

# Determinants of Breast-Feeding Initiation Time among Newborns Delivered in a Tertiary Baby Friendly Health Facility in Enugu, Nigeria

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## Abstract

**Background:** The importance of early breastfeeding initiation to both the mother and infant is enormous as it reduces the likelihood of neonatal mortality as well as maternal postpartum haemorrhage. The objectives of the study were to assess the prevalence and determinants of correct breastfeeding initiation time among newborns delivered at the University of Nigeria Teaching Hospital, Enugu. **Methods:** This was a cross sectional descriptive study. Relevant maternal and new-born birth characteristics were obtained using a pretested semi-structured questionnaire. Data were analyzed using SPSS version 20.0. Multivariate logistic regression was used to determine the factors that are significantly associated with correct breastfeeding initiation time with the level of significance set at  $p < 0.05$ . **Results:** A total of 321 mother-newborn pairs were studied. 86 (26.8%) of the respondents correctly initiated breastfeeding within 1 hour of delivery. Planned pregnancy, pre-pregnancy decision on infant feeding options, primiparity, vaginal delivery and breast milk as first food given to the neonate post-delivery were associated with increased likelihood of correct breastfeeding initiation time. **Conclusion:** Correct breastfeeding initiation time among respondents is low. Planned pregnancy, pre-pregnancy decision on infant feeding option before pregnancy, primiparity, vaginal delivery and breast milk as first food given to the neonate after delivery were associated with having correct breastfeeding

initiation time among respondents. Efforts should be made to complement Baby Friendly Hospital Initiative with baby friendly community initiative in order to improve the rate of correct breastfeeding initiation time in our setting.

## **Keywords**

Breastfeeding Initiation Time, Newborns, Baby Friendly Hospital Initiative

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## **1. Introduction**

Breastfeeding is a natural way of support for the optimal growth and development of young children particularly infants. The United Nations Children's Fund (UNICEF) and World Health Organization (WHO) have jointly recommended exclusive breast feeding (EBF) for the first 6 months of life and breastfeeding continued up to 2 years and beyond. Although, it is the desirable, form of infant feeding, partial breastfeeding as well as breastfeeding for shorter periods of time are also of benefits [1].

The benefits of breastfeeding towards the promotion of child health and development as well as in later life are well established. The first milk, colostrum contains varieties of immunologic and nutritious properties [2], with diverse functions including protection of the newborns from infections such as diarrhoeal disease [3], pneumonia [4], neonatal sepsis [5], among others in addition to the early normalization of intestinal physiologic functions.

The WHO and UNICEF have jointly launched and sustained the "Ten Steps to successful breastfeeding" under the framework of the Baby Friendly Hospital Initiative (BFHI) with the objectives of protecting, promoting and supporting breastfeeding which are the special role of maternity services. The chief target of the 4<sup>th</sup> step of the "Ten steps to successful breastfeeding" of the BFHI is to ensure that every health facility providing maternity services and care for newborn infants should help mothers initiate breastfeeding within a half hour of birth following vaginal delivery [6].

Breastfeeding initiation within an hour of delivery has been adjudged the desired form of feeding following its link with reduced neonatal mortality indices [7] [8]. Hence the provision of maternal breast milk to infants within one hour of birth is referred to as "early initiation of breastfeeding" and the WHO has recommended that in order to ensure early breastfeeding initiation newborns should be placed in skin to skin contact with their mothers soon after birth for at least 60 minutes [9].

Early breastfeeding initiation is beneficial to both the mothers and the infants. To the mother early initiation of EBF helps post-partum hemorrhage to be controlled with secreted oxytocin hormone from the anterior pituitary gland [10], while in children mortalities have been reported to be prevented in 42 high mortality countries through increased breastfeeding rates [11] [12].

A recent study suggests that fact that delayed initiation of breastfeeding is a risk factor for neonatal deaths [6] [7]. However, increasing the proportion of infants that receive breast milk within the first 24 hours of life has been associated with reduced neonatal mortality to about 16% [6] [7].

Currently the exclusive breastfeeding rate in Nigeria is at its lowest ebb of 17% among children less than 6 months of age with a median duration of 0.5 months [13].

It has been shown that when clinicians and other health workers are positive about the benefits of breastfeeding particularly pediatricians whose roles are key in the field of child health as counselors, educators and opinion builders; mothers are more likely to practice EBF [14] [15], including its early initiation.

Thus study aimed to evaluate prevalence and determinants of correct breastfeeding initiation time among newborns delivered at the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu, Nigeria.

## 2. Methods

This was a cross sectional study conducted in the labour ward, postnatal wards and New Born Special Care Unit (NBSCU) of University of Nigeria Teaching Hospital (UNTH) Ituku-Ozalla, Enugu from 1<sup>st</sup> April, 2014 to 10<sup>th</sup> June, 2016.

All eligible mothers with their respective newborn infant pairs who were delivered in the hospital and consented during the study period were consecutively recruited during the study period.

The inclusion criteria for the study were all mothers who were delivered in the hospital at the time of the study and consented to the study.

Mother-infant pairs were excluded from the study if mothers declined to consent for the study or the infant was born before arrival to the hospital.

Ethical approval for the study was obtained from the Health Research Ethics Committee of UNTH, Enugu.

Informed consent was obtained from all eligible mothers. Respondents were recruited from the labour ward, post-natal ward or New Born Special Care Unit of the hospital.

### 2.1. Study Participation and Data Collection

Questionnaire for the study was adapted from previous similar studies [8] [11] and was pretested prior to the commencement of the study among a sample of 20 mothers of which 95% found the content unambiguous.

Relevant information included in the study questionnaire were: maternal age, marital status, maternal and paternal education, maternal and paternal occupation, maternal birth characteristics (parity, mode of delivery—vaginal or caesarean section, antenatal care attendance in the index pregnancy, and maternal medical/psychological illness in the index pregnancy.

Also the social and medical characteristics of the newborns were collected including: infant's post-natal medical condition, gestational age at birth, gender of

baby, birth weight, and history of admission to the New-born Special Care Unit and the indication (s) for the hospitalization thereof.

The social class of each child was assessed using the criteria proposed by Oyedeji [16] in Ilesha, Nigeria with classification into five classes (social classes I to V). Here the social class of each child was determined based on the occupational status and highest educational attainment of the parents. The scores were summed and the mean (approximated to the nearest whole number) obtained. The mean score was used to assign the child to one of the socio-economic classes (1 to V). The social classes of the subjects were further stratified into upper (social classes I and II), middle (social class III) and lower (social classes IV and V).

## 2.2. Definition of Term

### Early Initiation of Breastfeeding

Correct breastfeeding initiation time was regarded as maternal initiation of breastfeeding within 1 hour post-delivery [7] [8].

## 2.3. Statistical Analysis

Data were analyzed using the statistical package for Social Sciences, (SPSS) Windows Programme (SPSS Inc, Chicago, IL, USA) version 20.0. Chi square test was used to compare the proportions. Bivariate analysis was done and variables that showed significant level of less than 20 (*i.e.*  $p < 0.20$ ) were in-put into the regression model.

The multivariate logistic regression model was used to determine the factors among parity, mode of delivery, post-natal medical history of newborns, planned pregnancy, maternal medical illness in the index pregnancy, gestational age at birth, birth weight, infant feeding decision made prior to conception and first food given to the newborn that actually predicted correct breastfeeding initiation within one hour of delivery, with the level of statistical significance set at  $p < 0.05$ .

## 3. Results

A total of three hundred and twenty-one (321) mother and neonatal pairs were recruited and interviewed.

One hundred and fifty nine (49.5%) of the mothers were within the 20 to 29 years age bracket, and 315 (98.1%) were married.

Two hundred and eighteen respondents (67.9%) had tertiary education while 84 (26.2%) had at least secondary education. Most of the mothers belonged to social classes IV and V, accounting for 135 (42.1%) of the total respondents as shown in **Table 1**.

In **Table 2**, 181 (56.4%) of the respondents were multiparous mothers while 128 (39.9%) were primiparous. 312 (97.2%) respondents had adequate attendance at antenatal clinic/care in the index pregnancy while 190 (59.2%) were delivered vaginally.

**Table 1.** Socio-demographic characteristics of study subjects.

Characteristics	Frequency (N = 321)	Percent (%)
<b>Age of mother:</b>		
<20 years	4	1.3
20 - <30	159	49.5
30 - <40	148	46.1
≥40	10	3.1
<b>Marital Status:</b>		
Married	315	98.1
Widow/Widower	3	0.9
Single Mother	2	0.6
<b>Maternal Educational level:</b>		
Primary	18	5.6
Secondary	84	26.2
Tertiary	218	67.9
<b>Social Economic Class:</b>		
1	34	10.6
2	61	15.0
3	91	28.3
4	93	29.0
5	42	13.1

**Table 2.** Maternal birth characteristic.

Characteristics	Frequency (N = 321)	Percent (%)
<b>Parity:</b>		
Primiparous	140	43.6
Multiparous	181	56.4
<b>Planned Pregnancy:</b>		
Yes	253	78.8
No	68	21.2
<b>Mode of Delivery in index pregnancy:</b>		
Vaginal Delivery	190	59.19
Caesarean section	131	40.81
<b>Attendance to Antenatal Care in index pregnancy:</b>		
Yes	312	97.2
No	9	2.8
<b>Maternal Medical Illness:</b>		
Yes	69	21.5
No	252	78.5
<b>Interval since last delivery (in months):</b>		
1 <sup>st</sup> pregnancy	128	39.9
<12 months	17	5.3
12 - <24	105	32.7
>24	71	22.1
<b>Maternal psychological illness:</b>		
Yes	12	3.7
No	309	96.3

Most of the mothers were stable in the post-delivery period with no significant medical illnesses reported in 252 (78.5%).

Two hundred and seventy (84.1%) of the newborns studied were medically stable while 51 (15.9%) were admitted into the NBSCU for different medical conditions post-partum.

One hundred and seventy five (54.5%) were males and majority of the neonates were of normal birth weight, 281 (87.5%) weighed up to 2.5 kg or more.

In general 86 (26.8%) of the respondent mothers correctly indicated breastfeeding within 1 hour of delivery.

Various indications for admission of the 51 sick neonates to the NBSCU were: perinatal asphyxia 21 (41.2%) neonatal jaundice 12 (23.5%), prematurity/low birth weight, 9 (17.6%), neonatal infections 5 (9.8%) and respiratory distress syndrome 4 (7.8%) as shown in **Table 3**.

On the test of association between early breastfeeding initiation time and the various maternal and newborn characteristics: parity ( $p = 0.000$ ), mode of delivery ( $0.000$ ), postnatal medical history of newborn ( $p = 0.001$ ), breastfeeding as first food given to the newborn and the decision of the infant feeding made by the couple/mother pre-pregnancy showed statistical significance ( $p < 0.05$ ) (**Table 4**).

Further statistics using bivariate analysis was done. The maternal and newborn characteristics/variables whose bivariate analysis showed a significant level

**Table 3.** Clinical characteristics of the newborns.

Characteristics	Frequency (N = 321)	Percent (%)
<b>Postnatal Medical History:</b>		
Normal/Stable	270	84.1
Admitted to NBSCU	51	15.9
<b>Gestational Age at Birth:</b>		
Preterm	35	10.9
Term/Post Term	286	89.1
<b>Gender of Baby:</b>		
Male	175	54.5
Female	146	45.5
<b>Birth Weight</b>		
<2.5 kg	40	12.5
>2.5 kg	281	87.5
<b>Reasons for admission to NBSCU:</b> (n = 51)		
Perinatal asphyxia	21	41.2
Neonatal Jaundice	12	23.5
Prematurity/LBW	9	17.6
Neonatal infections	5	9.8
Respiratory distress syndrome	4	7.8

Key: NBSCU: Newborn Special Care Unit; LBW: low birth weight.

**Table 4.** Association between breastfeeding initiation time and maternal and newborn characteristics.

Characteristics	Breastfeeding	Initiation	X <sup>2</sup>	P-value
	≥2 hours (n = 86)	>2 hours (n = 235)		
<b>Maternal Education:</b>				
Primary	3	15	1.079	0.583
Secondary	24	60		
Tertiary	59	160		
<b>Social Class</b>				
1	8	26	3.600	0.463
2	19	42		
3	20	71		
4	24	69		
5	15	27		
<b>Parity:</b>				
Primiparous	23	117	13.594	0.001
Multiparous	63	118		
<b>Mode of delivery:</b>				
Normal/vaginal	73	117	33.631	0.001
Caesarean section	13	118		
<b>Postnatal Medical History of the newborn:</b>				
Normal/stable	82	188	11.099	0.001
Admitted to NBSCU	4	47		
<b>Parental Harmony:</b>				
Harmonious	83	233	0.077	0.602
Disharmony	1	2		
<b>Planned pregnancy:</b>				
Yes	62	191	3.180	0.054
No	24	44		
<b>Maternal Social History (smoking):</b>				
Yes	3	8	0.001	0.605
No	83	226		
<b>Maternal alcohol use:</b>				
Yes	12	39	0.329	0.350
No	74	196		
<b>Maternal History of Intravenous Drug Use:</b>				
Yes	0	3	1.108	0.391
No	86	232		

## Continued

<b>Maternal Medical Illness in the index pregnancy:</b>				
Yes	13	56	2,833	0.060
Bi	73	176		
<b>Gestational age at birth:</b>				
Preterm	6	29	1.894	0.118
Term/Post term	80	205		
<b>Gender of baby:</b>				
Female	42	103	0.590	0.260
Male	44	131		
<b>Birth weight:</b>				
<2.5 kg	7	30	1.401	0.162
≥2.5 kg	79	202		
<b>1<sup>st</sup> food given to Newborn:</b>				
Breast milk	73	76	70.562	0.001
Formula	2	64		
Glucose water	8	70		
Others	3	24		
<b>Antenatal Care in index pregnancy:</b>				
Yes	84	7	0.099	0.650
No	2	228		
<b>Infant Feeding made before pregnancy:</b>				
Yes	76	185	3.857	0.032
No	10	50		
<b>Maternal Psychological Illness in Pregnancy/Peurperium:</b>				
Yes	1	11	2.165	0.123
No	85	224		

\*EBF: Exclusive breastfeeding as defined by the World health organization is feeding of the infant only breast milk and no other liquids or solids except for drops or syrups consisting of vitamins, mineral supplements, or medicines [41].

of less than 20 percent (*i.e.*  $p < 0.20$ ) were in-put into the multivariate logistic regression model.

Primiparity, vaginal delivery, planned pregnancy, breastfeeding as first feeding given and infantfeeding decision made before pregnancy added significantly to the model/prediction table (Table 5).

The odds of having the correct time of initiation of breastfeeding is 5.3 times greater for breastfed babies as opposed to formula fed/other fed babies. The odds of commencing breastfeeding on time was also 2.67 times greater for those

**Table 5.** Predictors of correct breastfeeding initiation time among study babies.

Variable	Odds ratio	95% Confidence interval for odds ratio		P-value
		Lower limit	Upper limit	
<b>Parity</b>				
Primiparous	1.948	1.038	3.650	0.038*
Multiparous	1			
<b>Mode of delivery</b>				
Normal/vaginal	0.163	0.076	0.350	0.001*
Caesarean/instrumental	1			
<b>Postnatal medical history of newborn</b>				
Normal/stable	0.293	0.058	1.480	0.138
Admitted to NBSCU	1			
<b>Planned pregnancy</b>				
Yes	0.453	0.219	0.930	0.033*
No	1			
<b>Maternal medical illness in index pregnancy</b>				
Yes	0.980	0.438	2.190	0.960
No	1			
<b>Gestational age at birth</b>				
Before 37 weeks/Preterm	1.113	0.318	3.89	0.866
After 37 weeks	1			
<b>Birth weight</b>				
<2.5 kg	1.004	0.277	3.640	0.996
≥2.5 kg	1			
<b>First food given</b>				
Breast milk	5.307	2.706	10.400	0.001*
Formula feeding and others	1			
<b>Infant feeding decision made before pregnancy</b>				
Yes	2.670	1.116	6.380	0.027*
No	1			
<b>Maternal psychological illness</b>				
Yes	0.552	0.096	3.180	0.506
No	1			

\*Statistically significant.

babies where infant feeding decision was made before pregnancy and 1.9 times higher for primiparous women when compared with multiparous women. The odds of having correct initiation time of breastfeeding was 6.13 times less for ba-

bies delivered by Caesarean section or instrumental delivery and 2.2 times less in situations where the pregnancy was not planned.

In other words, breastfeeding of babies, making decision on infant feeding options before pregnancy and primiparity were associated with an increase in having the correct time of initiation of breastfeeding. Conversely, assisted delivery (Caesarean section or instrumental delivery) and unplanned pregnancy were associated with a reduction in the likelihood of having a correct commencement time of breastfeeding.

#### 4. Discussion

From the current study, 86 (26.8%) out of the 321 mothers studied correctly initiated breastfeeding within one hour of delivery as recommended by the UNICEF/WHO. This rate is low as it falls within the zero to 29 percent bracket adjudged by the WHO as low [11]. It is also well below the Nigerian national prevalence of 40 percent in babies born in urban areas as well as 29 percent among those delivered in rural areas [17]. This prevalence is also much lower than the reports from some countries in sub-Saharan Africa and other developed countries including Kenya, Gambia, Cambodia, New Zealand and Italy [18] [19] [20] [21].

This reported low rate of correct breastfeeding initiation time as reported in the current study is coming at a time when the Nigerian recorded rate of 17% is regarded as one of the least exclusive breastfeeding globally [17].

It has been reported that the low rates of correct BFI time and EBF in Nigeria could be addressed by complementing and sustaining the BFHI with Baby Friendly Community Initiative (BFCl) as has been demonstrated in Kenya which currently has one of the highest EBF rate of 97% [19]. However, it is also important to note that a lot of inconsistent definitions of correct breastfeeding initiation time abound in the literature making comparison of the standard timing unreliable [22].

Timely BFI in newborns has been shown to have protective effects on the neonatal morality index within the first 28 days of life including overall neonatal mortality rate; infections related deaths, and low birth weights among other benefits as well as maternal health [22].

The WHO has recommended that all mothers should initiate timely breastfeeding, with health workers assisting mothers to ensure that newborn babies are placed in skin-to-skin contacts with their mothers within one hour of birth in order to achieve this goal. Also mothers should recognize the cues of their newborns readiness to breastfeed. All of these efforts are geared towards successful and timely initiation and sustenance of exclusive breastfeeding [1] [7] [22].

From the current study various maternal and newborn birth characteristics were significantly found to impact on timely breastfeeding initiation—planned pregnancy, parity, infant decision made before pregnancy, mode of maternal delivery, neonatal medical illness and breastfeeding as first food given to the new-

born.

Currently, it appears that the efforts of the BFHI which targets the mothers presenting to the designated health facilities is not meeting up with the desired goals in our setting. Hence, complementing the BFHI with Baby Friendly Community Initiative (BFHI) may be the step in the right direction for many developing nations including Nigeria struggling to achieve this goal.

Such collaboration has resulted in huge EBF success elsewhere as the BFHI is community driven with local involvement, training of mothers' support groups in the community with close links to the health facilities and applying messages obtained from the community interviews of the residents [18].

Mothers who planned their pregnancies as well as made the decisions to breastfeed their babies prior to achieving pregnancy were more likely to correctly initiate BF on time if given the right family and health facility support as reported in the current study. Various workers working independently had reported that mothers who planned and made decisions to breastfeed their babies are more likely to initiate breastfeeding early [23] [24] [25] [26].

Some researchers had shown that the support a mother receives from health workers can influence her decision on whether or not to initiate breastfeeding timely. Forster and colleague [27], showed that mothers should be encouraged by health workers to breastfeed immediately after birth, while efforts should be made to rightly identify those with higher risk of not successfully initiating and continuing breastfeeding and offer them extra support.

From the current study the odds of correctly initiating breastfeeding timely among mothers was 1.9 times higher for primiparous compared with multiparous mothers. The relationship between parity and birth order and breastfeeding has been found to be inconsistent among previous studies [28] [29] [30]. While some workers [28] [29] reported that primiparous mothers were more likely to initiate EBF timely and more likely to continue breastfeeding; other researchers documented the reverse, pointing that multiparity was significantly associated with early/correct initiation and sustained breastfeeding possibly from their past experiences [28] [30], while Ekstrom *et al.* [31] and Guo and co-workers [32] found no associations.

Also the odds of having correct initiation time of breastfeeding was 6.13 times less for babies delivered by caesarean section or instrumental delivery compared to those delivered vaginally. Similar findings have been corroborated by previous workers [33] [34]. Operative delivery has great psychological impact not only limited to the patient and her family, but sometimes on the attending physician who could become less motivated to encourage the mother to initiate breastfeeding early combined with the effects of anaesthesia on both the mother as well as on the newborn [33] [34]. However, this is in contrast to mothers who had vaginal deliveries, most of whom had demonstrated early and timely initiation of breastfeeding of their newborns as the process of normal vaginal delivery increases the physiological stimulation of milk production and therefore are more likely to have enough milk and initiate breastfeeding early [35].

Various maternal as well as newborn medical conditions could adversely affect early initiation of breastfeeding in the newborns. Such factors include prematurity, low birth weight, infections, congenital abnormalities, prenatal asphyxia among others. Mother with healthy babies are more likely to initiate breastfeeding timely compared with those who had sick newborns [22] [36].

Mothers who decided to practice exclusive breastfeeding before achieving pregnancy started their babies on breastmilk first and early as observed in the current study. Mothers who intended or practiced pre-lacteal feeding with formula milk, glucose water or whatever in their newborns first were more likely not to initiate breastfeeding early as it is when the newborn begins to suckle the maternal nipples that proper breast milk let down is established [37] [38] [39].

Maternal education as well as social class was not significantly associated with timely initiation of breastfeeding in the current study. This is in contrast to the findings by previous workers [25] [38] [40], that women with higher educational status were more likely to initiate and continue breastfeeding in their infants. This could partly be due to the fact that majority of the respondents in the current study had higher educational attainment.

## 5. Conclusions

In conclusion, the timely breastfeeding initiation rate of 26.8 percent among mothers in the current study is adjudged to be low in accordance with the World Health Organization standards.

Planned pregnancy, making decision of infant feeding option before pregnancy, primiparity, vaginal delivery, breastfeeding as the first food given to the neonate after delivery were associated with having the correct timing of breastfeeding initiation among respondents.

Efforts should be made to strengthen BFHI and complement it with Baby Friendly Community Initiative in order to improve the rate of correct breastfeeding initiation time in our setting to save lives.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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