

Food Demonstration as A Behavioural Change Communication Strategy for Maternal, Infant and Young Child Nutrition: A Descriptive Observational Study

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ABSTRACT

Malnutrition remains a major cause of morbidity and mortality among children under five years of age, particularly in low- and middle-income countries. Inadequate infant and young child feeding (IYCF) practices contribute substantially to this burden. Food demonstration, a practical component of Behaviour Change Communication (BCC), can help translate nutrition knowledge into feasible, context-specific feeding practices by giving mothers and caregivers hands-on experience preparing nutritious meals using locally available foods. However, its integration into routine maternal, infant, and young child nutrition counselling remains limited in many healthcare settings. **Objective:** This study assessed the role of food demonstrations as a Behaviour Change Communication strategy in maternal nutrition education and infant and young child feeding practices among mothers attending a tertiary hospital in Makurdi, Nigeria. **Methods:** A descriptive, observational study was conducted among antenatal and postnatal women, mothers/caregivers attending immunization and paediatric outpatient clinics, and healthcare workers at the Teaching Hospital of Rev. Fr. Moses Orshio Adasu University, Makurdi. Fifty-five (55) mothers/caregivers and fifteen (15) healthcare workers who were present and accessible on the day of data collection were recruited using total population sampling. Data were collected using pretested, structured questionnaires, followed by health education sessions and practical food demonstrations using locally available foods. Descriptive statistics summarized participants' sociodemographic characteristics, exposure to nutrition counselling and food demonstrations, and reported infant and young child feeding practices. **Results:** Most mothers/caregivers were aged 25–34 years (61.8%), married (87.3%), and had tertiary-level education (69.1%). Although 90.9% correctly identified the concept of food demonstration, only 32.7% had previously participated in one. Overall, 61.8% reported receiving nutrition counselling, most commonly through one-on-one sessions (44.1%) and group discussions (35.3%), whereas only 11.8% reported receiving food demonstrations. Reported complementary feeding practices were predominantly cereal-based, with limited inclusion of animal-source foods and fruits, indicating potential gaps in dietary diversity despite relatively high levels of maternal nutrition knowledge. **Conclusion:** The findings demonstrate a substantial gap between mothers' knowledge and practical exposure to food demonstrations. Food demonstrations were infrequently incorporated into routine nutrition counselling, despite their potential value as a Behaviour Change Communication strategy.

Keywords: Food demonstration, Behaviour Change Communication, Maternal nutrition, Complementary feeding, Infant and Young Child Feeding, Nutrition counselling, Nigeria.

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INTRODUCTION

Malnutrition continues to be one of the world's leading public health problems, and nutritional disorders remain predominant in Low-middle income countries.¹ Studies estimate that more than 200 million children under five years are undernourished, while others are overweight.² One of the key interventions for ensuring good health, growth, and development of children is Maternal, Infant and Young Child Nutrition (MIYCN). Children can achieve optimal nutrition through appropriate feeding from infancy to early childhood years.³

Optimal maternal nutrition is also key for women to maintain good nutritional status before conception to support a healthy pregnancy and lactation. Previous studies established an association between maternal poor nutritional status before and during pregnancy with Intrauterine Growth Restriction (IUGR), Low Birth Weight (LBW), and Preterm delivery.⁴ Child undernutrition is still a major public health problem across low-income countries globally and is responsible for about 45% of deaths in children under five years.² To reduce this burden, World Health Organization (WHO) member states adopted nine global nutrition targets leading into 2025, and these include: A 40% reduction in childhood stunting, a <5% prevalence of wasting, and the prevention of further increase in childhood overweight. By 2030, countries should also aim to eliminate all forms of malnutrition.^{5,6} Unfortunately, efforts to meet these set targets have not gone as planned. To date, only a few countries are well positioned to meet global nutrition targets, and malnutrition remains a challenge despite global efforts.⁶ Malnutrition continues to defy global efforts to eliminate it; hence, there is a need to explore alternative means that could provide a lasting solution to the problem. Promoting optimal MIYCN practices through BCC could be one intervention.^{7,8} BCC interventions are modelled on the understanding that good nutrition knowledge is a major facilitating factor in addressing poor diets and inadequate food consumption, and, by extension, poor nutritional status.

Improving mothers' nutrition should start long before pregnancy, as the window from conception to 24 months is the critical period for improving child nutrition, and deficits once acquired by this age become difficult to change.⁹ BCC is premised on having good knowledge and practices, which then act as the drivers for improving one's dietary behaviour.⁻⁷ Changing behaviours is pivotal for improving nutrition outcomes. The COM-B framework postulates that for one to change behaviour, they must have the Capability (physical & psychological), Opportunity (physical & social), and Motivation (automatic & reflective). The Behaviour Change Wheel then takes these components into account and determines what appropriate intervention functions could help induce change. Suitable behaviour change techniques are then selected to help design the intervention.¹⁰ Studies have shown that BCC interventions modelled after this framework improve good nutrition outcomes.¹¹ According to Shelton, behaviour change is the "missing block" in most global health systems. Many of the top health risk factors in Sub-Saharan Africa are attributed to behavioural issues. These risk factors include childhood undernutrition and micronutrient deficiencies.¹²

The study by Mbogori et al. showed that a demonstration-based nutrition education program can strengthen mothers' knowledge and caregiving practices, especially around complementary feeding and child illness management. However, it may not be enough on its own to change children's nutritional status.¹³

Watson *et al.* conducted a systematic review of 79 studies. All the studies were from Sub-Saharan Africa and assessed both nutrition-sensitive and specific interventions and their effects on maternal and child nutrition outcomes. Results from the review revealed that nutrition interventions accompanied by a behaviour change component, such as counselling and communication, produced the best outcomes. Examples of these positive outcomes were: reduced wasting, underweight, and stunting, as well as improved dietary diversity and overall food consumption.¹⁴ Another study conducted in Malawi concluded that dietary diversity

and nutrition can be improved simply by encouraging mothers to take locally available nutritious foods during their pregnancy. This intervention was based on the Theory of Planned Behaviour and results from the study showed significant improvements in diet and nutritional status.¹⁵ A study conducted in Nigeria determined the effect of BCC intervention on infant and young child nutritional outcomes. The study was done in South-West Nigeria, and results from it revealed that BCC targeting the mothers led to significant improvement in the nutritional status of the infants and children, thereby preventing malnutrition and its complications in early childhood.¹⁶

Nutrition education can be used to improve nutrition knowledge. This has also been shown to help shape one's attitude and practice towards good nutrition.^{17,18} Targeted educational campaigns play a foundational role in modifying caregiver behavior and improving nutritional literacy. In Uganda, institutional nutrition education has been shown to significantly enhance caregivers' actionable knowledge and hands-on practices, particularly regarding hygienic and nutritionally dense meal preparation for weaning children.¹⁹ Similarly, evidence from Ethiopia demonstrates that health education serves as a primary catalyst for behavioral compliance, specifically driving mothers to initiate complementary feeding at the globally recommended age of six months.²⁰ Collectively, these regional findings highlight that structured information dissemination successfully builds capacity and intent among caregivers. The kinds of foods to feed and how to prepare them in the right portions and combinations, as well as how to prepare them safely and cleanly for children's consumption, is key information that mothers should know. Behaviour change can help pass this vital information to mothers in a way that could alter their behaviour when it comes to feeding.⁻⁷ Therefore, empowering women with the right nutrition knowledge and skills can have a bigger impact on child nutritional outcomes. This study conducted food demonstrations. This will help improve the mothers' nutrition knowledge, thereby improving nutrition outcomes among the mothers as well as infants

and children.

MATERIALS AND METHODS

Study Design: A descriptive observational study carried out among mothers attending Antenatal and Postnatal clinics (ANC/PNC), immunization clinic and Paediatric outpatient department (POPD) in the Teaching Hospital of Rev. Fr. Moses Orshio Adasu University, Makurdi. It is a tertiary health facility that provides specialized clinical services/training as well as research in various fields of medicine. The hospital has over 350 beds across different clinical departments that attend to patients. These clinical departments include Paediatrics, Obstetrics and Gynaecology, Internal Medicine and Surgery, and Community Medicine, among others. The hospital also runs various clinics such as the ANC/PNC clinic, the immunization clinic, etc.

On average, the ANC and PNC have about 429 women attend their clinic monthly. The immunization clinic and POPD have about 800 and 213 mothers/caregivers attend the clinics monthly.

The study population comprised women attending antenatal and postnatal clinics, mothers of children attending the Immunization Clinic and Paediatric Outpatient department (POPD), as well as healthcare workers in these clinics. Only mothers/caregivers who provided informed consent and were present on the scheduled days of the food demonstrations were enrolled.

A whole-population sampling method was employed to enroll all eligible women, mothers/caregivers, and healthcare workers attending the selected clinics during the study period.

Data Collection Procedure

Data were collected using a structured, pretested questionnaire administered to mothers/caregivers and healthcare workers. Socio-demographic information obtained includes: age and education, among others. We ensured that mothers/caregivers who lived with the children and were responsible for preparing their meals were interviewed to obtain a true reflection of their diets.

Educational session: A health talk on nutrition during

pregnancy and lactation, the importance and benefits of breastfeeding, and complementary feeding was delivered by two of the researchers. A question-and-answer session then took place.

Food demonstration sessions highlighted the preparation of age-appropriate, nutrient-dense meals for infants and young children, as well as pregnant and breastfeeding mothers, using locally available foods. Emphasis was placed on dietary diversity, portion sizes, and hygienic preparation methods.

These sessions were recorded, and the videos were played for mothers attending subsequent clinic sessions as the study concluded. This was done to sustain the impact of the intervention even after the study.

Statistical Analysis

Data were analysed using Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive statistics were carried out using frequencies. Tables were used to present the univariate analysis.

Ethical Consideration

Ethical clearance was obtained from the Rev. Fr. Moses Orshio Adasu University Teaching Hospital Health Research Ethics Committee.

Results

Table 1: Sociodemographic characteristics of the mothers (n=55)

Characteristic	Frequency (n)	Percent (%)
Age		
20 -24	4	7.3
25 -29	17	30.9
30 -34	17	30.9
35 -39	11	20.0
≥40	6	10.9
Marital status		
Single	3	5.4
Married	48	87.3
Widowed	4	7.3
Education		
Primary	7	12.7
Secondary	10	18.2
Tertiary	38	69.1
Employment		
Unemployed	13	23.6
Self -employed	20	36.4
Employed in private sector	8	14.5
Employed in public sector	14	25.5
Clinic		
Antenatal	10	18.1
Postnatal	4	7.3
Immunization	32	58.2
Paediatrics	9	16.4

Table 1 shows that most respondents were aged 25–34 years (61.8%), married (87.3%), and had tertiary education (69.1%). Over a third were self-employed (36.4%), and more than half were recruited from the immunization clinic (58.2%).

Table 2: Sociodemographic characteristics of the healthcare workers (n=15)

Characteristic	Frequency (n)	Percent (%)
Age		
20 -24	0	0.0
25 -29	1	6.7
30 -34	2	13.3
35 -39	7	46.7
≥40	5	33.3
Gender		
Male	4	26.7
Female	11	73.3
Marital status		
Single	4	26.7
Married	11	73.3
Highest education		
Primary	0	0.0
Secondary	0	0.0
Tertiary	15	100.0
Job title		
Medical doctor	5	33.3
Nurse	3	20.0
Dietician	3	20.0
CHEW	2	13.3
Secretary	2	13.3

Table 2 shows that most of the healthcare workers were aged 35–39 years (46.7%), female (73.3%), and married (73.3%); all had tertiary education (100.0%). The largest professional group was doctors (33.3%), followed by nurses and dietitians (20.0% each).

Table 3: Knowledge and sources of information on food demonstration among the mothers (n=55)

Item	Frequency	Percentage (%)
What is a food demonstration?		
Teaching people about food and nutrition, and showing them how to prepare food	50	90.9
Displaying all the available kinds of food in the country	3	5.5
Training people to become professional cooks	2	3.6
One of these is a class of food		
Minerals	39	70.9
Rich food	6	10.9
Nutritious food	10	18.2
Ever attended a food demonstration?		
Yes	18	32.7
No	37	67.3
Ever been counselled on nutrition by a healthcare worker?		
Yes	34	61.8
No	21	38.2
Nutrition counselling method adopted by HCW		
One-on-one method	15	44.1
Group discussion	12	35.3
Videos	3	8.8
Food demonstration	4	11.8

Table 3 shows that most mothers (90.9%) correctly identified a food demonstration as teaching people about food and nutrition and showing them how to prepare food, while a majority (70.9%) incorrectly classified minerals as a class of food. Only 32.7% of mothers had ever attended a food demonstration, whereas 61.8% had been counselled on nutrition by a healthcare worker at some point. Among mothers who had received nutrition counselling (n = 34), the one-on-one method was the most commonly used (44.1%), followed by group discussion (35.3%), food demonstration (11.8%), and videos (8.8%).

Table 4: Dietary preferences and practices among the mothers (n=55)

Item	Frequency (n)	Percentage (%)
The most common source of food		
My farm	16	29.1
The market	39	70.9
Greatest influence on food choices		
Family background	36	65.5
Food adverts	9	16.4
Friends	2	3.6
Culture	8	14.5
Frequency of incorporating locally grown food in the diet		
Once a week	11	20.0
Three times a week	28	50.9
At least five times a week	16	29.1
Preference for processed food over natural food		
Yes	14	25.5
No	41	74.5
Reason for preferring processed food		
Faster to prepare	4	28.6
Tastes better	2	14.3
Healthier	8	57.1
Type of complementary food given to the last child		
Commercial	4	7.3
Home-made	27	49.1
Both	24	43.6
Age when complementary feeding was introduced (months)		
< 6	21	38.2
6	32	58.2
> 6	2	3.6
Components of complementary food given to the child		
Maize	17	32.1
Guinea corn	10	18.9
Soybean	12	22.6
Millet	32	58.2
Crayfish	12	22.6
Tomatoes	4	7.5
Palm oil	4	7.5
Onions	6	11.3
Pepper	4	7.5
Yam	4	7.5
Beans	10	18.9
Rice	10	18.9
Water melon	2	3.8
Banana	5	9.4
Eggs	4	7.5
Fish	2	3.8
Milk	5	9.4
Groundnut	7	13.2
Sugar	1	1.9
Tiger nut	1	1.9
Locust beans	2	3.8
Noodles	1	1.9

Table 4 shows that the market was the most common food source among respondents (70.9%), and family background had the greatest influence on their food choices (65.5%). More than half incorporated locally grown food into their diet up to three times a week (50.9%). Regarding complementary feeding, nearly half of the respondents gave their last child home-made complementary food (49.1%), while only a few gave

commercial varieties (7.3%); the remainder used a combination of both (43.6%). Most respondents commenced complementary feeding at 6 months (58.2%); however, nearly one-third did so before 6 months (38.2%).

DISCUSSION

This study identified an important gap between mothers' knowledge of food demonstrations and their actual exposure to demonstration-based nutrition education. Although most participants understood the concept of food demonstrations, relatively few had previously participated in one.

This gap has been reported several times in nutritional literature: Tubaramure in Burundi showed that combining food assistance with behavior change communication improved household food security, maternal dietary diversity, and child complementary feeding practices²¹. This supports the idea that nutrition education is more effective when paired with practical support and behavior-focused intervention. Although our findings suggest limited exposure to practical demonstrations, the present study did not assess whether participation in food demonstrations resulted in measurable behavioural or nutritional improvements.

The introduction of complementary foods before 6 months of age remains common in developing countries, despite numerous sensitization efforts on best practices²². This study found that nearly one-third of mothers introduced complementary foods before six months of age; children were therefore not only being introduced to complementary foods too soon, but were also receiving a diet lacking in diversity. Early introduction of complementary foods displaces exclusive breastfeeding at a stage when breast milk alone can still adequately meet an infant's nutritional and immunological needs, and increases exposure to microbial contamination from poorly prepared or stored foods, particularly in settings with limited access to safe water and sanitation.²³ This dual risk - reduced breastfeeding and greater pathogen exposure has been linked to higher rates of diarrheal disease and other infections in infants introduced to solids before the recommended age.²⁴ Evidence also suggests that early introduction of complementary foods is associated with increased body mass index and risk of childhood overweight and obesity.²⁵ The complementary foods reported by participants consisted predominantly of cereal-based preparations with relatively limited

inclusion of animal-source foods, fruits and vegetables. This pattern reflects a broader problem documented across sub-Saharan Africa and other low- and middle-income settings, where diets during the complementary feeding period are frequently dominated by starchy staples with minimal dietary diversity²⁶. Inadequate dietary diversity is a recognized proxy for poor micronutrient adequacy, and diets low in animal-source foods in particular predispose children to deficiencies in iron, zinc, and vitamin A, nutrients that are less bioavailable from plant-based staples alone²⁷. Such deficiencies, compounded by inadequate intake of vitamin A-rich fruits and vegetables, have been consistently associated with stunting, wasting, underweight, and increased susceptibility to infection in children under two years.²⁸ Globally, only around one-third of children aged 6–23 months meet minimum dietary diversity thresholds, and modelling studies suggest that a substantial proportion of stunting cases could be averted through improved diet diversity alone.²⁹ Taken together, the co-occurrence of early complementary feeding initiation and low dietary diversity observed in this study likely compounds nutritional risk, since children are both prematurely deprived of the protective and nutrient-dense benefits of continued breastfeeding and simultaneously receiving a complementary diet of poor micronutrient quality. Although this pattern suggests suboptimal dietary diversity, validated indicators of dietary diversity were not measured in this study. Studies of programmatic BCC packages implemented in structured settings have yielded mixed results. A cluster-randomised trial conducted in rural Bangladesh showed that intensive BCC increased the likelihood that women would feed their child eggs by 10 percentage points and legumes by 14.1 percentage points.³⁰ These findings suggest that demonstration-based BCC may be a useful strategy for increasing consumption of animal-source foods, although this hypothesis requires evaluation in intervention studies in the Nigerian context.

One key finding was that although mothers received nutrition education via didactic group or individual counselling, most had never been exposed to food

demonstration sessions. Active learning through behavioural modelling has been shown to promote positive nutrition behaviours.³¹ A scoping review of social behaviour change (SBC) techniques found that "demonstration of the behaviour" had one of the highest effectiveness ratios (>0.8) for improving complementary feeding practices.³² Passive counselling alone may be less effective than interactive BBC strategies in promoting sustained improvements in complementary feeding practices. However, giving instructions was identified as the least effective technique.³²

The JEEViKA project in rural India has demonstrated the significant impact of hands-on training. There, food demonstrations were used as "positive reinforcement". Women were able to visualize and recall takeaways from the session. This led to positive changes not only in frequency but also in dietary diversity.³³ Our study did not evaluate behavioural changes following food demonstrations, unlike the Indian intervention study. As a result, we cannot draw similar conclusions from our findings.

Strengths and Limitations

This study has several limitations. First, the descriptive cross-sectional design precludes causal inference. Second, the relatively small sample size from a single tertiary hospital limits generalizability. Third, dietary diversity was not assessed using validated WHO indicators. Fourth, feeding practices were based on maternal reports and may have been affected by recall or social desirability bias. Finally, no post-intervention assessment was conducted to evaluate the effectiveness of the food demonstrations.

Despite these limitations, the study provides valuable baseline information regarding maternal nutrition counseling practices in a tertiary healthcare setting. It highlights the underutilization of food demonstrations as a potentially valuable BCC strategy. The inclusion of healthcare workers alongside mothers provides additional insight into routine service delivery practices.

Public health Implications

These findings highlight a missed opportunity to strengthen complementary feeding practices through demonstration-based behaviour change communication (BCC). The low uptake of food demonstrations, despite general awareness of the concept, suggests that current infant and young child feeding counselling remains predominantly didactic, even though hands-on approaches are more effective in changing feeding behaviour. Integrating structured food demonstrations into routine antenatal, postnatal, and child welfare services alongside training healthcare workers to confidently deliver them could offer a low-cost, scalable strategy for improving both the timing and diversity of complementary feeding. Given the descriptive design of this study, intervention research is needed to formally evaluate the effectiveness of demonstration-based BCC on feeding practices and nutritional outcomes in Nigeria.

CONCLUSION

The study identified a substantial gap between awareness of food demonstrations and actual exposure to this practical approach to nutrition education. Food demonstrations were infrequently incorporated into routine nutrition counselling despite their potential to bridge the gap between nutrition knowledge and appropriate feeding practices. Integrating regular, culturally appropriate food demonstrations using affordable, locally available foods into maternal and child health services may strengthen BCC and support improved infant and young child feeding practices. Further longitudinal and intervention studies are needed to determine their effectiveness in producing sustained behavioural change.

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Conflict of interest:

The authors declare no conflict of interest.

Data Availability Statement:

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request, subject to institutional ethical approval and participant confidentiality requirements.

Author's contributions (CRediT statement)

A.R.J.: Conceptualization, Methodology, Supervision, Formal Analysis, Writing – Original Draft, Writing–Review & Editing.

U.P.M.: Methodology, Supervision, Investigation, Writing–Review & Editing.

A.M.: Investigation, Data Curation, Formal Analysis, Visualization, Writing – Original Draft, Writing–Review & Editing.

I.G.M.: Investigation, Project Administration, Writing–Review & Editing.

All authors read and approved the final manuscript and agree to be accountable for all aspects of the work.

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