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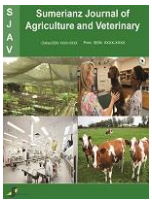

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Anthropometric Status and Feeding Practices of Infants (0 - 12months) in Awka, Anambra State, Nigeria

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Abstract

Background: Infant nutrition is an integral part of infant health. Infant feeding practices are feeding options and activities undertaken by mothers/caregivers to meet the infant's nutritional needs. Objectives: This study assessed the anthropometric status and feeding practices of infants (0-12months) in Awka, Anambra State. Methods: A cross sectional survey design was adopted. The population of the study were all the mothers with infants (0-12months). Data collection was done using a closed ended questionnaire. Recumbent length was measured using an infantometer and reading was taken to the nearest 0.1cm. Weight was taken using bathroom weighing scale and measurement was taken to the nearest 0.1kg. WHO-Anthro was used to assess the anthropometric status of the infants. In the classification of knowledge questions, correct response was assigned the value of one while zero was given to the wrong responses. The knowledge and attitude score was derived from the summation of the individual question scores, while the percentage knowledge score was obtained by dividing the knowledge score by the number of knowledge items. Knowledge was graded thus: poor knowledge (≤ 39.9), fair knowledge (40.0-69.9), while good knowledge (≥ 70.0). Statistical analysis was performed using the Statistical Package for Social Sciences version 22.0. Descriptive statistics (frequency and percentage, mean and standard deviation) were used for analysis. The Significant difference was judged at $p<0.05$. Results: About 42.1% of the infants were between 6-9months. The result revealed that many of the nursing mothers (65.5%) who participated in the study had good knowledge on practice of breastfeeding and continued breastfeeding at one year. About 10.3% of the infants were stunted, while 1.8% infants were severely stunted. Males (11.3%) were more stunted than females (9.7%). About 10.3% of the infants were underweight, while 1.8% were severely underweight. Males (11.3%) were more underweight than females (9.7%). The study also showed that 22.4% of infants were overweight, 5.5% infants had possible risk of overweight. Conclusion: Although many of the mothers had good knowledge and attitude on infant feeding practices, some of the mothers practiced early cessation of breast milk, early as well as late introduction of complementary foods.

Keywords: Anthropometric status; Infants; Feeding practices; Awka; Anambra state; Nigeria.

1. Introduction

Malnutrition is a universal public health problem in children in under five years [1]. Nutrition is the act and science of food consumption to help maintain a healthy and active life. An infant is a young child between zero to twelve (0-12) months after birth [2]. Infant nutrition is an integral part of infant health. The infant is more sensitive to abnormal nutritional situations and less adaptable than in later life to different types, form, proportions and quantities of food. Infant feeding practices are feeding options and activities undertaken by mothers/caregivers to meet the infant's nutritional needs [3]. Optimal Infant Feeding Practices recommended by World Health

Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) involves exclusive breastfeeding for the first 6months of life, followed by adequate complementary feeding and continued breastfeeding until the child is at least two years old [4]. Infant feeding practices have been responsible, directly or indirectly for 60 percent of the 10.9 million deaths annually among under five children [5]. Over two thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life [6]. According to the World Health Organization, 30 percent of children under five years worldwide have growth problems as a consequence of poor feeding [7]. Promoting adequate infant feeding practices such as early initiation of breastfeeding and exclusive breastfeeding for up to six months is an effective strategy for improving child survival. Breastfeeding remains a pivotal factor between life and death for the vast majority of children in developing countries such as Nigeria.

Feeding practices during infancy are critical for the growth and health of a child during the first two years of life and of importance for the early prevention of chronic degenerative diseases [8]. Complementary feeding for some children begins too early or too late and the foods are often nutritionally inadequate and unsafe [9]. Only about 29% of infants aged 0–6 months in Nigeria are exclusively breastfed [10]. Timely initiation of complementary foods remains a challenge as 16% of Nigerian infants are introduced to solid and semi-solid foods at 2–3 months, while 40% are introduced at 4–5 months, contrary to the WHO recommendation of six months [10], and these foods are often of poor nutritional value. There is need for a comprehensive strategic plan that is achievable to improve Infant and Young Child Feeding practices in Nigeria. Therefore, this study was conducted to assess the anthropometric status of infants (0-12months) and their feeding practices as reported by their mothers and caregivers in Awka metropolis, Anambra State, Nigeria.

2. Materials and Methods

2.1. Study Design

A cross sectional study was conducted to assess anthropometry and feeding practices of infants in Awka metropolis, Anambra State.

2.2. Study Area

The study was carried out in Awka the capital of Anambra State. Awka is in Awka South local Government Area, has an area of 523.2km^2 and a population of 301,657 people. Awka is located at latitude 8.2069°N and longitude 7.0678°E and has about seven communities and thirty-three villages. The occupations of the people are mainly white-collar jobs, business, and blacksmith. They practice subsistence farming because of civilization which has accorded it the urban status and this is greatly influencing the development and social life of the town. Some of the people in Awka practice Christianity, while others are steadfast to the traditional belief and practice.

2.3. Population of the Study

The sample population included infants aged 0-12months in Awka, Awka South Local Government Area.

2.4. Sampling and Sampling Technique

2.4.1. Sample Size Determination

The sample size was determined using the equation below

$$N = \frac{Z^2 \times P\,(100-P)}{X^2}$$

N = Number of samples

Z = Confidence interval =1.96

P = Prevalence of underweight children by Nigeria Demographic and Health Survey [10] (22%)

X = Estimated precision = 5

$$N = \frac{1.96^2 \times 22(100-22)}{5^2}$$

$$N = \frac{3.816 \times 22(78)}{25}$$

$$N = \frac{6592.19}{25}$$

$$N = 263.69 \approx 264$$

Calculation for dropouts at 10% = 10/100 × 264

= 26.4 ~26

Sample size = 264 +26 = 290

Sample size was rounded up to 290 to make up for drop outs and incorrectly filled questionnaires.

2.5. Sampling Procedure

A multi-stage sampling technique was used in the study. In the first stage, the seven communities in Awka were gotten from the Awka South local government secretariat. In the second stage, the thirty-three villages that comprised the seven communities were outlined, and systematic random sampling technique was used to select every third village starting from the first village on the list. A total of ten (10) villages were selected from the seven communities. The third stage was identification and determination of the numerical strength of infants in each of the villages. Most of the infants were selected from four villages which are Umudioka, Obunagu, Agbana and Umuokpu due to functioning and well equipped health centers that were situated in these villages, while the remaining infants

were randomly selected through church visitation to each of the other six villages. A total of 290 infants were selected for the study.

2.6. Preliminary visit/Informed Consent

A preliminary visit was made to the local government chairman and a letter of introduction was given to the chairman with respect to the research. Thereafter, visits were made to the village heads, health centers and churches to obtain permission for the survey. An informed consent letter was given to the mothers of the infants in the selected villages. They were provided with informed consent forms which they signed.

3. Data Collection

3.1. Questionnaire Design

The questionnaire was sectioned into four: Section A: socio-demographic/economic characteristics of the respondents; Section B: knowledge of the mother on breastfeeding and continued breastfeeding at one year; Section C: practice of breastfeeding and continued breastfeeding at one year; Section D: anthropometric indices of the infants.

3.2. Questionnaire Administration

Data were collected by the use of well-structured and validated questionnaires which were distributed to the mothers to fill for their children. Information on socioeconomic/demographic variables, Infant and young child feeding practices were collected.

3.3. Anthropometry Measurements

3.3.1. Recumbent length

Recumbent length was measured using an infantometer with a fixed head piece and horizontal backboard, and an adjustable foot piece. The child was laid on the infantometer with the feet toward the foot piece and the head against the fixed head piece. The child's head was secured in the proper alignment by lightly cupping the palms of the researcher's hands over the child's ears. The child's legs were aligned by placing one hand gently but with mild pressure over the child's knees. With the other hand, the researcher slide the foot piece to rest firmly at the child's heels. When the child was correctly positioned, reading was taken to the nearest 0.1cm.

3.3.2. Weight

Subjects were weighed using bathroom weighing scale which was adjusted such that the pointer was at the 0kg mark. Subjects were within one year of age and couldn't stand properly so the mother was weighed alone; then the mother and child were weighed together and the mother's weight was subtracted to determine the child's weight. The subjects' weight were taken with minimal clothing and no shoes. The measurement was taken to the nearest 0.1kg [11].

3.4. Data Analysis

In the classification of the knowledge questions correct response was assigned the value of one while zero was given to the wrong responses. The knowledge score was derived from the summation of the individual question scores, while the percentage knowledge score was obtained by dividing the knowledge score by the number of knowledge items. Knowledge was graded thus: ≤ 39.9 as poor knowledge, 40.0-69.9 as fair knowledge, while ≥ 70.0 as good knowledge. A 5 point likers scale with 1 as strongly disagree to 5 strongly agree was used to assess the attitude questions.

Classification of nutritional status of infants using WHO child's growth standards [12].

Weight-for-age:

<−2 SD and ≥−3 SD of the median = moderately underweight

<−3 SD of the median = Severely underweight

Height-for-age:

≤−2 SD and ≥−3 SD of the median = Moderately stunted

<−3 SD of the median = Severely stunted

BMI-for-age:

>3 SD of the median = Obese

>2 SD and ≤3 SD of the median = Overweight

≤−2 SD and ≥−3 SD of the median = Moderate acute malnutrition

<− 3 SD of the median = Severe acute malnutrition

3.5. Statistical Analysis

Statistical analysis was performed using the Statistical Package for Social Sciences version 22.0. Descriptive statistics (frequency and percentage, mean and standard deviation) were used to analyze the socio-demographic/economic characteristics, mothers practices on infant feeding, knowledge of mothers on infant feeding. WHO-Anthro was used to assess the anthropometric status of the infants.

Table 1 shows the personal and socio-economic characteristics of the mothers. One-third of the respondents (33.8%) were between the age group of 25-29years, 23.1% were between 20-24years, while 5.9% of the mothers

were 40years and above. More than half of the mothers (68.9%) who participated in the study were married, 14.1% were single mothers, while 6.9% were divorced. The study further revealed that 42.1% of mothers had secondary school education, 27.4% had primary education, 17.6% had tertiary education, while 12.4% had no formal education. Furthermore, more than half of the mothers (57.6%) were businesswomen or traders, 17.9% were civil servants, while 5.5% were unemployed. About 38.6% of the mothers had three children, 23.8% had four children, while 9.7% had one child.

Table-1. Personal and Socio-Economic Characteristics of Mothers

Variables	Frequency	Percentage
Age (years)		
16-19	41	14.1
20-24	67	23.1
25-29	98	33.8
30-34	39	13.4
35-39	28	9.7
40 and above	17	5.9
Total	290	100
Marital Status		
Married	200	68.9
Single	41	14.1
Separated	29	10.0
Divorced	20	6.9
Total	290	100
Educational Status		
Non-formal	36	12.4
Primary	81	27.9
Secondary	122	42.1
Tertiary	51	17.6
Total	290	100
Number of children		
1	28	9.7
2	44	15.1
3	112	38.6
4	69	23.8
>5	37	12.8
Total	290	100
Occupational Status		
Civil servants	52	17.9
Trading/Business	167	57.6
House wife	21	7.2
Farming	34	11.8
Unemployment	16	5.5
Total	290	100

Table 2 shows the personal characteristics of the infants. About 42.1% of the infants were between 6-9months old, 38.6% were between 9-12months, while 19.3% were 0-6months old. About 56.6% of the infants were female, while 43.4% were male.

Table-2. Personal Characteristics of the Infants

Variables	Frequency	Percentage
Age		
0-6months	56	19.3
6-9months	122	42.1
9-12months	112	38.6
Total	290	100
Sex		
Male	126	43.4
Female	164	56.6
Total	290	100

Table 3 shows the knowledge of mothers on breastfeeding. About 46.2% of the mothers were aware of exclusive breastfeeding. About 43.4% had a correct response of breastfeeding of baby within hours of birth. Half of the mothers (57.6%) knew colostrum was good for their babies. Almost all the mother (92.1%) knew the best age to give their babies only breast milk. About 69% of mothers knew the reason why breast milk was good for their babies.

About half of the mothers (55.5%) knew the benefits of breastfeeding to them. About 56.2% had correct responses to the reasons why some mothers do not produce enough breast milk. About 60.3% of the mothers knew the right age for introduction of other foods (complementary foods) to their infants. More than half of the mothers had good knowledge on the complementary foods to be given to their infants and what a good complementary food should be. More than half of the mothers had a good knowledge on ways babies should be fed during illness. Majority of the mothers (65.5%) who participated in the study had good knowledge of breastfeeding, 22.4% of mothers had fair knowledge, while few mothers (12.1%) had poor knowledge of breastfeeding.

Table-3. Knowledge of Breastfeeding among Nursing Mothers

Variables	Positive Responses	
	F	%
Awareness on exclusive breastfeeding	134	46.2
Time of introduction of baby to breast milk after birth	126	43.4
You think first milk (colostrum) is good	167	57.6
Age best to give only mother's milk	267	92.1
Reason breastfeeding is good for baby	200	69.0
Benefits of the mother from feeding the baby	161	55.5
Reasons some women do not have sufficient breast milk for their babies	163	56.2
Age other foods be introduced apart from breast milk	175	60.3
Foods to be given to babies as complementary foods	255	87.9
Composition of good complementary foods	228	78.6
Ways babies should be fed during illness	167	57.6
Knowledge grade		
Poor (0-39%)	35	12.1
Average (40-59%)	65	22.4
Good (60-100%)	190	65.5
Total	290	100

Table 3 shows the Infant feeding practices by mother's. About 38.3% of mothers said they gave their infants only breast milk, 23.1% gave breast milk and infant formula, 20.0% fed their infants formula only, while 3.1% fed their infants breast milk, water and other semi-solid foods for the first six months. About 39.7% of mothers said breast milk was the first food given to their infants after birth, 21.7% said they gave their infants water first, while 17.9% said they gave glucose and water. About 73.8% of mothers introduced breast milk to their infants within one hour after birth, 21% between 2 to 3hours after birth, while 5.2% introduced breast milk to their infants between 24hours after birth. About 36.2% of the mothers said they fed their infants 5-6timmes daily, 26.6% said they fed them more than 6times a day, while 11.4% said they fed their infants on demand. About 36.2% of mothers said they introduced complementary foods to their infants between 4-6 months, while 23.2% said they introduced their infants to complementary foods between 0-3 months. Few infants (2.4%) started complementary food between 7-9 months. Half of the mothers (50%) said they introduced complementary foods to their infants because breast milk was no longer enough for their babies. About 49.3% infants were fed pap as complementary food, 16.2% were fed cerelac, while 17.6% were given custard as complementary food. About 30.3% of the mother's said they gave their infants the complementary foods they could afford.

Table-5. Infant feeding Practices among Mother's

Variable	Frequency	Percentage
Infant feeding during the first 6months		
Breast milk alone	111	38.3
Breast milk + water	45	15.5
Breast milk + infant formula	67	23.1
Breast milk, water and other semi-solid foods	9	3.1
Infant formula	58	20.0
Total	290	100
First food given to your baby after birth		
Water	63	21.7
Glucose + water	52	17.9
Breast milk	115	39.7
Breast milk substitute	60	20.7
Total	290	100
Introduction of breast milk after baby birth		
1 hour	214	73.8
2-3 hours	61	21.0
4-6 hours	0	0.0

7-8 hours	0	0.0
24 hours	15	5.2
Total	290	100
Times you breastfeed your baby in a day		
Breastfeed on demand	33	11.4
1-2 times	12	4.1
3-4 times	63	21.7
5-6 times	105	36.2
>6 times	77	26.6
Total	290	100
Introduction of semi-solid foods		
I have not introduced	111	38.3
0-3 months	67	23.2
4-6 months	105	36.2
7-9 months	7	2.4
10-12 months	-	-
Total	290	100
Table 5 Cont'd		
Reasons for introducing semi-solid foods		
Breast milk is no longer enough	145	50.0
Baby was always hungry	101	34.8
Tradition	15	5.2
Advice from people	21	7.2
Appropriate age of introduction	8	2.8
Total	290	100
First food introduced to infant		
Pap (*Akamu*)	143	49.3
Cerelac	47	16.2
Soup	17	5.9
Plantain	20	6.9
Custard	51	17.6
Agidi	12	4.1
Total	290	100
Reasons for giving these foods		
What I can afford	88	30.3
What everyone gives	45	15.5
Advice from hospital	78	26.9
Advice from friends	59	20.4
No particular reason	20	6.9
Total	290	100

Information on the anthropometric indices of infants is summarized in table 6. About 10.3% of the infants were stunted, while 1.8% infants were severely stunted. Males (11.3%) were more stunted than females (9.7%). About 10.3% of the infants were underweight, while 1.8% were severely underweight. Males (11.3%) were more underweight than females (9.7%). The study also showed that 22.4% of infants were overweight, 5.5% infants had possible risk of overweight, while childhood obesity was found in 4.2% of infants.

Table-6. Anthropometric Indices of the Infants

Variable	Male		Female		Total	
	F	%	F	%	F	%
Height-for-Age						
Stunted <-2 (SD)	13	11.3	17	9.7	30	10.3
Severely stunted <-3 (SD)	2	1.7	3	1.7	5	1.8
Normal =0 (SD)	100	87.0	155	88.6	255	87.9
Total	115	100	175	100	290	100
Weight-for-Age						
Underweight <-2 (SD)	13	11.3	17	9.7	30	10.3
Severely underweight <-3 (SD)	2	1.7	3	1.7	5	1.8
Normal = 0 (SD)	100	87.0	155	88.6	255	87.9
Total	115	100	175	100	290	100
BMI-for-age						
Severely wasted <-3 (SD)	0	0.0	0	0.0	0	0

Wasted <-2 (SD)	0	0.0	0	0.0	0	0
Normal =0 (SD)	82	71.3	115	65.7	197	67.9
Possible risk of overweight <=+2 (SD)	5	4.4	11	6.3	16	5.5
Overweight >+2 (SD)	25	21.7	40	22.9	65	22.4
Obese >+3 (SD)	3	2.6	9	5.1	12	4.2
Total	115	100	175	100	290	100

4. Discussion

This study showed that more than half of the mothers who participated in the study were married. This is good because Morrison and Cherlin [13] had already documented the importance of stable unions on child health, nutrition and development. Marital status is known to influence the quality of care given to the child because both the parents are able to contribute to the care of the child by providing the basic needs, psychological support and general welfare of the child. The study further revealed that about a quarter of mothers had secondary school education. Several studies have associated exclusive breastfeeding and infant care practices with level of education. In a cross sectional hospital based study in Malawi, having secondary or tertiary education was associated with shorter duration of breastfeeding; with a higher level of association for tertiary education than for secondary education [14]. However in a longitudinal study in rural Malawi, literacy was found to be an independent predictor of exclusive breastfeeding [14]. Furthermore, more than half of the mothers were business-oriented. Jouret, *et al.* [15], reported that families like those of office employees and the business women may have high income and could afford to purchase nutritious foods. One third of the mothers had three children. The number of children can be linked to their early years of marriage. Majority of the mothers that participated in the study had good knowledge of breastfeeding. This contradicts the reports of Oche, *et al.* [16]. More than half of the mothers were aware of exclusive breastfeeding. This is in line with the work of Gale, *et al.* [17]. Exclusive breastfeeding serves as a growth monitoring tool which not only support the growth and development of an infant but also monitor the weight as well. During the first year of childhood development, babies who are exclusively fed are leaner and healthier than formula fed babies. Good number of infants about one quarter were breastfed less than one hour and few hours after birth. Adequate nutrition during infancy and early childhood is essential to ensure the growth, health, and development of children to their full potential [18]. More than half of the mother's gave their infants the first yellow milk (colostrum) after delivery. In line with the work of Munblit, *et al.* [19] yellowish milk called colostrum produced during the latter part of pregnancy through to delivery is highly recommended to be given to babies within the initial hours following delivery. Colostrum is very definite in volume, appearance and composition, it contains an elevated level of immunologic components like secretory immunoglobulin A (IgA), lactoferrin, leukocytes, and epidermal growth factor for development. After the first days of postpartum, this process of breast milk (colostrum) transformation continues into a transition milk, which lasts for eight to twenty days until it transforms into a mature milk. Each stage of breast milk composition contains nutrients, which are needed for the nourishment and growth of a baby [18]. About one third of mothers exclusively breastfed their infants for six months; this report is higher than the report of Nigeria Demographic and Health Survey [10] where 17% of children less than six months were exclusively breastfed. The study also revealed that one third of the infants were fed breast milk as their first food after birth. Early initiation of breastfeeding is important for both the mother and the child. Early suckling stimulates the release of prolactin, which helps in the production of milk, and oxytocin, which is responsible for the ejection of milk. About one third of the infants were introduced to complementary food between 4-6months. Few infants started complementary food between 7-9months. According to United Nations Children's Fund [20] complementary foods are often introduced too early or too late and are often nutritionally inadequate and unsafe. The study further revealed that about a quarter of the infants received pap and milk as complementary food. Nutrient dense animal source foods like eggs and fresh foods were infrequently offered to infants. Other studies from Ethiopia came up with parallel findings [21]. Information on the anthropometric indices of infants revealed that majority of the infants had normal height-for-age, weight-for-age and body mass index-for-age. The prevalence of stunting, wasting and underweight obtained in this study is lower than the report of the Nigeria Demographic and Health Survey [10]. The study also showed that one fifth of the infants were overweight, while some had possible risk of overweight. This report is in contrast with the report of Nigeria Demographic and Health Survey [10].

5. Conclusion

Many of the nursing mothers who participated in the study had good knowledge and attitude on practice of breastfeeding and continued breastfeeding at one year hence most of the infants had normal height-for-age, weight-for-age and body mass index-for-age. The study also showed that one fifth of the infants were overweight, while some had possible risk of overweight. Stunting, wasting and underweight were found to be prevalent among few infants involved in the study. Thus it concludes that although the knowledge and attitude of most mothers on breastfeeding and continued breastfeeding were good, some of the mothers practiced early ceasation of breast milk, as well as late introduction of complementary foods which were sometimes nutritionally inadequate.

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