ASSESSMENT OF NUTRITIONAL STATUS OF UNDER FIVE CHILDREN IN AKURE SOUTH LOCAL GOVERNMENT, ONDO STATE, NIGERIA

Quadri Jelili Akorede[1] & Ojure Mujitaba Abiola[2]
[1]Department of Nutrition and Dietetics, Federal University Of Agriculture Abeokuta, Ogun State, Nigeria.
[2]Department of Nutrition and Dietetics, Ogun State College of Health Technology, Ilese-Ijebu, Ogun State, Nigeria.
E-mail: olaquadri2004@yahoo.co.uk, biolarojure@yahoo.com

ABSTRACT

This study was conducted in Akure South Local Government of Ondo State to assess food consumption and nutritional status of under five children. A total of 355 children were systematically selected from a sample frame consisting of listed households in the seven wards of Akure South Local Government Area. Data were collected using a pre-tested, semi-structured questionnaire to obtain information on subject socio-economic status, hygiene practices, breastfeeding practices and clinical observation for signs of malnutrition. Data were analyzed using SPSS version 17 and ENA SMAT softwares. The prevalence of stunted, wasted and underweight children was 12.5, 14.8, and 8.5% respectively. A few of the children (2.6%) had a MUAC less than 12.5cm while 3.4% had between 12.5-13.5cm (Acute malnutrition) and 94.1% had MUAC above 13.5cm. A clinical symptom of Protein Energy Malnutrition (PEM) was observed in 2.3% of the children while eye (conjunctiva) pallor was noticed in 9.3% and pallor (palm) in 7.0% of the children. Mothers' education affected the health status of the children; 81.8% of the mothers with no education did not give colostrum to their children, 16.7% of the mothers exclusively breastfed and majority (60.0%) of those that did not exclusively breastfeed had little or no education. Household size had a negative correlation with the nutritional status of the children (underweight) ($r = -0.14$; $p<0.05$). Household income was positively correlated with nutritional status of the infants (Stunting) ($r = 0.18$; $p<0.05$). There was a positive correlation between Mothers' education and hygienic practice (food preservation) ($r = 0.12$; $p<0.05$). Level of mothers education was positively correlated with nutritional status of the children (stunting) ($r = 0.23$; $p<0.05$). There was a positive correlation between infants nutritional status (under-weight) and hygienic practices (food preservation) ($r = 0.15$; $p<0.05$). The result shows that more nutrition education is needed on the part of the mothers so that the poor nutritional status of the children can be improved, to ensure healthy living for both mothers and their children.

1. INTRODUCTION

Malnutrition is one of the biggest health problems that the world currently faces and is associated with more than 41% of the deaths that occur annually in children from 6 to 24 months of age in developing countries which total approximately 2.3 million. [1] World Health Organization in 2001 reported that 54% of all childhood mortality was attributable, directly or indirectly, to malnutrition. Sub-Saharan Africa has a high prevalence of the different types of malnutrition, namely stunting, wasting and underweight.[2]

Feeding practices during infancy are critical for the growth, development and health of a child during the first two years of life [3] and of importance for the early prevention of chronic degenerative diseases. Progress in improving infant and young child feeding practices in the developing world has been remarkably slow due to several factors like poverty and poor hygienic conditions [4]. The 2003 NDHS shows that 38 percent of Nigeria children under the age of five years are stunted, 29 percent are underweight, and 9.2 percent are wasted [5]. The Nigerian Food Consumption and Nutrition Survey of 2001-2003 observed similar trends among this age group with 42 percent stunted, 25 percent underweight, and 9 percent wasted [6].

It will be of greater help if a comprehensive study on the food consumption is conducted which will help to identify current good practices to be supported for improving the feeding practices of the children as effective strategies for solving childhood malnutrition. Such a study will be a contribution to knowledge on food consumption and nutritional status of under five children in Nigeria.

2. PROBLEM STATEMENT

Nigeria ranked 8th in the world in the prevalence of mortality rates of under-fives, with a staggering figure of 189/1000 in 2008 [7]. Malnutrition is the underlying cause in more than 50% of these deaths.[8] The World Health Organization estimates that approximately 150 million children younger than 5 years in developing countries are underweight and an additional 200 million children are stunted [9].

Malnutrition contributes to Nigeria's current health problems (morbidity and mortality) in several ways. Undernutrition remains a devastating problem in many developing countries affecting over 815 million people causing more than one- half of child death.[10, 11] Although, WHO, UNICEF and Nigeria's National breastfeeding policy recommended that infants be exclusively breastfed from birth to 6 months and continue breastfeeding to 24 months and beyond for optimal survival, growth development unfortunately only 17% of infants under six months of age are exclusively breastfed in Nigeria [6]. The poor breastfeeding and inadequate complementary feeding explained the protein energy malnutrition level in children as they grow older.

The Specific objectives are as follows:

- To assess the socio economic status of subjects parent in Akure South LGA.
- To determine the anthropometric indices of under-five children in the study area.
- To determine the usual dietary intake of the subjects and assess the adequacy.
- To report any clinical signs of malnutrition like Parlor and Goitre observed in the subjects.

3. METHODOLOGY

The LGA (Akure South Local Government) was randomly selected among urban local governments in Ondo state, Nigeria. Simple random sampling was used to choose seven wards that were considered for the study, The wards were Gbogi/isikan I, Gbogi/isikan II, Ilisa ,Oda, Oke-aro, Oshodi/isolo and Owode ward. A systematic random sampling was used to ensure spread among respondents, by taking household at regular interval beginning from the oba's house.

Methods of data analysis

Appropriate analytical techniques were used depending on the variables or the characteristics being considered. Descriptive and inferential statistical techniques were used for quantitative data including socio-economic and demographic information, anthropometry, food intake to generate frequencies and percentages using statistical package for social sciences (SPSS) Version 17.0. The anthropometric data obtained were used to determine the mean weight for age, mean weight for age, mean weight for height, and mean MUAC were compared with WHO Reference standard (2007).

4. RESULTS

Household demographic characteristics

The age distribution of the household head was depicted on Table 1. The age range of 30-40 years had the highest (56.3%) percentage of respondents; while age groupings 40-49years, 20-29 years and above 50 years had 24.2%, 15.2% and 4.2% respectively.

The distribution of mothers' age shows that the age range of 21-30years had the highest (58.6%) percentage and 31-40 years had 34.1% while the lowest percentage (2.5%) came from ages less than 20years.

The age distribution of children (month) shows that the age range of 0-6months had the highest (40.8%) percentage while 31-59months (34.9%) was higher than those between 7-12months (17.2%) and the least was 13-30months (7.0%).

The family size of the household was shown on Table 1, The breakdown is as follows, household with 1-4 members (59.2%) had the highest percentage while 5-8sized and 9-12sized household had 34.1% and 6.8% respectively.

The mothers educational status shows that, those with secondary education had the highest percentage of 46.5%, followed by those that had post secondary education (26.8%) while those that have only primary education was 18.6% and respondents with no formal education was 8.2%.

Table 1: Socio demographic characteristics of the respondents n=355

Variable	Frequency	Percentage (%)
Age group (Years)		
Household Head		
20 – 29	54	15.2
30 – 39	200	56.3
40 – 49	86	24.2
50 above	15	4.2
Total	355	100
Mother		
10 – 20	9	2.5
21 – 30	208	58.6

31 – 40	121	34.1
41 above	17	4.8
Mothers educational status		
No formal education	29	8.2
Primary education	66	18.6
Secondary education	165	46.5
Tertiary education	95	26.8
Children age (months)		
0 – 6	145	40.8
7 – 12	61	17.2
13 – 30	25	7.0
31 – 59	124	34.9
Total number of household member		
1 – 4	210	59.2
5 – 8	121	34.1
9 – 12	24	6.7
Total	**355**	**100**

Figure 1 shows that the major energy source of most households in Ondo town was PHCN, 96.6% of the household used electricity generated by Power holding company of Nigeria as the primary source of energy while 1.7% use personal generator as the source of electricity and about 1.1. % of the respondents did not have electricity in their house and the least is rural electricity which is just 0.6%.

As for the Primary occupation of the household, Figure 2 shows that 40.6% of the household head were civil servants and the artisan were 28.2% respondents while trading made a percentage of 22.3%. Farming was 1.4% and only 0.6% was fishermen.

Considering the estimated annual income of household depicted on figure 3, of all the respondents, those that their annual income was below 100 thousand naira had the highest percentage (48.7%) while those that earn between 100 – 199, 99 thousand naira came up with 18.3% followed by 200 – 299, 99 thousand naira with 16.6% and the respondent that earn between 300 – 399, 99 thousand naira annually had percentage of 9.6% and between 400 – 499, 99 thousand naira made up a percentage of 6.8%.

Primary source of water of the household as shown on Figure 4, indicated that larger percentage of respondents in Ondo town used deepwell (51.3%) while borehole followed deepwell with 31.3% and 17.2% used pipe borne water while the spring/river has the lowest percentage of 0.3%.

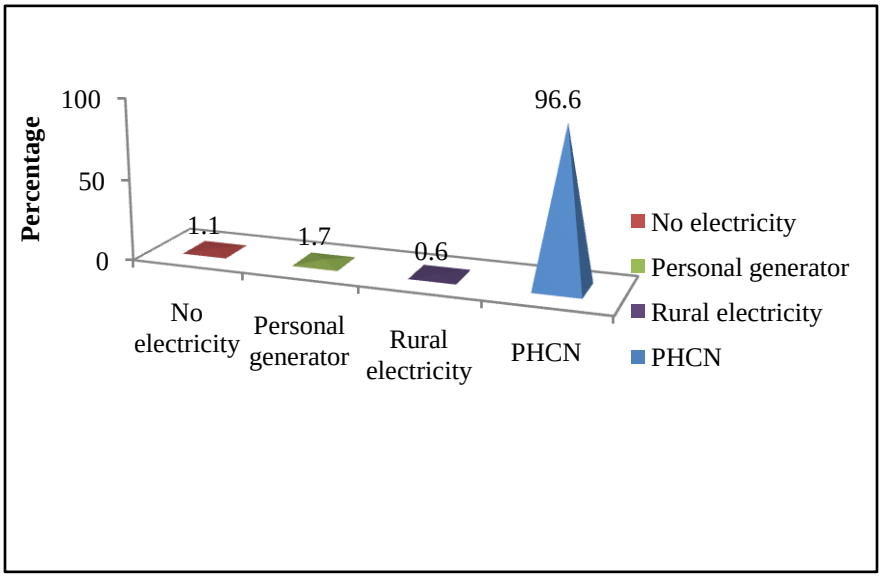

Figure 1: major energy sources of most households

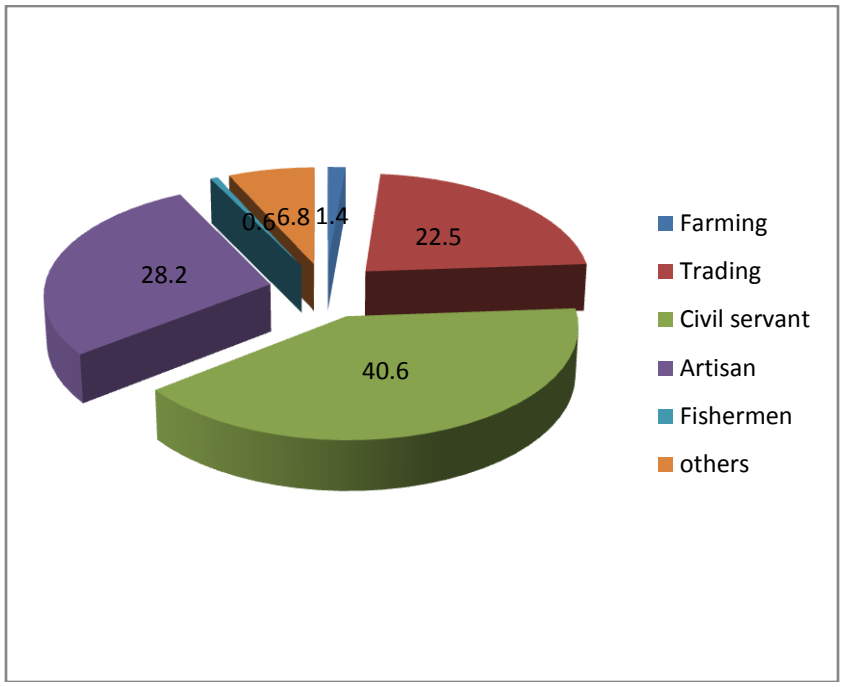

Figure 2: Primary occupation of the household Head

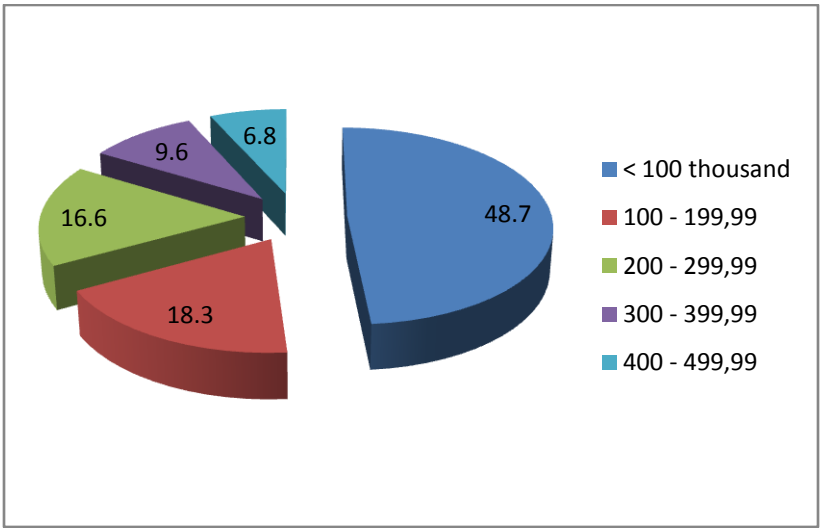

Figure 3: Estimated annual income of the households (In naira)
1 U.S dollar is 150 naira at the time of the research.

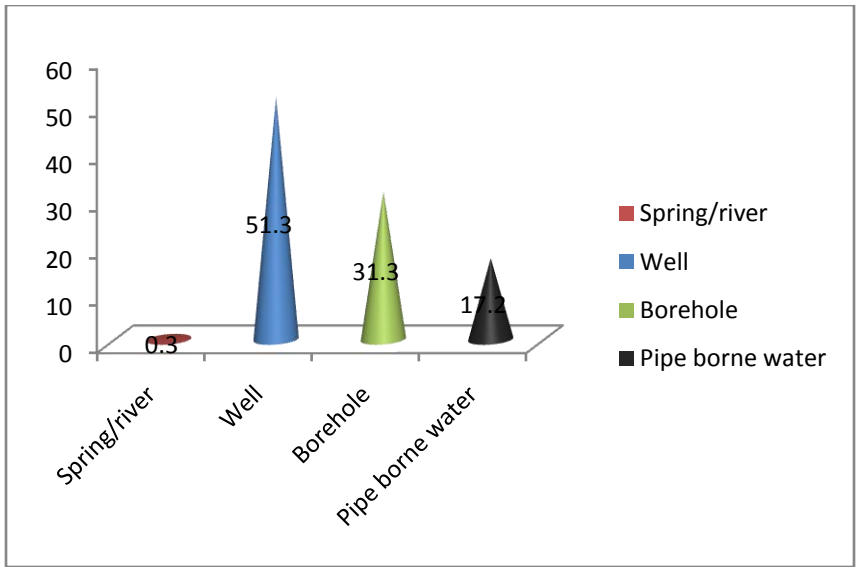

Figure 4: Primary source of water of the household

Breastfeeding and Complementary feeding pattern of the mothers

The Initiation of breastfeeding on table 3, shows those that commenced breastfeeding almost immediately after birth (30minutes or less) were only 46 (13%) while between 30minutes and an hour were 166 (46.8%) and those that initiate breastfeeding more than an hour after birth were 143 (40.3%) of the total population.

As for the administration of colostrums**,** it shows on Table 3 that 292 mothers (82.3%) gave colostrums to their babies while 63mothers (17.7%) did not.

To know the percentage of mothers that practice bottle feeding. The mothers that made use of bottle for feeding were 16.9% while those that did not use bottle feeding were 83.1%.

To know the food/drink given to the child before breastmilk begins to flow, It appears on Figure 5 that 114mothers (32.1%) gave water alone before breastmilk begin to flow while 75mothers (21.1%) gave sugar water and 17mothers (4.8%) gave Tea/herbal water.

The mothers that gave gripe water were 4.2% and about 3mothers gave infant formula and other milk (0.8%) and the percentage of mothers that did not give anything to the child before breastmilk begin to flow was 16.7%.

The time interval after birth that the baby was giving other fluid/food apart from breast milk as shown on Figure 6, indicated that the children that were given some type of food on the first day of their birth was 27.6% while another 19.2% were given food on the second day of their birth followed by those given food on the third day (10.0%).

The mother that introduce other foods on the 4^{th}, 5^{th}, 6^{th} and 7^{th} day were 6.5%, 3.4%, 5.3% and 3.1% respectively while 8^{th} day was 1.1% . The mothers that introduce food at 3rd month were 5.8% while those that introduce food to the baby when the child was 6months old made a percentage of 16.7%.

Table 2: Breastfeeding and Complementary section

Variable	Frequency	Percentage
Time of initiating breastfeeding		
30 minutes or less	46	13.0
Between 30minutes and 1hour	166	46.8
More than 1hour	143	40.3
Administration of Colostrum		
Yes	292	82.3
No	63	17.7
Total	355	100
Practice of bottle feeding		
Yes	60	16.9
No	295	83.1
Total	**355**	**100**

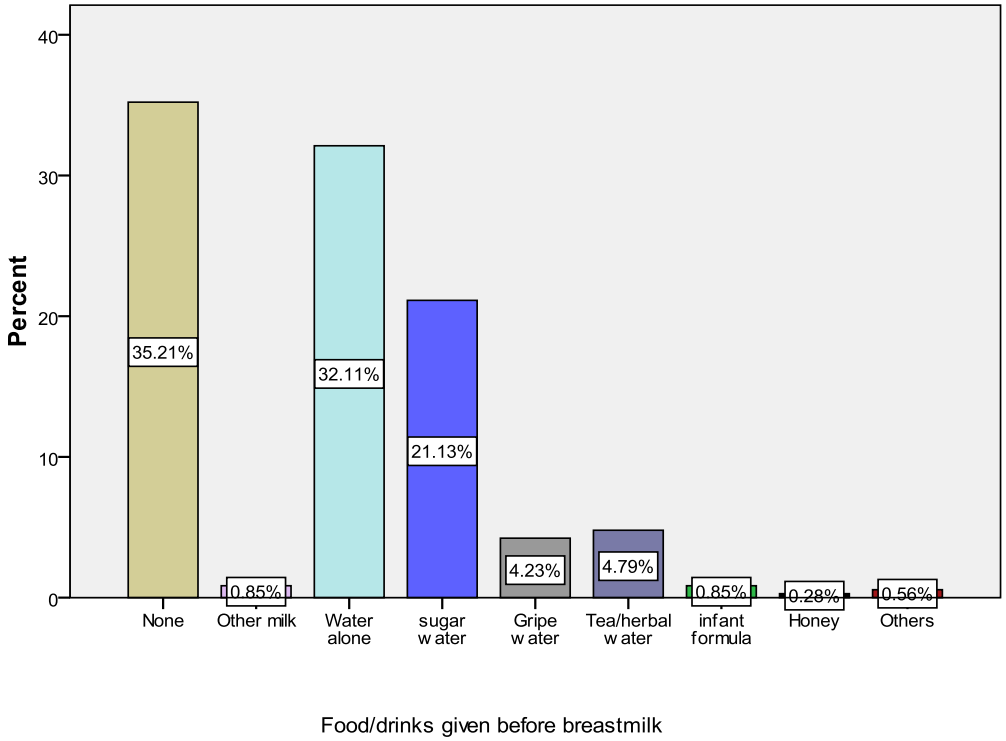

Figure 5: Food/drink given to infants before breastmilk flow

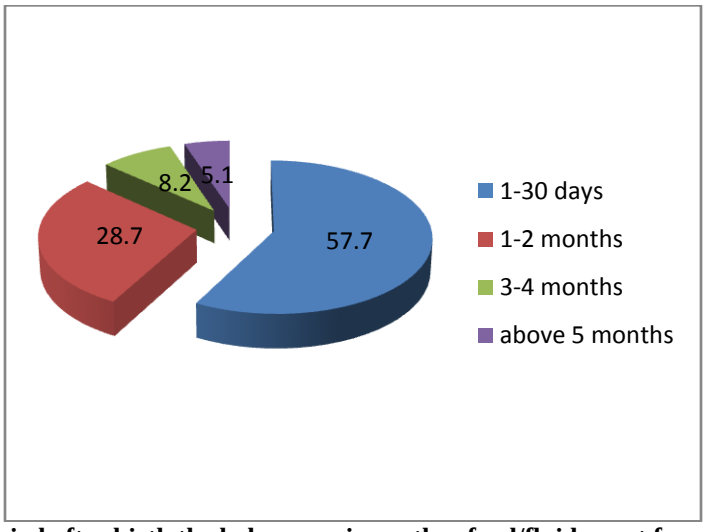

Figure 6: Period after birth the baby was given other food/fluid apart from breast milk

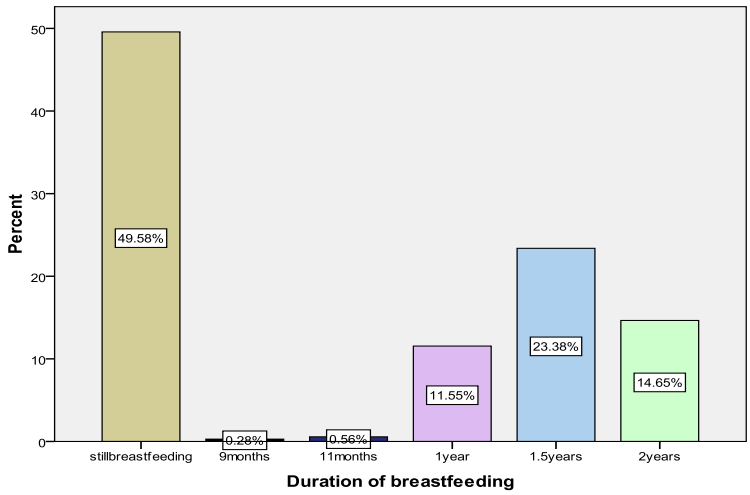

Figure 7: Duration of breastfeeding of the mothers

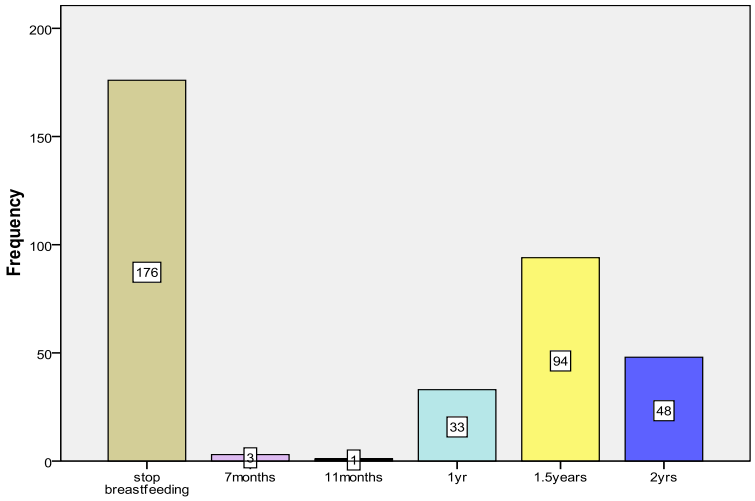

Figure 8: Period of breastfeeding

Anthropometric status of the children

The result of the prevalence of malnutrition among the subjects is depicted on Table 3, it showed that the male under five children 22.0% and 11.0% each were suffering from acute malnutrition, moderate acute malnutrition and severe acute malnutrition respectively while among the female subjects, 20.0%, 5.0% and 15.0% suffered acute, moderate and severe acute malnutrition.

Table 4 showed the result of mid- upper circumference. For the children that were above 13.5 (nourished),their percentage was 94.1% followed by those ones between 12.5-13.5cm (malnourished) and their percentage was 3.4% while those children within 11-12.5cm (moderate acute malnutrition) was 2.3% and a child with MUAC of 11cm (severe acute malnutrition) was (0.3%).

Table 3: Prevalence of malnutrition among the children

	Acute malnutrition (%) (<-2 z-score and/or oedema)	moderate acute malnutrition (%) (<-2 z-score and >=-3 z-score)	severe acute malnutrition(%) (<-3 z-score)
Boys affected	22.0	11.0	11.0
Girls affected	20.0	5.0	15.0
Not affected	58.0	84.0	74.0

Table 4: Mid Upper Circumference of the Children

Variable	Frequency	Percentage (%)
Mid upper arm circumference (cm) for children		
<11	1	0.3
11 - 12.5	8	2.3
12.5 - 13.5	12	3.4
13.5 Above	334	94.1

Hygiene practices of the households

To know where the member of the household wash their hands, Table 5 shows that 183 (51.5%) of the respondents household had in house wash hand basin where they cleaned their hands. The number of respondents that the family member washed their hands outside/yard or their compound when need arises was 100 (28.2%) while 68respondents (19.2%) did not have any particular place but can do the washing anywhere.

To know the percentage of those that have water/tap, basin, soap/cleaning agent and towel/napkin/toilet paper which can aid in the proper cleaning**.** For tap, 202 respondents (56.9%) household had tap water while 153respondents (43.1%) did not.

As for the use of basin, 202respondent families (56.9%) had basin for washing while 153respondents families (43.1%) did not and 89% of the respondents used soap or other cleaning agents in washing their hands after every activity. Another, 78.9% of the respondents families used towel/napkin or tissue paper after washing their hands while the remaining 21.1% did not.

In disposing off the stool of the youngest child in the family**,** table 5 shows that 29.9% of the children used toilet while the stool of 7% of the children were always thrown outside and about 5.6% of the stool were rinse away while 0.6% were buried in the compound and the remaining subjects (56.95%) used other source like potty, pampers.

Of all the respondents,204 of the respondents (57.5%) used cupboard in keeping the food that is not to be consumed immediately while 119respondents (33.5%) stored their food in the refrigerator, 20respondents (5.6%) kept their food warm while 7respondents covered their food in the open and the remaining 5respondents (1.4%) leave their food uncovered in open places. (Table 5)

Table 5: Observed Hygiene practices of the household

Character	Frequency	Percentage (%)
Where members of household wash hands		
Nowhere	4	1.1
In house wash hand basin	183	51.5
Outside/Yard/Compound	100	28.2
Disposing of youngest child stool		
Child uses Toilet	106	29.9
Throw out side	25	7.0
Bury in the compound	2	0.6
Rinse away	20	5.6
Methods of preserving food		
Not covered in the open	5	1.4
Covered in the open	7	2.0
In cupboard	204	57.5
Kept warm	20	5.6
In the refrigerator	119	33.5

The general cleanliness of the environment (using parameters such as clean gutter, adequate refuse disposal, clean environment) as observed by the interviewer shows that 181respondents (51%) did well in any one of the criteria stated while 138respondents (38.9%) satisfied two of the criteria and 24respondents (6.8%) did not satisfied any of the criteria and only 12respondents (3.4%) satisfied all the criteria. (Table 6)

Table 6: General cleanliness of the environment as observed by interviewer

Character	Frequency	Percentage (%)
Clean gutter, adequate refuse disposal, Clean environment	12	3.4
When any of the two above is adequate	138	38.9
When any of the above is adequate	181	51.0
None adequate	24	6.8

Clinical signs of malnutrition observed among the children

Observing some clinical signs of malnutrition, it was found that 2.3% of the children focused in this study had protein energy malnutrition while the remaining 97.7% did not. As for pallor (conjunctiva), it was noticed in 33children (9.3%) while pallor (palm) was noticed in 25children (7.0%).

Table 7: Clinical observation of the children and their mother

Variable	Frequency	Percentage
PEM in children		
Yes	8	2.3
No	347	97.7
Pallor in children (conjuctival)		
Yes	33	9.3
No	322	90.7
Pallor in children (Palm)		
Yes	25	7.0
No	330	93.0

Relationship between socio economic and nutritional status of the children

From Table 8, larger percentage of children that suffers severe acute malnutrition was from under age mothers and the trend follows that age increment. That is, the children of mothers less than 20years tend to suffer from different conditions because of the lack of needed nutrition education or experience needed by under age mothers and relationship was positive (r = +0.04), meaning that mothers at tender age had most children that are malnourished.

The results of this study shows a positive relationship ($r = 0.13$; $p<0.05$) between mother's educational status and importance of giving colostrum to new born. It appears that the higher the eduational status of the mother, the higher the awareness on the usefulness of colostrum to the baby when these two variables were compared, it shows that women with little nutrition education, majority of them did not give colostrum to their babies with the believe that it is dirty and should not be given, in other to protect the child from diseases. This ratio was reversed for women who had tertiary education.

Table showed a negative correlation ($r = -0.21$; $p <0.05$) between mothers educational status and the use of bottle for feeding, and the higher the level of education attained by the mothers the lower the use of the bottle but the use of bottle for feeding of the children is still at high level in each level just that education is really assisting in increasing the awareness of the mothers.

The estimated annual income of the families shows a positive relationship ($r = 0.15$; $p<0.05$) with the rate of exclusive breastfeeding. It showed that the family income greatly affects the period the mothers breastfeed. Though, an average mother in Ondo town can say some little things about exclusive breastfeeding which means the awareness in Ondo town is a bit improving but the coverage was poor.

The level of mother education is compared with hygienic practices such as where mothers washes their hands after any activities and if there is a basin in the house where they easily clean their hands, also if soap or any other cleaning agent is readily available for cleaning at all time and if there is a napkin ,towel or toilet paper to keep the hand dry after washing, the result shows that the level of education of the mothers has a lot to do with the practice because the higher the education of the mothers, the better the orientation on how to maintain the level of hygiene ($r= 0.03$, $p>0.05$).

Correlation analysis between the socio-economic and children nutritional status

Correlation	r – value
Mothers age & MUAC	+ 0.04
Mothers age & Severe acute malnutrition	0.22
Mothers education & Colostrum administration	+ 0.13
Mothers educational status & bottle feeding	- 0.21
Family income & Exclusive breastfeeding	+ 0.15
Mothers education & hygienic practices	+0.03

P = 0.05

5. DISCUSSION

The socio economic characteristics of the household revealed that the majority (40.6%) of the head of the household was civil servants and 48.7% of they earn less than 100,000 naira annually (1U.S dollar equivalents 150 naira). Such a relatively low income will most likely affect the nutritional status of subjects in such homes considering the cost of

living in Akure town. In a recent study carried on assessment of nutritional status of pre-school children from low income families in Lagos State, Aboka[12] reported poor nutritional status of majority of the subjects. The income of the household head therefore, appears to be a major factor in determining the nutritional status of mothers and children in the household.

The result of the also revealed the apparent significance of breastfeeding and complementary feeding pattern of the mothers. It shows that only 13% of the mothers initiated breast milk at 30 minutes or less after birth. "Early initiation of breastfeeding (within one hour of birth) facilitates breast milk production and consumption of colostrum which appears right after delivery. The result of the study is in conformity with findings of a recent study which established that only 12.3% babies were put to breast immediately ($\leq$ 1hr) after delivery [4]. If few mothers initiated breastfeeding within the recommended 30minutes, this might explain why malnutrition rate was high among under five children in the study area.

The result of the correlation analysis ($r=0.13$; $p<0.05$) showed that the mothers' education had a positive and highly significant influence on the administration of colostrums and also indicated that the mothers education have a significant influence on their breastfeeding habit. This finding is in line with the findings of Matthew and co-workers which established that, a more educated mother\caregiver raises a better quality child than a less educated mother . [13]

Also, the result of the survey shows that only 17.6% of the mothers exclusively breastfed their babies while others introduced other food at that tender age. The early introduction of complementary foods especially before the first six months of life has long been discouraged by the World Health Organization and UNICEF. [3] Exclusive breastfeeding rate (EBF) in the present study is similar to the result of NFCS, 2003 that reported 17% coverage for exclusive breastfeeding at national level. The study by Ukegbu et al on breastfeeding pattern, anthropometry and health status of infants attending child welfare clinics of a teaching hospital in Nigeria established that exclusive breastfeeding rate declined progressively from 64.9% at birth to 37.3% at 24weeks of age .[14]

Results of this study reveals a poor infant feeding practices among the mothers with about three quarter (71%) introducing the child to complementary foods between the age of 1 and 3 months and another 11% of the mothers given foods between the ages of 4 and 6 months. It therefore means that about 82% of mothers had introduced solid foods before the recommended age of 6 month.

The overall assessment of nutritional status of children shows that 12.5%, 8.5% and 14.8% were stunted, wasted and underweight respectively and the mid-upper circumference revealed that 2.6% were moderately malnourished. This finding is in line with the findings of Egbere [15] which established 22.2% of the under five children with severe malnutrition and several national and international organizations reported similar scenario. [5, 6, 9,15]

The observed hygiene practices of the household shows that 48.5% did not have an in-house wash hand basin and 10% of the household neither keep their food in cupboard nor preserved in the refrigerator but left the food in an open place. The primary source of water to majority of household was deep well which may not be too clean for consumption. Infections due to contaminated foods and feeding utensils may be attributed to inadequate facilities in the household and the poor hygiene practices in the preparation of foods, this combine with inadequate dietary intake would result in vicious malnutrition cycle.

6. CONCLUSION

The high levels of malnutrition in the present study underline the great need for nutritional intervention. Timely introduction of appropriate complementary feeding is a key factor in child growth. The results of this work indicated that mothers introduced the children complementary food too early in life which may adduce to be a major contributory factor for the high incidences of undernutrition observed in this study. Therefore, the most urgent priority is to ensure access to, improve the quality and proper timing of complementary foods which should be given to the children as from six months old.

The assessment of nutritional status using indicator such as stunting, wasting and underweight and MUAC for children shows that 26%, 12.5% and 8.5% were stunted, wasted and underweight respectively and this may be as a result of poor breastfeeding and complementary practices, low education of mothers and poor economic status of the parents. Considering these figures something need to be done to save the future generation of Nigeria.

The MUAC also shows that 5.7% and 0.3% were moderately malnourished and severely malnourished respectively, since the present condition (nutritional status) have a lot of effect on the future then adequate care should be given to the children at that tender age and the only way to achieve this, is more nutrition education for the mothers, most especially on the proper care of the children.

The clinical observations also supported the result of anthropometric status of children. It shows that 9.3%, 7.0% and 2.3% of the children had pallor (conjuctival), pallor (palm) and PEM respectively. This may be as a result of low education on the part of the mothers because if they are not rightly informed about the food needed by the children at different stages of their growth, there may be problem.

Also, hygiene practice is another factor that can greatly affects the status of the children, it was gathered from the study that many of the mothers with little nutrition education did not always care about the safety of their food whereby it may be an avenue for different organism causing disease to grow which will at the end affects the health status of the child.

The correlation analyses done shows that education, age and income level are important factors that influenced or affect the status of not only the children both also the mothers. The mothers age and children MUAC ($r=0.25$; $p<0.05$), Educational status of mothers and hygienic practices($r=0.21$; $p<0.05$), Educational status of mothers in relation to colostrum administration($r=0.13$; $p<0.05$), Family income and time other food introduced($r=0.15$, $p<0.05$) are all positively related except for mothers education and practice of bottle feeding($r=-0.21$, $p<0.05$) that is negatively related because the higher the level of mothers education the lower the practice.

Nutrition education is the most sensitive factor that is needed by all mothers because this will keep them informed about the right food for them and their children at different stages of life and from there better living can be assured that will give the assurance of a better nutritional status for mothers and their children.

7. RECOMMENDATIONS

The results of this study suggest that the following recommendations be made in other to improve the food consumption and the nutritional status of mothers and their under five children.

-Exclusive breastfeeding should be encouraged among the mothers because the coverage was low in the study area. Intensified efforts should be made in Akure South Local Government in orientating women of child bearing age on the need for exclusive breastfeeding, so that the status of most children can be improved.

-There is need for more nutrition education. An educated mother is most likely to provide better health care interm of good nutrition and better hygiene which will in turn improve the status of the subjects.

-There is need for more attention on feeding and hygienic practices, easy access to portable water, so that the problem of malnutrition can be reduced to the minimum in Akure South LG.

-Survey of this nature should be conducted at intervals of at most five years, so that it will assist government in knowing the nutritional status of those they governs and how to plan for improvement.

8. REFERENCES

[1]. Sandoval-Priego, A.A., Reyes-Morals, Perez-Cuevas.D, Abrego-Blass.R, and Orrico-Torres, 2002. Family Strategies of Life Associated with Malnutrition in Children less than 2 Years of Age. Salud publica de Mexico, 44: 1-9.

[2]. Lutter, C.K. and J.A. Rivera,(2003). Nutritional status of infants and young children and characteristics of their diets. J. Nutr., 133: 2941s-2949s.

[3]. Ruel, M.T.,Levin, C.E, Armar-Klemesu, M. D., Maxwell and Morris, (1999). Good care practices can mitigate the negative effects of poverty and low maternal schooling on children's nutritional status: Evidence from Accra. World Dev., 27: 1993-2009.

[4]. Nigeria Demographic and Health Survey.(2003).National Population Commission, Federal

[5]. UNICEF'S (2009) state of the World's Children Report.

[6]. Federal Ministry of Health,(FMOH) Nigeria (2007). Integrated Maternal, Newborn and Health Strategy. Republic of Nigeria

[7]. WHO (2007): WHO Multicentre growth reference study group: WHO child growth standards based on length/ height, weight and age. ACTA 95 (suppl. 450), 76-85.

[8]. WHO (2005). Nigeria: Country Status Report.

[9]. Laura, C. (2004). Under nutrition as underlying cause of child deaths associated with Diarrhea, Pneumonia, Malaria and Measles, America Journal of Clinical

[10]. Ruel,M.T.,(2003).Progress in Developing Indicators to Measure Complementary Feeding Practices. In: SCN News. Meeting the Challenge to Improve Complementary Feeding, Moreira, A.D. (Ed.). United Nations System Standing Committee on Nutrition, Lavenhem Press, UK, pp: 20-22.

[11]. Ukegbu et al,(2007) Exclusive breastfeeding practices among caregivers in three selected LGA's Of Gombe State, Nigeria. Proceeding of 41st Annual General Meeting and Scientific Conference, Pp 16.

[12]. Egbere et al, (2010), Prevalence of malnutrition amongst under five children and food security Situation in Kuru B Ward of Jos South, Plateau State, Nigeria. Proceeding of 41st Annual General Meeting and Scientific Conference, Pp 29.

[13]. UNICEF, (2001). Children's and Women's Rights in Nigeria: A Wake-up Call. In: Situation Assessment and Analysis, Hodges, A. (Ed.). National Planning Commission, Abuja and UNICEF, Nigeria.