding/day</b>	
On demand	277 (86.0%)
≤ 8	33 (10.3%)
>8	12 (3.7%)

of exclusive breastfeeding at six months was found to be 17.1% (Table 3).

Factors found to be significantly associated with timely initiation of breastfeeding were mothers' occupation ( $p = 0.000$ ), parity ( $p = 0.001$ ) and breastfeeding advice during ANC ( $p = 0.021$ ) (Table 4). Maternal occupation ( $p = 0.018$ ); frequency of ANC visits ( $p = 0.005$ ); breastfeeding advice during ANC ( $p = 0.008$ ) and mode of delivery ( $p = 0.009$ ) were found to be significantly associated with exclusive breastfeeding practice (Table 5).

Maternal employment was found to be the key determinant of timely initiation of breastfeeding. The study showed that mothers who were unemployed were four times more likely to initiate breastfeeding within one hour following delivery compared with employed ones ( $OR = 4.809$ ,  $95\% CI = 2.293-10.072$ ,  $p = 0.000$ ). Parity does not have any influence on the likelihood of initiating breastfeeding within an hour of delivery ( $OR = 0.227$ ,  $95\% CI = 0.087-0.594$ ,  $p = 0.003$ ) (Table 6).

Frequency of ANC visit was the main determinant of exclusive breastfeeding. Mothers who attended four or less ANC visits had a two times odds of practicing

Table 4: Relationship between some variables and timely initiation of breastfeeding

Variables	Timely initiation of breast feeding		$\chi^2$ (chi-square)	p-value
	'Yes' response n			
<b>Mothers' occupation</b>	<b>N = 322</b>			
Unemployed	255	166 (65.5%)	27.019	0.000*
Employed	67	20 (29.9%)		
<b>Parity</b>				
Primiparous	35	11 (31.4%)	11.163	0.001*
Multiparous	287	175 (60.9%)		
<b>Breastfeeding advice during Antenatal Care</b>	<b>N = 258</b>			
Yes	192	122 (63.5%)	5.589	0.021*
No	66	31 (46.9%)		

$p < 0.05$

Table 5: Relationship between some variables and exclusive breastfeeding at six months

Variables	Exclusive breast feeding		$\chi^2$ (chi-square)	p-value
	'Yes' response n			
<b>Mothers' occupation</b>	<b>N = 322</b>			
Unemployed	255	50 (19.6%)	5.526	0.018*
Employed	67	5 (7.5%)		
<b>ANC visit</b>				
≤ 4	68	22 (32.4%)	8.537	0.005*
>4	190	30 (15.8%)		
<b>Breast feeding advice during ANC</b>				
Yes	192	46 (23.9%)	6.746	0.008*
No	66	6 (9.1%)		
<b>Mode of delivery</b>				
Normal	316	51 (16.1%)	10.614	0.009*
Cesarcean	6	4 (66.7%)		

\*  $p < 0.05$

†ANC: Antenatal Care

exclusive breastfeeding compared to mothers who had greater than four ANC visits (OR = 2.157, 95% CI = 1.055–4.412, p-value = 0.035). Type of family (monogamous/polygamous) setting does not have any impact on the practice of exclusive breastfeeding (OR = 0.484, 95% CI = 0.236–0.991, p-value = 0.047). A similar lack of impact on the practice of exclusive breastfeeding was observed with parity (OR = 0.163, 95% CI = 0.028–0.935, p-value = 0.042) (Table 7).

## DISCUSSION

Breastfeeding has been conclusively demonstrated as one of the important determinants for optimal growth and development of infants and for any neonate, ‘Breast is best’ is now a universal concept [14]. This study showed that all the women breastfed their infants and this is similar to studies in Makurdi and Edo state which showed that all mothers breastfed their children [15, 16]. Economic factors may contribute to this high rate of breastfeeding as majority (69.3%) of the families studied belonged to the lower class and breast milk may be the most affordable

and available feed for the child. Although most Nigerian mothers breastfeed their infants, it is agreed that the nature of such breastfeeding remains contentious [17]. Early initiation of breastfeeding is important for mother-infant bonding, helps in establishment of longer and more successful breastfeeding and lengthens the duration of breastfeeding. More than half of the mothers had timely initiated breastfeeding within one hour following delivery in the study. This is comparable to studies done in Umuahia, Ibadan, Kenya and the Gaza strip where they found a timely initiation of breastfeeding amongst 53.3%, 50.8%, 61.1% and 61.7% of their study subjects respectively [18–22]. However, it was found to be higher than NDHS 2013 figure of 40.8% and 29% in Sokoto State and rural areas respectively and far higher than that obtained by Oche and Umar in another study from Sokoto where they obtained 8% [5, 10]. The dissimilarity from other studies could be attributed probably to some cultural and religious beliefs that allow babies to be fed with other breast milk substitutes at birth before breast milk is established. Colostrum is described as “nature’s prescription” as it is rich in immunoglobulin. Major carbohydrate in breast milk is lactose providing 40% of

Table 6: Determinants of timely initiation of breastfeeding

Variables	N = 322	Timely initiation of breastfeeding 'Yes' response n	p-value	AOR	Odd's Ratio	95% CI for OR
<b>Mothers' occupation</b>						
Unemployed	255	166 (65.1%)	0.000*	4.67	4.806	2.293–10.072
Employed	67	20 (29.9%)		1.71		
<b>Parity</b>						
Primiparous	35	11 (31.4%)	0.003*	0.13	0.227	0.087–0.594
Multiparous	287	175 (60.9%)		0.19		

\*p < 0.05

Table 7: Determinants of exclusive breastfeeding

Variable		Exclusive breastfeeding 'Yes' response n	p-value	AOR	Odd's Ratio	95% CI for OR
<b>Type of family setting</b>	<b>N = 322</b>					
Monogamous						
Polygamous	194	30 (15.5%)	0.047*	0.16	0.484	0.236–0.991
	128	25 (19.5%)		0.44		
<b>Parity</b>						
Primiparous	35	3 (8.6%)	0.042*	0.08	0.163	0.028–0.935
Multiparous	287	52 (18.1%)		0.14		
<b>Antenatal Care visits</b>	<b>N = 258</b>					
≤ 4	68	22 (32.4%)	0.035*	2.13	2.157	1.055–4.412
>4	190	30 (15.8%)		1.97		

\*p < 0.05

energy needs and it has high whey: casein ratio which facilitates digestion [23]. Majority of the women in this study gave their babies colostrum and this is similar to a study in Nassarawa and Ethiopia where 84.2% and 82% of the mothers respectively gave colostrum at birth [19, 24]. These findings could demonstrate the mothers' acceptance of colostrum as being nutritious to the baby. However, few of the mothers did not give colostrum and this is similar to a study in India where 15.4% did not give colostrum [25]. Of the few mothers who did not give colostrum, less than half gave cultural beliefs as the reason for not giving colostrum to their children. This finding is similar to a study in rural India where the most common reason for not giving colostrum was religious belief (63.6%) [26]. Such cultural beliefs that colostrum is dirty milk, hence harmful to the baby, a belief that the mother should rest and clean up first, and performance of rituals and prayers before the baby starts breastfeeding have been noted as reasons why colostrum is not given to the children [27]. A sharp contrast can be seen in the proportion of women who gave pre-lacteal feeds as majority of the women did so in the study. This finding is similar to NDHS 2013, a study in India and Pakistan that reported 91.2%, 91.25% respectively, and 94% were given pre-lacteals prior to initiation of breast milk [5, 28, 29]. This could be attributed to the study being conducted in rural areas where literacy level and knowledge of appropriate child feeding practices might be low thereby leading to more pre-lacteal feeds given as compared to their urban counterparts who might be more enlightened. Some of the mothers gave their children water as pre-lacteal feed which is a common practice in many developing countries due to the misconception by the mothers that breast milk is not sufficient for their children. This finding of giving plain water was not very common as seen from studies in Kano (23.6%), Umuahia (9.2%), Edo state (12%) and Kenya (21.7%) [16, 18, 21, 30]. Differences in geographical conditions may account for the low rate of giving plain water. In addition, washings from Quranic inscriptions on a slate was also given as pre-lacteal feeds and this is believed to be medicinal to the children as it was reported to remove dirt from the abdomen.

Despite the universal recommendation that infants be exclusively breastfed from birth to six months of age and thereafter the gradual introduction of complementary or weaning foods, this study revealed the prevalence of exclusively breastfed at six months to be low (17.1%). This is similar to findings from elsewhere that reported very low prevalence of exclusively breastfed [18, 20, 30, 31]. The low rate of exclusively breastfed obtained in this study could in part be due to traditional beliefs, practices and rites that are deeply rooted in the study area. Such cultural practices include giving water in addition to breast milk by some communities in Nigeria to quench the child's thirst [32]. However, the practice of giving water while breastfeeding may increase mortality rates

in Nigeria due to contaminated water and poor sanitary conditions [33].

In this study, factors found to be associated with timely initiation of breastfeeding were mothers' occupation and parity. Studies in the UAE have also found parity to be significantly associated with timely initiation of breastfeeding [34]. Contrary to this, other studies have found history and frequency of ANC; place and mode of delivery; and maternal education to be significantly associated with timely initiation of breastfeeding [24, 35, 36]. On further binary logistic regression, mothers' occupation and parity were still found to be determinants of timely initiation of breastfeeding. Mothers who were unemployed were four times more likely to initiate breastfeeding within one hour following delivery, while multiparous mothers were also found to be more likely to initiate breastfeeding within one hour following delivery. Most mothers who were unemployed were housewives and so might have more time to initiate breastfeeding since they do not have any pre-occupation unlike their employed counterparts who might see breastfeeding as a secondary obligation and might not be in a hurry to initiate breastfeeding.

Factors found to be associated with exclusive breastfeeding in this study were mothers' occupation; frequency of ANC visits; breastfeeding advice during ANC and mode of delivery. This finding was similar to several studies that also showed that maternal occupation, mode of delivery and breastfeeding advice during ANC were significantly associated with exclusive breastfeeding [14, 37, 38]. However, this was different from studies in Sokoto State, Kano and Ilorin which found a statistical significant relationship between maternal age and education, maternal occupation, parity, family income and exclusive breastfeeding [11, 30, 39]. When the variables were subjected to binary regression, the key determinant was mothers who had attended at least four ANC visits were more likely to exclusively breastfeed their children. Mothers who attended at least 4 ANC visits were more likely to exclusively breastfeed.

Multiparous mothers were more likely to exclusively breastfeed. Mothers in polygamous setting were more likely to exclusively breastfeed. Although mothers' occupation and breastfeeding advice during ANC were significantly associated with exclusive breastfeeding, they were not found to be determinants of exclusive breastfeeding.

## CONCLUSION

Although breastfeeding in this study was universal, more than half of the mothers initiated breastfeeding within one hour of delivery. Exclusive breastfeeding was very low, with only 17.1% of the mothers practicing it. It is also evident from this study that breastfeeding practices were influenced by maternal, house-hold, obstetric and

health service-related factors. This underscores the need to develop interventions aimed at bridging the gap between current breastfeeding practices in rural settings and adopting the WHO recommendations on optimal breastfeeding practices. Therefore, women who have timely initiated breastfeeding; not given pre-lacteal feeds; fed colostrum to their child and successfully exclusively breastfed their child for six months should be made role models and support groups consisting of such women should be formed at the community level in the rural areas to encourage other women to practice such.

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### Author Contributions

Nneka Christina Okafoagu – Substantial contributions to conception and design, Acquisition of data, Drafting the article, Final approval of the version to be published

Oche Mansur Oche – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Raji Olayinka Mansur – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Ben Onankpa – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Raji Ismail – Analysis and interpretation of data, Drafting the article, Final approval of the version to be published

### Guarantor

The corresponding author is the guarantor of submission.

### Conflict of Interest

Authors declare no conflict of interest.

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