



## Initiation, maintenance and continuation of exclusive breast feeding: Socio-demographic and maternal correlates for abandonment

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### Abstract

**Background:** Exclusive breast feeding (EBF) has been shown to be an important and effective feeding practice essential for infant development. Initiation, maintenance and continuation of EBF were associated with several maternal and socio-demographic characteristics which influence EBF abandonment.

**Methodology:** The study is a prospective cross-sectional study conducted at the child health clinic in general hospital Bonny, in Bonny Island. The study population were nursing mothers of infants six months and below. All eligible nursing mothers that presented to the clinic were enlisted into the study until the required sample size was achieved. Study tool was a structured interviewer administered questionnaire. Multinomial regression analysis was done using SPSS with statistical significance set at 0.05.

**Result:** Results reveal significant statistical association between duration of EBF and some maternal variables such as parity, ante-natal attendance, breast feeding counselling, birth interval, gestational age and mode of delivery. Also, significant association was seen between duration of EBF and socio-demographic characteristics such as maternal occupation, income, education and marital status.

**Conclusion:** Abandonment of EBF before and its continuation up to six months can be influenced by socio-demographic factors such as maternal occupation, income and marital status. Other maternal variables which also influence EBF include ante-natal care attendance including the number of times of breast-feeding counselling, mode of delivery, gestational age, parity and birth interval.

Key words: Exclusive breast feeding, abandonment, initiation, maintenance, continuation.

### Introduction

Breast feeding newborn was identified as the single most effective and affordable feeding practices necessary for development of healthy infants.<sup>1</sup> Breast milk contains ideal source of nutrients and natural immunity for protection of infants against infections and chronic diseases and also for development of neurocognitive system.<sup>2</sup> The human breast milk (HMB) contains several components

including nutrients in a perfect combination.<sup>3</sup> They also contain immune protective substances which help protect against neonatal infections and death.<sup>4</sup> It is therefore imperative to place newborn on HBM soon after delivery as the colostrum which is rich in nutrients and immunoglobulins helps in priming the gastro-intestinal-tract thus reducing morbidity and mortality.<sup>5</sup> Several benefits of breast feeding infants have been highlighted and includes reduced risk of otitis media, diarrhoea and other gastro-enteric diseases,<sup>6</sup> reduced risk of stunting and wasting,<sup>7</sup> decreased risk of rare diseases such as leukaemia, severe lower respiratory tract diseases and sudden infant death syndrome.<sup>8</sup> Also, breast feeding helps prevent chronic diseases such as obesity,<sup>9</sup> type 2 diabetes,<sup>10</sup> and asthma.<sup>8</sup>

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The benefits of breast-feeding abound and cannot be overemphasized. It is therefore important to develop programs and encourage research which will facilitate the promotion of breast-feeding. As important as breast feeding, even more important is engagement of nursing mothers in exclusive breast feeding (EBF). Exclusive breast feeding requires new born to receive only breast milk without any other food or drink including water except medicines prescribed by a doctor or nurse for six months of life.<sup>11</sup> Many international initiatives such as “innocenti declaration” which is better known as “baby friendly hospital initiative” (BFHI) whose main objective is early initiation of breast-feeding with complementary feeds into second year of life,<sup>12</sup> International code for the marketing of breast milk substitute,<sup>13</sup> and implementation of ten steps towards successful breast-feeding<sup>14</sup> amongst others have highlighted the importance of EBF. Most international organization such as the academy of medicine, the American academy of paediatrics and the Spanish association of paediatrics all recommend EBF for six months and complementary feeding for two years or more.<sup>15</sup> Therefore, encouraging EBF and determining factors which could cause abandonment of EBF is critical if the world health organization global nutrition target for 2025 aimed at increasing EBF rate in first six months of life to at least 50% is to be achieved.<sup>16</sup> Factors which could cause abandonment are multifactorial. The author identified three broad categories which included; (a) individual level; this includes biological factors such as cracked nipple, insufficient milk flow, psychological and personality trait of the nursing mother, (b) Environmental factors such as political commitment of the government e.g. government policy on infant feeding formular, cultural, religions and other geographical influences and (c) social factors including maternal education, maternal occupation, marital status, health care services e.g. antenatal care services etc. This study examined the effects of some of these social factors on abandonment of EBF before six months and continuation of EBF up to six months respectively. It has been documented that any amount of breast feeding is better than none with greater benefits if EBF is practiced for more than just six weeks or three months or mixed feeding.<sup>18</sup> It is therefore

imperative to identify some of these social factors which will encourage initiation, reduce abandonment and increase the duration of EBF by nursing mothers.

In Nigeria, the 2018 national demographic health survey reveals an EBF rate of 2.8 months with only 29% of infants exclusively breast fed.<sup>19</sup> Suboptimal breast feeding in Nigeria is estimated to account for about 103,742 child deaths annually, translating to almost 12 billion dollars in future economic losses rising higher to 21 billion per year (4.1% of gross national income) if cognitive losses and health care cost are factored in.<sup>20</sup>

Nigeria is noted to have one of the highest rates of non EBF among infants aged 0-5 months despite introduction and implementation of various national and subnational initiatives to decrease non EBF among women.<sup>21</sup> The initiation of breast feeding is increasing in Nigeria, however the duration and practice of EBF among women who had their babies delivered in a health facility and outside such facilities have remained low.<sup>22</sup> In sub-Saharan Africa, prevalence of early initiation of breast-feeding ranges from 37.8% to 69.3% while prevalence of EBF ranges from 23.7% to 56.5%.<sup>23</sup>

Non EBF has remained the leading causes of death in most sub-Saharan African countries accounting for 45% of neonatal infectious death, 30% of diarrhoea and 18% of acute respiratory mortality among children under 5 years.<sup>24</sup> In China, India, Nigeria, Mexico and Indonesia alone, suboptimal breast feeding accounted for over 236,000 annual child death with further economic cost and cognitive losses estimated at 119 billion dollars per year.<sup>25</sup> To effect changes in present prevalence rate in terms of initiation and duration of EBF, there should be development, adoption and implementation of strategic initiatives aimed at policies which will reduce abandonment of EBF, enhance positive maternal attitude, improve on breast feeding counselling, strengthen the health care system and alter the present narrative to favour improved maternal education and economic empowerment of women.

The objective of the study is to determine socio-demographic and maternal variables which could influence initiation, abandonment and continuity of EBF at various stages of infant life up to six months after birth among nursing mothers.

Rationale for this study lies in the paucity of data on factors which influence abandonment of EBF at various stages of infant's life up to six months after delivery and also to identify variables which could improve duration of EBF.

### Material and method

The study is a prospective cross-sectional study conducted at the child health clinic in general hospital Bonny, in Bonny Island. The study population were nursing mothers of infants six months and below. Using the formular for determination of sample size for cross sectional studies,<sup>26</sup> a sample size of 426 was derived after making adjustments for attrition. All eligible respondents that gave consent following explanation of study protocol were enlisted into the study on every child health clinic day which takes place on Tuesdays and Thursdays. Respondents were enlisted until the required sample size was achieved. Nursing mothers who refused consent and those with infants above six months were excluded from the study. This was to avoid recall bias. Data was collected using structured pretested interviewer administered questionnaire, prepared in English language. Data elements included variables on maternal and socio demographic characteristics that could influence exclusive breast feeding. Data collected was cleaned and entered into excel spread sheet and then transported into statistical package for social sciences (SPSS) version 20.1. Analysis was done using multinomial regression analysis with level of statistical significance set at 0.05. Data was presented in simple frequency distribution table. Ethical approval was issued by the research and ethics committee of Rivers State hospital management board, while permission for the study was granted by the management of Rivers State hospital board.

### Results

1.0 The mean maternal age was 30.06±6.12. The most predominant age grade among nursing mothers were women aged 15-30, 232(54.5%) while men aged 31-40 years where the most predominant amongst the spouses 255(59.8%). Table 1.

**Table 1. Socio-demographic characteristics**

Variable	Freq. (%) (N=426)
<b>Maternal age</b>	
15-30	232(54.5)
31-40	166(39.0)
41-50	28(6.5)
<b>Maternal occupation</b>	
Unemployed	120(28.2)
Public servant	86(20.2)
Private sector/artisan	18(4.2)
Businesswoman	202(47.4)
<b>Religion</b>	
Christian	407(95.5)
Muslim	15(3.5)
Others	4(1.0)
<b>Maternal education</b>	
No formal education	12(2.8)
Completed primary	12(2.8)
Completed secondary	213(50.0)
Completed tertiary	189(44.4)
<b>Marrital status</b>	
Married	357(83.8)
Single	66(15.5)
Separated/divorced	3(0.7)
<b>Tribe</b>	
Igbo	96(22.6)
Yoruba	27(6.3)
Hausa	18(4.2)
Rivers ethnic minority	186(43.7)
Non-rivers ethnic minority	99(23.3)
<b>Maternal income</b>	
Nil	141(33.2)
0-20,000	138(32.4)
21,00-50,000	102(23.9)
51,000-100,000	33(7.7)
>100,000	12(2.8)
<b>Spouse age</b>	
15-30	48(11.3)
31-40	255(59.8)
41-50	120(28.2)
>50	3(0.7)
<b>Spouse occupation</b>	
Unemployed	9(2.1)
Public servant	180(42.2)
Private sector/artisan	96(22.5)
Businessman	141(33.2)
<b>Spouse education</b>	
No formal education	3(0.7)
Completed primary education	6(1.4)
Completed secondary education	207(48.6)
Completed tertiary education	210(49.3)
<b>EBF</b>	
Yes	288(67.6)
No	138(32.4)
<b>Duration of EBF</b>	
2-3 months	84(29.2)
4-5 months	48(16.7)
= 6 months	156(54.1)

**Table 2. Socio-demographic characteristics and EBF duration**

Variable	N (%) =426	x <sup>2</sup>	p
<b>Maternal age</b>			
15-30	232(54.5)		
31-40	166(39.0)	9.422	0.151
41-50	28(6.5)		
<b>Maternal occupation</b>			
Unemployed	120(28.2)		
Public servant	86(20.2)	41.105	0.000
Private sector/artisan	18(4.2)		
Businesswoman	202(47.4)		
<b>Religion</b>			
Christian	407(95.5)		
Muslim	15(3.5)	11.431	0.076
Others	4(1.0)		
<b>Maternal education</b>			
No formal education	12(2.8)		
Completed primary	12(2.8)	17.132	0.047
Completed secondary	213(50.0)		
Completed tertiary	189(44.4)		
<b>Marrital status</b>			
Married	357(83.8)		
Single	66(15.5)	14.157	0.028
Separated/divorced	3(0.7)		
<b>Maternal income</b>			
Nil	141(33.2)		
0-20,000	138(32.4)	73.460	0.000
21,00-50,000	102(23.9)		
51,000-100,000	33(7.7)		
>100,000	12(2.8)		
<b>Spouse age</b>			
15-30	48(11.3)		
31-40	255(59.8)	16.417	0.05
41-50	120(28.2)		
>50	3(0.7)		
<b>Spouse occupation</b>			
Unemployed	9(2.1)		
Public servant	180(42.2)	49.906	0.000
Private sector/artisan	96(22.5)		
Businessman	141(33.2)		
<b>Spouse education</b>			
No formal education	3(0.7)		
Completed primary education	6(1.4)	14.595	0.103
Completed secondary education	207(48.6)		
Completed tertiary education	210(49.3)		

**Table 3. Maternal variables and EBF duration**

Variables	n (%)	x <sup>2</sup>	p
<b>ANC attendance</b>			
Yes	405(95.1)	23.292	0.000
No	21(4.9)		
<b>No. of ANC attendance</b>			
Nil	21(4.9)		
Three	18(4.2)	101.319	0.000
Four	174(40.8)		
=five	213(50.0)		
<b>Preg. intendedness</b>			
Desired	285(66.9)		
Not desired	114(26.8)	51.812	0.000
Indifferent	27(6.3)		
<b>Gest. Age</b>			
<28 weeks	12(2.8)		
29-39 weeks	381(89.4)	70.815	0.000
>39 weeks	33(7.8)		
<b>Mode of delivery</b>			
Vaginal	345(81.0)		
Elective CS	27(6.3)	88.368	0.000
Emergency CS	54(12.7)		
<b>Parity</b>			
Nil	3(0.7)		
One	153(35.9)		
Two	123(28.9)	56.423	0.000
Three	93(21.8)		
=four	54(12.7)		
<b>Birth interval</b>			
= 1 year	9(2.1)		
1-2 years	216(50.7)	82.756	0.000
3-4 years	153(35.9)		
=5 years	48(11.3)		
<b>Breast feeding counselling</b>			
Yes	414(97.2)	22.941	0.000
No	12(2.8)		
<b>Number of breast feeding counselling</b>			
Nil	12(2.8)		
1-2	15(3.5)	76.297	0.000
3-4	57(13.4)		
5-6	117(27.5)		
=6	225(52.8)		
<b>EBF method</b>			
None	138(32.4)		
Expressed	9(2.1)	100.230	0.000
Breast feed	252(59.2)		
Mixed	27(6.3)		

## 2.0. Socio-demographic characteristics and EBF duration

Multinomial regression analysis reveals significant association between EBF and socio-demographic

variables such as maternal education, occupation, marital status spouse occupation and age.

**Table 4.0 Univariate logistic regression model showing EBF and socio-demographic characteristics**

Variable	Coefficient			Abandonment prevalence				P value			AOR		
	1-2	3-4	5-6	NIL	1-2	3-4	5-6	1-2	3-4	5-6	1-2	3-4	5-6
<b>Maternal occupation</b>													
Unemployed	-0.83	-2.46	-0.05	39(32.5)	12(10.0)	18(15.0)	51(42.5)	0.048	0.000	0.925	0.435	0.085	0.950
Public servant	-0.43	-0.49	-0.10	24(27.9)	15(17.4)	9(10.5)	38(44.2)	0.307	0.318	0.864	0.645	0.609	0.899
Private sector	1.53	1.43	-14.52	9(50.0)	6(33.3)	0	3(16.7)	0.042	0.089	0.991	4.623	4.202	4.9E-7
Businesswoman	R	R	R	66(32.7)	51(25.2)	21(10.4)	64(31.7)	R	R	R	R	R	R
<b>Maternal education</b>													
Nil	-0.051	-15.484	-30.622	3(25)	0	0	9(75)	0.968	0.989	0.990	0.9	1.8E-7	5.0E-14
Primary	14.639	15.133	16.206	6(50.0)	3(25.0)	3(25)	0	0.991	0.991	0.990	2.2E+6	3.7E+6	1.0E+6
Secondary	-0.343	-0.139	0.772	66(31.0)	45(21.1)	30(14.1)	72(33.8)	0.404	0.793	0.162	0.7	0.8	2.1
Tertiary	R	R	R	63(33.3)	36(19.1)	15(7.9)	75(39.7)	R	R	R	R	R	R
<b>Marital status</b>													
Married	-16.4	-0.4	0.8	111(31.1)	69(19.3)	39(11.0)	138(38.6)	0.994	0.468	0.216	7.3E-8	0.645	2.263
Single	-14.9	0.5	0.9	24(36.4)	15(22.7)	9(13.6)	18(27.3)	0.995	-	-	3.2E-7	1.717	2.665
Separated/divorced	R	R	R	3(100)	0	0	0	R	R	R	R	R	R
<b>Maternal income</b>													
Nil	-0.390	-1.0438	0.817	48(34.0)	30(21.3)	18(12.8)	45(31.9)	0.710	0.164	0.994	0.677	0.265	2.5E+6
0 - 20,000	-1.613	-3.759	14.490	36(26.1)	18(13.0)	21(15.2)	63(45.7)	0.131	0.000	0.994	0.199	0.023	1.9E+6
21,000 - 50,000	-0.171	-1.633	14.533	36(35.3)	30(29.4)	6(5.9)	30(29.4)	0.871	0.086	0.994	0.843	0.195	2.0E+6
51,000-100,000	0.681	-17.324	14.618	15(45.5)	0	3(9.1)	15(45.5)	0.545	0.982	0.994	1.975	2.9E-8	2.2E+6
>100,000	R	R	R	3(25.0)	6(50.0)	0	3(25.0)	R	R	R	R	R	R
<b>Spouse age</b>													
15 -30	17.695	4.346	18.118	12(25.0)	15(31.3)	9(18.8)	12(25.0)	0.000	0.000	0.000	4.8E+7	77.190	7.3E+7
31 – 40	17.966	3.135	17.701	96(37.6)	42(16.5)	24(9.4)	93(36.5)	0.000	0.000	0.000	6.3E+7	22.984	4.8E+7
41 -50	17.353	3.138	17.936	30(25.0)	27(22.5)	15(12.5)	48(40.0)	-	-	-	3.4E+7	23.066	6.1E+7
=51	R	R	R	0	0	0	3(100)	R	R	R	R	R	R

**3.0. Maternal variables and EBF duration**

Multinomial regression analysis reveals significant association between EBF and maternal variables such as ANC attendance, number of ANC attendance, pregnancy intendedness, GA, parity, birth interval, breast feeding counselling and method of EBF.

**4.0. Univariate logistic regression model showing EBF and socio-demographic characteristics**

Univariate logistic regression analysis reveals 1-2 months of EBF as the critical period for

abandonment of EBF by nursing mothers also, increasing maternal income was associated with increasing odds for abandonment of EBF

**5.0. Univariate logistic regression model showing EBF and maternal variables**

Univariate logistic regression analysis reveals maternal parity two and above associated with increasing odds for continuation of EBF up to 5-6 months also, mothers who had CS have high odds of abandonment of EBF at 1 – 2 months of infant life.

**Table 5.0. Univariate logistic regression model showing EBF and maternal variables**

Variable	Coefficient			Abandonment Prevalence				P value			AOR		
	1-2	3-4	5-6	NIL	1-2	3-4	5-6	1-2	3-4	5-6	1-2	3-4	5-6
<b>ANC attendance</b>													
Yes	-29.9	-31.04	-9.48	126(31.1)	78(19.3)	48(11.9)	153(37.7)	0.966	0.965	0.998	-0.00	3.3E-14	7.5E-5
No	R	R	R	12(57.1)	6(28.6)	0	3(14.3)	R	R	R	R	R	R
<b>Number of ANC attendance</b>													
3	0.130	2.301	17.661	62(28.6)	3(14.2)	6(28.6)	6(28.6)	0.911	0.028	0.957	1.138	9.983	4.6E+7
4	17.03	4.53	17.90	12(66.6)	0	3(16.7)	3(16.7)	0.976	0.997	0.957	2.5E+6	93.0	5.9E+7
=5	2.51	5.13	-0.36	75(43.1)	45(25.9)	12(6.9)	42(24.1)	0.000	0.000	0.740	12.3	35.0	0.69
	R	R	R	45(21.1)	36(16.9)	27(12.7)	105(49.3)	R	R	R	R	R	R
<b>Mode of delivery</b>													
Vaginal	0.97	0.82	14.12	114(33.0)	72(20.8)	39(11.3)	120(34.9)	0.071	0.165	0.977	2.645	2.274	1.3E+6
Elective CS	1.38	-5.04	22.33	9(33.3)	3(11.1)	9(33.3)	6(22.2)	0.232	0.001	0.964	3.996	0.006	5.0E+8
Emergency CS	R	R	R	15(27.8)	9(16.7)	0	30(55.5)	R	R	R	R	R	R
<b>Gestational age</b>													
<28 weeks	-59.1	-48.1	-43.6	0	0	3(25.0)	9(75.0)	0.96	0.98	0.99	0.00	1.2E-21	1.1E-19
29-39 weeks	0.6	0.18	-3.9	132(34.6)	78(20.5)	36(9.5)	135(35.4)	0.32	0.78	0.00	1.95	1.2	0.019
=40 weeks	R	R	R	6(18.2)	6(18.2)	9(27.3)	12(36.3)	R	R	R	R	R	R
<b>Parity</b>													
Nil	-16.8	-19.8	-15.2	0	0	0	3(100)	0.99	0.99	0.99	0.0	2.2E-9	2.4E-7
One	-0.1	-2.9	-0.4	57(37.3)	27(17.6)	18(11.8)	51(33.3)	0.75	0.00	0.69	0.83	0.05	0.65
Two	-0.8	-3.2	-4.0	39(31.7)	21(17.1)	9(7.3)	54(43.9)	0.18	0.00	0.00	0.44	0.04	0.01
Three	-1.4	-2.4	-2.7	24(25.8)	21(22.5)	9(9.7)	39(42.0)	0.02	0.001	0.003	0.22	0.08	0.65
=four	R	R	R	18(33.3)	15(27.8)	12(22.2)	9(16.7)	R	R	R	R	R	R
<b>Birth interval</b>													
One year	32.7	49.8	66.2	0	3(33.3)	6(66.7)	0	0.99	0.99	0.98	0.0	4.3E+21	6.2E+28
Two years	-0.50	-2.04	8.5	72(33.3)	39(18.1)	21(9.7)	84(38.9)	0.46	0.002	0.001	0.6	0.12	5082
Three years	1.12	-1.81	7.11	54(35.3)	27(17.6)	18(11.8)	54(35.3)	0.11	0.007	0.004	3.07	1.16	1234
Four years	R	R	R	12(25.0)	15(31.3)	3(6.3)	18(37.4)	R	R	R	R	R	R
<b>Breast feeding counselling</b>													
Yes	12.63	0.53	19.03	132(31.9)	84(20.3)	48(11.6)	150(36.2)	0.98	0.98	0.98	2.9E+5	1.8E+13	1.8E+8
No	R	R	R	6(50.0)	0	0	6(50.0)	R	R	R	R	R	R
<b>Number of breast feeding counselling</b>													
Nil	0.71	-18.08	11.45	6(50.0)	0	3(25.0)	3(25.0)	0.45	0.99	0.99	2.03	1.4E-8	94466
One	-0.42	1.94	-18.17	3(20.0)	6(40.0)	0	6(40.0)	0.70	0.08	0.99	0.65	7.001	1.2E-8
Two	0.96	-0.97	6.22	33(57.9)	6(10.5)	9(15.8)	9(15.8)	0.13	0.21	0.98	2.61	0.379	506.46
Three	1.23	-1.97	0.99	57(48.7)	18(15.4)	15(12.8)	27(23.1)	0.002	0.002	0.188	3.44	0.139	2.709
=Four	R	R	R					R	R	R	R	R	R
<b>EBF method</b>													
Nil	14.75	-1.1	2.92	72(52.2)	24(17.4)	3(2.2)	39(28.3)	0.983	0.182	0.997	2.5E+6	0.33	18.61
Expressed	29.33	-0.16	35.99	6(66.6)	0	3(33.3)	0	0.985	1.00	0.983	5.5E+12	0.5	4.2E+15
Breast feed	15.95	2.26	26.40	60(23.8)	54(21.4)	42(16.7)	96(38.1)	0.982	0.002	0.976	8.4E+6	9.64	2.9E+11
Mixed	R	R	R	0	6(22.2)	0	21(77.8)	R	R	R	R	R	R

## Discussion

The study identified significant association between initiation, abandonment and continuity of EBF with socio-demographic factors such as maternal occupation, income, education, marital status, spouse age and occupation. So also, were some maternal variables such as mode of delivery (MOD), gestational age (GA), parity, ante-natal-care (ANC) attendance, number of ANC attendance, pregnancy intendedness, breast-feeding counselling and method of EBF

Also, 138 (32.4%), 84 (19.7%), 48 (11.3%) and 156 (36.6%) of nursing mothers did not engage in EBF, discontinued EBF between 1-2 months, discontinued EBF between 3-4 months and exclusively breast-fed their infants up to 5-6 months respectively.

This study examined the most critical or vulnerable period of abandonment of EBF and did an appraisal of the odds for initiation, abandonment and continuation of EBF up to six months with reference to above mentioned socio-demographic and maternal factors.

The author identified three distinct period or phases during the first six months of EBF of an infant which includes period of initiation, maintenance and continuation corresponding to 1-2 months, 3-4 months and 5-6 months of period of EBF.

It was shown that, 156 (36.6%) of nursing mothers engaged in EBF up to 5-6 months of their infant's life. This is high considering the global EBF rate of 15.2% and 21% at six months.<sup>24</sup> However in Brazil, a high EBF rate of 68.4% was recorded at six months.<sup>27</sup> In contrast, lower figures 5.5% and 18% were recorded in Italy and Ethiopia respectively.<sup>28,29</sup>

It has been documented that EBF rate could be multifactorial. Key social factor which might have influenced the high rate of EBF in this study could be high literacy rate of nursing mothers and their spouses. However, the influence of other factors which could also have had influence on EBF rate were not fully explored.

The critical point of abandonment of EBF by most nursing mothers was identified as the initiation phase (1-2 months) of EBF. It follows that, given all variables under study, most nursing mothers abandon EBF between the first two months of their infant's life. This result corroborates the findings in other studies which identified second month of an

infant's life as the critical period for abandonment of EBF.<sup>29,30</sup> In contrast, other studies revealed fourth month as the critical point of abandonment.<sup>31</sup> The import of this finding is to identify, develop and implement programs proven to encourage EBF targeted at this vulnerable period with the ultimate aim of achieving greater EBF rate for infants. Therefore, further research should be encouraged on this frontier aimed at enhancing EBF at this critical point. Two factors which have shown strong positive influence in reducing abandonment during this critical period are high number of ANC attendance and maternal education up to secondary and tertiary level. These factors could be leveraged upon to circumvent abandonment at this period. Also, most nursing mothers result to infant formula following abandonment at this phase therefore, imposition of restriction by government on marketing infant formula milk and promoting breast feeding practices through mass media campaign,<sup>32</sup> will greatly reduce the rate of abandonment at this point.

Abandonment of EBF have shown strong association with various maternal and socio-demographic factors. High maternal education up to secondary and tertiary level was associated with low odds for abandonment at initiation and maintenance phase with higher odds of continuation of EBF up to 5-6 months. This finding was corroborated in other studies which revealed a low prevalence and abandonment prevalence ratio, with high level of maternal education.<sup>31,33</sup> It is believed that highly educated nursing mothers would appreciate the benefits of EBF following academic and educational exposures and would not be encumbered with the myths associated with EBF as seen in poorly educated nursing mothers.

Married nursing mothers showed remarkable low odds of abandonment of EBF both at initiation and maintenance phase with greater chances of EBF up to continuation phase. Some studies also concur with the result expressed in this study.<sup>30</sup> It is believed that the spouse serves to motivate and encourage the nursing mother, providing assistance needed to practice EBF up until six months. It is therefore the opinion of the author that communities and the society be encouraged to promote matrimony and place a high premium on it, at least for the purpose of encouraging EBF and its attendant benefits.

Elective and emergency caesarean section (CS) was associated with higher chances of abandonment at the initiation phase. This was similar to a South American study.<sup>31</sup> Expectedly, women who had CS may not initiate EBF and worse still may abandon it at the initiation phase, due to complications of surgery. Some studies corroborate this finding in which it states that mode of delivery was the strongest determinant of initiation and continuation of EBF.<sup>33</sup> Therefore efforts should be targeted at initiation phase for nursing mothers who delivered via CS to improve EBF at this point. Some measures which could assist in this regard include infection control and improved surgical procedure to decrease post surgical morbidity which greatly contribute to inability to initiate EBF or even abandonment at the initiation phase.

Gestational age (GA) 28 weeks and below have higher chances of engaging in EBF up to continuation phase with low odds of abandonment at initiation and maintenance phase. Study by Machado MCM et al was in tandem with this result.<sup>31</sup> However some studies do not concur.<sup>36</sup> Nursing mothers who delivered at GA of 28 weeks and below are more anxious over the welfare of their newborn and will comply with the advice of health care workers (HCW) to exclusively breast feed up to six months. It is expedient therefore to continuously engage these group of women on the need for EBF and to sustain the gains already achieved. Most importantly, more effort should be targeted at other groups with GA above 28 weeks.

Odds for abandonment increases with increasing maternal income at the initiation phase, similarly, increasing maternal income was associated with decreasing odds for EBF up to continuation phase. This result was similar to the result seen in a study in Poland.<sup>34</sup> Expectedly increasing maternal income is associated with greater economic and physical engagement which might disrupt EBF. Therefore, special program targeted at initiation and continuation phase should be designed for working class women to improve EBF rate. Therefore, nursing mothers who are engaged with any economic activity should have a baby friendly working environment. This may require policies which will encourage baby friendly working environment and also flexible working hours to encourage these women to sustain EBF.

Birth interval two years and above was statistically associated with EBF up to continuation phase. Most remarkable was a significant improvement in EBF at maintenance phase following increase in birth order from one to two years. This result was corroborated by a study in Ethiopia giving credence to increased EBF rate following birth interval two years and above.<sup>35</sup> Therefore, encouraging women to practice birth spacing of at least two years via modern family planning method will enhance rate of EBF.

Attending ANC clinic with its attendant breast-feeding counselling greatly encourages EBF up to continuation phase and subsequently reduces abandonment especially at the maintenance phase. Interesting to note that odds for abandonment decreases with increasing number of breast-feeding counselling. Other studies found credence with our results.<sup>36</sup> Encouraging women to register for ANC with its corresponding number of breast-feeding counselling have been shown to be a cost-effective measure towards increasing rate of EBF and subsequent reduction in abandonment of EBF.

Parity was shown to be associated with EBF in which increasing maternal parity two and above was significantly associated with EBF up to continuation phase and also a significant low odd for abandonment at maintenance phase. There have been divergent views among scholars on this issue. While some scholars agree with our results<sup>31,34</sup> some others disagree.<sup>36</sup> With credence to the result obtained in this study, logical reasoning would indict inexperience and anxiety for poor practice of EBF in nulliparous and women with single parity. Therefore, efforts and programs should be targeted at this group to enhance EBF up to continuation phase and reduce rate of abandonment.

However, the results obtained in this study have limitations in that, individual and environmental factors which also might affect abandonment of EBF and its sustainability to the phase of continuation was not fully investigated. It therefore reasons that, the factors discussed above will suffice if they acted alone or in which individual and environmental factors do not play significant role. The author therefore encourages research into the multifactorial nature of variables influencing EBF.



## Conclusion

Abandonment of EBF before and its continuation up to six months can be influenced by socio-demographic factors such as maternal occupation, income and marital status. Other maternal variables which also influence EBF include ANC attendance including the number of times of breast-feeding counselling, MOD, GA, parity and birth interval.

## References

- Katsinde SM, Srinivas SC. Breast feeding and the sustainable development agenda. *Indian journal of pharmacy practices* 2016; 9(3): 144-146
- Akuse RM, Obinya EA. Why healthcare workers give pro lacteal feeds. *European journal of clinical nutrition*, 2002; 56(8): 729-34
- Ballard O, Morrow AL. Human milk composition: nutrients and bioactive factors. *Paediatric clin north Am*. 2013; 60(1): 49-74
- Edmund KM, Zandoh Z, Quigley MA, Amenga-Etego S, Owusu Agyei S, Kirkwood BR. Delayed breast-feeding initiation increases risk of neonatal mortality. *Paediatrics*. 2006; 117(3): e380-6
- Nguyen PH, Keithly SC, Nguyen TT, Nguyen NT, Tran LM, Hajeebhoy N. pre lacteal feeding practices in Vietnam: challenges and associated factors. *BMC public health*. 2013; 13:932
- Chien PF, Howie PW. Breast milk and the risk of opportunistic infection in infancy in industrialized and non-industrialized settings *Adv nutri res* 2001; 10:69-104
- Meshram II, Al, KV, NV BG. Impact of feeding and breast-feeding practices on the nutritional status of infants in a district of Andhra Pradesh, India. *National medical journal of India*. 2012; 25(4): 201-6.
- IPS, Chung M, Raman G, Chew P, Magila N, Devine D, Trikalinos T, Lau J. Breast feeding and maternal and child health outcomes in developed countries. Rockville: MD: agency for health care research and quality 2007. AHRQ publication No. 07-E007.
- Arenz S, Ruckerl R, Koletzko B, Von Kries R. Breast feeding and childhood obesity, a systematic review of obesity related metabolic disorder 2004; 28(10): 1247-56.
- Owen CG, Martin RM, Whincup PH, Smith GD, Cook DG, American journal of clinical nutrition. 2006; 84(5); 1043-54
- Who/UNICEF. Infant and young child feeding. Global strategy in infant and young child feeding. (A 55/15/ of 16/4/2002) endorsed by fifty fifth WHA in resolution WHA 55.25 may 18 2002 Geneva; WHO, 2003. <https://www.who.int>. accessed 12/5/21
- Nutrition. The innocent declaration: progress and achievement part 1. *Weekly epidemiological record*. 1998 73(5): 25-30
- World health organization, the international code of marketing of breast milk substitutes. Geneva. 1981. <https://www.who.int/nutrition/publication/code-english.pdf>. accessed 4/3/22
- Organizacion mundial de la salud. Pruebas cientificas de ios diez pasos Italia unafeliz lactancia natural. Division de salud y. desarrollo de nino Gine bra, Geneva, Switzerland. 1998.
- Holmes AV, mcLeod AY, Bunik M. Breastfeeding. *Medicine*. 2013; 8(6):464-73
- Global target 2025. World health organization. 2020 / April / 10 <https://www.who.int/nutrition/global-target-2025/en> accessed 25/2/2022
- Salami L. Factors influencing breast feeding practice in Edo State, Nigeria. *African journal of food, agriculture, nutrition and development*. 2006;6(2):1-12
- Kramer MS, Kakuma R. Optimal duration of executive breast-feeding. *Cochrane data base system*. Rev. 2002; (1): cd003517
- DHS. Nigerian demographic health survey 2018. <https://dhsprograms.com/what-we-do/survey/survey-display-528.cfm>
- Nurturing the health and wealth of nations; the investment case for breast feeding: the global breastfeeding collective. 2017 <https://www.who.int/nutrition/publications/infantfeeding/global-bf-collective-investmentcase/pdf?ua=1> page 4 assessed 23/1/2022
- Ogbo FA, page A, Agho KE, Clandio F. Determinants of trends in breast feeding indicators in Nigeria. 1999-2013. *Public health nutrition*. 2015; 18(18); 3287-3299
- Ogunlesi TA. Maternal socio-demographic

- factors influencing the initiation and exclusivity of breast feeding in Nigerian semi-urban setting. *Maternal and child health journal* 2010; 14 (3): 459-465
23. Isaaka AI, Agho KE, Renzaho AM. Prevalence of key breast-feeding indicators in 29 sub-Saharan African countries; a meta-analysis of demographic and health surveys (2010-2015) *BMJ open* 2017; 7(10): eD14145
  24. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K et al. A comparative risk assessment of burden of disease and injury attributable to 69 risk factors and risk factor clusters in 21 regions 1990-2010; a systematic analysis for the global burden of disease study. 2010 *lancet* 2012; 380 (9859): 2224-60
  25. Holla –Bhar R, Lellemo A, Gupta A, Smith JP, Dadhich JP. Investing in breast feeding - the world breast feeding costing initiative. *International breastfeeding journal* 2015; 10:8
  26. Charan J, Biswas T. How to calculate sample size for different study designs in medical research in medical research. *Indian journal of psychological medicine.* 2013;35(2):121-126. [10.4103/0253-7176.116232](https://doi.org/10.4103/0253-7176.116232).
  27. Muelbert M, Giugliani ERJ. Factors associated with the maintenance of breastfeeding for 6, 12, and 24 months in adolescent mothers. *BMC public health* 2018; 18:675. [10.1186/s12889-018-5585-4](https://doi.org/10.1186/s12889-018-5585-4)
  28. Istituto nazionale di statistica <https://www.istat.it/archivio/141431>. Accessed 18/2/22
  29. Adugna B, Tadese H, Reta F, Berhan Y. Determinants of EBF in infants less than six months of age in Hawassa, an urban setting, Ethiopia. *International breastfeeding journal.* 2017; 12:45. [10.1186/s13006-017-0136-6](https://doi.org/10.1186/s13006-017-0136-6)
  30. Tsegaw SA, Dawed YA, Amsalu ET. Exploring the determinants of exclusive breastfeeding among infants under Six months in Ethiopia using multilevel analysis. *PLOS one* 2012; 16 ( 1 ) : e 0 2 4 5 0 3 4 . [10.1371/journal.pone.0245034](https://doi.org/10.1371/journal.pone.0245034)
  31. Machado MCM, Assis KF, Oliveira F, Ribeiro AQ, Araujo RMA, Cury AF, Priore SE, Franceschini S. Determinants of the exclusive breast-feeding abandonment: Psychosocial factors *Revista de Saude publica.* 2014;48(6):985-994
  32. Km YM, Haq ZU, Soomro J, Suitana Z, Faizunnisa A, Agha S. Case study: effects of a media campaign on breast feeding behaviour in Sindh province, Pakistan. *World health population* 2015; 16 (2);39-45
  33. Economou M, Kvikotroni O, Paphiti-Demetriou I, Kouta C, Lambrinou E, Hadjigogiou E. et al. Prevalence of breastfeeding and exclusive breast feeding at 48 hours after birth and up to the sixth months in Cyprus: The BrEaST start in life project. *Public health nutrition.* 2018; 21(5):967-980 [10.1017/s1368980017003124](https://doi.org/10.1017/s1368980017003124). EPUB 2017 Nov 27.
  34. Tracz J, Gajewska D, Myskowska-Ryciak J. The association between the type of delivery and factors associated with exclusively breast-feeding practice among polish women: a cross sectional study. *International journal of environmental research and public health.* 2021; 18(20):10987. [10.3390/ijerph182010987](https://doi.org/10.3390/ijerph182010987).
  35. Tsegaw SA, Dawed YA, Amsalu ET. Exploring the determinants of exclusive breast feeding among infants' under six months in Ethiopia using multilevel analysis. *PLOS one.* 2021; 16 ( 1 ) e 0 2 4 5 - 034. [10.1371/journal.pone.0245034](https://doi.org/10.1371/journal.pone.0245034).
  36. Santacruz-salas E, Segura-fragaso A, Pozuelo-Cavascosa DP, Cobo–Cuenca AI, Carmona-Torres JM et al. Maintenance of maternal breast feeding up to six months: predictive model. *Journal of personalised medicine.* 2021; 11(5):396