PREVALENCE AND PREDICTORS OF EXCLUSIVE BREASTFEEDING AMONG MOTHERS IN A SEMI-URBAN NIGERIAN COMMUNITY: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: **The uptake of exclusive breastfeeding (EBF) is low globally including Nigeria despite its benefits and interventions. This study aimed to assess the prevalence and predictors of EBF among mothers in a semi-urban Nigerian community.**

Methods: **We conducted a cross-sectional study among nursing mothers attending the immunization clinic at the Federal Medical Centre, Owo, Ondo State. A semi-structured questionnaire containing the World Health Organization's indicators for assessing breastfeeding practices was used for data collection.**

Results: **A total of 386 mothers were recruited with a mean age of 30.8 ± 5.0 years. Among them, 149 (36.8%) were below 30 years, 345 (89.4%) have had ANC visit at least four times, and 259 (67.1%) had initiated breastfeeding immediately after delivery. The prevalence of EBF was 52.6%. Natural feeds were the common feeds introduced after 6 months among 159 (78.3%) mothers. One hundred and forty-four (62.1%) nursing mothers aged 30 years or older practiced EBF compared to 72 (48.3%) persons below 30 years (X^2 = 6.290, p = 0.012). Also, 38 (70.3%) mothers who have delivered four or more children practiced EBF compared to 180 (54.2%) with fewer children (X^2 = 5.437, p = 0.020). Nursing mothers aged 30 years or older had 36% higher odds of practicing EBF compared to younger persons (Adjusted Odds Ratio = 1.358, 95%CI = 0.886 – 2.081, p = 0.160).**

Conclusion: **To achieve the WHO recommended target of ensuring that 90% of nursing mothers practice EBF, advocacy and health education must be intensified.**

Keywords: Exclusive breastfeeding, Pregnancy, Immunization clinic, Exclusive breastfeeding practices, Nigeria.

INTRODUCTION

Exclusive breastfeeding (EBF) means an infant receives only breast milk from his/her mother or a wet nurse for the first six months of life without other solids or liquids.[1] The World Health Organization (WHO) recommends EBF for the first six months of life. Complimentary foods can thereafter be added at six (6) months of age with the continuation of breastfeeding up to two years and beyond.[1,2] It is evident from the literature that EBF offers both long and short-term benefits both to the mother and the infant.[3] The benefits of EBF to the infant include a reduction in the vulnerability to infectious diseases, steady infant growth and cognitive development, as well as a reduced risk of childhood hypertension, obesity and diabetes mellitus.[3] For the mother, the benefits of EBF include the strengthening of mother-child bond, and a reduction in post-partum blood loss, depression, type 2 diabetes, breast and ovarian cancer.[4,5] Despite these benefits, global trends suggest that early cessation of breastfeeding, and poorly timed introduction of liquids, solid and semi solid foods is the norm in many communities across the globe.[6]

The United Nations Children's Fund (UNICEF) reports that 40% of infants aged six (6) months and younger are exclusively breastfed globally.[7] Of this estimate, only 23 countries across the globe have achieved the UNICEF and WHO recommendation of EBF for 60% of infants six (6) months and younger.[8] According to the Global Burden of Diseases,

Injuries, and Risk Factors Study, an estimated 47.5 million Disability Adjusted Life Years (DALYs) were lost in 2010 due to suboptimal breastfeeding.[9] In addition, the low uptake of EBF has been reported as a factor that has contributed to 11.6% of Under-5 deaths in sub-Saharan Africa.[9,10]

In sub-Saharan Africa, there is a disparity in the uptake of EBF with the prevalence ranging from 23.7% in Central Africa to 32.6% in West Africa, 53.5% in East Africa and 56.6% in Southern Africa. The countries with the lowest prevalence in each region were Gabon – 6.0% (Central Africa), Cote d'Ivoire- 13.2% (West Africa), Comoros-13.5% (East Africa) and Namibia-48.7% (Southern Africa). In Nigeria, the estimated prevalence of EBF was 17.5%, a proportion that is lower than the minimum 60% recommended by the World Health Organization and UNICEF. Despite the baby-friendly hospital initiative that was introduced in 1991 by UNICEF, Nigeria reports sub-optimal practice of EBF among nursing mothers.[8,11] Evidence however suggest that the reported low uptake of EBF in Nigeria could be an outplay of some underlying factors.[12]

Previous studies conducted in Edo, Osun, Imo, Cross-River, and Anambra States have investigated the association between various factors and EBF.[11,13,14,15,16] Findings from these studies suggest that maternal factors such as maternal age, maternal education, socioeconomic status, marital status, parity, and familial predisposition towards EBF were associated with EBF. In addition, infant-related factors such as infant age and proximity of the mother to the baby were also identified as factors that predict EBF.[13,14,15] Other identified factors were health service-related factors such as the use of health facility based antenatal care, delivery at a government facility and breastfeeding education from a government health facility.[13,14,15] Most of these studies have however been conducted in few states and also just urban regions hence, there exists a dearth of literature on EBF in Ondo State and semi-urban areas in Nigeria at large. A yearly breastfeeding program was instituted by the Federal Medical centre, Owo, Ondo State in 1994. The programme was geared towards improving the practice of EBF among nursing mothers, however, the effectiveness of the breastfeeding program has not been assessed since its commencement. The current prevalence and predictors of EBF in Owo several years after commencement of the annual breastfeeding week remains unknown. A study of this nature is needed to provide data required for nationwide comparison of the prevalence of EBF in Nigeria. Also, this study could provide statistics for subsequent evaluation of the annual breastfeeding program. This would subsequently inform on the strategies for improving EBF practice across Nigeria. Therefore, this study aimed to assess the prevalence and predictors of EBF in a semi-urban Nigerian community.

METHODS

Study Design and Area

This was a cross-sectional study conducted at the Federal Medical Centre (FMC), Owo. The FMC, Owo is a tertiary health facility located in Owo Local Government Area of Ondo State, Nigeria. FMC, Owo provides healthcare services at all levels to residents of Ondo and neighbouring states. The FMC, Owo is sited close to the highway and so admit patients from the Federal Capital Territory and farther areas in the country. It is approved by the West African Postgraduate College and the National Postgraduate College as a training centre for Resident Doctors in some specialties and sub-specialities of medical services. Presently, the centre has 21 clinical and 7 non-clinical departments. FMC, Owo is a 250-bed tertiary health centre with a bed occupancy of about 70% always. The average monthly attendance, by all age groups, at the outpatient department is about 4,980. The centre has a staff strength of 1200 workers.

Study Population

The target population included nursing mothers attending the immunization clinic at FMC, Owo whose babies were below 2years.

Sample Size Calculation

A minimum sample size (n) of 382 nursing mothers was estimated using the formula for the estimation of a single proportion. This took into consideration few assumptions including the standard normal deviate (z) corresponding to a confidence level of 95% (1.96), prevalence rate (p) of 52.9%,[16] and 5% level of precision (d).

Sampling Technique

Systematic random sampling was used to recruit the women attending the immunization clinic. About 98 women are seen weekly at the immunization clinic for children older than 6 months. Clinic holds once a week, with approximately four clinic days in a month. The sampling frame at the clinic over three months was 1,176 ((98 mothers) *(12 days) *(3 months)). The sampling interval, i.e., sampling frame/sample size was 1,176/382 = 3. The first mother was recruited using simple random sampling to select one out of every first 3 women on every clinic day. Depending on the number selected first, every third woman was recruited. Only 32 women were recruited once in a week, giving an average of 128 women enrolled monthly.

Data Collection Instrument

A questionnaire containing the WHO indicators for assessing breastfeeding practices was adapted. The semi-structured questionnaire was used to interview mothers of infants attending immunization clinic on scheduled days. The questionnaire included questions on sociodemographic characteristics of mothers and infants (age, sex, mothers' age, religion, occupation, marital status, education, and family income), feeding practices (breastmilk, mixed (breastmilk plus artificial feeding), or solely artificial feeding) and other details of breastfeeding practices, such as the time of breastfeeding initiation, the duration and frequency of feeding. EBF was defined as giving breast milk alone in the first 6 month of life. The check questions included "At what age did you add water?" and "At what age did you commence complementary feeds?" Those defined to have practiced EBF were nursing mothers who did not give water or other feeds until after six months of life.

Statistical Analysis

The statistical analyses were done using the Statistical package for Social Sciences (SPSS) version 17. Sociodemographic characteristics such as age, level of education, employment status, marital status, number of children, average monthly income, and smoking status during pregnancy were presented in frequency tables. The minimum wage in the country as at the time the study was conducted was 18,000 naira, and was used to dichotomize average income. Mothers who stated that EBF meant placing the baby exclusively on breastmilk for the first six months of life were said to have "correct knowledge" of the meaning of EBF. Persons who defined EBF as the combination of breast milk with formula feeds or animal milk were said to have "wrong knowledge" of the meaning of EBF. Mothers who correctly defined EBF and the recommended duration (i.e., 6 months) for which it should last were said to have "adequate knowledge" of EBF. Those who stated otherwise were said to have "inadequate knowledge" of EBF. The association between sociodemographic characteristics and EBF practice among mothers attending the immunization clinic were tested with Chi-square test. Logistic regression analyses were conducted on variables that were statistically significant at the bivariate level to identify the predictors of EBF. Statistical significance was considered at p-value <0.05.

Ethical Approval

Permission to conduct the study was obtained from the Health Research Ethics Committee of Federal Medical Centre, Owo, Ondo State, Nigeria. Verbal informed consent was obtained from the mothers before the questionnaires were administered. No form of harm was inflicted on the individuals who participated in the study.

RESULTS

Table 1 shows the sociodemographic characteristics of the respondents. The mean age of the 386 women was 30.8 ± 5.0 years. Among them, 149 (36.8%) were below 30 years, 226 (58.5%) had completed tertiary

Table 1: Sociodemographic characteristics of mothers attending the immunization clinic at the Federal Medical Centre Owo, Ondo State, Nigeria.

Variable	Frequency	Percentage
Mean age: 30.8 ± 5.0 years		
Age (Years)		
<30	149	38.6
≥30	237	61.4
Level of education		
Secondary or lower	160	41.5
Tertiary	226	58.5
Employment status		
Employed	242	62.7
Not employed	144	37.3
Marital status		
Married	364	94.3
Others	22	5.7
Number of children		
<4	332	86.0
≥4	54	14.0
Median average monthly income: #20,000 (Range = ₦2,000 - ₦1,000,000)		
Average monthly income (₦)		
< 18,000	82	21.2
≥18,000	304	78.8
Smoking status during pregnancy		
Smoking	11	2.8
Not Smoking	375	97.2

Table 2: Antenatal related characteristics of mothers attending the immunization clinic at the Federal Medical Centre Owo, Ondo State, Nigeria.

Characteristics	Frequency (N=386)	%
Health problems during pregnancy		
Yes	70	18.1
No	316	81.9
Had at least four ANC visits		
Yes	345	89.4
No	41	10.6
ANC care provider		
Non-Physician	53	13.7
Physician	333	86.3
Place of delivery (N=383)		
Hospital or Clinic	342	89.3
Traditional birth Attendance	9	2.3
Home	11	2.9
Missionary Homes	21	5.5
Type of delivery		
Vaginal	316	81.9
Caesarean	53	13.7
Assisted (Forceps delivery)	17	4.4
Hospitalization of baby after delivery		
Yes	115	29.8
No	271	70.2
Index baby's sex		
Male	195	50.5
Female	191	49.5
Index baby's age		
Nine months	343	88.9
Others	43	11.1
Mother resumed work < 6 months after delivery		
Yes	270	69.9
No	116	30.1
Age at first pregnancy		
≤ 19	25	6.5
20-29	259	67.1
30-39	94	24.4
40	8	2.1
Gestational age at birth		
27 and below	12	3.1
28-36	73	18.9
37-40	269	69.7
41 and above	32	8.3
Weight of baby at birth		
≤2.4	42	10.9
2.5-3.5	246	63.7
≥3.6	98	25.4

education, and 242 (62.7%) were employed. Also, 364 (94.3%) were married, 332 (86%) had less than 4 children, and 304 (78.8%) earned an average monthly income of ₦18,000 or more. The median income was 20,000 naira and ranged between ₦2,000 and ₦1,000,000.

Among the women, 259 (67.1%) commenced breastfeeding within 30 minutes after delivery. Table 2 shows the antenatal-related characteristics of the mothers attending the immunization clinic at the FMC, Owo. Among them, 316 (81.9%) had no health problems during pregnancy. Also, 345 (89.4%) mothers had ANC visit at least four times, 333 (86.3%) had physicians as their ANC care providers, and 342 (89.3%) had their babies delivered in hospital settings. Vaginal delivery accounted for 316 (81.9%), while 271 (70.2%) of the babies were not hospitalized after birth, and

the index baby's sex was male in 191 (50.5%) deliveries. At the time of this study, 343 (88.9%) of the babies were 9 months old, and 257 (71.4%) mothers had resumed work less than 6 months after delivery.

Table 3 shows breastfeeding knowledge and practices among the mothers. The prevalence of EBF was 52.6%. Among the breastfeeding mothers, 350 (90.7%) breastfed their babies as often as the babies wanted. (23.6%) suggested extended paid maternity leave would improve breastfeeding practice. Overall, 218 (56.5%) mothers had adequate knowledge of EBF.

Table 4 shows the factors associated with EBF practice among the mothers interviewed. One hundred and forty-four (62.1%) nursing mothers aged 30 years or older practiced EBF compared to 72 (48.3%) persons below 30 years ($X^2 = 6.290$, $p = 0.012$). Also, 38 (70.3%) mothers who have delivered four or more

Table 3: Breastfeeding knowledge and practices among mothers attending the immunization clinic at the Federal Medical Centre Owo, Ondo State, Nigeria.

Practices	Frequency	%
Breastfeeding alone for 6 months		
Yes	203	52.6
No	183	47.4
Type of feed introduced among those who breastfed for 6 months		
Artificial feeds	44	21.7
Natural feeds	159	78.3
Pattern of breastfeeding daily		
< 6 times	15	3.9
6 to 8 times	13	3.4
>8 times	8	2.1
As often as the baby wants	350	90.7
Reason for choosing breastfeeding		
Affordable	39	10.1
Healthy Growth	258	66.8
Bonding	30	7.8
Child Spacing	29	7.5
None	30	7.8
Spouse's Support		
Provision of needs	252	65.3
Helping with home chores	80	20.7
No support	54	14.0
Suggested support to improve breast feeding practice		
Extended paid maternity leave	91	23.6
Break for breast feeding during working hours	40	10.4
Closing from work earlier to breastfeed the baby	24	6.2
More enlightenment	86	22.3
Provision of employment	145	37.5
Best time to make decision about breast feeding		
Before pregnancy	60	15.5
During pregnancy	97	25.1
After the baby is born	229	59.3
Adequate knowledge of exclusive breastfeeding		
Yes	218	56.5
No	168	43.5

Among the 203 (52.6%) mothers that breastfed their babies for six months, 159 (81.6%) introduced complementary feeds 6 months after EBF. In addition, 258 (66.8%) mothers chose breastfeeding to achieve babies' healthy growth, Also, 252 (65.3%) gained spouse's support for the provision of needs, and 91 children practiced EBF compared to 180 (54.2%) with fewer children ($X^2 = 5.437$, $p = 0.020$). Furthermore, 174 (55.1%) of mothers with no health problems during pregnancy practiced EBF compared to 45 (64.3%) with health problems during pregnancy ($X^2 = 2.501$, $p = 0.114$).

Table 4: Factors associated with exclusive breastfeeding practice among mothers attending the immunization clinic at the Federal Medical Centre Owo, Ondo State, Nigeria.

Variable	Exclusive breast feeding		X^2	p-value
	Yes (%)	No (%)		
Age (Years)				
<30	72 (48.3)	77 (51.7)	6.290	**0.012**
≥30	144 (62.1)	88 (37.9)		
Levels of education				
Secondary or lower	84 (52.5)	76 (47.5)	0.838	0.360
Tertiary	132 (58.4)	94 (41.6)		
Employment status				
Employed	138 (57.0)	104 (43.0)	0.006	0.939
Not Employed	82 (56.9)	62 (43.1)		
Marital status				
Married	208 (57.1)	156 (42.9)	0.193	0.661
Not married	12 (54.5)	10 (45.5)		
Median number of children = 2 (Range: 1 – 6)				
Number of children				
<4	180 (54.2)	152 (45.8)	5.437	**0.020**
≥4	38 (70.3)	16 (29.7)		
Health problems during pregnancy				
Yes	45 (64.3)	25 (35.7)	2.501	0.114
No	174 (55.1)	142 (44.9)		
Adequate knowledge of EBF				
Yes	128 (58.7)	90 (41.3)	0.667	0.414
No	92 (55.8)	76 (45.2)		

Table 5: Determinants of Exclusive Breastfeeding among mothers attending the immunization clinic at the Federal Medical Centre Owo, Ondo State, Nigeria.

Variable	Adjusted Odds Ratio	95% CI for Adjusted Odds Ratio		p-value
		Lower	Upper	
Age (Years)				
<30	1			
≥30	1.358	0.886	2.081	0.160
Number of children				
<4	1.079	0.594	1.959	0.802
≥4	1			

Table 5 shows the determinants of EBF among the mothers interviewed. Nursing mothers aged 30 years or older had 36% higher odds of practicing EBF compared to younger persons (Adjusted Odds Ratio = 1.358, 95%CI = 0.886 – 2.081, p = 0.160).

DISCUSSION

This study was conducted to determine the prevalence and predictors of EBF among women attending the immunization clinic at the FMC, Owo, Ondo State. The prevalence of EBF in Owo was found to be 52.6%. The finding in this study was higher than the 16.4% EBF prevalence reported in the Nigeria Demographic and Health Survey (NDHS) in 2018.[17] The prevalence of EBF observed in this study is also higher than 20% reported in a study in Benin city, Edo State, Nigeria.[4,15] A lower prevalence of EBF has been recorded in Calabar (22.9%) and the United States (19%).[13,18-21] Though the uptake of EBF prior to the commencement of the annual breastfeeding week in Owo is not known, the higher prevalence of EBF compared to other regions in the country could possibly be ascribed to the annual breastfeeding week. The week usually involves breastfeeding campaigns, and incentives awarded to nursing mothers who had practiced EBF. These activities could have therefore resulted in mothers being more informed and also better motivated to practice EBF.

The practice of EBF in Owo, a semi-urban community could have further contributed to the results obtained in this study. The difference may be due to the promotion of EBF among Owo residents, and the political will associated with the annual breastfeeding program in Owo, a feat that has not been recorded elsewhere. However, a study from Kano reported a high prevalence of 70.0% which was a hospital-based study among health workers. [22] The prevalence of EBF recorded in our study is lower than the 60% cut-off recommended by the UNICEF and WHO. This therefore highlights the need for continuous promotion of EBF in Owo community. The proportion of mothers who practiced EBF in this study was also low compared to the 89.9% who had correct knowledge of EBF. This shows an existing gap between knowledge and practice and underscores the need to intensify the practice of EBF among nursing mothers.

In our study, majority of the mothers (67%) commenced breastfeeding immediately after delivery which is in tandem with the 70% reported from a similar research conducted in a rural setting in Ife, Osun State, Nigeria.[23] Our results are however higher than what was reported in an urban setting in Edo State, Nigeria (44.5%), and a multicentred study in Nigeria (36%).[22,24] Our findings could be an outplay of a higher proportion of natural deliveries in rural and semi-urban communities compared to urban communities. The cultural acceptability of breastfeeding is further strengthened in our study in the introduction of natural feeds (56.5%) as a complimentary feed, similar to maize-based diet (53.5%) in a multicentred study in Nigeria.[2] The use of natural feeds as complimentary feed in our study could also be due to the high poverty level of the respondents and therefore adoption of cost-effective and easy-to-get nutritious feeds.

Majority (59.8%) of the mothers in our study opted for breastfeeding because breastmilk enhances babies' growth and wellbeing. This is similar to a report from the United Nations Children's Fund (UNICEF) and a study from Calabar, Nigeria.[7,13] The agreement between these studies therefore suggests that besides the cost-intensive nature of breastfeeding, nursing mothers are aware of the potential benefits EBF presents. Improved health education in this regard would therefore be important to prevent the occurrence of many childhood illnesses and improve the likelihood of child survival, as elucidated by the child survival strategies.[7]

From our study, older women had higher odds of practicing EBF compared to younger persons. This finding could be attributed to the engagement of a higher proportion of young persons in career building pursuit, and reduced time and commitment to EBF practice. This result is consistent with the findings in the literature that younger women are more likely to cease EBF prior to the attainment of the 6-month benchmark.[25,26] Although educational attainment has been reported elsewhere as a predictor of EBF practice among mothers, the present study however found no association between maternal education and EBF. In Ethiopia, higher educational status has been described as a predictor of EBF.[27] In Nigeria however, older maternal age, higher parity, delivery at a government facility, a positive family attitude towards EBF, and breastfeeding education from a government health facility were factors that determined EBF.[12,16] Other studies conducted in Nigeria reported high socioeconomic status, four or more antenatal visits, female gender and living in the North Central geopolitical region as predictors of EBF.[13,15]

It intrigues to know that mothers with four or more children had higher odds of practicing EBF. This implies that the those with fewer children were more likely to attend ANC clinic regularly and adhere to all breastfeeding instructions issued by instructors during antenatal health education. Therefore, breastfeeding education delivered at ANC clinic should be adequately packaged and delivered by seasoned professionals who have adequate understanding of the community and have undergone trainings on antenatal health education. Findings in our study revealed that adequate knowledge of EBF does not translate into practice. Therefore, context-based assessment of how EBF practice could be promoted should be immediately undertaken to ensure child health.

No single factor could be a predictor of EBF. Therefore, understanding the importance of breastfeeding and the responsibility of promoting EBF practice does not rest solely on the mother. Rather, spousal support should be provided to encourage EBF among nursing mothers. Also, the political, social, and environmental frameworks to improve the uptake of EBF in Nigeria should be built and sustained.

CONCLUSION

This survey revealed that gaps exist regarding the adoption and practice of EBF among nursing mothers in Nigeria. To achieve the WHO recommended target of ensuring that 90% of nursing mothers practice EBF, incentives can also be given to encourage mothers who conscientiously practice the breastfeeding policy. Spousal support of EBF should be promoted, and advocacy/health education must be intensified by national and professional stakeholders.

Author Contributions

AMA, OOA, and BAO conceived the study and supervised data collection. OSI, DTF, SOO, AOK, IFA, FOA, and AAA participated in data collection, data analysis and writing of the first draft of the manuscript. AMA, OSI, and AAA revised the manuscript for critical intellectual content. All authors approved the final version of the manuscript.

Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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