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CAREGIVERS' NUTRITION KNOWLEDGE, PRACTICE AND NUTRITIONAL STATUS OF THEIR CHILDREN (0-59 MONTHS): CASE STUDY OF KADUNA METROPOLIS, KADUNA, NIGERIA

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ABSTRACT

A cross-sectional study was conducted to determine the caregiver's nutrition knowledge, practices and nutritional status of children (0-59 months) in Kaduna metropolis. A semi-structured interview and questionnaire were used to generate the needed information from 416 respondents. The analysis was carried out using SPSS version 20.0 and p-value ($p < 0.05$) was considered significant. Finding of present study revealed that 65.5% of caregivers were between 19 to 45 years, not educated beyond primary school (60.8%) and were mostly (71.8%) living below the poverty line. Knowledge of caregivers on breastfeeding, complementary feeding, and hygiene practices was high. However, indices on practices were generally poor. It showed 24.8% initiated breastfeeding within an hour of delivery, 87.7% introduced substances including food to the child before the age of six months. Only 21.4% met the minimum meal frequency, 13.5% diversification and 6.9% met the minimum acceptable diet. Barriers to effective practices include inadequate financial resources, lack of family support and perception that children of lesser age are too young to be fed from all the food groups. On nutritional status, 66.9% of the children had varying degrees of underweight, 30.2% wasting and 55.3% stunting. There was a negative relationship between child undernutrition and caregivers' level of education, income status and minimum acceptable diet significantly at $p < 0.05$. The pragmatic approach is needed to close the existing gap between caregivers' knowledge and practices on breastfeeding and complementary feeding to reduce the high level of child malnutrition in the metropolis.

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1 Introduction

The role of Caregivers, especially during the early days of the child (0-24 months) is essential in determining the future health and nutritional status of individuals. The Infant and Young Child Feeding (IYCF) concept provide the guide for achieving the needed care. The IYCF protocol provides for exclusive breastfeeding, adequate complementary feeding (both quantity and quality) along with good hygiene practices (WHO, 2010). The low capacity of caregivers to provide for these has often led to child malnutrition in different forms depending on the magnitude and duration of the deviations.

The greatest risk of malnutrition occurs during the first 100 days of the child, starting from the intrauterine life through infancy to early childhood and this incidentally provides an opportunity to address perceived/ observed deviations (Sawaya, 2006). Guled et al. (2016) identified the factors responsible for malnutrition among the under fives includes limited knowledge of the caregivers on proper feeding practices; poor exclusive and continuous breastfeeding practice, inadequate complementary feeding and limited time to provide the needed care for the child. Others are household food insecurity, inadequate health and sanitation services.

The report on the high rate of morbidity and mortality with malnutrition being one of the principal factors continue to give cause for concern. In Nigeria, low birth weight stands at 15%, mortality rates for neonatal, infants and under-fives were 34/1000, 69/1000/ and 109/1000 respectively (UNICEF, 2016). Similarly, rate of Underweight (31.5%), stunting (43.6%) and wasting (10.8%) were also reported to remain high (MICS, 2017). Further, cases of diarrhoea are also very high (14.3%). The Stunted children in particular have a shorter lifespan when compared with non-stunted children; they have smaller and fewer brain cells with poorer interconnectivity between them (thus, poor cognitive capacity), and by extension less ability to learn in school and earn as adults. Children that wasted are often weak with low immunity and more prone to diseases (Srilakshmi, 2006; Mahan & Escott-Stump, 2008; Nabugoomu et al, 2015)

Despite a report that showed a good level of maternal understanding of the importance of proper child feeding and hygiene practices, gaps continue to exist between knowledge and the actual practice of what was learnt. Guled et al. (2016) reported that in the developing countries including sub-Saharan Africa, 48.6% to 90% of caregivers knew the importance of colostrums to the newborn; 70% to 96% had knowledge of exclusive breastfeeding; 62% knew the appropriate time to introduce complementary feed and 83.3% knew that breastfeeding should not be stopped before the age of two years yet Nigerian MICS

(2018) report revealed only 32.8% practice the early initiation of breastfeeding within an hour of delivery; 23.7% practice exclusive breastfeeding and 37.1% continue breastfeeding up to two years. The MICS (2017) report also showed complementary feeding was also sub-optimal as minimum frequency and dietary diversity was 42.4% and 40.2%, respectively.

This has contributed to the non-achievement of many set goals including the Millennium Development Goals (MDGs) and might likely impact negatively on the Sustainable Development Goals (SDGs) if deliberate actions are not taken to improve the situation. The MDGs which spanned between 2000 and 2015 have among other goals 1, 4 and 5 that targeted eradication of extreme poverty and hunger, reduction in child mortality and improves maternal health respectively, while the SDGs which was conceived to sustained the gains of MDGs have among others Goal 1, 2, 3 and 6 that targets ending hunger, zero poverty, provision of good health, clean water and sanitation respectively. All the goals contribute to reducing malnutrition and improving quality of health

To prevent malnutrition among the under fives it is important to identify the specific factors limiting good health and nutrition care practices by caregivers that will ensure proper growth and development of the children. This study was aimed at generating information on the knowledge and practices of caregivers, factors limiting effective child feeding practices and their relationship to child nutritional status that will assist in planning and implementation of programmes for the improvement of children's health and nutritional status.

2 Materials and Methods

2.1 Study design

The study was cross-sectional and descriptive in design. A semi-structured interview and questionnaire were used to generate the needed information on respondents' socio-demographic, nutritional knowledge, complimentary food practices and factors limiting successful child feeding. Information on the index child's anthropometry was also collected. Only caregiver residing in the study communities and has a child of 0-59 months that were willing to participate were considered for this study. The instrument for data collections was validated and pre-tested before the actual data collection.

2.2 Sample size

Sample size calculation was done using Cochran formula (Cochran, 1963):

$$n = Z^2pq/d^2$$

where n is the sample size, Z is 1.96 (the standard normal deviate), p equals 0.73, derived from an estimate of proportions of children age 6 to 9 months who received complementary food in Nigeria in 2008 (NPC and ICF Macro 2009), q is $1-p$, and d (5%) is the desired level of precision. About 394 respondents were worked out and 5% was added for the possible withdrawal of the respondents from the study. This gave a total of 416 caregivers that were recruited for this study.

2.3 Sampling Procedure

Multi-stage random sampling technique was adopted for selecting the subjects. Kaduna metropolis comprised of four administrative Local Government Areas (LGAs) and each LGA was considered a stratum. Each stratum was further subdivided into urban and peri-urban; from each sub-division, a community (ward) was randomly picked for the study. From each sample ward, a systemic random technique was used to arrive at the household earmarked for the study (Figure 1). Where a household has more than a child of less than five years of age, only the index child was considered. In a compound with more than one household, all the qualified caregivers with their children were considered. A total of 52 caregivers with a child of less than 59 months were targeted in each of the eight (8) wards and data collection terminates as soon as the required number of respondents was reached; thus a total 416 respondents was interviewed and assessed in the metropolis.

2.4 Data collection

Qualitative data on complementary feeding practices of 24 hours prior the survey day was obtained from the caregivers. Anthropometry measurements for each child were taken. The

anthropometry measurement was done according to the International Society for the Advancement of Kinanthropometry (ISAK) standards. Height and length were measured to the nearest 0.1cm using stadiometer of 60-220 cm with locking device head board and Infantometer of 45-90 cm with sliding panel respectively. Weight was obtained with an electronic scale with accuracy of 50g. Inform consent was obtained from the caregivers before data collection and they were assured of the confidentiality of the information volunteered.

2.5 Data analysis

The data obtained was analysed using the SPSS statistical package Version 20.0. The information obtained was first sorted, coded before entry to ensure uniformity and completeness. Descriptive and inferential statistical analysis was employed to obtain mean, standard deviation; level of significance and correlation of some variables. The level of the significance was set at $p < 0.05$. Level of malnutrition for the indicators used were arrived at when values obtained were less than -2 SD from the median value of height for age, weight for age and weight for height for of stunting, underweight and wasting and respectively.

3 Results

Most of the household size used in this study was varied from 4-6. Table 1 showed 61.5% of the caregivers were between 19 and 45 years, not educated beyond primary school (60.8%) and were mostly (71.9%) living below the poverty line (i.e. living on less than 1US dollar/person/day). In fact, 26.4% were ultra-poor (i.e. living on less than a quarter of US dollar/person/day). Knowledge of caregivers on breastfeeding, complementary feeding and

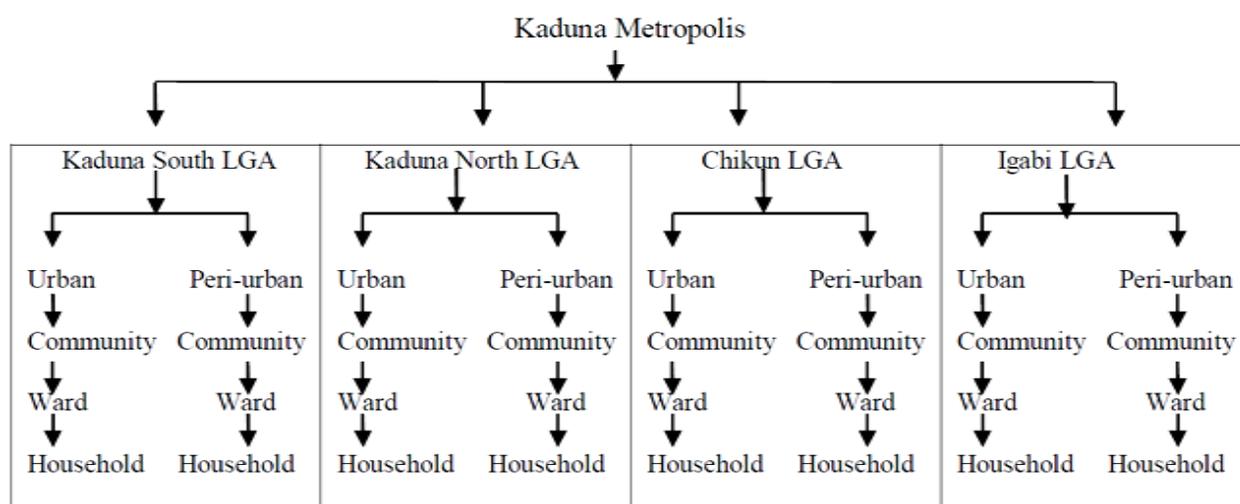


Figure 1 Schematic diagram on the multistage random technique for this study

Table 1 Socio-Demographic Characteristics of the respondents

Variable		Frequency	Percentage	Cumulative %
Residence	Urban	206	49.5	49.5
	Semi-Urban	210	50.5	100.0
Number in household	1-3	136	32.7	32.7
	4-6	182	43.7	76.4
	≥7	98	23.6	100.0
Caregiver's age	≤18	94	22.6	22.6
	19-34	139	33.4	56.0
	35-45	117	28.1	84.1
	Above 45	66	15.9	100.0
Educational status	Unlettered	52	12.5	12.5
	Non formal	55	13.2	25.7
	Primary Sch.	146	35.1	60.8
	Secondary	92	22.1	82.9
	Tertiary	71	17.1	100.0
Employment status	Unemployed	268	64.4	64.4
	Employed	148	35.6	100.0
Economic Status	Above poverty	117	28.1	28.1
	Subjacent poor	74	17.8	45.9
	Median poor	115	27.6	73.5
	Ultra poor	110	26.4	100.0
Marital status	Married	350	84.1	84.1
	Divorced	42	10.1	94.2
	Widowed	21	5.1	99.3
	Yet to married	3	0.7	100.0

hygiene practices were very high. They were able to describe colostrum (91.6%), and know its importance to the child (72.4%); they also know when to initiate breastfeeding after delivery (81.7%) and the importance of exclusive breastfeeding (94.2%). On complementary feeding, the majority of the respondents understand the importance (98.6%) of and the appropriate time (82.7%) to introduce complementary food to the child (Table 2). They were also able to mention food items required for planning complimentary food including healthy snacks. Caregivers were able to explain what constitute good hygiene practices and substances required for cleaning that includes water, soap and ash.

Findings on caregiver's practices on most of the indices were generally poor (Table 3). Only 24.8% initiate breastfeeding within

an hour of delivery and 87.7% introduced other substances including food and drinks to the child before the age of six months. Hand washing was regularly practiced by only 42.1% of the caregivers. Assessment of the child feeding practices showed only 21.4% met the minimum meal frequency, 13.5% diversified food selection for complementary meal and 6.9% met the minimum acceptable diet (Table 4).

Table 5 contained information on the factors affecting successful child feeding in the study area. More than three quarter of the respondents identified inadequate financial resources as the main limiting factor to effectively feed the child. Other barriers to effective child feeding include lack of family support (51.4%), inadequate time to stay with the children (61.8%) and the

Table 2 Caregiver's Knowledge on child feeding and related practices

Variable	Yes Freq. (%)	No Freq. (%)
Caregiver knowledge on BF		
Description of colostrum	381 (91.6)	35 (8.4)
Importance of colostrum to the child	301 (72.4)	115 (27.6)
Time to initiate breastfeeding after delivery	340 (81.7)	76 (18.3)
Meaning of exclusive breastfeeding	387 (93.0)	29 (7.0)
Importance of exclusive breastfeeding practice	392 (94.2)	24 (5.8)
Caregiver knowledge on Complementary feeding		
Importance of complementary food to the child	410 (98.6)	6 (1.4)
Period to begin complementary feeding	344 (82.7)	72 (17.3)
How to select food items for the preparation of complementary food	313 (75.2)	103 (24.8)
Need to prepare child's meal separately	309 (74.3)	107 (25.7)
Knows healthy snack for the child	287 (69.0)	129 (31.0)
Frequency of meal and snack for the child at appropriate age	271 (65.1)	145 (34.9)
Caregiver knowledge on hygiene practices		
Knows good hygiene practices when handling a child	314 (75.5)	102 (24.5)
Knows the cleaning agents required for hygiene practices	387 (93.0)	29 (7.0)

Table 3 Caregiver's child feeding and related practices

Variable	Frequency	%
When breast feeding is initiated after delivery		
Within one hour	103	24.8
After one hour	313	75.2
Pattern of breastfeeding the child		
On scheduled	97	23.3
On demand	319	76.7
Introduction of food/ drink other than breast milk (and medication) before six month		
Yes	51	12.3
No	365	87.7
Duration of breastfeeding		
<12 months	82	19.7
12-24 months	276	66.4
>24 months	58	13.9
Time complementary feed normally starts		
<6 month	335	80.5
At 6 month	72	17.3
> 6 month	9	2.2
Child regularly fed snacks		
Yes	361	86.8
No	55	13.2
Wash hands before child is fed		
Yes	175	42.1
No	128	30.7
No response	113	27.2
Have separate place for hand washing		
Yes	32	7.7
No	384	92.3

Table 4 Meal frequency and diversification

Variable	Frequency	%
Minimum meal frequency		
Met	89	21.4
Not met	327	78.6
Minimum Dietary diversity		
Met	50	13.5
Not met	360	86.5
Minimum acceptable diet		
Met	29	6.9
Not met	387	93.1

Table 5 Limiting factors for successful child feeding practices

Variables	Yes (%)	No
Limited resources	318 (76.4)	98 (23.6)
Lack of family support	214 (51.4)	202 (48.6)
Perception that children can't eat from many food groups	161 (38.7)	255 (61.3)
Lack of adequate time to stay with the child	257 (61.8)	159 (38.2)
Lack of getting access to getting various food items	88 (21.2)	328 (78.8)

Table 6a Nutritional Status of the children

Nutritional Indicator			
Level of underweight	Frequency	%	Cumm. %
Severely underweight	118	28.4	28.4
Moderately Underweight	88	21.2	49.6
Mildly Underweight	72	17.3	66.9
Normal	138	33.1	100.0
Level of wasting			
Severely wasted	11	2.6	2.6
Moderately wasted	35	8.4	11.0
Mildly wasted	80	19.2	30.2
Normal	290	69.8	100.0
Level of Stunting			
Severely stunted	93	22.4	22.4
Moderately stunted	60	14.4	36.8
Mildly stunted	77	18.5	55.3
Normal	186	44.7	100.0

Table 6b Prevalence of malnutrition by age group

Age group (Months)	Underweight (n=278)	Wasting (n=126)	Stunting (n=230)
6-8	80 (28.8%)	15 (11.9%)	28 (12.2%)
9-11	97 (34.9%)	53 (42.1%)	68 (29.6%)
12-14	101 (36.3)	58 (46.0%)	134 (58.2%)
Sig (P-value)	0.072	0.042*	0.038*

*Values with Significance difference at p<0.05

perception that child even after six months is considered too early to be given food from all the food groups (38.7%).

The distribution of children's nutritional status is in table 6. It showed only 33.1% had normal weight for age, 30.2% were wasted (with 2.6% been severely wasted) and 55.3% stunted. Disaggregation of prevalence of malnutrition by age shows generally that as children advance in age, their state of malnutrition get worsen.

Analysis to determine the possible relationship between child nutritional status and some variables as shown on table 7 revealed a negative correlation between child's level of under-nutrition and caregivers' level of education, income status minimum acceptable diets and period of initiation of breastfeeding that are significant at p<0.05

4 Discussion

Caregiver's knowledge and practices are important factors in ensuring adequate feeding for the child. Efforts made by stakeholders in ensuring information get to the caregivers at community level have helped create awareness on breastfeeding, complementary feeding and hygiene practices among mothers. Result of this study showed more than three quarter of the caregivers knows the importance of colostrum to the child, early initiation of breastfeeding after delivery and the need to practice exclusive breastfeeding. They also know the importance of complementary food to the child, when to introduce it and food items required for its preparation. Many also know that good hygiene practice is important when handling a child. Findings from this study concurred with the study conducted by Guled et al. (2016) and Berra (2013). Both studies revealed high rate of caregivers' knowledge on breastfeeding and complementary feeding.

However, our study discovered a wide gap between the caregiver's knowledge and the actual practices in

Table 7: Correlation of child undernutrition level and some variables

Variable	Child' under-nutrition
Caregiver's educational level	
Pearson correlation	-0.676
Sig. (p-value)	0.061
Start of complementary diet	
Pearson correlation	0.505
Sig. (p-value)	0.007*
Caregiver's economic level	
Pearson correlation	-0.797
Sig. (p-value)	0.005*
Minimum acceptable diet	
Pearson correlation	-0.98
Sig. (p-value)	0.049*
Initiation of breastfeeding after delivery	
Pearson correlation	- 0.89
Sig. (p-value)	0.067
Caregiver's hygiene practice level	
Pearson correlation	0.167
Sig. (p-value)	0.074
Child's under-nutrition level	
Pearson correlation	0.00
Sig. (p-value)	

* Correlation is significant at the 0.05 level

the study areas. Only few mothers did actually initiated breastfeeding within an hour of delivery and many introduced substances beside breast milk and medication to the child before six month of age. A child is expected to be exclusively breastfed up to six months as it promotes sensory and cognitive development and protects infant against infection and chronic diseases (NLIS, 2010). Early introduction of food or other substances is part of the factors responsible for the high rate of malnutrition and death of children. WHO/NCIS (2010) report has revealed that exclusive breast feeding reduces infant mortality due to common childhood illnesses such as diarrhea and pneumonia and varying degree of malnutrition right from the early stages of life. The low level of exclusive breastfeeding practice observed agreed with the finding by NDHS (2013) that discovered 8.4% practicing rate in Kaduna State.

Adequate complementary feeding in addition to breast milk helps to prevent the onset of malnutrition for child of 6 and 18-24 months of age. It is expected that the complementary meal should be adequate in quantity, quality and variety. Our study showed very low dietary diversity practice among the caregivers. In this

study achieving adequate diversification was measured upon consumption of food from ≥ 4 food groups on a scale of 7 food groups. Many of the children were fed essentially from cereal and root crops with few receiving foods from legumes and vegetables; animal product was not a common feature in their meals. This has confirmed the study conducted by Udo & Amodu (2016) in Cross river State, Nigeria but much lower than findings in Uganda (Nabugoomu et al., 2015).

Minimum acceptable diet which describes adequate diversification and meal frequency was also very low (6.9%). This is occasioned by the fact that many caregivers failed to adequately diversified and feed the children the required number of such diets. Previous study (KDSG, 2017) had revealed a minimum acceptable diet of 5.0% for children 0-59 months in Kaduna State which is quite close to finding in this study but lower than the national figure (13.8%)(MICS, 2017) and that of Udoh & Amedu (2016). Without adequate dietary diversity and meal frequency, infants and young children are vulnerable to malnutrition, especially stunting and micronutrient deficiency that lead to increase morbidity and mortality (NLIS, 2010).

Many factors are attributable to limiting caregivers from practicing the acceptable ways of child caring despite having the knowledge of what to do. Many of the parents are living below the poverty line and can hardly afford what is required to prepare adequate meal for the children. Populations living below the poverty line are more likely to consume less nutritious meal. Inadequate food alone overtime easily put children at negative nutritional status and provoke health problem including susceptibility to diseases, stunted growth and premature death (WHO, 2000; NLIS, 2010)

This study has discovered that substantial number of caregivers rarely receive support from their family members including their spouses particularly when it is required to prepare child's meal separate from the family diet. Many caregivers also believed that eating variety of foods enhances quality of life, they think children during the period of complementation does not have the capacity to effectively digest food from all the food groups. This study also discovered that many parents rarely have enough time for their children as they have to report back to work places after the expiration of the maternity leave or too busy attending to their customers in their various trades.

Child growth is internationally recognized as an important indicator of nutritional and health status in population group. Findings from this study have revealed high level of different forms of malnutrition that are of public health importance among the children. More than half were stunted and close to one-third were with different degrees of wasting. Underweight was also common among the population assessed. Finding from this study

agreed with MICS (2017) that showed similar high rates of malnutrition indicators for the under-five in Nigeria. Child undernutrition is often linked to poor dietary practice and parents' economic status. This is compounded by the low level of exclusive breastfeeding practiced by the mothers and possible repeated illnesses. The rate of malnutrition in our study has also been found to significantly ($p < 0.05$) increase as children advance in age particularly with respect to wasting ($p = 0.042$) and stunting ($p = 0.038$). Although most caregivers in this study agreed that breastfeeding need to be complemented with other foods and drinks when the child reach six months, the low level of education among the caregivers would have impacted negatively on the choices and preparation of the child's complementary meal. The inferential statistics showed a negative but significant association between child's nutritional status and caregivers' education, income status, minimum acceptable diets and period of initiation of breastfeeding at $p < 0.05$. Therefore it showed that caregivers' income and education levels improved and ensure that children gets the minimum acceptable diet, the level of under-nutrition in the community will reduce significantly. This study corroborate the finding of Katepa-Bwalya et al. (2015) which showed that children born to the mothers with low education (primary level) are more likely to be stunted than children born to mothers with more than secondary education. The same study also agreed that early introduction to complementary feeding was associated with lower weight for age and increased risk of respiratory infection.

Conclusion

This study has showed that despite caregivers' knowledge on complementary feeding and hygiene practices, many failed to put it into practice owing to variety of reasons. The limiting factors ranged from limited education, poverty to lack of support from other family members including the spouse. Policy makers and other stakeholders need to re-strategize on ways to combat the problem. This will include advocacy, sensitization and capacity building at various levels of intervention.

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