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Influence of maternal breastfeeding practices on the anthropometric status of their infants (0-12 months) in Arochukwu L.G.A Abia state, Nigeria

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Abstract

Background: Breast milk remains the best start to life in all areas of infants' development. Cow milk is best for cows and human breast milk is best for human babies.

Objectives: This study assessed the influence of maternal breastfeeding practices on the anthropometric status of their infant (0-12 months) in Arochukwu L.G.A. Abia State.

Methods: A total of 250 mothers were selected using simple random sampling technique. Data on socio-economic/demographic characteristics, knowledge, attitude and practice of mothers towards exclusive breastfeeding, factors that influence maternal breastfeeding. Anthropometric measurements of weight and height were taken using standard procedures. The IBM SPSS version 20 was used to analyze the data. WHO anthro was used to compute anthropometric status of children.

Results: About 38.4% of the mothers were aged between 20-24 years. Majority of the mothers (62.5%) were married. About 73.2% of the mothers earned below ₦20, 000 monthly. About 42.4% of mothers exclusively breastfed their babies while about 33.2% of the children were initiated to breast milk within 30 mins after birth. About 42.4% of the mothers breastfed their babies for about 0-6 months before introducing complementary foods. Half of the mothers (53.6%) had a good knowledge on exclusive breastfeeding; 41.2% had poor knowledge, while a few (5.2%) had an excellent knowledge. About 33.6% of the mothers fed their babies with infant formula, while 24.8% fed their babies with breast milk after delivery. Majority (71.2%) fed their children 3-4 times daily. More than half of the infants (56.8%) were stunted, 40.4% were underweight and 15.2% wasted. The prevalence of stunting and wasting was higher in males than in females; wasting was more among 7-9 months old children.

Conclusion: The high levels of malnutrition in this study underline the great need for nutrition intervention. Exclusive breastfeeding and timely introduction of appropriate complementary feeding is a key factor in child growth.

Keywords: Breastfeeding practices, anthropometric status, maternal, infants, Arochukwu L.G.A. Abia State, Nigeria

Introduction

Breastfeeding is feeding an infant or young child with breast milk directly from human breast. Breastfeeding is an unequal way of providing food for the healthy growth and development of infants. Breastfeeding is very useful both for the child and the mother. For the child, the breast milk is easy to digest; it is the most complete form of nutrition for the infants (WHO, 2007) ^[15]. Exclusive breastfeeding based on the WHO (2004) ^[16] definition refers to the practice of feeding only breast milk (including expressed breast milk) for six months. Breastfeeding should be initiated within the first hour after birth. Exclusive breast feeding reduces infant mortality due to common childhood illness such as diarrhea or pneumonia and makes for a quicker recovery during illness.

In Nigeria, breastfeeding practices continue to fall well below the WHO/UNICEF recommendations. For instant, current percentage of children who are breastfed exclusively in Nigeria is 17% (UNICEF, 2015) ^[14]. Various factors associated with sub-optimal breastfeeding practices have been identified in various settings; these include maternal characteristics such as age, mental status, occupation, educational level, antenatal and maternity health care; partner or friend family, fear of inadequate milk supply (UNICEF, 2008) ^[12]. Successful breastfeeding requires adequate nutrition, rest and support of all who care about the well-being of mother and infants. Breast milk remains the best start to life in all areas of infant development (UNICEF, 2008) ^[12]. Breast milk alone is the ideal nourishment for infants for the first 6 month of life, providing all the nutrients including vitamins and minerals an infant needs at this period of life.

Human milk contains many immunological agents that protect infants against variety of infections. Poor infant feeding practices particularly inadequate breastfeeding or early shift to bottle and complementary feeding is associated with high rate of infection and malnutrition resulting in undesirable anthropometric profile in infants and children.

Anthropometric measurements are useful criteria for assessing nutritional status. It is one of the simplest and cost effective methods of assessment of growth and development especially in infants and children. Anthropometric measurements are concerned with the measurements of the variation of physical dimensions. Certainly, physical dimensions of the body are much influenced by nutrition particularly in the rapid growing period of infancy (Kamla, 2005) [6]. Anthropometry has become the conventional practical tool for evaluating the nutritional status of infants and children in Nigeria.

The global initiative to promote exclusive breastfeeding is still a concern in Nigeria. Thus this paper focused on the influence of maternal breastfeeding practices on the anthropometric status of their infants (0–12 months) in Arochukwu L.G.A Abia State, Nigeria.

Materials and Methods

Study design

The study was a cross sectional survey designed to establish influence of maternal breastfeeding practices on the anthropometric status of their infants (0-12 months).

Study area

This research was carried out in Arochukwu Local Government Area of Abia State. The local government headquarters is in Arochukwu which is a small town located at the Southern end of Abia State, Nigeria. The Local Government Area comprises of four communities and 88 autonomous villages making up Arochukwu L.G.A.

Sample population

The study comprised the infants and their mothers attending health centers in Arochukwu Local Government Area of Abia State.

Sample size

The sample size was calculated using the formula;

$$n = \frac{z^2 p (100-p)}{x^2}$$

Z = Standard normal deviate which is 1.96 for 95% confidence interval.

P = Percentage of nursing mothers practicing exclusive breastfeeding. P will be taken to be 17% (UNICEF, 2015) [14].

X = Width of confidence or required precision levels taken to be 5%.

n = Sample size.

$$n = \frac{2^2 \times 17(100 - 17)}{5^2} = \frac{4 \times 17(83)}{25}$$

$$= \frac{5644}{25} = 225.76 = 226$$

Sample size was rounded up to 250 to make up for drop-outs and incorrectly filled questionnaires.

Sampling and sample technique

There are four communities in Arochukwu. Purposive sampling technique was used to select 250 children and their mothers from the four communities on their immunization days at their health care centers.

Data collection

Pretested, validated questionnaires were administered to consenting women by trained interviewers during post natal clinic sessions in the selected health centers. The questionnaire contained questions on socio-demographic characteristics of the women, personal data, knowledge and practice of mothers towards breastfeeding, factors that affect maternal breastfeeding and infant anthropometry. The children were weighed using the special child weighing scale (Salter scale). The scale's balance indicator was checked to ensure that the scale was balanced. The child was undressed with the help of the mother/care-giver. The child was laid safely in the centre of the weighing scale. The reading was taken to the nearest 0.1kg and recorded. The recumbent length was obtained using a crown-heel length board. Shoes, stockings and hats were removed and hairs flatten. The child was laid flat on his back on the measuring board; the child's head was located at the end with fixed headpiece and the child's eyes facing upwards. The child's trunk and legs were aligned. Both legs were extended by placing one hand on the knees to obtain full extension. The foot piece was brought firmly against the child's heels, pointing the toes upwards. The reading was taken to the nearest 0.1cm and recorded. The Head circumference was obtained using a non-stretch fibre glass tape. The child was made to sit on the mother's lap to hold the child's head still. A non-stretch fibre glass tape was placed horizontally around the head at a level just above the eyeball (supra-orbital), the ears and the prominent bulge at the back of the head. The tape was tightened over the forehead but not to compress soft tissues. Then the reading was taken to the nearest 0.1cm and then recorded. Mid upper arm circumference (MUAC) was obtained by Sitting the child on the mother's lap, the child was undressed. The left hand was removed and hanged freely. A non-stretch fibre glass tape was placed around the left arm midway between the acromion process of the scapula and the olecranon process of the ulna. The reading was taken to the nearest 0.1cm and recorded.

Data and statistical analysis

The classification of the children into MUAC, weight-for-age, height-for-age and weight-for-height anthropometric indicator was calculated using z-scores by WHO (2006) growth standard. The variables were coded as;

Table 1: Shows in z scores, Height for age, Weight for age, Weight for height and BMI for age

z scores	Height for age	Weight for age	Weight for height	BMI for age
3	Excessive tall	Obese	Obese	Obese
2	Normal	Overweight	Overweight	Overweight
1	Normal	At risk	At risk	At risk
0	Normal	Normal	Normal	Normal
-1	Normal	Normal	Normal	Normal
-2	Stunted	Underweight	Wasted	Underweight
-3	Severely Stunted	Severely underweight	Severely wasted	Severely underweight

Knowledge was scored and categorized using grades as children. shown below:

Table 2: Knowledge grade

Knowledge grade
Poor knowledge (<39)
Fair knowledge (40-49)
Good knowledge (50-69)
Excellent knowledge (>70)

Information gathered from the questionnaire was coded and entered into the computer using Statistical package for the social sciences (SPSS), version 20. A descriptive statistical method such as frequency and percentage was used to analyze data on socio-economic, knowledge, attitude and feeding practices. Pearson’s correlation coefficient was used to determine relationship between the parental knowledge, attitude and feeding practices and nutritional status of the

Result

Table 3 shows the socio-economic characteristics of mothers. About 30% of the mothers were less than 20 years, 38.4% were between 20-24 years while 12.4% were between 25-30 years. Most of the women (64.2%) were married while the remaining 34.8% were single. About a quarter of the women (45.6%) had primary education as their highest educational qualification, while 34.4% had secondary education only. Only a few (9.8%) had tertiary education. Furthermore, 43.2% of the women were petty traders while 24.8% and 13.6% were business women and unemployed respectively. More than half of the women (73.2%) earned below ₦20, 000 per month, 10.8% earned between ₦21, 000-₦40, 000 per month, while a few (8.8%) earned above ₦40, 000 per month.

Table 3: Personal and socio-economic characteristics of the mothers

Variable	Frequency	Percentage
Age		
Less than 20 year	96	30
20-24 years	75	38.4
25-30 years	31	12.4
31-34 years	19	7.6
35-39 years	29	11.6
Total	250	100
Marital status		
Married	163	65.2
Single	87	34.8
Total	250	100
Educational status		
No formal education	24	9.6
Primary education	114	45.6
Secondary education	86	34.4
Tertiary education	24	9.6
No response	2	0.8
Total	250	100
Occupation		
Civil servant	12	4.8
Petty trader	108	43.2
Business woman	62	24.8
Artisan	27	10.8
Unemployed	34	13.6
House wife	7	2.8
Total	250	100
Income per month		
Below ₦20, 000	183	73.2
₦21, 000-₦40, 000	26	10.4
Above ₦41, 000	22	8.8
No response	19	7.6
Total	250	100

Table 4 shows the knowledge on exclusive breastfeeding by the mothers. Half of the mothers (53.6%) had a good knowledge on exclusive breastfeeding; about a quarter (41.2%) had poor knowledge, while a few (5.2%) had an excellent knowledge on exclusive breastfeeding.

Table 4: Mothers knowledge on exclusive breastfeeding

Knowledge	Frequency	Percentage
Poor knowledge (<39)	103	41.2
Fair knowledge (40-49)	0	0
Good knowledge (50-69)	134	53.6
Excellent Knowledge (>70)	13	5.2
Total	250	100

Table 5 shows the mothers' practices on exclusive breastfeeding. About 33.2% breastfed their baby within 30mins after delivery, 25.2% within 6-10 hours after delivery, 14.8% within 1-5 hours, 7.2% within 24 hours. About 33.6% of the mothers said infant formula was the first food they fed their baby after delivery, 30.4% gave

glucose water, while 10% gave plain warm water. About 44.4% of the mothers said they have continued giving only breast milk to their babies, 17.6% said breast milk and plain warm water, 14.4% said breast milk and family food and a few (9.6%) said breast milk and formula. However, 22% of the mothers said the reason of giving formula and other foods before 6 months is because their babies always cries after breastfeeding. About 38% of the women expressed their breast milk when they left home for some hours, 16.8% use family food while 10.4% gave infant formula to their children when left for some hours at home. Furthermore, 28.4% of the women that used expressed breast milk stored the expressed breast milk using a food warmer while 2.8% used freezer. The results further showed that about 42.4% of the women introduced other foods to their babies from 6 months and above, 27.2% at 3 months and 15.6% at 1 month. Thirty- six percent of the women breastfed their children for 12-13 months. Majority of the women (71.2%) fed their children 3-4 times daily.

Table 5: Mothers practices on breastfeeding and feeding

Variable	Frequency	Percentage
Time of breastfeeding after delivery		
Within 30mins	83	33.2
Within an hour	37	14.8
1-5 hours	37	14.8
6-10 hours	63	25.2
Third day	11	4.4
Within 24 hours	18	7.2
Total	250	100
First food given to baby after delivery		
Plain warm water	25	10
Glucose water	76	30.4
Breast milk	62	24.8
Infant formula	84	33.6
No response	3	1.2
Total	250	100
Type of food given to baby since birth		
Breast milk only	111	44.4
Breast milk and formula	24	9.6
Breast milk and complementary foods	32	12.8
Breast milk and plain warm water	44	17.6
Breast milk and family food	36	14.4
No response	3	1.2
Total	250	100
Reason for giving formula/other foods before 6 months		
Breast milk alone is enough	35	14.0
I have insufficient breast milk	13	5.2
My health is affected if I give only breast milk	7	2.8
My work does not give me chance to breastfeed	8	3.2
Baby is small and does not look healthy	7	2.8
Baby always cry after breastfeeding	55	22
My husband and other family member	3	1.2
No response	122	48.8
Total	250	100

Table 5(cont.): Mothers practices on breastfeeding

Variable	Frequency	Percentage
Method of feeding when baby is left at home		
Infant formula	26	10.4
Expressed breast milk	95	38
Pap and other cereal gruel	37	14.8
Family food	42	16.8
No response	50	20

Total	250	100
Storing expressed breast milk		
Refrigerator	3	1.2
Freezer	7	2.8
Food warmer	71	28.4
Container with cold water	3	1.2
On the table	3	1.2
No response	163	65.2
Total	250	100
Age of introduction of complementary feeds		
1 month	39	15.6
2 months	32	12.8
3 months	68	27.2
5 months	3	1.2
6 months	106	42.4
No response	2	0.8
Number of times child feeds daily		
2-3 times	15	6
3-4 times	178	71.2
Anytime the food is available	50	20
No response	7	2.8
Total	250	100

Information on the nutritional status of the infant was summarized on table 6. About half of the infants (56.8%) were stunted while 43.2% had normal length-for-age. About 47.6% of the infants had normal weight-for-age while

40.4% were underweight. About 31.2% of the infants had normal weight-for-length while 15.2% were wasted. Furthermore, the result also revealed that 47.2% had normal BMI-for-age, while 17.2% were underweight.

Table 6: Anthropometric measurement of infants

Parameters	Frequency	Percentage
Length-for-age		
Stunted	132	56.8
Normal	108	43.2
Total	250	100
Weight-for-age		
Underweight	101	40.4
Normal	119	47.6
Above normal	30	12
Total	250	100
Weight-for-length		
Wasted	38	15.2
Normal	78	31.2
Above normal	134	53.6
Total	250	100
BMI-for-age		
Underweight	43	17.2
Normal	118	47.2
Above normal	89	35.6
Total	250	100

Table 7 shows the anthropometric measurement of the children by sex. The prevalence of stunting was higher in males (58.9%) than females (52%). The result also revealed that the prevalence of wasting was higher in males (16%) than in females (14.9%). Also, 40.4% of the children which

comprised of 49.3% males and 36.6% females were underweight. Furthermore, the result revealed that 17.3% males and 17.1% females were underweight going by their BMI-for-age.

Table 7: Anthropometric measurement of the infants by sex

Parameters	Male		Female		Total	
	Freq.	%	Freq.	%	Freq.	%
Length-for-age						
Stunted	39	52	103	58.9	132	56.8
Normal	36	48	72	41.1	108	43.2
Total	75	100	175	100	250	100
Weight-for-age						
Underweight	37	49.3	64	36.6	101	40.4
Normal	29	38.7	90	51.4	119	47.6

Above normal	9	12	21	12	30	12
Total	75	100	175	100	250	100
Weight-for-length						
Wasted	12	16	26	14.9	38	15.2
Normal	26	34.7	52	29.7	78	31.2
Above normal	37	49.3	48	27.4	134	53.6
Total	75	100	175	100	250	100
BMI-for-age						
Underweight	13	17.3	30	17.1	43	17.2
Normal	33	44	85	48.6	118	47.2
Above normal	29	38.6	60	34.3	89	35.6
Total	75	100	175	100	250	100

Table 8 shows the anthropometric measurements of the infants by age. Majority of the infants (76%) between the ages of 0-3 months had above normal weight for their length, while 43.5% of them between 7-9 months were wasted. In their height-for-age z-scores, majority (82.1%) of

the infants between the ages of 0-3 months were stunted. About 34.2% of the infants between 0-3 months and 4-6 months (88.2%) were underweight. About 50.5% of infants between 0-3 months that had normal BMI-for-age.

Table 8: Anthropometric measurements of the infants by age

Parameters	0-3 months F (%)	4-6 months F (%)	7-9 months F (%)	10-12 months F (%)	Total F (%)
Weight-for-length					
Wasted	5 (4.3)	2 (5.9)	19 (43.5)	12 (27.2)	38 (15.2)
Normal	23 (19.6)	8 (23.6)	25 (45.4)	22 (50)	78 (31.2)
Above Normal	89 (76)	24 (70.6)	11 (20)	10 (22.7)	134 (53.6)
Total	117 (100)	34 (100)	55 (100)	44 (100)	250 (100)
Height-for-age					
Stunted	96 (82.1)	30 (88.2)	9 (16.3)	7 (15.9)	142 (56.8)
Normal	21 (18)	4 (11.8)	46 (83.6)	39 (84.1)	108 (43.2)
Total	117 (100)	34 (100)	55 (100)	44 (100)	250 (100)
Weight-for-age					
Underweight	40 (34.2)	30 (88.3)	21 (38.1)	10 (22.7)	101 (40.4)
Normal	70 (59.8)	4 (11.8)	25 (45.5)	20 (45.5)	119 (47.6)
Above normal	7 (6.0)	0 (0)	9 (16.3)	14 (31.8)	30 (12)
Total	117 (100)	34 (100)	55 (100)	44 (100)	250 (100)
BMI-for-age					
Wasted	16 (5.1)	2 (5.9)	21 (38.1)	14 (31.8)	43 (17.2)
Normal	59 (50.5)	13 (38.2)	25 (45.4)	21 (47.7)	118 (47.2)
Above normal	52 (44.5)	19 (55.9)	9 (16.4)	9 (20.5)	89 (35.6)
Total	117 (100)	34 (100)	55 (100)	44 (100)	250 (100)

Discussion

Most of the mothers were less than 24 years. It could be that the study area was made up of younger adults, and this is in line with a study by Mohidul *et al.* (2013) [8] where majority of mothers were aged 20-30 years. This further indicates the peak of fertility, and the age at which ladies commonly marry. Majority of the women had primary education as their highest education followed by secondary education. This shows that the respondents mostly had some level of formal education. Educated mothers are mostly employed and are more likely to mixed feed than exclusively breastfeed in the first six months of their child's life. Most women in this study were into petty trading and business. Mohidul *et al.* (2013) [8] pointed out that maternal employment may not be a constraint to child care, because mothers modified their work patterns to attend to their young children's need; but their employment status could influence child's feeding. More than half of the women (73.2%) earned below ₦20, 000 per month. This study is consistent with the findings of Ene-Obong *et al.* (2010) [5]. Half of the mothers (53.6%) had a good knowledge of exclusive breastfeeding; about a quarter (41.2%) had poor knowledge of exclusive breastfeeding. This result did not

support the 19.2% reported by Mo Oche and Amed. (2011) [7] in Plateau State. Poor knowledge of exclusive breastfeeding is a great barrier to the practice of exclusive breastfeeding. The perceived poor knowledge of respondents on exclusive breastfeeding could partly be attributed to the quality of information transferred to them, not all health care providers have enough knowledge about breastfeeding to inform or help women who are encountering difficulties. About 33.2% breastfed their baby within 30mins after delivery, while 14.8% breastfed within 1-5 hours after delivery. A similar finding was reported in a study of lactating mothers in Ile Ife Osun State, Nigeria where more than 50% of the lactating mothers said the time of initiation of breast milk after delivery was within 30mins (Ojofeitimi, 2000) [10]. The importance of breast feeding initiation within 30 minutes of delivery cannot be overemphasized. It has been shown to reduce neonatal morbidity and mortality. About 44.4% of the mothers said they have been giving only breast milk to their babies. This indicates that 44.4% of the women practiced exclusive breastfeeding. About 38% of the women expressed their milk for their babies to be fed when they were not at home. Expressing breast milk is important when direct

breastfeeding of the baby from the mother is not possible either because the mother is away from the baby or in some health cases (Safaa, 2012) ^[11]. About 42.4% of the women introduced other foods to their babies from 6 months and above. This perceived time of introduction of complementary food could be attributed to their knowledge, practice and attitude of exclusive breastfeeding. This is in line with the UNICEF (2009) ^[13] recommendation that breast milk alone is the ideal nourishment for infant for the first six months of life because it provides all the nutrients including vitamins and minerals an infant needs. One third of the women breastfed their children for 12-13 months. This result is in contrast with Eman, *et al.* (2016) on the study among working class lactating women in Enugu which showed that 50% of the respondents did not breastfeed up to one year. Optimal breastfeeding for 2 years and beyond provides comforts, enhances child spacing and survival (UNICEF, 2009) ^[13]. Majority of the women fed their children 3-4 times daily. WHO (2004) ^[16] suggested that children between 6-8 months and 9-11 months be fed 2-3 times and 3-4 times, respectively. More than half of the infants (56.8%) were stunted. The prevalence of stunting reported in this study was higher than 43% and 41% prevalence reported in Nigeria by NDHS (2013) and UNICEF (2009) ^[13] respectively. About 40.4% of the infants were underweight, 15.2% wasted. This result was similar to NDHS. (2013); this could be attributed to unhealthy feeding practices by their mothers, thus affecting their healthy growth and development. The finding of this study was comparable with 14% wasting recorded among under-five children in Nigeria by UNICEF (2009) ^[13]. Prevalence of stunting and underweight in this study was high compared to the report by Ekerette and Olukemi. (2016) ^[3]. The prevalence of stunting was higher in males than females. In agreement with this study, Danjin and Dawud. (2015) ^[2] in a study among children 0-12 months in Gombe, Nigeria found that prevalence of stunting was more among the male children compared to the females. The prevalence of wasting was higher in males than in females; this was slightly lower than that reported by Ene-Obong *et al.* (2010) ^[5]. Adequate nutrition during infancy and early childhood is essential to ensure the growth, health, and development of children. The low prevalence of wasting among 0-3 months and 4-6 months children in this study concurred with the report by Danjin and Dawud (2015) ^[2]. High prevalence of wasting among 7-9 months old children in this study could be due to the type of complementary foods given to them as breast milk alone cannot sustain them. Majority (82.1%) of the infants within the age of 0-3 months were stunted. Level of stunting at this age in month could be regarded a serious public health problem; it is noteworthy that children who are deprived of nutrients for healthy growth are also deprived of nutrients for healthy brain development and healthy immune systems (Amsalu and Tigabu, 2008) ^[1]. Infants between 4-6 months were the most underweight; the observed underweight status of the infants at this age could be attributed to early introduction of complementary food by their care givers.

Conclusion

The high levels of under-nutrition in this study points to the need for nutrition intervention. Exclusive breast feeding and timely introduction of appropriate complementary feeding is a key factor in child growth and development. The

assessment of nutritional status showed that many children were stunted, wasted, and underweight and this may be as a result of poor feeding, inadequate complementary feeding practices and poor economic status of their parents. There is need for more education focused on women of reproductive age on the importance of exclusive breastfeeding, followed by adequate complementary feeding.

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