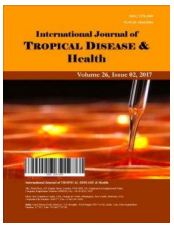

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Trends in Breastfeeding Practices among Women of Childbearing Age in Nigeria: (A Review of National Demographic Health Survey 1999, 2003, 2008)

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Authors' contributions

This work was carried out in collaboration between all authors. Author AT managed literature searches, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author MDD supervised the study and managed the analyses of the study while author AO edited the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Background: Breastfeeding is the appropriate method recommended by World Health Organization (WHO) for feeding infants. The recommendations includes initiation of breastfeeding within the hour of life, exclusive breastfeeding for the first six months then the introduction of complimentary foods and continued breastfeeding for at least twelve months of age, breastfeeding on demand as often as the child wants. Despite these recommendations, compliance with breastfeeding recommendations in developing countries is still low. This study, however, describes breastfeeding pattern among women of childbearing age and identifies the factors associated with the pattern over the years (1999, 2003, 2008).

Methods: This study is a comparative cross-sectional population based study in which a secondary data review and analyses of NDHS 1999, 2003 and 2008 data were done. Frequencies, proportions and chi-square for trends were used to investigate and describe the pattern of initiation, frequency

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and duration of breastfeeding over the years. All analyses were done at 5% level of significance.
Results: Few women initiated breastfeeding immediately and this proportion decreases over the years; 1999(40%), 2003(31.7%) and 2008(39.2%), X^2=6.132, p=0.013. There was no much change in the proportion of women that breastfed for at least one year over the years. A higher percentage of women breastfed during the day (X^2=8.725, p=0.003) than those that breastfed in the night (X^2=33.211, p=0.000) over the years, with an increasing trend over the years. Age of the mothers, religion, marital status and education amongst others have been observed to be significantly associated with increasing trends in breastfeeding practices over the years.
Conclusion: Breastfeeding practices significantly increased over the years (1999, 2003, 2008) only amongst women aged 30-34 years, married women, women with primary and secondary education, Urban dwellers, Christian women, women from the south region amongst others.

Keywords: Breastfeeding; women; childbearing age; initiation; duration; frequency.

1. INTRODUCTION

United Nation International Children Emergency Funds (UNICEF) and WHO recommend that children be exclusively breastfed during the first six months of life and that children be given solid or semi-solid complementary foods in addition to continued breastfeeding from age 6 months to 24 months (or more) when the child is fully weaned [1]. Exclusive breastfeeding is recommended because breast milk is uncontaminated and contains all the nutrients necessary for children in the first few months of life. In addition, the mother's antibodies in breast milk provide immunity to disease [2]. Early supplementation is discouraged for several reasons. First, it exposes infants to risk of infection. Second, it decreases infants' intake of breast milk and therefore the frequency of breastfeeding, which reduces breast milk production. Third, in low resource settings, supplementary food is often nutritionally inferior.

Extensive research using improved epidemiologic methods and modern laboratory techniques documents diverse and compelling advantages for infants, mothers, families, and society from breastfeeding and the use of human milk for infant feeding. These advantages include health, nutritional, immunologic, developmental, psychologic, social, economic, and environmental benefits [3]. Child survival strategies include prolonged and intensive breastfeeding, together with its early initiation, and breastmilk only for the first six months of life [4]. The important issue of childhood survival has been highlighted in recent years, with statistics indicating 99% of childhood deaths occur in less-developed countries, and gaps between rich and poor within many countries are increasing [5].

Early initiation of breastfeeding is encouraged for a number of reasons. Mothers benefit from early suckling because it stimulates breast milk production and facilitates the release of oxytocin, which helps the contraction of the uterus and reduces post-partum blood loss. The first breast milk contains colostrum, which is highly nutritious and has antibodies that protect the newborn from diseases. Early initiation of breastfeeding also fosters bonding between mother and child. Initial breastfeeding protects against obesity in later life. Globally, over one million newborn infants could be saved each year by initiating breastfeeding within the first hour of life. In developing countries alone, early initiation of breastfeeding could save as many as 1.45 million lives each year by reducing deaths mainly due to diarrheal disorders and lower respiratory tract infections in children [6]. Sub-Saharan Africa contributes a high proportion of neonatal deaths, and its progress has been the slowest of any region in the world. Because the majority of neonatal deaths occur at home, feasible interventions for home-based implementation are needed urgently [7]. Promotion of early initiation of breastfeeding has the potential to make a major contribution to the achievement of the child survival millennium development goal; 16% of neonatal deaths could be saved if all infants were breastfed from day 1 and 22% if breastfeeding started within the first hour [7].

While breastfeeding rates are no longer declining at the global level, with many countries experiencing significant increases in the last decade, only 38 per cent of children less than six months of age in the developing world are exclusively breastfed and just 39 per cent of 20-23 month olds benefit from the practice of continued breastfeeding [8]. Exclusive breastfeeding reduces infant mortality due to common childhood illnesses such as diarrhea and pneumonia and enhances quick recovery during infectious and chronic diseases [9].

Amongst infants aged six months or younger in the developing world, the prevalence of exclusive breastfeeding is 39% and the prevalence of no breastfeeding is 5.6%. The prevalence of continued breastfeeding is 86% and 68% for infants and children aged 6–11 and 12–23 months, respectively, in the developing world [10]. It is important for an infant to breastfeed frequently as this improves milk production. Breastfeeding at least every two to three hours helps to maintain milk production. For most women, eight breastfeeding or pumping sessions every 24 hours make their milk production high [3].

Breastfeeding-promotion programs should emphasise early initiation as well as exclusive breastfeeding. This has particular relevance for sub-Saharan Africa, where neonatal and infant mortality rates are high but most women already exclusively or predominantly breastfeed their infants. In Nigeria, just about 38% of infants were given breast milk within one hour of birth, and about 68% were given breast milk within 24 hours of birth (NDHS, 2008). Exclusive breastfeeding for the first six months is poorly practised in Nigeria. Only about one in ten (13 percent) infants below six months of age were exclusively breastfed (NDHS, 2008). Among children under six months, younger children are more likely to be exclusively breastfed. Twenty percent of infants below two months were exclusively breastfed, compared with only 7 percent of infants' age 4-5 months [11]. Overall in Nigeria, the median duration of any breastfeeding is 18.1 months, while the median duration of exclusive breastfeeding is only half a month [11].

A study carried out in Ibadan, Nigeria in 1992 showed that the exclusive breastfeeding rate dropped from 57.4% at 1 month to 23.4% at 6 months [12]. Younger age of infant, higher maternal occupation, and delivery in tertiary or secondary health facility were significantly predictive of exclusive breastfeeding. Mothers 24 years or younger and primiparous mothers were less likely to breastfeed their babies exclusively [12]. Compliance with breastfeeding recommendations in developing countries is low and so striking is the size of the gap between breastfeeding practice and recommendations. Therefore more attention should be given to increasing breastfeeding, especially exclusive breastfeeding and to monitoring trends [10]. This study is meant to investigate and improve the patterns of breastfeeding practices in Nigeria and how effective breastfeeding programs have been over the years, thereby reducing infant and child morbidity and mortality rates. This would help policy makers and those in government in knowing old policies to modify and also new sectors to improve on in areas of child nutrition, health and education.

2. METHODS

This was a comparative cross-sectional population based study. Secondary data obtained from NDHS in 1999, 2003, and 2008 were analysed.The primary survey (NDHS 1999, 2003, 2008) was a national study involving each of the 36 states of Nigeria, each of the six major regions in Nigeria and rural & urban areas of Nigeria. The population of the 1999, 2003 & 2008 NDHS covered is the universe of all women aged 15-49 and eligible men aged 15-59 from half of the selected households for the women sample. For this study, women aged 15-49 years was considered from the study population of the NDHS 1999, 2003 & 2008.

For this study, the study unit of enquiry was the women of reproductive age (15-49 years) who had ever breastfed five years preceding the survey from the study population of 1999, 2003 & 2008 NDHS. The sampling procedure was a multi stage eligible sampling aimed at selecting eligible persons. It was a stratified two-stage cluster design.

All women of reproductive age who had children ever breastfed five years preceding the survey were included for the evaluation of initiation of breastfeeding and those with children under three years were included for duration & frequency of breastfeeding who were not currently breastfeeding at the time of the survey. (N:B, those currently breastfeeding at the time of the survey were used to estimate the mean & median duration & frequency of breastfeeding which is not the purpose for this study). All women aged 15-49 years were eligible to be interviewed. A total of 7,919 households were selected in 1999, with 8918 eligible women, 7,864 households were selected in 2003 with 7985 eligible women while in 2008, 36,298 households were selected with 34596 eligible women.

The primary data were collected by personal interview method using questionnaires administered to the selected women of age group15-49 years who at least breastfed their last child within the three years preceding the

study. For this study, window SPSS version 15.0 was used for editing & re-analyses of the available data. Epi-info version 3.5.1 was used for analysis of the trends.

The independent variables reviewed were age of the women, residence (Urban/Rural), education, religion, marital status, occupation, region and place of delivery while the dependent variables are initiation of breastfeeding, duration of breastfeeding & frequency of breastfeeding among women of reproductive age 15-49 years. Some variables were edited to suite the analyses to be done. For example, initiation of breastfeeding was re-coded into immediately (i.e. within 1 hour after birth) & not immediately. Then duration was re-coded into 'less than 1year' and '1 year or more'. Frequency was re-coded into '6 times or more' and 'less than 6 times'. Religion was re-coded into three categories; Christianity, Islam and Others. The descriptive statistics such as frequencies were used to summarise quantitative variables while qualitative variables were summarised as proportions and in cross-tabulations. The chi square test for trends analysis was used to describe trends between two qualitative variables and also to investigatethe pattern of trend over the years. All analyses were done at 5% level of significance and 95% confidence interval. An ethical approval for the re-analyses was obtained from National Demographic and Health Survey (NDHS) in releasing the data related to breastfeeding practices among women of child-bearing age group 15-49 in Nigeria.

3. RESULTS

As shown in Table 1, over the years, the highest proportion of women within the reproductive age is in the 15 – 19 years which is the lowest range. The highest percentage of women are married, had no formal education, resided in rural areas, were from the North western region of Nigeria and had deliveries at home.

Table 1. Socio-demographic characteristics of the respondents

Variables	1999	2003	2008
	Proportion (%)	Proportion (%)	Proportion (%)
Mothers' age			
15-19	1774 (21.6)	1749 (23.0)	6591 (19.7)
20-24	1528 (18.6)	1464 (19.2)	6103 (18.3)
25-29	1521 (18.6)	1356 (17.8)	6303 (18.9)
30-34	1142 (13.9)	940 (12.3)	4557 (13.6)
35-39	983 (12.0)	798 (10.5)	3883 (11.6)
40-44	689 (08.4)	695 (9.1)	3043 (9.1)
45-49	562 (06.9)	618 (8.1)	2905 (8.7)
Marital Status			
Never	3674 (37.5)	2087 (27.4)	8021 (24.0)
Married	5808 (59.2)	5157 (67.7)	23954 (71.8)
Widowed	133 (1.4)	167 (2.2)	763 (2.3)
Divorced	195 (2.0)	209 (2.7)	646 (1.9)
Education			
No Education	3706 (37.8)	3005 (39.4)	13242 (39.7)
Primary	2692 (27.4)	1666 (21.9)	6591 (19.7)
Secondary	2891 (29.5)	2462 (32.3)	10905 (32.7)
Higher	521 (5.3)	487 (6.4)	2647 (7.9)
Occupation			
Not Working	5695 (58.6)	3227 (42.3)	12735 (38.3)
Unskilled	1088 (11.2)	1276 (16.7)	428 (1.3)
Skilled	2739 (27.9)	2781 (36.5)	18822 (56.6)
Professional	195 (2.0)	336 (4.4)	1248 (3.8)
Residence			
Urban	3218 (32.8)	3057 (40.1)	10489 (31.4)
Rural	6592 (67.2)	4563 (59.9)	22896 (68.6)
Region			
North Central	1739 (17.7)	1256 (16.5)	6366 (19.1)
North East	1250 (12.7)	1413 (18.5)	6217 (18.6)

Variables	1999	2003	2008
	Proportion (%)	Proportion (%)	Proportion (%)
North West	2135 (21.8)	1791 (23.5)	7297 (21.9)
North East	1112 (11.3)	1081 (14.2)	3667 (11.0)
North South	1811 (18.5)	938 (12.3)	5025 (15.1)
North West	1763 (18.0)	1141 (15.0)	4813 (14.4)
Place of Delivery			
Home	1877 (61.3)	2348 (62.4)	11795 (65.6)
Government Hospital	733 (23.9)	790 (21.0)	3722 (20.7)
Private Hospital	405 (13.2)	607 (16.1)	2186 (12.2)
Others	49 (1.6)	19 (0.5)	279 (1.6)
Religion			
Christianity	5322 (54.4)	3884 (51.0)	17171 (51.7)
Islam	4293 (43.9)	3601 (47.3)	15449 (46.5)
Others	161 (1.6)	127 (1.7)	588 (1.8)

Table 2. Pattern of breastfeeding among respondents

Variables	1999	2003	2008	Chi Square	P value
	Frequency (%)	Frequency (%)	Frequency (%)		
Initiation of breastfeeding					
Immediately	1166 (40)	1171 (31.7)	6861 (39.2)	6.132	0.013
Not immediately	1752 (60)	2523 (68.3)	10658 (60.8)		
Total	2918 (100.0)	3694 (100.0)	17519 (100.0)		
Duration of breastfeeding					
12 + months	808 (86.5)	1473 (85.0)	7263 (87.2)	2.753	0.097
< 12months	126 (13.5)	260 (15.0)	1065 (12.8)		
Total	934 (100.0)	1733 (100.0)	8328 (100.0)		
Frequency of breastfeeding (Day)					
6 +	1218 (71.6)	1324 (71.1)	6425 (74.3)	8.725	0.003
< 6times	482 (28.4)	537 (28.9)	2222 (25.7)		
Total	1700 (100.0)	1861 (100.0)	8647 (100.0)		
(Night)					
6 +	561 (32.9)	721 (38.2)	3513 (40.4)	33.211	0.000
< 6 times	1143 (67.1)	1167 (61.8)	5173 (59.6)		
Total	1704 (100.0)	1888 (100.0)	8686 (100.0)		

P<0.05 = Statistical Significance*

Table 2 shows that higher percentage of women initiated breastfeeding late from 1999 to 2008. This trend is statistically significant at P<0.05. For duration of breastfeeding, a high percentage of women breastfed for at least 1 year over the years but there was no significant change in this proportion over the years from 1999 to 2003. The proportion of women that breastfed for at least 6 times during the day slightly increased from 71.6% in 1999 to 74.3% in 2008 which was statistically significant at p = 0.003. At night, the proportion of women who breastfed their children for 6 times or more were low as compared to those that breastfed during the day though this proportion increased over the years from 32.9% in 1999 to 40.4% in 2008.

As shown in Table 3, there was no significant change over the years in the proportion of mothers who initiated breastfeeding by their age groups. However, among mothers aged 30-34 years, there was a significant increase in proportion who initiated breastfeeding early from 40.9% in 1999 to 42.4% in 2008. There appears to be a significant decrease in the proportion of married women that initiated breastfeeding immediately after birth over the years from 1999 (40.2%) to 2008 (38.9%). The proportion of mothers that initiated breastfeeding early decreased significantly from 1999 to 2003 and then increased from 2003 to 2008 for all categories of education. There was a significant increase in the proportion of unskilled, skilled and professional mothers that initiated breastfeeding early over the years.

Table 3. Trends of the association between socio-demographic variables and initiation of breastfeeding

Variable	1999	2003	2008	Chi square	P value
	*IMM Frequency (%)	*IMM Frequency (%)	*IMM Frequency (%)		
Mothers' age					
15-19	80(30.2)	73(24.3)	367(30.4)	0.526	0.468
20-24	269(40.8)	216(28.1)	1221(35.7)	0.728	0.394
25-29	337(41.6)	349(34.4)	1921(41.0)	1.387	0.239
30-34	248(40.9)	209(29.8)	1483(42.4)	8.108	0.004
35-39	163(40.3)	192(37.4)	1051(40.2)	0.176	0.675
40-44	46(37.4)	96(32.8)	550(38.9)	1.722	0.189
45-49	22(46.8)	36(35.3)	268(39.6)	0.120	0.729
Marital status					
Never	16(30.2)	34(34.0)	169(38.7)	1.951	0.162
Married	1127(40.2)	1075(31.2)	6449(38.9)	4.068	0.044
Widowed	6(33.3)	19(38.0)	102(46.6)	2.090	0.148
Divorced	17(38.6)	43(41.7)	140(46.5)	1.397	0.237
Mothers' education					
No education	569(40.1)	522(28.6)	2824(32.7)	11.974	0.001
Primary	279(39.1)	316(35.3)	1774(44.9)	19.380	0.000
Secondary	268(39.7)	269(32.4)	1789(44.3)	18.487	0.000
Higher	50(45.0)	64(44.8)	474(52.6)	4.035	0.045
Occupation					
Not working	614(43.8)	385(30.7)	1855(33.6)	35.147	0.000
Unskilled	127(35.6)	235(34.9)	68(49.3)	4.398	0.036
Skilled	392(36.5)	492(30.2)	4627(41.2)	40.154	0.000
Professional	24(44.4)	59(43.7)	274(52.6)	3.439	0.064
Residence					
Urban	472(55.1)	454(34.3)	2069(44.0)	6.921	0.009
Rural	1280(62.1)	717(30.2)	4792(37.4)	266.896	0.000
Region					
North Central	255(53.3)	277(43.3)	2002(61.9)	42.107	0.000
North East	155(35.5)	263(30.8)	934(24.1)	37.454	0.000
North West	362(41.8)	288(26.0)	1572(33.0)	7.752	0.005
North East	102(44.3)	153(50.2)	534(38.3)	8.854	0.003
North South	176(40.2)	142(38.5)	849(38.3)	0.458	0.498
North West	116(24.7)	48(11.4)	970(47.7)	154.836	0.000
Place of delivery					
Home	696(39.3)	661(28.5)	4008(34.8)	0.880	0.348
Government Hospital	330(46.7)	278(36.1)	1822(50.5)	16.627	0.000
Private Hospital	127(32.6)	227(38.8)	906(42.8)	14.891	0.000
Others	12(25.5)	3(15.8)	118(43.5)	7.641	0.006
Religion					
Christianity	496(38.4)	536(36.9)	3407(46.3)	49.096	0.000
Islam	646(41.2)	603(27.8)	3256(33.5)	9.682	0.002
Others	21(44.7)	31(46.3)	165(47.0)	0.092	0.762

**IMM=immediate initiate of breastfeeding i.e. within 1 hour of birth, *significant at p<0.05*

There was a significant decrease in the percentage of women in rural and urban areas that initiated breastfeeding immediately though this decrease was higher among the rural women over the years from 1999 to 2008. There was a statistically significant association among women from different region and early initiation of breastfeeding over the years from 1999 to 2008 with the exception of women from the South South regions in Nigeria. Among women who delivered in private hospitals and government hospitals, there was a steady and significant increase in the proportion of women that initiated breastfeeding their babies immediately over the

years. However, a significant decrease was noticed in the proportion of those who delivered in other places initiate breastfeeding immediately from 1999 (25.5%) to 2003(15.8%) and then an increase to 43.5% in 2008. An increase in the proportion of Christian women and a decrease in the proportion of Muslim women that initiated breastfeeding immediately over the years from 1999 to 2003 and these observations were statistically significant respectively.

Table 4. Trends in the association between socio-demographic variables and duration of breastfeeding from 1999 to 2008

Variable	1999	2003	2008	Chi square	P values
	*≥ 1 yr Frequency(%)	*≥ 1 yr (%) Frequency(%)	*≥ 1 yr (%) Frequency(%)		
Mothers' age					
15-19	40(88.9)	71(74.7)	264(78.3)	0.903	0.342
20-24	174(87.9)	250(82.5)	1152(84.6)	0.411	0.521
25-29	237(83.5)	385(85.2)	1883(86.7)	2.542	0.111
30-34	177(83.5)	293(87.7)	1504(88.2)	3.139	0.076
35-39	133(93.7)	237(84.6)	1278(89.1)	0.091	0.763
40-44	32(88.9)	170(87.6)	797(90.7)	1.286	0.257
45-49	15(88.2)	67(89.3)	385(88.1)	0.048	0.826
Marital status					
Never	9(56.3)	39(72.2)	172(79.6)	5.105	0.024
Married	771(87.0)	1347(85.5)	6788(87.4)	1.627	0.202
Widowed	11(84.6)	39(88.6)	142(87.7)	0.017	0.896
Divorced	17(89.5)	48(80.0)	181(86.6)	0.227	0.633
Mothers' Education					
No education	336(93.9)	699(87.3)	3290(88.7)	3.020	0.082
Primary	212(86.2)	354(84.7)	1755(89.8)	7.575	0.006
Secondary	206(78.9)	353(83.3)	1781(84.6)	3.894	0.048
Higher	54(78.3)	67(74.4)	437(77.9)	0.056	0.812
Occupation					
Not working	323(88.5)	428(84.4)	2075(87.4)	0.040	0.840
Unskilled	115(83.9)	295(83.6)	58(75.3)	1.864	0.172
Skilled	337(86.4)	692(86.2)	4833(87.7)	1.477	0.224
Professional	25(75.8)	58(82.9)	265(81.5)	0.275	0.600
Residence					
Urban	281(84.1)	570(85.5)	2126(86.7)	244.908	0.000
Rural	527(87.8)	903(84.7)	5137(87.4)	0.850	0.356
Region					
North Central	140(90.3)	259(84.9)	1426(89.1)	0.455	0.500
North East	124(93.9)	311(86.4)	1418(89.4)	0.097	0.755
North West	200(95.2)	417(90.5)	1870(89.6)	5.509	0.019
North East	70(74.5)	125(76.7)	599(78.7)	1.070	0.301
North South	132(74.2)	172(77.1)	1055(87.6)	30.776	0.000
North West	142(86.1	189(85.5)	895(82.1	2.471	0.116
Place of delivery					
Home	443(91.5)	876(87.0)	4498(88.7)	0.509	0.476
Government Hospital	232(82.9)	338(85.4)	1662(86.4)	2.557	0.110
Private Hospital	114(76.5)	250(78.6)	980(82.0)	3.820	0.051
Others	16(88.9)	7(70.0)	117(87.3)	0.070	0.792
Religion					
Christianity	405(81.0)	630(80.4)	3267(84.6)	8.898	0.003
Islam	391(93.5)	820(89.4)	3815(89.8)	3.257	0.071
Others	9(69.2)	22(73.3)	141(83.9)	3.140	0.076

≥ yr = breastfeeding for 1 year (12 months) or more, P<0.05= Statistical significance*

Table 5. Trends in the association between socio-demographic variables and frequency (Day) of breastfeeding

Variable	1999	2003	2008	Chi square for trend	P value
	*6+ Frequency(%)	*6+ Frequency(%)	*6+ Frequency(%)		
Mothers' age					
15-19	133(70.4)	138(69.7)	646(77.1)	5.740	0.017
20-24	302(75.5)	300(67.9)	1434(73.4)	0.001	0.981
25-29	322(70.9)	383(71.2)	1743(73.9)	2.472	0.116
30-34	231(68.5)	252(72.6)	1244(74.2)	4.376	0.036
35-39	151(71.2)	168(76.4)	802(72.9)	0.010	0.921
40-44	58(73.4)	66(72.5)	384(77.6)	1.190	0.275
45-49	19(70.4)	17(68.0)	172(77.1)	1.107	0.293
Marital status					
Never	17(54.8)	29(67.4)	151(68.9)	2.018	0.155
Married	1187(72.2)	1264(71.4)	6166(74.4)	6.564	0.010
Widowed	2 (66.7)	4(66.7)	40(71.4)	0.073	0.787
Divorced	12(54.5)	27(65.9)	67(76.1)	4.397	0.036
Mothers' Education					
No education	742(77.7)	726(75.6)	3517(76.8)	0.084	0.772
Primary	233(61.3)	308(67.4)	1357(71.2)	14.987	0.000
Secondary	223(66.0)	256(65.3)	1353(73.4)	12.656	0.000
Higher	20(74.1)	34(65.4)	198(62.7)	1.334	0.248
Occupation					
Not working	697(75.5)	536(75.5)	2161(73.1)	2.788	0.095
Unskilled	115(65.3)	191(63.5)	37(66.1)	0.013	0.910
Skilled	384(67.4)	553(70.3)	4060(75.2)	22.430	0.000
Professional	11(78.6)	44(69.8)	127(69.0)	0.350	0.554
Residence					
Urban	301(69.5)	450(71.4)	1543(73.5)	3.300	0.069
Rural	917(72.4)	874(71.0)	4882(74.6)	5.298	0.021
Region					
North Central	166(61.0)	217(66.4)	1017(66.7)	211.536	0.000
North East	220(81.5)	346(75.7)	1630(74.8)	4.812	0.028
North West	482(80.9)	463(75.4)	1993(80.6)	0.518	0.472
North East	63(55.3)	82(62.6)	462(75.2)	23.011	0.000
North South	117(56.5)	81(60.0)	732(76.0)	38.745	0.000
North West	170(70.5)	135(68.5)	591(66.3)	1.723	0.189
Place of delivery					
Home	830(73.5)	908(73.5)	4532(75.1)	1.896	0.169
Public Hospital	238(66.9)	246(68.0)	1147(72.1)	5.123	0.024
Private Hospital	130(70.7)	165(64.7)	653(73.8)	3.128	0.077
Others	18(62.1)	5(62.5)	90(68.7)	0.530	0.467
Religion					
Christianity	393(60.6)	402(63.4)	2336(70.0)	27.543	0.000
Islam	803(79.0)	897(75.3)	3943(77.4)	0.157	0.692
Others	20(71.4)	24(70.6)	113(66.9)	0.330	0.565

**6+ = frequency of breastfeeding for 6 times or more, P<0.05*= Statistical significance*

The proportion of mothers between the age groups 25- 29 and 30-34 years who breastfed their babies for at least one year increased over the years but this is not statistically significant. There was a significant increase in the proportion of single women who breastfed their wards for at least one year over the years at P =0.024, X^2= 5.105**.** For the women with primary and

secondary education, there was a statistically significant increase in the proportion of those who breastfed for at least one year at P<0.05 however a slight decrease in percentage was observed among women with no formal and higher education respectively. There appears to be a significant decrease in the proportion of women that breastfed for one year or more among the unskilled and non-working women while an increase was observed for the skilled and professional women.

Among the urban dwellers, there was a statistically significant increase in proportion of urban dwellers that breastfed for at least one year while there wasn't a change among the rural dwellers. In the category of region, the proportion of women who breastfed for one year or more appears to have decreased over the years from 1999 to 2008 except for those in the South East region. A statistically significant increase was also observed at for women from the South South region (X^2=30.771, P=0.001). There was an increase in the trend for breastfeeding for one year or more among women that delivered their babies in private and government hospitals over the years. There was an increase in the proportion of Christian women and a decrease in the proportion of Muslim women that breastfed for at least one year from 1999 to 2008.

There was a statistically significant increase in the proportion of the women in 15-19 years and 30-34 years age group who breastfed for more than 6 times during the day at p<0.05 over the years. The proportion of single women that breastfed their children at least 6 times in the day increased insignificantly from 1999 to 2008 though a statistical significant increase was observed among the divorced women (X^2=4.397, P=0.036) who breastfed for at least six times during the day over the years. There was a statistically significant difference only for the women with primary (X^2=14.987, P<0.001) and secondary (X^2=12.656, P<0.001) education from 1999 to 2008. There was a significant increase in trend among skilled women for breastfeeding at least six times during the day; 1999 (67.4), 2003(70.3) and 2008(75.2) while there was no significant (P=0.095) change in proportion among unemployed women that their babies for at least six times during the day.

The proportion of those who breastfed for at least six times during the day increased insignificantly over the years among the urban dwellers while there was a statistically significant increase among rural dwellers (X^2=5.298, P=0.021). There was a statistically significant association among women from all regions and frequency of breastfeeding during the day except for North West and South West. Among women from the North central, there was an increase over the years for breastfeeding frequency of six or more times during the day (X^2=211.536, P<0.001). This increase was also observed for women from South east (X^2=23.011, P<0.001) and South South (X^2=38.745, P<0.001) over the years from 1999 to 2003. There was a steady increase observed in the proportion of those that delivered in government and private hospitals who breastfed for at least six times in the day over the years. There was a steady and significant increase in trend among Christian women that breastfed for at least six times over the years (X^2=27.543, P<0.001).

It is observed from Table 6 that women within the age groups 25-29, 30-34 and 45-49 years have a statistically significant association with at least six times frequency of breastfeeding at night which increased over the years from 1999 to 2008 (X^2=7.084, P=0.008), (X^2=20.450, P<0.001) and (X^2=4.054, P=0.044) respectively. Among the married women, the proportion of those who breastfed for at least six times at night increased steadily over the years; 1999(33.3%), 2003(38.2%) and 2008(40.7%) and this was statistically significant (X^2=32.232, P<0.001). There was a statistically significant increase in the proportion of all women in all educational status who breastfed their babies for at least six times at night over the years from 1999 to 2008 and all these were statistically significant.

There was an increase in the proportion among non-working, unskilled and skilled mothers who breastfed for at least six times at night over the years and this was statistically significant at P<0.05 respectively. The proportion of those in rural areas that breastfed for at least six times at night increased over the years; 1999 (32.2%), 2003(34.7%) and 2008(40.1%) and this was statistically significant (X^2=34.924, P<0.01). Among women from North Central, North west, South east and South South, the proportion of those that breastfed for at least six times at night increased over the tears from 1999 to 2008 and this was statistically significant (X^2=40.474, P<0.01), (X^2=17.075, P<0.001), (X^2=7.036, P=0.008) and (X^2=15.693, P<0.001) respectively.

The proportion of those that delivered their children in homes, government hospitals and

private hospitals who breastfed six times or more increased over the years from 1999 to 2008 and these were statistically significant (X^2=13.642, P<0.001), (X^2=11.730, P<0.001) and (X^2=10.094, P=0.001) respectively. The proportion of both Christian and Muslim mothers that breastfed for at least six times at night increased statistically significant at P<0.05 over the years.

Table 6. Trends in the association between socio-demographic variables and frequency (Night) of breastfeeding

Variable	1999	2003	2008	Chi square for trend	P value
	*6+ Frequency(%)	*6+ Frequency(%)	*6+ Frequency(%)		
Mothers' age					
15-19	58(30.5)	69(34.5)	300(35.8)	1.751	0.186
20-24	139(34.8)	158(35.1)	754(38.5)	2.741	0.098
25-29	153(33.6)	209(38.3)	959(40.3)	7.084	0.008
30-34	98(29.1)	140(40.0)	723(42.9)	20.450	0.000
35-39	81(37.9)	94(42.0)	468(42.4)	1.317	0.251
40-44	25(31.6)	39(41.5)	203(40.8)	1.680	0.195
45-49	7(25.0)	12(48.0)	106(47.5)	4.054	0.044
Marital status					
Never	6(20.0)	16(35.6)	68(31.1)	0.632	0.427
Married	549(33.3)	685(38.2)	3389(40.7)	32.232	0.000
Widowed	0(0.0)	3(50.0)	18(32.1)	0.219	0.640
Divorced	6(27.3)	17(40.5)	37(42.0)	1.251	0.263
Mothers' Education					
No education	347(36.4)	340(34.9)	1932(41.9)	16.942	0.000
Primary	116(30.2)	190(41.0)	746(39.1)	6.751	0.009
Secondary	86(25.4)	167(41.8)	697(37.7)	10.334	0.001
Higher	12(41.4)	24(46.2)	138(43.4)	69.277	0.000
Occupation					
Not working	342(37.0)	298(41.3)	1236(41.5)	5.171	0.023
Unskilled	50(28.1)	137(44.5)	28(50.0)	14.068	0.000
Skilled	161(28.2)	260(32.7)	2143(39.6)	37.848	0.000
Professional	5(38.5)	26(40.0)	77(42.1)	0.132	0.716
Residence					
Urban	150(35.0)	287(45.1)	876(41.5)	2.380	0.123
Rural	411(32.2)	434(34.7)	2637(40.1)	34.924	0.000
Region					
North Central	82(30.0)	125(38.1)	750(49.0)	40.474	0.000
North East	97(36.1)	170(36.5)	725(33.2)	1.996	0.158
North West	230(38.7)	182(29.5)	1097(44.0)	17.075	0.000
North East	28(23.7)	88(65.2)	286(46.6)	7.036	0.008
North South	55(26.6)	59(41.0)	409(42.3)	15.693	0.000
North West	69(28.4)	97(49.0)	246(27.5)	3.266	0.071
Place of delivery					
Home	408(36.1)	433(34.6)	2448(40.4)	13.642	0.000
Public Hospital	106(29.8)	159(43.6)	664(41.5)	11.730	0.001
Private Hospital	39(20.7)	127(48.7)	350(39.5)	10.094	0.001
Others	7(24.1)	2(25.0)	48(36.6)	1.848	0.174
Religion					
Christianity	174(26.5)	290(44.6)	1254(37.5)	13.150	0.000
Islam	375(36.9)	411(34.2)	2150(42)	18.969	0.000
Others	9(34.6)	20(57.1)	84(49.7)	0.845	0.358

**6+ = frequency of breastfeeding 6 times or more, P<0.05*= Statistical significance*

4. DISCUSSION

The recommendations of WHO and UNICEF on breastfeeding practices are exclusive breastfeeding for the first six months, continued breastfeeding until 12 months, initiation within the first hour of life, breastfeeding on demand that is as often as the child wants, no use of bottles, teats or pacifiers. This study was carried out to describe the trends in breastfeeding practices among women of childbearing age in Nigeria from 1999 to 2008 and to ascertain possible factors associated. Although improvements have been observed across all demographic subgroups, trends in breastfeeding have been found to vary by both maternal characteristics, such as race, ethnicity, age and parental education, as well as geographic location [13].

4.1 Initiation of Breastfeeding

Generally over the years, a higher percentage of women initiated breastfeeding late. The percentage of mothers who initiated breastfeeding within 1hour of birth dropped from 40% in 1999 to 31% in 2003 and increased in 2008 to about 39%. This is in contrast to the high proportion of mothers in a study carried out to determine the trends in breastfeeding practices in Canada which reports that the percent of mothers who initiated breastfeeding their last child increased significantly between 2001 and 2005; 2001 (81.6%), 2003 (84.9%), 2005 (87.0%) but no significant difference in the percent of mothers who reported initiating breastfeeding was detected between 2007-2008 (87.9%) and 2005 [14]. In Sub-Sahara Africa, less than 15% of infants were breastfed immediately after birth in Madagascar, Mali, Senegal and Cameroon with the highest rates of about 60-70% of immediate breastfeeding in Kenya, Malawi, Namibia, Morocco and Guatemala [11]. Initiation of breastfeeding is influenced by interplay of different cultural, socioeconomic and religious reasons.

The age of mothers is a very crucial factor in initiation of breastfeeding. The proportion of mothers across all age group initiating breastfeeding immediately after birth have been observed to have dropped from 1999 to 2003 and increased in 2008 which was only significant for mothers aged 30-34 years. This might be because women in within this age group have more experience in breastfeeding initiation. This trend was also observed for the married women in immediate initiation of breastfeeding though a drop was observed in their proportion over the years which may be due to improvement in civilisation.

Key findings revealed that mothers' education has been a significant factor in early initiation of breastfeeding in Nigeria over the years. The trend observed is like the previous, which decreases from 1999 to 2003 and then increases in 2008. From 1999 to 2008, it has been found out that mothers with higher education have had the highest proportion that initiated breastfeeding immediately. This is in contrast with a study carried out in Singapore which reported that breastfeeding initiation increased over time from 2000 to 2008 and were independently associated with maternal education [15].

Occupation is a very significant factor for initiation of breastfeeding over the years as shown in this study. An increase in trend over the years has been observed for the unskilled, skilled and professional women with the highest increase among the unskilled women. Rural women had a greater drop over the years from 1999 to 2008 to initiate breastfeeding immediately than urban women. This might be due to increase in urbanisation as the years proceed and so there is increase in change of location from the rural to the urban settings.

The trend for the women from the North East and West for early initiation of breastfeeding reduced from 1999 to 2003 while it increases for those from the North Central. For the south east women, the proportion of women initiating breastfeeding immediately increases from 1999 to 2003 and then drops in 2008. This might be due to the fact that by 2003, some of the south east states have been carved out as south south and so leading to some change in beliefs and culture. A contrast was observed for the south west which decreased from 1999 to 2003 and then greatly increased in 2008. This could be due to increased awareness and knowledge in that region of the nation.

A steady increase has been detected in the proportion of women that delivered in private hospitals who initiated breastfeeding immediately from 1999 to 2008. This implies that these institutions have been diligent and consistent in their duties in educating women that come to deliver their babies there. For those who deliver in government hospitals and other places of delivery, the trend for women in early breastfeeding initiation drops from 1999 to 2003

and then increases to 2008. It has been found out that in western hospitals, immediate initiation have been discouraged because soon after birth, mothers are been separated from their newborns which might be a reason for this trend. Early initiation of breastfeeding increases in trend among Christian mothers as this was seen as their proportion increases over the years from 1999 to 2008 while the reverse is the case for their Muslim counterparts. This might be as a result of some changes in their belief systems.

4.2 Duration of Breastfeeding

Duration of breastfeeding for at least one year varies with the different socio-demographic variables studied among women of reproductive age in Nigeria. There was no significant change in the proportion of women who breastfed for at least 1 year from 1999 to 2008. This is in accordance to a study conducted in Pakistan, the percentage of infants over 12 months and under 16 months who were continuing to breastfeed increased slightly from 78.2% in 1990-91 to 79% in 2006-07 [16].

Mothers aged 30-34 years had a significant association with breastfeeding for at least one year which increases steadily over the years from 1999 to 2008. This might be due to higher awareness and interest in breastfeeding practices. This implies that breastfeeding programs in Nigeria for the past years might have failed in targeting younger aged women. According to a Study done by Hwang et al in 2006, women aged 35 years or older showed longer breastfeeding duration than the younger age groups [17]. Women who were never married had experienced an increase in proportion among those that breastfed their wards for at least one year from 1999 to 2008.

The proportion of women who had no formal education that breastfed their babies for one year or more reduced over the years from 1999 to 2008 while those with primary and secondary education increased from 1999 to 2008. This is in support of a Swedish study published in a 2007 issue of the 'European Journal of Public health'. This reported that a lower degree of maternal education and less disposable income translated to a reduced chance of a mother breastfeeding her child, despite breastfeeding being the most economical choice [18]. This implies that women should keep educating themselves about the benefits of breastfeeding practices, which will help them to continue to breastfeed their babies more successfully. This is in contrast to study conducted in Korea which reported that the higher the mothers' education level, the shorter is the breastfeeding duration [17]. It also reported that the mother's work status played a significant role in the early termination of breastfeeding but occupation was not a significant factor for duration of breastfeeding in this study. There was a steady increase in the proportion of women that are urban dwellers who breastfed for at least one year from 1999 to 2008 which might be due to advance in knowledge and better quality education as most might have attended antenatal clinics during pregnancy.

Among women in the North West region, a decrease was detected in the proportion of those that breastfed for at least one year from 1999 to 2008 whiles the reverse was the case for those in the South South region. This may be associated to their cultures and traditions. This may be similar to the beliefs of some cultural groups in Canada where formula feeding is dominant and preferred to breastfeeding [19]. This might also be as a result that some cultures are becoming more westernised thereby inculcating the practice of weaning their infants before the age of one year. Also some cultures have a taboo against sex during nursing, so a mother may wean her child to enable her to resume sexual relations.

Delivering in hospitals or homes was not significantly associated with duration of breastfeeding for at least one year among women. Recent findings revealed that some hospital systems does little to promote recommended breastfeeding practices because new mother are given free samples of formula to take home due to the deals of those hospitals and pharmaceutical companies who want their products to be promoted. According to a study conducted in Nairobi, it was found out that health seeking behaviour (place of delivery) of mothers was a significant factor in their breastfeeding practices [20]. The proportion of Christian mothers and those with other religion who breastfed for at least one year increased steadily over the years from 1999 to 2008 while the reverse is the case for their Muslim counterparts. This is puzzling, given the importance of breastfeeding in the Islamic religion but it is also similar to the low rate of compliance among Muslim women in North America was perhaps due to lack of education about the benefits of breastfeeding, combined with a lack of support network to assist new mothers [21].

4.3 Frequency of Breastfeeding (Day)

Furthermore, the study revealed that frequency of breastfeeding during the day was associated with some factors. There was no difference in the proportion of women who breastfed their babies for six times or more during the day from 1999(71.6%) to 2003(71.1%) but a slight increase from 2003(71.1%) to 2008(74.3%) which might be as a result of increase in awareness of breastfeeding practices since 2003.

There was an increase in frequency of breastfeeding by daytime for at least 6 times over the years for mothers aged 15-19 years from 1999 to 2008. Among mothers aged 30-35 years, there was a steady increase in the proportion of those who breastfed their babies for six times or more during the day over the years. For the married women, the frequency of breastfeeding at least six times during the day didn't really change since the proportion of these women from 1999 to 2008 was almost unchanged, though it was high. Among the divorced, this proportion constantly increased over the years from 1999 to 2008 probably due to increase in their knowledge about infant feeding practices.

Significantly, there was a steady increase in the proportion of women who breastfed for at least six times by daytime over the years from 1999 to 2008 for who women who had a primary education. A similar observation was determined for women with a secondary education. There was a significant increase in the proportion of skilled mothers who breastfed their wards for at least six times during the day over the years from 1999 to 2008. For non-working mothers, there was no remarkable change in the proportion of those that breastfed their babies for at least six times during the day from 1999 to 2008. There was a steady increase in the proportion of women who reside in the urban areas that breastfed for at least six times during the day. Though those of rural settings also increased, the increase was more constant for the urban women.

A very significant increase was observed among the proportion of the women from the South East and South South regions that breastfed their children for at least six times during the day from 1999 to 2008. Some cultures have a period of post-partum rest for new mothers where family and community members would step in to help and support the mothers so they can focus on feeding the child. Their North East counterparts experienced a drop in their proportion over the years. Some cultures have taboos in relation to breastfeeding practices.

The proportion of women who delivered in government hospitals that breastfed their babies for at least six times in a day significantly increased steadily from 1999 to 2008. For their counterparts who delivered in private hospitals, an increase also occurred over the years but not as steady. Only among Christian mothers was there a significant increase over the years of those that breastfed their babies for six times or more during the day from 1999 to 2008.

4.4 Frequency of Breastfeeding (Night)

The trend of feeding the baby for at least 6 times at night increased from 1999(32.9%) to 2003(38.2%) and then increased in 2008(40.4%) for women of childbearing age in Nigeria. It is therefore observed that higher proportion women in Nigeria do not frequently breastfeed their children at night, though there was an increase in trend of night breastfeeding from 1999 to 2008. It has been shown that period of breastfeeding has a significant relationship with night breastfeeding according to a study conducted in Iran [22].

Mothers aged 20-24, 25-29 & 30-34 years have shown significant increase in proportion that breastfed their babies six times or more at night over the years from 1999 to 2008. This might be as a result of them not having spare time except in the night since they are still young and of productive age. This increase was also observed for mothers aged 45-49 years. Among the married, the proportion of those that breastfed for at least six times at night increased significantly over the years from 1999 to 2008. This might be due to the influence of their husbands' encouragement in breastfeeding their babies. Most times, couples prefer sleeping with their children on the same bed or in the same room. This would therefore enable numerous breastfeeding at night.

Among women with primary, secondary and higher education, the proportion of women who breastfed six times or more at night increased from 1999 to 2003 and then dropped in 2008 while the reverse situation was observed for women with no education. This is probably because from 2003, there might have been an increase in girl-child education and moreover more women are been educated notwithstanding

them having a child or not. Over the years, there was a steady increase for the unskilled and skilled women that breastfed six times or more at night from 1999 to 2003. This was also observed for the professional women though it was not significant.

The proportion of rural women who breastfed for at least six times at night increased steadily from 1999 to 2008 unlike their urban counterparts. This might be as a result of increase in westernisation over the years because long intervals between timed feedings, a lack of night feeding, and supplementation of mother's milk with other species' milk or artificial milk, is a recent pattern practiced primarily in the West. A steady increase was observed for the North central and South South women who breastfed their children for at least six times at night from 1999 to 2008. Among the women from the South east and South west, the proportion of those that breastfed for six times or more at night increased from 1999 to 2003 and then dropped in 2008. This might be due to their belief systems since some cultures believe that children are naturally dependent in their early years; that children need responsive relationships with family members while some others believe that children need to learn to be independent almost from the time of birth.

The proportion of women who delivered in homes, government and private hospitals that breastfed their children at night for at least six times increased over the years from 1999 to 2008.There was an increase in the proportion of Christian mothers who breastfed their babies six times or more increased from 1999 to 2003 while it dropped in 2008. The reverse was observed for Muslim women.

5. CONCLUSION

Key findings revealed that for immediate initiation of breastfeeding, there was an increasing trend for women of reproductive age in Nigeria over the years from 1999 to 2008 for the following factors; mothers aged 30-34 years, married, education, occupation, delivering in private hospitals, Christian religion, North East and South West regions. For duration of breastfeeding for 12months or more, there was an increasing trend for the following factors; mothers aged 30-34 years, unmarried, primary & secondary education, urban residence, Christian religion, South South region.

For increasing trend over the years for frequency of breastfeeding for at least six times in the day have been associated with mothers aged 15-19 and 30-34 years, married and divorced, primary and secondary education, urban residence, delivering in government & private hospitals, Christian religion, South east, South South and North east regions. Factors for increasing trends for breastfeeding at night for at least six times include mothers aged 20-24, 25-29, 30-34& 45-49, married, primary, secondary and higher education, unskilled and skilled, rural residence, delivering in homes, government and private hospitals, North central and South South, Religion.

It was found out that there is increasing prevalence of breastfeeding practices over the years among women of childbearing age in Nigeria from 1999 to 2008 only for women aged 30-34 years, married women, women with primary and secondary education, Urban dwellers, Christian women, women from the south region amongst others. This shows an increasing trend in breastfeeding practices for these variables only over the years. This is an indication that there is need for an increase in breastfeeding practices for the other factors.

6. IMPLICATIONS

More attention should be given to increasing knowledge and education in each region of the nation and also to breastfeeding and mother friendly programs to encourage the women in carrying out better breastfeeding practices. There should be increase in awareness of breastfeeding benefits in Nigeria, but future health policies may need to target younger women, unmarried women and less educated women. Formula feeds should be discouraged for new mothers except prescribed by a nutritionist. Breastfeeding practices should be imbibed religious bodies and practices. Younger pregnant women should be aware of the importance of breastfeeding practices and of avoiding the interruption of the breastfeeding periods.

It is recommended that the health authorities should incorporate training and education programmes as well as healthcare measures to their family health programmes in order to overcome the problems of inadequate breastfeeding practices. There is a need for improving maternal care facilities in the government & private hospitals and women

should be discouraged from delivering in homes. There should be more family support for women and better support for breastfeeding in work places and in the public in general.

CONSENT

It is not applicable.

ETHICAL APPROVAL

An ethical issue related to this study was seeking the consent of the Nigeria Demographic and Health Survey in releasing the data related to breastfeeding practices among women of child-bearing age group 15-49 in Nigeria, which was obtained before the commencement of the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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