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# Research Article
# Assessment of Nutritional Status, Knowledge, Attitude and Practices of Infant and Young Child Feeding in Kumbotso Local Government Area, Kano State, Nigeria

[1]Sa'adatu Sulaiman, [1]A'isha Muhammad Gadanya, [1]Amina Sa'id Muhammad, [1]Hafiz Abubakar and [1,2]Salisu Maiwada Abubakar

[1]Nutrition Research Group, Biochemistry Department, Bayero University Kano, P.M.B. 3011, Kano, Nigeria
[2]African Centre of Excellence for Population Health and Policy, Bayero University, P.M.B. 3011, Nigeria

## Abstract

**Background and Objective:** Optimal feeding practice for infants and young children is a prerequisite for good nutrition, health and development of children. Despite high burden of malnutrition, there is limited data on the nutritional status, knowledge, attitude and practices for infant and young child feeding in Kano State, Nigeria. This study assessed caregivers' knowledge, attitude and practices for infant and young child feeding and nutritional status of children 0-59 months. **Materials and Methods:** A descriptive cross-sectional study was conducted which randomly sampled 270 children of 0-59 months and their caregivers. Data were collected using modified questionnaire developed by the Food and Agricultural Organisation of the United Nations (FAO-UN). **Results:** Majority (51.1%) of the caregivers were 25-34 years of age, 53.7% of caregivers have secondary school education as highest level of formal education. Only 23.7% of mothers initiated breastfeeding (BF) within one hour of birth. While only 15.4% practiced exclusive breastfeeding (EBF), 19.26% started complementary feeding at the right time. In the current study 26.63% of children between 6-59 months of age had adequate dietary diversity. Only 11.35% of children reported intake of meat/meat products and 15.7% of milk/milk products based on 24 h recall. Less than half (48.7%) of the children (24-59 months of age) consumed fruits and vegetables. Only 11.4% of caregivers wash their hands before feeding their child. There was a significant positive relationship between knowledge of BF and BF initiation ($r = 0.288$), practice of EBF ($r = 0.445$) and place of child delivery ($r = 0.547$). **Conclusion:** Results of this study suggests poor nutrition knowledge, attitude and practices among caregivers of children under 5 years in Kano and call for more interventions towards behaviour change for improved feeding practices of infant and young child.

Key words: Optimal feeding, nutritional status, knowledge attitude and practice (KAP), hand washing, caregivers, infants feeding

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Corresponding Author: Sa'lisu Maiwada Abubakar, Nutrition Research Group, Biochemistry Department, Bayero University Kano, P.M.B. 3011, Kano, Nigeria
African Centre of Excellence for Population Health and Policy, Bayero University, P.M.B. 3011, Nigeria Tel: +2348036190005



Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

## INTRODUCTION

The first 1000 days (from conception to second birthday of a child) is considered as a critical window of opportunity for solid foundation of good nutrition, health and development with long lasting beneficial effects throughout life[1,2]. The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of infant's life followed by the introduction of complementary foods at 6 months with continued breastfeeding until two years or beyond[3]. Breastfeeding protects child against infectious diseases and increase intelligent quotient[4]. Growth faltering and micronutrients deficiency are more prevalent during the complementary feeding period[5,6].

Women and children are the most vulnerable to malnutrition in population. Nutritional status of children is an indicator of the level of development and future potential of the community. The World Health Organization (WHO) recognises the importance of good feeding practices of infant and young child in the survival, growth and development of children. In 2003, WHO launched the global strategy for infant and young child feeding and issued the guiding principles for complementary feeding of breastfed and non-breastfed Children[3,7,8]. In addition, appropriate feeding of infant and young child during and after illness is part of the WHO-led Global Strategy for the Integrated Management of Childhood Illnesses[9]. Problems associated with complementary feeding include poor timing for the introduction of complementary foods (too early or too late), bottle-feeding, infrequent feeding, unsupervised feeding, poor feeding methods, poor hygiene and child care practices[10].

Malnutrition is a universal problem that affects all age groups and sexes irrespective of social status[11]. The economic cost of malnutrition could be up to US$3.5 trillion per year, with overweight and obesity alone costing US$500 billion per year[12]. Other consequences of malnutrition include increase in childhood death and future adult disability, diet-related non-communicable diseases (NCDs), as well as human capital costs[13]. Under nutrition explains around 45% of deaths among children under five, mainly in low and middle-income countries[14]. Wasting and stunting are associated with increased mortality, especially when both are present in the same child[15]. It is becoming increasingly clear that children who are wasted are more likely to become stunted and children who are stunted are more likely to become wasted[16]. There are about two billion children under five years and adults who are deficient of vitamins and minerals which can lead to greater susceptibility to many diseases resulting in higher mortality rate[17]. Moreover, one third of deaths among children less than five years of age are attributable to malnutrition, most of which is associated with inappropriate feeding practices that occurs during the first year of life[18]. Malnutrition in girl child could lead to poor obstetrics outcome when they are having children later in life. Other consequences include delayed sexual development, reduced muscle mass and strength, weakened immune system and increased lifetime risk of osteoporosis[19].

**Statement of problem:** One of the most critical factors for children's health and development is their nutritional status. The burden of malnutrition across the world remains unacceptably high and progress unacceptably slow. According to Global Nutrition Report 2018, children under five years of age face multiple burden of malnutrition with 150.8 million stunted, 50.5 million wasted and 38.3 million overweight. Meanwhile 20 million babies are born with low birth weight each year. Children who are undernourished are less able to fight infections and more likely to die young. Malnutrition is the underlying cause of more than 50% of under-five deaths[20]. Infant and young child feeding is a key area to improve child survival and promote healthy growth and development. Although infant and young child feeding policies recommended that infants be exclusively breastfed from birth to 6 months and continue breastfeeding to 24 months and beyond for optimal survival, growth and development, only 17% of infants fewer than six months of age are exclusively breastfed in Nigeria[21].

**Justification:** Data gap in infant and young child feeding practices in Kano appears to be one of the major problems for assessing progress of programs, interventions and policies on appropriate feeding practices of infant and young child. Therefore, the need and importance of this research and others of its kind cannot be overemphasized.

**Aim of the study:** The aim of this study was to assess the caregiver's knowledge, attitude, practices of infant and young child feeding and nutritional status of children in Kumbotso Local Government Area, Kano State, Nigeria.

## MATERIALS AND METHODS

**Study area:** The study was conducted in Kumbotso Local Government Area (LGA) of Kano State, Nigeria. The local government has an area of 158 km$^2$ and a population of 295,979 based on population census conducted by the National Population Commission in the year 2006[22].

**Study population:** The study population is made up of children less than five years of age and their care givers who are permanent residents of the study area.

**Sample size determination:** Considering a precision of ±5 and 95% confidence interval and based on 51.9% estimated prevalence of stunting in Kano state as reported in the year 2015 National Nutrition and Health Survey (NNHS)[23] report on the Nutrition and Health situation of Nigeria, sample size was calculated using Cochran[24] formula ($N = pqZ^2/d^2$).

**Ethical considerations:** All caregivers of the children gave informed consent for participation of their children prior to administration of the questionnaire. All the information collected during the survey is treated as confidential and used for the study purpose only.

**Data collection methods:** Modified questionnaire on nutrition knowledge, attitude and practices of FAO was used in data collection. Data was collected on the social, demographic and household characteristics, infant and young children feeding, hygiene and sanitation practices.

**Anthropometric measurements:** Length/Height of children was measured using meter ruler (for those that can stand) and stadiometer (for children less than 24 months). A Standardized scale was used to weigh the children in their underpants. For children who could not stand, their caregivers were weighed together with them, then the caregiver's weight alone was measured and the difference was recorded as the child's weight in kilogram. The scale was calibrated before each weighing to ensure that the mark returned to zero. The mid upper arm circumference of the children (6-59 months) was taken at the level of the left upper arm midpoint between the tip of the scapula (acromion process) and the olecranon process using Shaker's strip.

**Urine sample collection:** Urine samples were collected to detect biomarkers of protein and calorie intake (Urea nitrogen and Creatinine) and were analyzed using Urease-Berthelot method and Jaffe/colorimetric methods respectively.

**Data analysis:** Data was analysed using Statistical Package for Social Sciences (SPSS) version 20. The anthropometric indices of the children were interpreted using anthropometric software developed by World Health Organization.

## RESULTS

The results obtained in the study are summarised in Table 1-10 and divided into demographical characteristics; infant and young children feeding practices; hygiene and sanitation; and nutritional status.

Table 1 shows that most of the mothers (51.1%) were in the age group of 25-34 years. The modal level of education of mothers studied was secondary school education. Table 2 shows a total of 270 children between the ages of 0-59 months (58.5% boys and 41.5% girls), with their caregivers which comprised of mothers and grandmothers living in Kumbotso local government Kano state during the period of data collection were sampled and their data was analysed. Majority of the children were between the ages of 6-24 months. Table 3 shows the breastfeeding practices of the caregivers studied. Majority of the mothers did not practice early initiation of breastfeeding; only few initiated breastfeeding within one hour of birth. The major reason for not initiating breastfeeding early was that the infant does not demand for it or there was no breast milk supply during the first few days after birth.

Based on the results obtained from this study, only few of the infants and children assessed were exclusively breastfed. Majority of infants and children were fed with other fluids

Table 1: Characteristics of the caregivers

| Variable | Frequency (N = 270) | Percentage |
|---|---|---|
| **Caregivers** | | |
| Mothers | 268 | 99.26 |
| Grandmothers | 2 | 0.74 |
| Others | 0 | 0.00 |
| **Age (years)** | | |
| 15-24 | 64 | 23.70 |
| 25-34 | 138 | 51.10 |
| 35-44 | 42 | 15.60 |
| ≥45 | 26 | 9.60 |
| **Level of education** | | |
| No formal education | 43 | 15.90 |
| Primary | 52 | 19.30 |
| Secondary | 145 | 53.70 |
| Tertiary | 30 | 11.10 |
| **Place of delivery** | | |
| Hospital | 80 | 29.60 |
| Home | 190 | 70.40 |

Table 2: Characteristics of the infant/child

| Variables | Frequency | Percentage |
|---|---|---|
| **Age of the child** | | |
| 0-6 months | 41 | 15.2 |
| 6-24 months | 191 | 70.7 |
| 24-59 months | 38 | 14.1 |
| **Gender** | | |
| Female | 158 | 58.5 |
| Male | 112 | 41.5 |

Table 3: Breastfeeding practices

| Practice supporting exclusive breastfeeding | Frequency | Percentage |
|---|---|---|
| **Initiation of breastfeeding within 1 h of delivery (N = 270)** | | |
| Yes | 64 | 23.7 |
| No | 206 | 76.3 |
| **Reasons for not initiating (N = 206)** | | |
| No milk | 63 | 30.6 |
| Child did not demand | 98 | 47.6 |
| Baby was sick | 17 | 8.3 |
| Mother was sick | 28 | 13.6 |
| **Mothers knowledge on exclusive breastfeeding (N = 270)** | | |
| Have knowledge | 126 | 46.7 |
| No knowledge | 144 | 53.3 |
| **Practice of exclusive breastfeeding for up-to 6months (N = 228)** | | |
| Yes | 35 | 15.4 |
| No | 193 | 84.6 |
| **Reasons for not practicing Exclusive breastfeeding (N = 193)** | | |
| No milk | 78 | 40.4 |
| Baby needs water | 97 | 50.3 |
| Others | 18 | 9.3 |

Table 4: Complementary feeding practice

| Variable | Frequency | Percentage |
|---|---|---|
| **Knowledge about appropriate complementary feeding** | | |
| Have knowledge | 9 | 3.30 |
| No knowledge | 261 | 96.70 |
| **Age when complementary foods are introduced (n = 244)** | | |
| <6 months | 178 | 72.95 |
| 6 months | 47 | 19.26 |
| >6 months | 19 | 7.79 |
| **Weaning (n = 82)** | | |
| <24 months | 44 | 11.30 |
| 24 months | 36 | 13.80 |
| >24 months | 2 | 0.60 |

Table 5: Dietary habit and diversity from 24 h recall

| Variables | Frequency (N = 230) | Percentage |
|---|---|---|
| Children consumed cereal and grains | 229 | 100.00 |
| Children consumed Milk and milk products | 36 | 15.70 |
| Children consumed legumes and nuts | 97 | 42.36 |
| Children consumed meat and meat product | 26 | 11.35 |
| Children consumed other fruit and vegetables | 111 | 48.47 |
| Children consumed vitamin A fruits and Vegetables | 142 | 62.00 |
| Dietary diversity | 61 | 26.63 |

besides breast milk. More than half of the mothers interviewed have no knowledge regarding exclusive breastfeeding where only 46.7% reported having knowledge on exclusive breastfeeding. Majority of the mothers did not practice exclusive breastfeeding because most of them think that the breast milk is not enough to provide the required amount of fluid an infant needs to prevent him/her from feeling thirsty.

Table 4 shows that, majority of the mothers appears to have no knowledge about appropriate complementary feeding practices. Majority of them started introducing complementary foods to their children before the age of 6 months. Only 13.8% of children were weaned from breast milk at the age of 24 months.

According to the 24 h recall interview results summarised in Table 5, less than half of children (6-59 months of age) have adequate dietary diversity (four or more food groups consumed the previous day). The result revealed that children (6-59 months of age) were mainly fed with diet containing basic staples, legumes and vitamin A rich fruits and vegetables. Meat/meat products and milk/milk products intake was inadequate among children (6-59 months of age). Table 6 shows that tap water is the major source of water for drinking and cooking among the studied population. Majority of the caregivers practiced hand washing before cooking always, while only few practiced hand washing before feeding their children.

Table 7 shows the anthropometric indices of the studied children. The overall prevalence of wasting and stunting among the children was 10.4 and 16% respectively. Severe

(<-3SD) and moderate (-3SD to -2SD) wasting in the children was 6.3 and 4.1% respectively. Few of the children (9.1%) were found to be overweight/obese. Table 8 shows that about half of the 100 children have abnormal urea and creatinine nitrogen. The results in Table 9 indicate that there is significant positive correlation between knowledge of breastfeeding and place of child delivery (r = 0.547); knowledge of breastfeeding and practice of exclusive breastfeeding (r = 0.445) and breastfeeding initiation (r = 0.288).

As shown in Table 10, there was significant positive correlation between urine urea nitrogen level and MUAC (p<0.01). There was no significant correlation between practice of EBF, knowledge of complementary feeding, age of starting complementary feeding, consumption of protein-rich foods and urine urea nitrogen status level (p>0.01) of the respondents. There was significant correlation between MUAC and the urine creatinine levels (p<0.01) of the respondents. However, there was no significant correlation between practice of EBF, knowledge of complementary feeding, age of starting complementary feeding, consumption of protein rich foods and urine creatinine level (p>0.01).

Table 6: General hygiene practices of the respondents

| Variables | Frequency | Percentage |
|---|---|---|
| **Water source for drinking** | | |
| Tap | 125 | 39.2 |
| Borehole | 76 | 23.8 |
| Well | 69 | 21.6 |
| **Vessels use for fetching water** | | |
| Vessel for that purpose | 155 | 57.4 |
| Bathing bucket | 99 | 36.7 |
| Washing basing | 16 | 5.9 |
| **Washing of hands before cooking** | | |
| Always | 107 | 39.63 |
| Sometimes | 161 | 59.63 |
| Never | 2 | 0.74 |
| **Washing of hands before child feeding** | | |
| Always | 31 | 11.48 |
| Sometimes | 156 | 57.78 |
| Never | 83 | 30.74 |
| **Frequency of child bathing** | | |
| Once a day | 129 | 47.78 |
| More than once | 129 | 47.78 |
| Every other day | 12 | 4.4 |

## DISCUSSION

Findings from this study suggest that mothers with high educational attainment (tertiary education) were more likely to breastfeed exclusively. This observation (association between exclusive breastfeeding and education) agrees with the findings of a recent study in Nigeria[25]. Results from the study demonstrated that there is inappropriate child feeding practices mostly due to lack of mother's knowledge about infant and young children feeding practices. More than half of

Table 7: Nutritional status

| Variable | Frequency (N = 270) | Percentage |
|---|---|---|
| **Weight-for-height** | | |
| Severely wasted | 20 | 6.3 |
| Moderately wasted | 13 | 4.1 |
| Normal | 208 | 65.2 |
| Overweight/Obese | 29 | 9.1 |
| **Height-for-age** | | |
| Severely stunted | 27 | 8.5 |
| Moderately stunted | 24 | 7.5 |
| Normal | 219 | 68.7 |
| Tall | 13 | 4.1 |
| **Mid-upper arm circumference** | | |
| Severely wasted | 1 | 0.4 |
| Moderately wasted | 35 | 15.3 |
| Normal | 193 | 84.3 |

Table 8: Urea nitrogen and creatinine level of children between 6-59 months of age

| Variable | Frequency (N = 100) | Percentage |
|---|---|---|
| **Urine creatinine level** | | |
| Normal (1-1.5 g/24 h) | 51 | 51 |
| Deficient (< 1 g/24 h) | 39 | 39 |
| Above (>1.5 g/24 h) | 11 | 11 |
| **Urea nitrogen level** | | |
| Normal (20-35 g/24 h) | 60 | 60 |
| Deficient (<20 g/24 h) | 20 | 20 |
| Above (>35 g/24 h) | 20 | 20 |

Table 9: Comparison between Knowledge of breastfeeding, breastfeeding initiation and practice of exclusive breastfeeding

| Variables | Mean±SD | r-value |
|---|---|---|
| Place of delivery | 1.70±0.457 | 0.547** |
| Breastfeeding initiation | 2.14±0.755 | 0.288** |
| Practice of EBF | 1.53±0.500 | 0.445** |

SD: Standard deviation, r: Correlation, EBF: Exclusive breastfeeding

Table 10: Association between nutritional status and related factors

| Variables | Urine urea nitrogen status level (p-value) | Urine creatinine status level (p-value) |
|---|---|---|
| Practice of EBF | 0.356 | 0.197 |
| Knowledge of CF | 0.510 | 0.281 |
| Age of introducing CF | 0.398 | 0.565 |
| MUAC | 0.000 | 0.000 |
| Consumption of PRFs | 0.253 | 0.115 |

**Correlation is significant at the 0.01 level (2-tailed). EBF: Exclusive breastfeeding, CF: Complementary feeding, MUAC: Mid-upper arm circumference, PRFs: Protein rich foods

the mothers (53.3%) had no knowledge about exclusive breastfeeding and 76.3% of the infants were not breastfed within one hour of birth.

Studies have demonstrated that early introduction to solid foods is a risk factor for infection, early cessation of breastfeeding and increased consumption of fatty or sugary foods at one year of age[26]. Results showed that more than half of the children were introduced complementary foods before the recommended age of 6 months. This high frequency is similar with the studies in north western Nigeria where majority of the children (41.2%) were introduced to complementary foods much earlier at 3rd month[27]. Poor practice of early introduction of complementary foods may be due to the fact that mothers have wrong perception about feeding breast milk alone for the recommended duration of six months. In fact, this study indicates that majority of mothers and caregivers believed that their babies were not satisfied with breast milk as such they felt complementary feeding should commence.

Dietary diversity is an important element for diet adequacy. The poor diet diversity among children could be due to the poor knowledge, attitude, infant and young child feeding practices of the caregivers. Diets of children assessed in this study were: often poorly balanced; composed mainly of staple foods, legumes, Vitamin A rich-fruits and vegetables; and poor in fruits and vegetables, meat and milk products. Findings of the present study revealed that only few (26.63%) of the children (aged 6-59 months) have adequate dietary diversity score. In contrast, a previous study reported adequate dietary diversity in Moramanga (57.8%) and Morondava (52.3%.) districts[28].

The most important way to reduce the spread of infection among children is clean water, basic toilets and good hygiene practices. Finding from this study depicted that tap was the major source of water for drinking and cooking food which is similar to a study conducted in urban slum of Butwal sub-metropolitan city of Nepal[29]. However, the extensive use of dirty containers and improper water storage facilities and practices are the main cause of waterborne illnesses in the population studied.

Similar study[30] conducted in Adama town, Central Ethiopia suggested positive association between high level of formal education and employment status of mothers with nutritional status of children. The low level of formal education and high level of unemployment among caregivers may have contributed to the poor feeding practices of infant and young child. A related study conducted among pastoral community in Simanjiro District, Tanzania[31] suggested the need to promote appropriate multidisciplinary approach on nutrition education, environmental sanitation and hygienic practices at family and community level in order to reduce childhood illnesses thereby increasing child health and nutritional status. A closely related primary health care facility -based study[32] concluded that majority of mothers of children under-five years in Indian rural settings had fair to good knowledge, attitude and practices regarding under-five nutrition and prevention of malnutrition.

## CONCLUSION

The Research demonstrated that there is inappropriate feeding practice among children under-five compared to the recommend standard, which is mostly due to lack of mother's knowledge, attitude and practice about infant and young children feeding. The need for aggressive campaign for good feeding practices of infant and young child is necessary to make required progress in tackling malnutrition in Kano, Nigeria.

## SIGNIFICANCE STATEMENT

This study discovered that poor knowledge, attitude and practices of caregivers is a significant contributor to the poor nutritional status of children under five. To the best of our knowledge, this is the first study that assessed knowledge, attitude and practices among caregivers of children less than 5 years in Kumbotso Local Government Area of Kano State, Nigeria. Findings of this study will guide appropriate policy formulation and encourage nutritional education intervention to address the poor knowledge, attitude and practices among caregivers of children in Kano State, Nigeria.

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