



Effects of Care Provision Practices on the Nutrition and Health Status among Children in Gadagau and Hanwa Communities of Zaria Metropolis, Kaduna State Nigeria

¹Yaradua, AI, ³Gadagau AA, ⁴Alhassan AJ ¹Nasir A, ¹Matazu KI, ¹Usman A, ¹Umar MI ²Musa A, ³Wagini NH

¹Department of Biochemistry, Faculty of Natural and Applied Sciences, Umaru Musa Yaradua University, P.M.B. 2218, Katsina

²Department of Chemistry, Faculty of Natural and Applied Sciences, Umaru Musa Yaradua Univ¹ersity, P.M.B. 2218, Katsina

³Department of Biological Sciences, Faculty of Natural and Applied Sciences, Umaru Musa Yaradua Univ¹ersity, P.M.B. 2218, Katsina

⁴Department of Biochemistry, Faculty of Biomedical Sciences, College of Health Sciences, Bayero University, Kano Nigeria

Abstract

A cross sectional study was conducted among male and female under- five children from urban and rural settings around Zaria city in Kaduna State-Nigeria to assess effect of care provision practices on their nutritional status. A total of 440 (218 male and 222 female) children under-five years of age were randomly selected from Hanwa community (urban) in Zaria city and Gadagau village (rural) both located within Zaria metropolis of Kaduna State- Nigeria. We determined anthropometric indices using standard methods. Information on care provision, source of drinking water, infections and hospital visits were obtained using a well structured questionnaire. The results of the study indicate that there is a significant difference ($p<0.05$) in anthropometric parameters across all the age groups in the male subjects. From the results, apart from age group 20-30 months, there is significant difference ($p<0.05$) in anthropometric parameters between the rural and urban female children. The results have indicated that 100% of mothers from the rural setting acquire knowledge of infant food preparation at home while for mothers from urban setting 80% acquire the knowledge from home. 60% (rural) and 65% (urban) of the subjects have access to improved water source. The result of the study has indicated that the extent of malnutrition is more prevalent in the urban than the rural subjects.

Keyword: anthropometry, communities, infants, Kaduna, Malnutrition, Care provision

INTRODUCTION

Malnutrition is a major public health problem throughout the developing world and is an underlying factor in over 50% of the 10-11 million under 5 years of age who die each year of preventable death (Black *et al.*, 2003). Malnutrition is a serious health problem in Nigeria. This is more severe among infants and children. Malnutrition has led to high morbidity and mortality among the vulnerable group (Imonikebe, 2009). The survival risks of early childhood in Nigeria remain considerable. A newborn Nigerian baby has a 30 times higher chance of dying before the age of 5 years than a baby born in the developed, industrialized countries (Anigo *et al.*, 2009) Weaning is described as the transitional period starting from 4 months onwards till the end of second or even third year in certain cultures so that the infants

diet progressively changes from milk alone to semi solid and finally to the adult family food (Shamim, 2005). In developing countries, the age of introduction of weaning foods is of public health importance because of the risk of diseases particularly diarrhea diseases from contaminated weaning foods and the risk of growth faltering and malnutrition from delayed weaning (Uwaeghute, 1990). Baby feeding practices are nutritional behaviors and action by mothers and childcare providers which have direct implications on the nutritional status of child (Ogbuji, 2005). UNICEF (1994) pointed out that the period between the introduction of complementary feeding and finally stopping breastfeeding, which is commonly referred to as weaning is a time of particular danger to the child (Imonikebe, 2009).

This is because he/she may not only be in danger of malnutrition but will also have lost immunity obtained from the mother and be very liable to severe and repeated infection.

Infants in Nigeria are faced with a lot of feeding problems which could lead to malnutrition. In some cases, children are not allowed to eat nourishing food such as meat during weaning period (Imonikebe, 2009). Also, mothers do not know how to prepare weaning foods from locally available foods in nutritionally adequate forms (Imonikebe, 2009). Lack of access to safe water and poor environmental sanitation due to unsanitary waste disposal are considered important causes of infectious diseases, especially diarrhea and intestinal parasites. Illness due to contaminated food is now regarded as one of the most widespread health problems (Anigo et al., 2009).

Therefore, it is vital that a comprehensive study on the risk factors such as child care provision practice is conducted which will help to identify current good practices to be supported for improving the feeding practices as effective strategies for solving childhood malnutrition.

This study is intended to assess the nutrition and health status of 1-5 years old children (440 weaned male and female children from Hanwa and Gadagau communities) by assessing care provision, source of knowledge of care givers on food formulation, frequency of infections, hospital visitations, sources of drinking water and anthropometric parameters (height, weight, MUAC) of respondents.

MATERIALS AND METHODS

Study Population

A descriptive cross-sectional study was conducted among male and female children under-five years of age within Hanwa community (urban) in Zaria city and Gadagau village (rural) both located within Zaria metropolis in Kaduna State- Nigeria.

A total of 440 children (218 male and 222 female) under-five years of age were randomly selected from the study areas for participation in the study. All participants were Hausa-Fulani and appeared apparently healthy.

Sampling Technique

A comprehensive list of all the wards in the designated areas of study was collected from the State regional and urban planning board. The wards were divided based on location (rural or urban). Two wards were then selected one from

each setting with the use of the simple random technique applied through the table of random numbers. With the use of the stratified sampling technique, proportionate allocation was given to each ward to make up the required sample size depending on the population of the children in each age group. All under-five years of age children of the two chosen wards within the study age groups were considered. However, in each age group, systematic sampling method was employed in which the children were given numbers serially according to their house number, thereby giving each child an equal chance. The random number table was used to select the first number and thereafter the children were picked at regular interval (sample interval) so as to meet the sample size requirement in each group. The sample interval was determined by dividing the total number of children in the age groups by the sample size: $4820/500=9.64=10$ (Yusuf et al., 2013).

A total of 500 children were selected for the study out of which 440 have complete data. Only those with complete data were included in the study analysis. Excluded from the study were those children that were ill and those without complete data.

Anthropometric Measurements

All measurements were made by persons trained on the proper techniques of measuring height and weight. Weighing scale was standardized by the technicians and weight was taken based on internationally accepted standards for weight measurements (Jelliffe and Jelliffe, 1996). The weighing scales were calibrated after each measurement before the next weighing was done. The weight of each child that can stand was measured, with the child bare footed and with light clothing, using WEYLUX weighing scale, model 424J; Sliding Beam Column Scale, (Short Pillar with height of 560 mm) other children were weighed with their mothers carrying them. However, each mother was weighed alone. The child's weight was obtained by subtracting mother's weight from both the weight of the infant. The measurement was done to the nearest 0.1kg.

Their height was measured using ACCUSTAT Ross stadiometer, 44817, manufactured by Genentech Incorporated. The readings were recorded to the nearest 1 cm. Mid Upper Arm Circumference (MUAC) was measured using non stretchable MUAC tape, as described by WHO (2006).

Data on age, child’s care provision, source of knowledge for complementary food formulation, disease affliction, source of drinking water and frequency of hospital visits was obtained using a well structured questionnaire.

Statistical analysis

Statistical data analysis was carried out using instat statistical package (instat software, Sandiago, USA) quantitative variables were assessed using student’s t-test. Descriptive statistics of mean and standard deviation were used to examine the age and gender specific anthropometric indices. Difference between parameters compared were considered to be statistically significant at $p < 0.05$.

RESULTS

The mean Anthropometric parameters of the weaned urban and rural children are represented in table 1. There is significant a difference ($P < 0.05$) across all the age groups. At age 21-30 month, the weaned urban children are significantly heavier ($P < 0.05$) than their rural counterparts. The weaned rural children are significantly heavier ($P < 0.05$) than their urban counterparts at age 31-40 months. From the result, there is a significant difference in weight between the urban and rural weaned children at age 41-50 months with the rural children being significantly heavier ($P < 0.05$) than the urban children. There is no significant difference in the anthropometric parameters between rural and urban children at age 51-60 months ($p > 0.05$).

TABLE 1: Mean Anthropometric Parameters for Weaned Urban and Rural Male Children

Age (month)	No. of weaned Children	Height (m)		Weight (kg)		MUAC (cm)	
		Urban	Rural	Urban	Rural	Urban	Rural
21-30	44	0.79±0.04	0.75±0.05	*14.00±4.93	*8.25±1.83	12.9±1.00	11.80±2.02
31-40	65	0.75±0.19	0.82±0.13	*10.60±4.82	*11.50±2.8	11.22±2.68	12.33±1.57
41-50	59	0.93±0.12	0.90±0.12	*11.50±5.74	*14.00±2.20	11.24±2.66	12.3±1.60
51-60	50	1.01±0.80	0.92±0.71	14.08±4.06	14.43±3.93	11.27±2.63	12.01±1.89

Columns with asterisk are significantly different ($P < 0.05$)

Table 2 showed the mean Anthropometric parameters for the female urban and rural children. From the result, there is no significant difference between the anthropometric parameters of urban and rural female children of age group 20-30 months ($p > 0.05$). At the age of

31-40 months, the rural children are significantly heavier ($P < 0.05$) than the urban female children. At age 41-50 months, the rural female children are significantly heavier ($P < 0.05$) than the urban female children. At age 51-60 months, the urban female children are significantly taller ($P < 0.05$) than the rural female children.

TABLE 2: Mean Anthropometric Parameters for Weaned Urban and Rural Female Children

Age (month)	No. of weaned Children	Height (m)		Weight (kg)		MUAC (cm)	
		Urban	Rural	Urban	Rural	Urban	Rural
21-30	48	0.86±0.03	0.78±0.042	10.00±1.80	10.33±1.47	10.80±3.00	11.93±1.87
31-40	80	0.86±0.07	0.83±0.108	*11.00±2.90	*13±0.90	11.23±2.57	12.42±1.38
41-50	44	0.87±0.03	0.90±0.108	*12.60±3.20	*13.86±1.94	11.36±2.41	11.76±2.04
51-60	50	*1.03±0.05	*0.93±0.15	14.00±3.90	14.00±3.90	11.02±2.78	11.58±2.22

Column with asterisk are significantly different (P<0.05)

Tables 3, 4, 5 and 6 represent the percentage % care provision, infection, sources of water and hospital visitations of the urban and rural children. From the results, the percentage of the children fed by their mothers is highest (60%) among the rural children as compared to those in the urban area (55%). However 100% of mothers

from the rural acquired knowledge of formulating complementary food at home as opposed to those mothers in the urban area (80%). Malarial infection is higher in the rural children (80%) than in the urban children (75%). Incidence of typhoid infection is higher in the urban children (25%) than in the rural children (20%). Hospital visitation when sick is higher in the urban children than in the rural children.

Table 3: Care Providers for the Under-five Rural and Urban Children (%)

	Rural	Urban
Mothers	60	55
Grand mothers	37	30
Mother's in-law	3	10
Mother's sister	-	5

Table 4: Infections and Disease Affliction in the Rural and Urban Children at the Time of Visit (%)

	Rural	Urban
Malaria	80	75
Typhoid	20	25
Diarrhea	-	-
Polio	-	-
Sickle cell	-	-

Table 5: Sources of Drinking Water for the Rural and Urban Children (%)

	Rural	Urban
Dam	-	-
Well	60	65
Tap	-	30
Reservoir	40	5
River	-	-

Table 6: Hospital Visitations When Sick in the Rural and Urban Children (%)

	Rural	Urban
Always	5	10
No	15	
Sometimes	80	90

DISCUSSION

The subjects in this study were from rural and urban parts of Kaduna state of Northern Nigeria. Assessment of Nutritional status in children is expected to reflect a number of variables that might influence early growth and development. The study therefore compared the nutritional status of children in urban and rural areas of Kaduna state. The result indicates that generally there is a serious case of malnutrition among the subjects.

Among the criteria for diagnosis of severe acute malnutrition for children aged 6-60 months proposed by the World Health Organization (WHO) and the United Nations Children Fund (UNICEF) is mid arm upper circumference below

115mm (WHO, 1995). Using these criteria 52.5% of all the male infants are suffering from severe acute malnutrition while 24.5% of the male subjects suffer from moderate acute malnutrition. Among the female subjects 53% are suffering from severe acute malnutrition while 21.5% suffer from moderate acute malnutrition. These values are higher than the mean values reported for the subjects aged under- five for South Western Nigeria (10%), North Eastern Nigeria (20%) and North West Nigeria (27%), (NDHS, 2013). The higher values as seen in the study subjects as compared to other studies might be attributed to the down turn of the Nigerian economy.

The mean height and weight for the rural children is higher than that for the urban children in this study which is similar to a previous study conducted in Lagos state Nigeria that reported a higher mean for height and weight in rural children compared to urban children (Senbanjo et al., 2016).

The source of drinking water is an indicator of whether it is suitable for drinking. Sources that are likely to provide water suitable for drinking are identified as improved sources. These include a piped source, a public tap/stand pipe or a borehole; a protected well or spring; and rainwater (WHO and UNICEF, 2010). The mean average of 60% (rural) and 65% (urban) for well as a source of water for the study subjects reported in this study is similar to the reported Nigerian national average of 61% of households as having access to drinking water from an improved source (NDHS, 2013).

From the result the rural subjects as compared to the urban subjects have lesser degree of malnutrition. This could be attributed to the fact that 60% of the rural mothers usually feed their babies by themselves as compared to 55% in the urban subjects a value that is lower than that reported by Imonikebe (76.7%). It was reported by Imonikebe (2009) that 54% of mothers in her study got their information on infant feeding from the hospital. This percentage is higher than that recorded in this study with only 20% of mothers in the urban areas getting information on infant feeding from hospitals and 100% of the rural women getting their information at home. This could well be a reason for high prevalence of malnutrition as depicted in this study

It has been reported previously that (Nassar et al., 2007; Salimonu et al., 1982) in addition to predisposing children to death, malnutrition often affects a child's immune system. This could well explain the high percentage values for infections as seen in the study (77% for malarial infection and 22.5% for typhoid infections).

Malaria is one of the major health problems in sub-Saharan Africa. According to the 2013 world malaria report, malaria is a cause for about

627,000 malaria deaths worldwide. The report also indicates that 3.4 billion people were at risk of malaria. Most of these malaria deaths (90 %) occurred in sub-Saharan Africa and in children under five years of age (WHO, 2013). The mean prevalence of malarial infection in this study is higher than that reported in a Nigerian Malarial survey that revealed an average prevalence of 42 percent among children under age 5 and zonal variations ranging from 28 percent in the South East to 50 percent in the South West of Nigeria (National Population Commission, National Malaria Control Programme, and ICF International, 2012). The prevalence of low mid upper arm circumference (MUAC) and high malarial infection in the children in this study is in concord with a cross sectional study done in Rwanda that showed that children with low mid upper arm circumference were significantly associated with increased *P. falciparum* infection (Jean-Bosco et al., 2011). The degree of malnutrition and malarial infection in this study is also consistent with a case control study done in Nigeria which revealed high likelihood of malaria in acutely malnourished children (Seka et al., 2011). The limitations of our study are the involvement of only two communities in Zaria metropolis. However, the findings can be generalized to the broader community. We recommend that further cross-sectional research work involving other communities and a larger sample frame is needed to better understand rural-urban differences in care provision practices among under-five children.

CONCLUSION

The nutritional status of the infants in the study is poor. Low values for anthropometry obtained from this study suggest that there is need for improvement in the nutritional status of these infants. The result of the study has indicated that the extent of malnutrition is more prevalent in the urban than the rural subjects. There is a need for nutritional intervention to arrest the problem of acute malnutrition in the Under-five years of age children studied

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