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Awareness and Determinants of Exclusive Breastfeeding Practices among Nursing Mothers Attending Primary Health Care Facilities in Uyo, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author OOM designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AME and VEI managed the analyses of the study. Author AME managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Exclusive breastfeeding (EBF) is a nutrition specific intervention that is crucial to growth and development of a young child and contributes to the attainment of sustainable development goals.
Aim: To determine the level of awareness, prevalence and determinants of EBF among nursing mothers attending Primary Health Care (PHC) facilities in Uyo Local Government, Nigeria
Place and Duration of Study: three selected Primary Health care facilities in Uyo Local Government (LG) of Akwa Ibom state Nigeria. June-July 2017.
Methods: The study used a descriptive cross sectional design involving 331 mothers attending child welfare clinics in three (PHC) facilities that were selected using simple random sampling techniques. A structured interviewer administered questionnaire was used to collect data on socio-

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demographic characteristics, awareness and practice of EBF. Categorical variables were summarized using percentages, and continuous data using mean and standard deviation, chi square was used to assess the relationship between variables. While multivariate logistic regression was used to determine independent predictors of EBF practice .

Results: The level of awareness of EBF and early initiation of breastfeeding (EIBF) were 89% and 88.5% respectively and universal awareness was 81.3%. Out of 231 infants below 6 months, 42% of them were currently on EBF and 36.8% (122/331) of the infants 0-12 months had EBF, the EIBF rate was 54.4%, about 45% of the infants had been on infant formula. Mothers who practiced EBF were significantly older than those who did not, the predictors of EBF were; delivery at the health facility (AOR 4.3; 1.84-10.49), normal delivery (AOR 2.3; 1.15-4.4), those with 2 (AOR 1.9; 1.04-3.4) or more than 3 children (AOR 4.7;1.91-9.9), mothers who had opportunity to breastfeed at work place (AOR 4;1.2-12.9) and mothers who were unemployed/self-employed (AOR 7.2; 2.2-23.7).

Conclusion: The practice of EBF remains poor despite relatively high level of awareness, measures such as Community-based breastfeeding support groups, one-on-one counselling and establishment of crèches in workplaces should be put in place. The international codes on marketing of breast-milk substitutes should be fully implemented.

Keywords: Exclusive breastfeeding; Awareness; Practice; Determinants; Uyo.

1. INTRODUCTION

Exclusive breastfeeding (EBF) is said to be the most important child survival intervention, and has been described as the best gift a mother can offer her baby [1]. World Health Organization (WHO) defined EBF "as the intake of only breast milk in the first 6 months of life and no food or drinks not even water except oral rehydration salt (ORS) and syrups (vitamins and other medicine) and if medically indicated"[2]. WHO recommends that mothers should initiate breastfeeding within 1 hour of delivery and breastfeed exclusively for 6 months and continue breastfeeding to 24 months (the first 1000 days of life). This practice alone can save 800,000 lives of under-five annually [3]. EBF makes available the best nutrients, which is easily absorbable, it serves as the first immunization for the baby, helps in the cognitive development and protects the child in adulthood against non-communicable diseases like diabetes mellitus [4]. It is equally beneficial to the mother in reducing post-partum hemorrhage, while some studies have also shown that it protects against some cancers in women [5,6]. The practice of EBF is key to the attainment of sustainable development goals.

Breast feeding is a common practice in African society but exclusive breast feeding is still foreign [7]. The indicators of optimal breastfeeding practice include; i) early initiation of breastfeeding which is defined as initiation of breastfeeding within 1 hour of delivery, ii) exclusive breastfeeding for 6 months and continued breastfeeding up to 24 months [8]. With the numerous benefits of breastfeeding known and the recommendation by WHO, the practice of EBF is still very poor globally with a rate of 40% as at 2016 [9]. and a pooled prevalence of EBF in West Africa is 34.6% [10, 11]. In Nigeria, a survey done in 2017 reported EBF rate of 23.7% for the country and 27.2% for South-south region [11], the national average of early initiation of breastfeeding (EIBF) was 32.8% of children under the age of two [12]. These rates are far below the target of 90% coverage of infant less than 6 months recommended by WHO [13].This is in spite of, various government policies and programmes, such as the Baby Friendly Hospital initiative (BFHI) and Infant and young child feeding practices (IYCF), However, to what extent these programmes and policies translate to actual practice, and the gaps and factors responsible for this experience have not been properly evaluated at the PHC level. Some studies have identified factors like attitudes of mothers [14], socio-cultural factors, maternal age [15], household income, and number of antenatal visits and place of delivery [16] among others.

This study therefore aimed to determine the awareness and practice of exclusive breastfeeding and its determinants among mothers whose infants were receiving immunization in selected PHC facilities in Uyo, Akwa Ibom State, in order to generate evidence for advocacy and decisions making on how to improve on the practice of exclusive breastfeeding in the study setting.

2. METHODOLOGY

The study was conducted in Uyo, the capital city of Akwa Ibom State, one of the oil rich South-south states of Nigeria. Uyo Local Government Area (LGA) is one of the 31 LGAs and has an estimated population of 456,996 [17]. The Local government has a number of both public and private health facilities, these include a tertiary institution, one public private secondary facility and 14 primary health care facilities. This study was done in three selected PHC facilities in Uyo

The study population was all nursing mother-infant pairs attending child welfare clinics in the selected primary health care facilities in Uyo.

2.1 Study Design

This was a descriptive cross sectional study of nursing mother-infant pairs attending child welfare clinic in the three selected PHC facilities in Uyo, June 2017.

A sample size of 331 was determined using exclusive breastfeeding rate of 22.8% [18] and a non-response rate of 10%.

Three health facilities were selected out of the `14 Primary health facilities in Uyo using simple random sampling technique. The sample size was proportionally allocated to the selected facilities; PHC barrack road, Uyo (PHC operational base), PHC Idoro and PHC Ikot Okubo at 55%, 25% and 20% respectively based on the CWC attendance in the month before the study. The nursing mother-infant pairs were enrolled consecutively in the order in which the babies were immunized until the sample size was attained in each facility. Mothers whose babies were above 12 months old were excluded from the study.

2.2 Data Collection Tool

Data was collected by trained research assistants (final year medical students) using a pre-tested interviewer administered structured questionnaire to the nursing mothers at the selected facilities.

The questionnaire captured two questions on awareness based on WHO recommendation;

1) How soon should a child be put to breast after delivery?

2) How long should a baby be exclusively breastfed for?

And a set of questions on practice and socio-demographic factors, socio-cultural, ante natal attendance and some obstetric factors.

2.3 Data Analysis

Data was entered, cleared and analyzed using STATA version 12. Data was summarized using proportions for categorical data and mean and standard deviation (SD) for continuous data. Relationship was determined using chi square. Variables that were significant (p value<0.05) at bivariate level were fed into a multivariate model, to compute adjusted Odd ratio with 95% confidence interval. Results were presented using tables and figure.

2.3.1 Outcome variables and indicators

2.3.1.1. Awareness

Proportions of nursing mothers who were aware of early initiation of breastfeeding within 1 hour (EIBF) after delivery.

Proportion of nursing mothers who were aware that nothing should be added to breast milk not even water before the 6th month.

Proportion of nursing mothers who were aware of both (universal awareness).

2.3.1.2 Practice

Proportion of babies 0 -12 months who initiated breastfeeding within the first 1 hour of life.
Proportion of babies 0 to 5 months who were currently on exclusively breastfeeding.
Proportion of babies 0 to 12 months who were exclusively breastfed for at least 5 months.
The proportion of babies 6 to 12 months on continuous breastfeeding.
Proportion of babies 0 to 12 months on bottle feeding.

2.4 Ethical Consideration

The ethical approval was obtained from Ethical Review Committee of University of Uyo Teaching Hospital. Participation in the study was voluntary and the respondents were assured of their confidentiality. Written informed consent was obtained from each respondent.

3. RESULTS

Three hundred and thirty-one mother-infant pairs was recruited and analyzed for the study with the mean age of 27.8 (5.0) years, 38% of the women were within age group 26-30 years and were mostly married (82%). About 85% had at least secondary level of education while more than half (58%) of them had at least 2 children, 40% of them had a monthly income above N40, 000. About 60% of the mother delivered in a health facility and about 39% were unemployed (Table1). The mean age of the infants was 3.6 (3.0) months and 52% (173) were males, about 62% of the babies were delivered in the health facility. (Table 1).

Eighty-nine percent of the mothers were aware of EBF for 6 months, 88.5% of them were aware that ideal time for initiation of breastfeeding is within 1 hour of delivery and 81.3% were aware of both (universal awareness) (Fig.1)

Almost all the babies (99.7%) had ever been breastfed and 54.4% initiated breastfeeding within the first 1 hour of life, at the end of 1 month of life about 44% had been given water, 33% of received artificial feeding before 6 months of life, 45% of the children under 12 months were on artificial feeding. (Table 2). Among infants 0-5 months, about 97% of them were still on breastfeeding and 42.0% were currently on EBF (Table 3), 25% of infants 6-12 months were exclusively breastfed for at least 5 month and only 3% of them had completely stopped breastfeeding (Table 4).

A total of 122 (36.8%) were practicing or had practiced EBF. Socio demographic characteristics like maternal age and number of children were significantly associated with the practice of EBF (Table 5). Other factors like place of delivery, ante natal attendance, mode of delivery and whether or not the nursing mother work place do not encourage breastfeeding were also significantly associated with EBF practice. (Table 6).

The predictors of EBF practice include; delivery at the TBA (AOR 3;1.08-7.80), delivery at health facility (AOR 4.3; 1.84-10.49), normal delivery (AOR 2.3; 1.15-4.4), those who have 2 children (AOR 1.9; 1.04-3.4) or more than 3 children (AOR 4.7;1.91-9.9), those who were permitted to breastfeed at the workplace (AOR 4;1.2-12.9) and those who were unemployed or self-employed (AOR 7.2; 2.2-23.7). (Table 7).

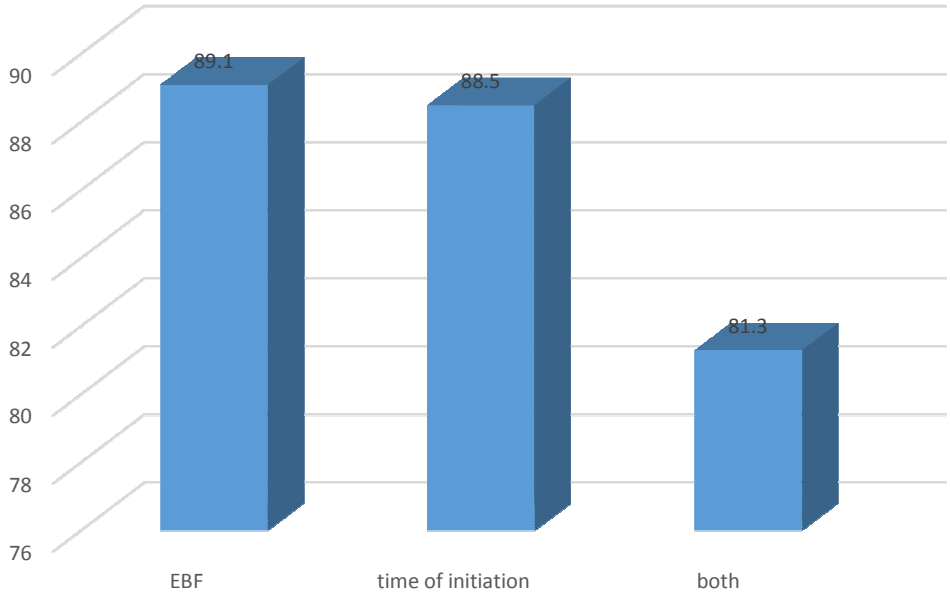

Fig.1. A bar chart showing the proportion of awareness of Exclusive breastfeeding, EIBF and Universal awareness

Table 1. Socio-demographic characteristic of the respondents, June 2017

Socio demography	Frequency	Percentage
Age (years)		
Less than 21 years	25	7.6
21-25	85	25.7
26-30	126	38.1
31-35	77	23.3
36- 40	18	5.4
Mean age (SD) 27.9 (5.0)		
Marital status		
Single	60	18.1
Married	271	81.9
Level Education		
Primary	47	14.2
Secondary	158	47.7
Tertiary	126	38.1
Occupation		
Civil/public servant	59	17.8
Artisan	58	17.5
Trader	85	25.7
Professional	20	6.0
Unemployed	109	32.9
Number of children		
1	138	41.7
2	97	29.3
3	58	17.5
4	28	8.5
Above 4	10	3.0
Mean =2		
Family income		
Less than 10,000	37	11.2
10,000-20,000	46	13.9
20,000- 30,000	44	13.3
30,000-40,000	71	21.5
Above 40,000	133	40.2
Sex of infants		
Male	173	52.3
Female	158	47.7
Place of delivery		
Home	42	12.7
TBA	56	16.9
Church	29	8.8
Health facility	204	61.6
Age of infant in Month		
Mean (SD)= 3.6 (3.0)		
Less than 1 month	33	10
1	60	18.1
2	54	16.3
3	65	19.6
4	12	3.6
5	7	2.1
Above 5	100	30.2

Table 2. Practice of Exclusive breastfeeding among nursing mothers attending PHC facilities in Uyo, June 2017

Variable	Frequency	Percentage
It's this child ever breastfed		
Yes	330	99.7
No	1	0.3
When was breastfeeding commenced		
Within the first I hour	180	54.4
After the 1st 1 hour	150	45.3
Not breastfed at all	1	0.3
How long was the child breastfed		
I month	65	19.6
2 to 3 months	74	22.4
3 to 4 months	55	16.6
4 to 5 months	38	11.5
5 months and above	98	29.6
When was water first added		
Within the first week of life	21	6.3
Within the first 1 month	125	37.8
2nd month	22	6.6
3rd month	17	5.1
4th month	9	2.7
5th month	15	4.5
6th month	24	7.2
Not yet given	98	29.6
When was formula feeding introduced		
Not yet given	181	54.7
First month	42	12.7
1 to 3 months	37	11.2
3 to 5 months	30	9.1
At 6 months and beyond	41	12.4

Table 3. Infants age 0 to 5 months attending PHC facilities in Uyo, June 2017

Variable	Frequency	Percentage
Babies age 0 to 5 months still breast feeding		
Yes	223	96.5
No	8	3.5
Babies 0 to 5 months still breast feeding		
With water	126	54.5
Without water (EBF)	97	42.0
Not breastfeeding currently	8	3.5

4. DISCUSSION

This study showed the level of awareness of EBF and EIBF and the various factors associated with the practice of EBF. Of the 331 women recruited for the study, 231 were mothers of infants 0-5 months and 100 had infants 6 -12 months old.

In this study 89% of the respondents were aware that infants are to be given only breast milk for the first 6 months of life, and 88.5% of them were also aware that breastfeeding should be initiated within the first one hour of life and universal awareness was 81.3%. However, a study in the South-East of the country reported awareness of 95% [19]. This high level of awareness had been attributed to the health education usually received during the antenatal services [20], since about 95% of the respondents attended ante natal care at least once during pregnancy of the index child. More so, about 85% of the mothers had at least secondary level of education and studies had shown that there is a strong relationship between level of education and

awareness of EBF [21]. EIBF rate in this study was 54.4% among infants 0-12 months, this is much higher than 22.8% reported in a previous study in Uyo 2011 [18], 21% reported in the Northern part of the country, these differences could be due to the fact that the level of

Table 4. Infants 6-12 months attending PHC facilities in Uyo, June 2017

Variable	Frequency	Percentage
Babies above 5 months still breast feeding		
Yes	97	97.0
No	3	3.0
When was water added		
Within first week of life	23	23.0
1 month	10	10.0
2 months	6	6.0
3 months	9	9.0
4 months	4	4.0
5 months	23	23.0
After 5 months	15	15.0
No water yet	10	10.0

Table 5. The relationship between Socio demographic characteristics of nursing mothers and the practice of exclusive breastfeeding in Uyo, June 2017

Variables	Breast feeding status n (%)		Total (n=331)	Statistical indices
	EBF(n=122)	No-EBF (n=209)		
Maternal age(years)				
Less than 21	6 (4.9)	19 (9.1)	25 (7.6)	χ^2 =6.5471
21-25	26 (21.3)	59 (28.2)	85 (25.7)	Df=4
26-30	51 (41.8)	75 (35.9)	126 (38.1)	*P* value=.16
31-35	30 (24.6)	47 (22.5)	77 (23.3)	
36- 40	9 (7.4)	9 (4.3)	18 (5.4)	
				Df=329
Mean (SD)	28.7 (4.9)	27.4 (5.0)	27.8 (5.0)	Tt=-2.334
				P value= .02+
Level of Education				χ^2 =3.3153
Primary	12 (9.8)	35 (16.7)	47 (14.2)	Df=2
Secondary	59 (48.4)	99 (47.4)	158 (47.7)	*P* value=.19
Tertiary	51 (41.8)	75 (36.9)	126 (38.1)	
Marital status				χ^2 =3.2706
Single	16 (13.1)	44 (21.1)	60 (18.1)	Df=1
Married	106 (86.9)	165 (78.9)	271 (81.9)	*P* value=.07+
Occupation				
Civil/public servant	18 (14.7)	41 (19.6)	59 (17.8)	χ^2 =1.5176
Artisan	23 (18.8)	35 (16.7)	58 (17.5)	Df=4
Trader	31 (25.4)	55 (26.3)	86 (26.0)	*P* value=.82
Professional	8 (6.6)	12 (5.7)	20 (6.0)	
Unemployed	42 (34.4)	66 (31.6)	108 (32.6)	
Number of children				
1	38 (31.2)	100 (47.8)	138 (41.7)	χ^2 =11.6780
2	40 (32.8)	57 (27.3)	97 (29.3)	Df=3
3	23 (18.8)	35 (16.7)	58 (17.5)	*P* value=.01+
More than 3	21 (17.2)	17 (8.1)	38 (8.5)	
Maternal income				
Less than 10,000	17 (13.9)	20 (9.6)	37 (11.2)	χ^2 =3.3955
10,000-20,000	13 (10.7)	33 (15.8)	46 (13.9)	Df=4
20,000- 30,000	16 (13.1)	28 (13.4)	44 (13.3)	*P* value=.49
30,000-40,000	29 (23.8)	42 (20.1)	71 (21.5)	
Above 40,000	47 (38.5)	86 (41.1)	133 (40.2)	

Table 6. Factors affecting EBF practices of nursing mothers attending PHC facilities in Uyo, June 2017

Factors	Breast feeding status n (%)		Total (n=331)	Statistical indices
	EBF(n=122)	No EBF (n=209)		
Place of delivery				
Health facility	91 (74.6)	113 (54.1)	204 (61.6)	χ^2 =16.3193
TBA	18 (14.8)	38 (18.2)	56 (16.9)	Df=3
Home	8 (6.6)	34 (16.3)	42 (12.7)	*P* value<.001+
Church	5 (4.1)	24 (11.5)	29 (8.8)	
ANC Visit				
Not booked	4 (3.3)	14 (6.7)	18 (5.4)	χ^2 =19.7444
Less than 4	48 (39.3)	127 (60.8)	175 (52.9)	Df=2
4 or more	70 (57.4)	68 (32.5)	138 (41.7)	*P* value<.001+
Mode of delivery				χ^2 =6.0293
Vaginal delivery	105 (86.1)	156 (74.6)	261 (78.8)	Df=1
Caesarean section	17 (13.9)	53 (25.4)	70 (21.2)	*P* value=.01+
Sex of the babies				χ^2 =2.0232
Male	70 (57.4)	103 (49.3)	173 (52.3)	Df=1
Female	52 (42.6)	106 (50.7)	158 (47.7)	*P* value=.15
Employer do not allow breastfeeding in the place of work				Fischer's exact
Yes	38 (31.1)	66 (31.6)	104 (31.4)	Df=2
No	4 (3.3)	22 (10.5)	26 (7.9)	*P* value=.04+
Self/unemployed	80 (65.6)	121 (57.9)	201 (60.7)	
The culture believes water should be added				χ^2 =2.0941
Yes	56 (45.9)	79 (37.8)	135 (40.8)	Df=1
No	66 (54.1)	130 (62.2)	196 (59.2)	*P* value=.15
Awareness of EBF& EIBF				χ^2 =0.2925
Yes	101 (82.8)	168 (80.4)	269 (81.3)	Df=1
No	21 (17.2)	41 (19.6)	62 (18.7)	*P* value=.59

awareness was low in those populations [22]. EIBF rate in this study is above the 32.8% reported in 2017 MICS [12], even though the denominator used in the survey was children 0-24 months. Late initiation of breastfeeding has been reported to increase the neonatal mortality [1]. According to WHO, EIBF rate of 50-89% is described as being good [22] and is to be encouraged in order to have significant reduction in neonatal mortality. With high level of awareness, one would expect a good level of practice of EBF, this suggests that, there are other barriers to practice of EBF including negative attitudes of the mothers.

The current EBF rate in this study was 42.0% among infants 0 to 5 months this is low considering the high level of universal awareness. EBF rate was defined as proportion of children 0-5 months on exclusive breastfeeding [12]. For Akwa Ibom state it was 28.3% and 23.7% as the national average [12]. Studies done in the North reported EBF rate of 39.7% in Jos [23] and 31% in Sokoto [24], most other studies have different study populations. However, higher EBF rates were reported outside Nigeria, 66% in Ghana [25], 61% in Ethiopia [26]. EBF rates among 0 to 12 months in this study was 36.9% greater than 22.8% reported from previous study with similar study population [13]. In a similar study done in the south west Nigeria EBF rate among under 2 was reported to be 56% [27]. Abasiattai et al reported EBF rate of 44.5% among antenatal attendees in a referral centre in Uyo [20] the only value greater than the rates reported in this study, probably because the age of the infants were not put into consideration and as such is not a good definition of EBF rate. The lower EBF rates seen in Nigeria may be responsible for high rate of malnutrition and invariable high child mortality. Initiation of exclusive breast feeding alone within the first hour of live increases the child survival

significantly [1], the EBF rate of 42% is far below the expected 90% set by WHO [12], for the EBF to produce a reasonable impact in the population.

In this study, at the end of the first month of life, 45% of infants 0-12 months had already received water, about 44% of the infants had already taken infant formula, this is slightly lower than 49.6% earlier reported by Egwuda [18], and these two practices alone had been attributed to high diarrhea morbidity and mortality in sub-Sahara Africa [28]. This high used of infant formula may be due to the high level of income, where over 40% of the respondents earned more than N40.000 and perhaps thought they could afford infant formula. It is known that this practice is not sustainable, not safe and has been discouraged.

The maternal age of those who practice EBF were significantly higher than those who did not. This may be as a result of maturity and experience, this finding is different from what had been reported in other studies, mothers above 20 years in Ghana [25] and 30 years in Ethiopia [29] were more likely to practice exclusive breastfeeding compared to those below those ages. Level of education of the mothers also influenced the practice of EBF in Nnewi, it was reported that those with higher education were more likely to practice EBF [19]. However, in Ghana higher level of education of the mother predicted poor practice of EBF [25]. In this study, no relationship was seen between level of education and practice of EBF probably due to the fact that most of the respondents had good level of education, about 85% had at least completed secondary education.

Antenatal care attendance did not independently predict EBF practice in this study, a study in Sokoto reported that women who attended ANC were more likely to exclusively breastfed their children [24], even though ANC affords pregnant women the opportunity to receive health education on EBF. This does not always translate to practice. However, women who delivered in the health facilities were about four-fold more likely to exclusively breastfed their babies compared to those who delivered at home.

Table 7. Multivariate logistic regression in response to Exclusive breastfeeding practice among nursing mothers in Uyo

Variables	Odd ratio	95%CI	*P* value
ANC visits			
Not booked	Ref.		
Less than 4 visits	1.29	0.41-4.05	.66
4 or more visits	2.25	0.69-7.31	.18
Place of delivery			
Home	Ref		
TBA	2.90	1.08-7.80	.04+
Church	1.50	0.45-5.08	.51
Health facility	4.34	1.84-10.49	.001+
Mode of delivery			
Caesarean section	Ref		
Normal delivery	2.25	1.15-4.40	.02+
Number of children			
1	Ref		
2	1.87	1.04-3.37	.04+
3	1.82	0.91-3.66	.09
Above 3	4.68	1.91-9.85	.001+
Employer does not permit breastfeeding at work place			
I am cant breastfeed at my work place	Ref.		
Employer permits me to breastfeed	3.96	1.21-12.93	.02+
Unemployed/self employed	7.23	2.22-23.68	.001+

This study shows that women who had spontaneous vaginal delivery were two times more likely to practice EBF than those who had caesarean section, this is consistence with a study in Nnewi [19]. This is probably due to the time it takes to recover from anaesthesia, the weakness, pain and other stress associated with surgery, the baby is given pre lacteal feed and the mother simply have a good reason to continue on that. The likelihood of practicing EBF increased with the number of children a mother had, this might be as a result of past experiences and repeated contact with the health facility during ANCs and deliveries, mothers with 2 children had 87% increased chance to practice EBF and mothers with more than 3 children were four-fold more likely to practice EBF when compared to mothers who just had their first babies.

In this study, women who were self-employed or unemployed were 7 fold more likely to practice EBF compared to those who were employed and were not allowed to bring their babies to workplace. This is similar to what was reported in Ghana where women who worked in public places were not likely to exclusively breastfed their babies [30]. The unemployed or self-employed have enough time with their babies which enable them to exclusively breastfeed their babies while the 90 days maternity leave given to those that are employed is not sufficient for them to practice EBF up to 6 months.

5. LIMITATION

The study was a facility based and it was where most mothers go to for immunizations, it may not represent the situation of EBF in the entire community. Other factors like cultural factors and maternal attitude had been reported to affect EBF practice but these were not assessed in this study.

6. CONCLUSION

The practice of exclusive breastfeeding is still very low in this setting despite the high level of awareness, there is a need to institute more drastic measures such as community-based breastfeeding support groups, and one-on-one counselling sessions to assist mothers overcome their barriers to EBF and not just the routine health talks. Employers of labour should establish crèches where mothers can breastfeed their babies. The International codes on marketing of breast-milk substitutes should be fully implemented

CONSENT

Written informed consent was obtained from each respondent.

ETHICAL APPROVAL

All authors hereby declare that the research was approved by appropriate ethical committee and has therefore been performed in accordance with ethical standards laid down in the Declaration of Helsinki.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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