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COMPLEMENTARY FEEDING PRACTICES OF OLDER INFANTS ATTENDING CHILD WELFARE CENTRE IN A SOUTH WESTERN TOWN, NIGERIA

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ABSTRACT

Under-nutrition among children is worse during the complementary feeding period and results in high morbidity, irreversible complications, and death. This study examined the complementary feeding practices and nutritional status of older infants (6 – 24 months) attending the child welfare clinic in Ota State Hospital, Ogun State. The study was a descriptive cross-sectional study. Weight,length and Mid Upper Arm Circumference (MUAC) measurements of 152 children were taken according to standard procedures to calculate the weight for age, weight for length, length for age z-scores using WHO Anthro software. A food frequency questionnaire was used to elicit information on the complementary feeding practices of the children. Exclusive breastfeeding rate among these mothers was 57%. Early (≤ 3 months), timely (4-6 months) and late (≥ 7 months) introduction of complementary foods were observed in 11.8%, 42.8% and 45.4% of the children, respectively. The most common food offered as the first complementary food was pap (31.6%), followed by commercial cereal-based complementary foods (23.7%) and infant formula (15.1%). Children consumed more cereals either as local or commercial based (79.5%), followed by meat/fish (64.7%), and milk/milk products (63.2%). However, daily, a greater number of children were given commercial cereal-based complementary foods (24.3%) compared to local cereal-based complementary foods (19.7%). Minimum meal frequency was met by 86.8 percent of the children while the majority of the children did not meet minimum dietary diversity. About 48%, 40.7% and 38.9% of the children were wasted, underweight and stunted, respectively. Under-nutrition particularly wasting was high among the children.

Keywords: Complementary feeding, nutritional status, Ota

INTRODUCTION

Globally, improving feeding practices and nutritional status of children in the first 1000 days of life is a major concern because under-nutrition during this period results in devastating consequences (Victora *et al*., 2008). Growth faltering is highest at this stage of life due to poor complementary feeding and a high incidence rate of infectious diseases (Ochornogor, 2013). Appropriate complementary feeding practice which emphasizes the timely introduction of varied foods/drinks from 6 months with continued breastfeeding can reduce the under-five mortality rate by 6% (Jones *et al*., 2003). The first two years of life are therefore regarded as a window of opportunity for improving child nutritional status. Informed by this, many researchers have investigated the complementary feeding practices of caregivers from different social and ethnic backgrounds. In Nigeria, despite the recommendations, an increasing number of infants are not exclusively breastfed until the sixth month and are introduced to poor complementary foods very early in life (Ochornogor, 2013). A study in the Satellite Town of Lagos reported that about 48.4% of mothers introduced their children to other foods at about six months of age (Olatona *et al*., 2014). Ashwini *et al*. (2014) reported that 69% of urban mothers introduced complementary food to their infants before 6 months. According to National Demographic Health Survey (NDHS) reports,only about 17% and 29% of infants are given only breast milk till six months [National Population Commission (NPC) Nigeria and ICF, 2014 and 2019] compared to 79.6% in Pakistan, 49% in Tanzania, 42.5% in Bangladesh, 31.5% in India (Hassain *et al*., 2013) and 46% in Ghana (Gyampoh *et al.*, 2014). This implies that more than 70% of infants are given other things such as milk, foods or drinks before 6 months. World Health Organisation recommends the timely introduction of foods/drinks from at least four out of seven food groups (WHO, 2010). Masresha *et al.* (2013)

reported that 86% of the children in rural communities of Ethiopia did not meet the recommended dietary diversity (> 4 food groups). A study done in Nigeria showed that the minimum dietary diversity for children aged 6–23 months worsened from 26% in 2003 to 16% in 2013 (Ogbo, 2015). This occurred regardless of household wealth status. In Lagos, it was found that 37.3, 49.7 and 51.2% of the infants were fed according to recommended practices at age 6-8, 9-11 and 12-24 months, respectively (Olatona *et al*., 2014). Providing a variety of foods from different food groups was seen as a challenge to many mothers. In Cross River, it was observed that about 85.4% of infants aged 6-8 months were introduced to complementary foods timely but only 7.3% met the minimum acceptable diet (Udoh and Amodu, 2016). Another study done in Lagos revealed that timely introduction of complementary foods (47.9%), dietary diversity (16.0%) and minimum acceptable diet (16.0%) for 6 to 9-month-old children were low (Olatona *et al.*, 2017). Seventy-nine percent of children aged 6-8 months given breast milk in Nigeria consume complementary foods, while 40.2% of the breastfed infants receive foods from at least 4 food groups daily [National Bureau of Statistics (NBS) and the United Nations Children's Fund (UNICEF), 2017]. Low complementary feeding practices (47.0%) were observed in mothers in Lagos (Olatona *et al*., 2017). It was also reported that knowledge of appropriate complementary feeding practices was low (14.9%) and was associated with younger mothers' age, not being married and lower level of education (Olatona *et al.*, 2017). Similarly, Owoaje *et al*., (2017), observed that polygamous marriage, monthly income below $20 and below secondary education were the maternal factors associated with child undernutrition. In Nigeria, about 11% of 6-23 months old children are fed properly with respect to IYCF recommendations (NPC and ICF, 2019).

A global report by UNICEF states that in 2017, an estimated 22.2% of children under-five years were stunted while the rate of wasting among these children was 7.5%. More than 30% and 25% of the world's children, who are stunted and wasted, respectively, live in Africa (NBS/UNICEF, 2017). According to the Nigeria Demographic Health Survey (NDHS) (2018), about 32%, 24% and 13% of children aged 6 to 23 months were stunted, underweight and wasted, respectively. It was also observed that the stunting rate among under-five children increased from 27% at 6 months to 50% at 23 months. There is widespread malnutrition among children in Nigeria, particularly, in the rural areas (Quadiri and Ojuore, 2013; Samuel, 2014; NPC and ICF, 2019).

Although the literature is replete with works done on the complementary feeding practices of children from different ethnic and social groups, there is scarcity of information on children residing in Ota. Ota shares boundary with Lagos and over the years, its inhabitants have greatly increased in number. There is a need for data on the health and nutritional status of children in this area for early intervention. Adequate nutrition of young children is very essential to achieving sustainable development goals. Therefore, this study examined the complementary feeding practices and the nutritional status of children (6-23 months) attending the child welfare clinic in Ota State Hospital, Ogun State.

METHODOLOGY

Study Area

Ota is a fast growing town located at 6^0 41'00"N and 3^0 41'00"E to the north of Ado-odo/Ota Local Government Area (LGA) of Ogun State in the South Western zone. Ota is the headquarter of Ado-odo/Ota LGA and measures approximately 878 km^2 in size. The population of Ota at the last census count (2006) was 163,783 residents which increased to 217,084 in 2015 by projection (Ufoegbune *et al*., 2016). The town harbours both the indigenes who are mainly the Aworis and non indigenes who have either migrated from Lagos or working in some of the organizations. The proximity of Ota to Lagos and Idiroko have not only led to increased population but to increased market capacities and industrialization. Ota has the highest number of industries in Ogun State. However, the major occupations of Ota indigenes are trading and farming. Some of the organisations and industries located in Ota include Obasanjo's Farm, De-United Foods Industries, Unique as well as May & Baker Pharmaceuticals, Honda Manufacturing Industries, Convenant and Bells University of Technology. The region lies within the tropical rain forest and exhibits two climatic conditions; the rainy season (April - October) and the dry season (November - February).

Research Design

The study was a descriptive cross-sectional study carried out among mothers and children pairs attending the child welfare clinic at Ogun State General Hospital, Ota. Children were classified into three age groups 6-8 months, 9-11 months and 12-23 months. Weight and length measurements of the children were taken according to the World Health Organisation (WHO) standard procedures. The recumbent lengths of the children were measured to the nearest 0.1cm with the use of a calibrated measuring board with children lying supine. The sole of the children's feet was held firmly against the zero end of the board with their knees held down while the length was taken at the crown of the head. Weight was measured to the nearest 0.1kg with the use of a Salter scale (914WHLKR). The scale was calibrated before each measurement to ensure that it was at the zero mark. Three weight measurements per child were taken and average taken. All measurements were taken by the investigator using the same equipment. The WHO Anthro software was used to convert the weight and length values to weight-for-length z-score (WLZ), weight-for-age z-score (WAZ), and length-for-age z-score (LAZ). These anthropometrical indices were used to compute stunting, wasting and underweight prevalence at less than <-2 z-score of the WHO 2006 Child Growth Reference standard (Onis, 2007). Interviewer administered questionnaires which included sections on socio-demographic characteristics, complementary feeding practices, food frequency and WHO validated 24-hour recall sample were used to extract relevant information on the complementary feeding practices. Data was entered and analysed using the statistical package IBM SPSS Statistics 20.0.

RESULTS AND DISCUSSION

About 152 children participated in the study of which 64 were males (42.1%) and 88 were females (57.9%). The majority of the children fell within the age range of 6.0-11 months (93.0%) (Table 1). The mean MUAC, length, weight, age and birth-weight were 15.07 ± 1.58 cm, 70.8 ± 5.84 cm, 7.78 ± 5.46 kg, 10.39 ± 1.92 months and 2.89 ±1.36 kg, respectively. The majority of the mothers had at least secondary school education (76.3%) and about 57% earns between 5000-20,000 naira monthly.With reference to Table 2, about 38% of the mothers initiated breastfeeding within one hour of childbirth while an appreciable number of mothers (61.8%) residing in this area did not give any prelacteal food to their infants. Exclusive breastfeeding rate (57%) among these mothers was double the national rate (29%). The EBF rate recorded in this study was higher than the EBF rate of 39% reported among Indonesian mothers (Ahmad *et al*., 2018). The relatively higher EBF rate observed in this study may be attributed to intensive health talks offered during child welfare clinic days.

Table 1: Socio-demographic characteristics of respondents

Variables	Frequency	Percentage
Age group		
6 – 8	68	44.7
9 – 11	75	49.3
12 – 23	9	5.9
TOTAL	152	100
Level of education		
None	10	6.6
Primary education	26	17.1
S.S.S/Vocational/Technical	72	47.4
Tertiary education	44	28.9
TOTAL	152	100
Monthly income		
5,000 – 20,000	87	57.2
20,000 – 50,000	49	32.2
51,000 – 100,000	14	9.2
100,000 and above	2	1.3
TOTAL	152	100

Table 2: Complementary Feeding Practices of the children

Variables	Frequency	Percentages
Prelacteal feeding		
Plain water	29	19.1
Sugar water	7	4.6
Powdered milk or fresh milk	10	6.6
Infant formula	10	6.6
Not given anything other than breast milk	94	61.8
others	2	1.3
TOTAL	152	100
Exclusive breastfeeding		
No	65	42.8
Yes	87	57.2
TOTAL	15	100

Early (≤ 3m), timely (4-6 m) and late (≥ 7m) introduction of complementary foods were observed in 11.8%, 42.8% and 45.4% of the children (Figure 1). The prevalence of timely introduction of complementary foods (42.8%) observed among the children in this study was relatively low compared to that reported among Nigerian children (79%) (NBS/UNICEF, 2017). Similar studies undertaken among mothers in Ogun (41%) and Lagos (47.9%) States also reported low prevalence of timely introduction of complementary foods (Ogunlesi *et al*., 2014; Olatona *et al*., 2017). It is noteworthy that the major problem discovered among this study group was the delayed introduction of complementary food instead of early initiation observed in many surveys. The caregivers gave some information that could explain this practice. One is related to the misconception that even beyond six months, breast milk is still a complete and nutritious food. Secondly, the refusal of the older infants to take other foods apart from breast milk particularly exclusively breastfed infants. Delayed complementary food introduction and predominant/partial breastfeeding beyond six months may also be attributed to the low income of the majority of mothers (Table 1). Therefore, some of these mothers might have relied on readily available and affordable breast milk as the major meal for their children even beyond twelve months of age. Ashwini *et al*. (2014) opined that socio-economic status including the level of education and place of delivery has a significant relationship with the age of complementary food initiation. However, higher rates of timely initiation of complementary foods were recorded among mothers in Cross River (85.4%) (Udoh and Amodu, 2016) and Indonesian mothers (50%) (Ahmad *et al*., 2018). In a study, children with untimely complementary food initiation had 55.4% malnutrition compared to 21.9% observed in children with a timely introduction (Ogunlesi *et al*., 2014).

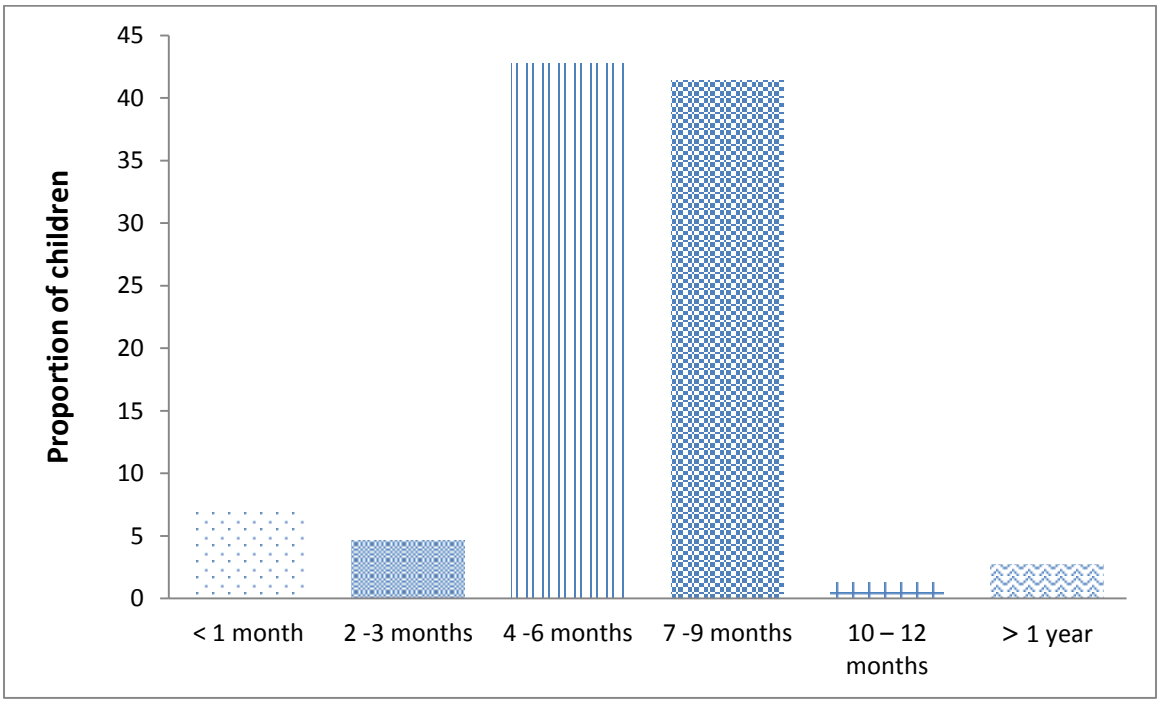

Fig. 1. Age of introduction of complementary foods

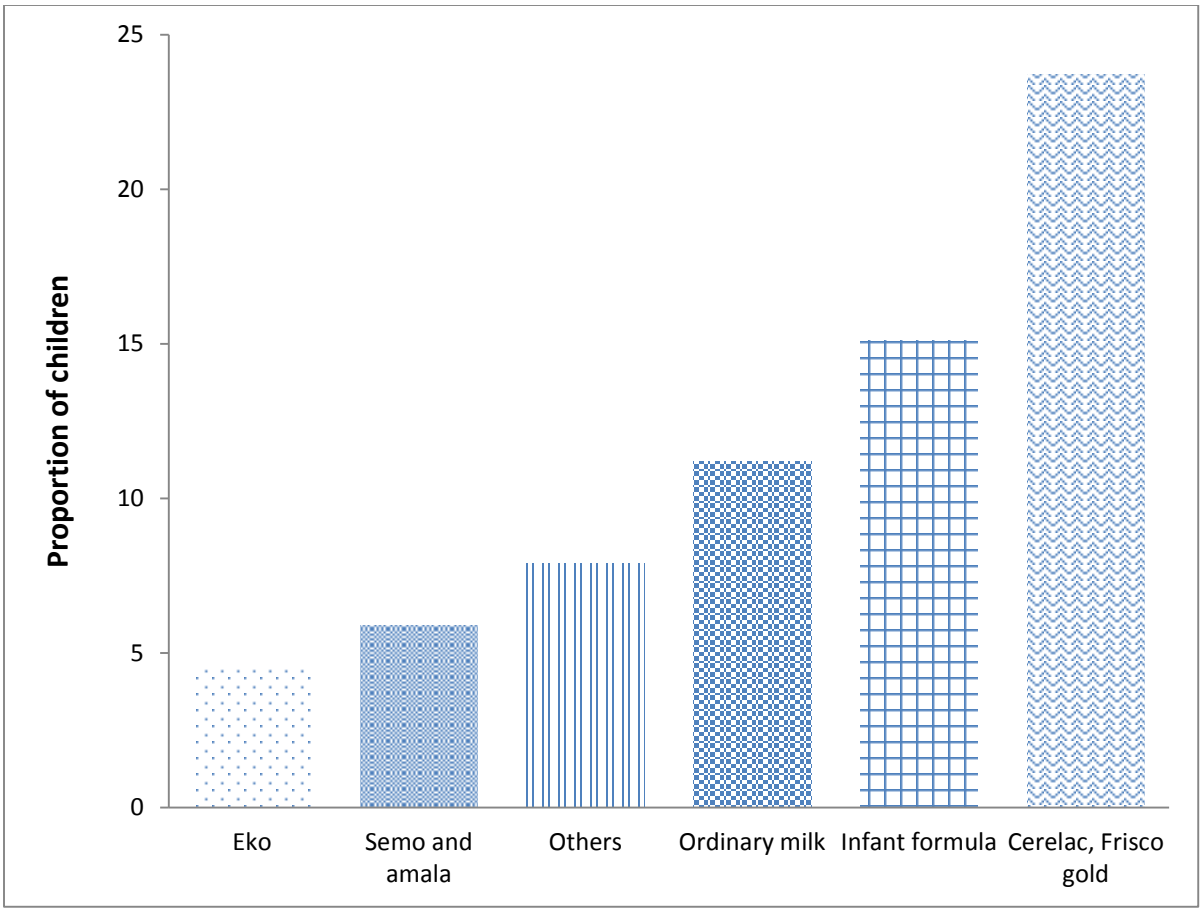

Fig. 2. Introduction of liquids and semi-solid foods

The most common food offered as the first complementary food was pap (31.6%), followed by commercial cereal-based complementary foods (23.7%) and infant formula (15.1%) (Figure 2). Pap, fermented cereal is usually the first food given by majority, but it was observed in this survey, that appreciable number of children was introduced to commercial cereal-based complementary foods. These mothers preferred ready to eat foods. The proportion of children that were introduced to adult milk as complementary food was low (11%) but still of great concern. It was found that 52% of the childrenwere fed at least twice daily while 46% were fed when hungry (Figure 3). Responsive feeding includes using cues such as cry, restlessness among others to know when to feed infants and older infants. Unfortunately, information on the signals of hunger displayed by the children fed when hungry (46.1%) was not collected. It is possible that some of these children might not have shown detectable signs, left hungry and underfed. Frequent hunger may also be caused by giving low energy-dense or over diluted complementary foods to children

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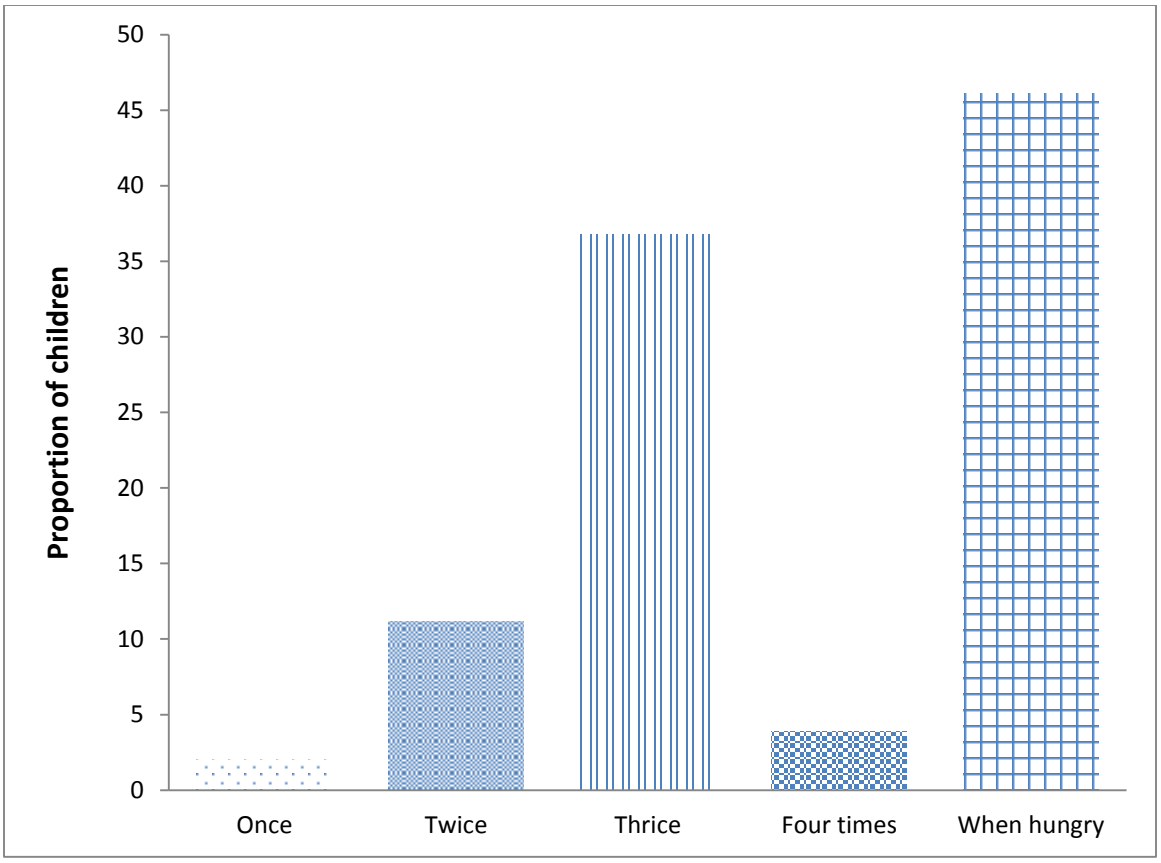

Fig. 3: Daily meal frequency among the children

Food consumption patterns (Figure 4), showed that the children consumed more cereals either as local or commercial based (79.5%), followed by meat/fish (64.7%), and milk/milk products (63.2%). However, it is noteworthy that on a daily basis, a greater number of children were given commercial cereal-based complementary foods (24.3%) compared to local cereal-based complementary foods (19.7%). A similar finding was reported by Ogunlesi *et al.* (2014) who observed that about 44.8% of the mothers gave commercially processed cereal products compared to 32.1% that gave locally prepared maize gruel. This indicates a gradual drift from the practice of giving gruels made from local cereal to older infants and young children. This implies that some of the mothers who introduced local maize cereal, later changed to commercial complementary food as their children grew older. This may be attributed to the fact that the majority of the mothers are working and preferred commercial cereal-based complementary foods that are ready to eat. This practice has strong implications for the promotion of fortified local cereals that are not ready to eat for young children.

About 34%, 43% and 32% of the mothers gave the children foods from vegetable, meat/fish and milk groups every day, respectively (Figure 4). Vegetables were consumed more than fruits (20.4%). However, it was not ascertained if the vegetable given was as vegetable in soups as typical of most Nigerian meals, as a side dish or given separately. Also, the method of soaking vegetables in hot water before cooking as practiced by the majority tribe in this study remains a problem because of the leaching of nutrients. Surprisingly, the daily consumption of animal flesh foods (42.3%) was quite high compared to legumes and nuts (13.2%) which was low. Udoh and Amodu (2016) and Ahmad *et al*. (2018) also reported 18.6 and 14.8% rates of legume/nut consumption among children. However, in contrast to the finding in this study, Ahmad *et al*. (2018) reported that about 8.7% of the children consumed flesh foods daily. Consumption of animal flesh foods improves iron status and may reduce the prevalence of anaemia (World Food Programme and UNICEF, 2006). The national prevalence of anaemia among under-five children recorded high value (68%) (NPC and ICF,

2019). Minimum meal frequency was met by 86.8 percent of the mothers. This finding is consistent with other studies done in Lagos (90%), India (71.8%) and Indonesia (74.4%) while lower prevalence rates were recorded in Cross river (36.7%) and Nigeria (42.4%). Similar to other studies (Udoh and Amodu 2016; Olatona *et al*., 2017), the majority of the children did not meet minimum dietary diversity and minimum acceptable diet.

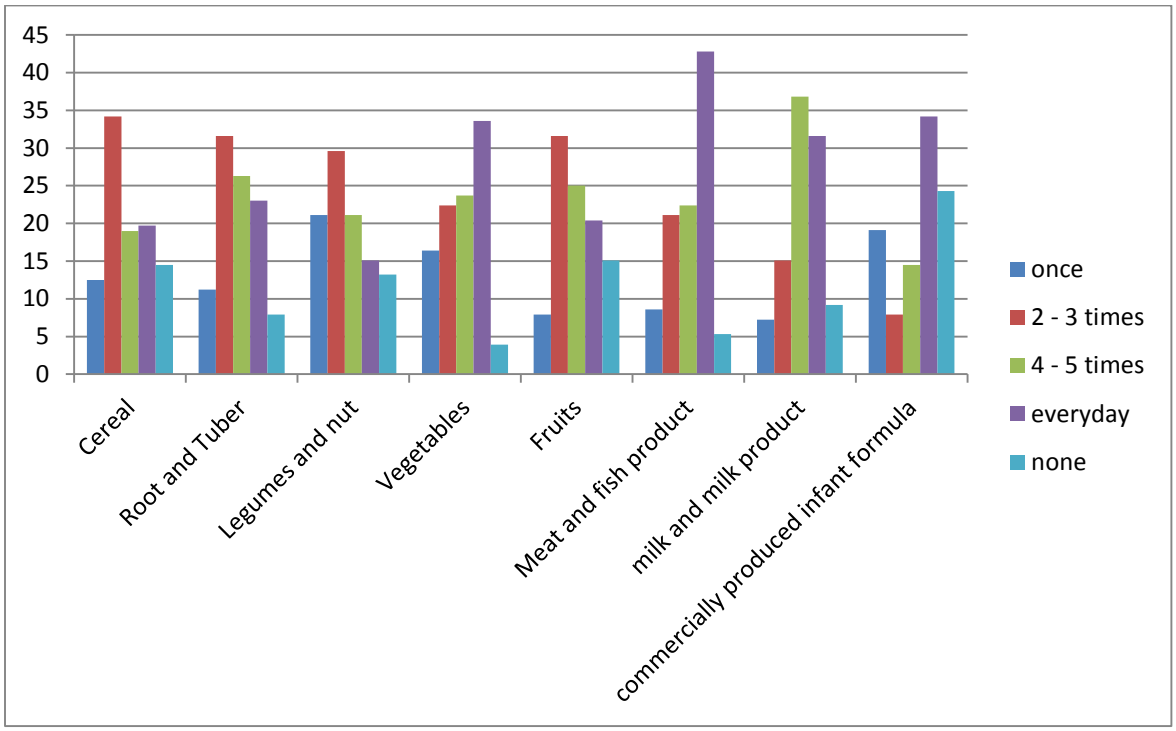

Fig. 4: Weekly food consumption pattern of the children

The prevalence of wasting, underweight and stunting among 6-23 months old children were 48% (male:48.4%, female: 47.7%), 40.7% (male: 42.2%, female: 36.3%) and 38.9% (male: 40.7%, female: 37.5%), respectively (Table 3). These values are higher than the 26.4%; 23.0% (wasting), 33.3; 26.0% (underweight), 24.7%; 28% (stunting) reported by Udoh and Amodu (2016) and Ahmad *et al*. (2018), respectively. In this study, wasting prevalence was the highest and about 3.8 times higher than the national prevalence. In children, wasting which is low weight for height indicates recent weight loss due to inadequate food intake and/or frequent illness/diarrhoea. The high prevalence of severe wasting (35.5%) was unexpected since more than 80% of these children met minimum meal frequency. This observation emphasizes the need to include factors such as the energy density, actual quantity of food consumed, bioavailability of nutrients and frequency of infections as variables in complementary feeding studies. Udoh and Amodu (2016) observed that infants who had diarrhoea fourteen days before the study were more wasted (36.4%) than those who did not have diarrhoea (20.4%). Owoaje *et al.*(2014) also reported that under-nutrition was associated with recent episodes of diarrhea. Besides, the majority of the children studied consumed commercial cereal-based complementary food which is expensive and might have been rationed to last longer. Based on the findings, 89% of the mothers earn less than 51,000 (142$) monthly and probably might not have provided the adequate quantity and quality of foods required to sustain rapid growth. It was also observed that more males were severely undernourished compared to females (Table 3). Kimwele (2014) in her survey of 6 to 23 months old children (Nairobi) also found that males exhibited higher rates of under-nutrition compared to female children. Table 4 displays the nutritional status of these children by age group. It was observed that wasting increased with age and the highest prevalence of under-nutrition occurred

among 12 -23 months age group. About 66.7% prevalence of wasting was recorded among children in this group compared to about 12% reported among Nigerian children of the same age group in 2018. This is the period that rapid development coincides with increased activities in children. Thus deficit in energy and nutrient intake would affect weight gain.

Table 3: Prevalence of malnutrition by sex

Nutritional Status	Severe			Moderate		
	Percentage			**Percentage**		
	M	**F**	**Total**	**M**	**F**	**Total**
Wasting	35.9	35.2	35.5 (54)	12.5	12.5	12.5 (19)
Underweight	26.6	22.7	24.3 (37)	15.6	13.6	14.5 (22)
Stunting	26.6	14.8	19.7 (30)	14.1	22.7	19.1 (29)

Table 4. Nutritional status by age group

		Stunting (%)			**underweight (%)**			**wasting (%)**		
Age group	No	Severe	Moderate	Normal	Severe	Moderate	Normal	Severe	Moderate	Normal
6 – 8	68	22.1	22.1	55.9	25.0	14.7	60.3	33.8	8.8	57.3
9 –11	75	17.3	16.0	66.5	23.9	13.3	62.5	34.6	16.0	49.2
12 –23	9	22.2	22.2	55.6	22.2	22.2	55.6	55.6	11.1	33.3
Total	152	30	29	93	37	22	93	54	19	79

CONCLUSION

Delayed introduction of complementary foods and poor dietary diversity were the major inappropriate complementary practices found among these children. The children in this study consumed more of cereals, flesh and dairy foods compared to fruits and vegetables. Legumes were barely consumed. Although minimum meal frequency was adequate, the prevalence of under-nutrition particularly wasting was high among the children. There is a need for urgent nutrition intervention.

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