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ASSESSMENT OF THE INFLUENCE OF THE DIETARY PATTERN OF MOTHERS ON THE NUTRITIONAL STATUS OF THEIR UNDER-FIVE CHILDREN IN ILORIN METROPOLIS

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ABSTRACT: *Malnutrition is a significant contributor to child mortality and morbidity in Nigeria, with poor dietary practices of mothers of under five children being a critical indicator of their nutritional outcomes and health status. This paper reviews studies on the influence of dietary practices on the nutritional status of children in Ilorin Metropolis, Nigeria. The studies were sourced from various electronic databases, including PubMed, Google Scholar, Sci-space, and Consensus. The study was conducted in the Ilorin metropolis, Kwara State, between February 15th and March 31st, 2024. The research aimed to assess the dietary patterns of mothers of their under five children in the city. The study used a descriptive design and a multistage sampling technique to select 225 children of under-five age. The sample size was determined using the Leslie Kish multistage formula. Data collection tools included self-structured questionnaires, weighing scales for children, and meter rules. The study used SPSS 25.0 windows for data analysis, which was presented using frequency distribution tables, percentages, chi-square, and univariate regression statistical methods. The findings showed that dietary practices by mothers significantly influence the body max index of children (at $p<0.05$), with undernutrition being more prevalent. Overweight and normal children were the least associated with dietary practices (at $p<0.05$). The study also found that the dietary practice of children is affected by mothers aged at first birth (at $p<0.05$), suggesting that mothers aged at first birth can contribute to formulating policies on right dietary practices to enhance nutrition security, especially for young mothers between 18 and 25 years old. The findings provided insights into strategic interventions to enhance dietary practices and eradicate all forms of malnutrition associated with undernutrition in children under five years old.*

KEYWORDS: Dietary, Pattern, Mothers, Nutritional status, Under five.

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INTRODUCTION

Yau et al. (2020) stated that healthy dietary patterns are crucial for maintaining good health and preventing chronic diseases. Food-based dietary guidelines (FBDG) provide advice on foods, food groups, and dietary patterns to provide necessary nutrients, prevent chronic diseases, and promote overall health while considering cultural preferences. According to Mahmood et al. (2021), dietary intake has been linked with obesity in terms of volume, composition, meals' frequency, snacking habits and diet quality. UNICEF (2023) asserts that a woman's nutritional status is a powerful barometer of her and her children's well-being. Sturgeon et al. (2023) stated that improving maternal, infant and young child nutrition expands opportunities for every child to reach his or her full potential. Khadka et al. (2020) revealed that health experts opined that poor maternal health among women is directly contributing to child malnutrition; nearly a quarter of the country's estimated 14.5 million women are malnourished, afflicted particularly by a low body mass index. According to the 2016–2017 Global Competitiveness Report, South Asia is also one of the regions in the world where child undernutrition is highest. The reasons attributed to such high rates of undernutrition in South Asia include gender inequality, poor sanitation, poor diets and low dietary diversity and ineffective nutritional programs (Goto et al., 2019); and in Nigeria, the level of income earning in the rural area, particularly among women, couple with large family size, has contributed to an increase in the level of child malnutrition (Ashagidigbi et al., 2022).

UNICEF (2023) stated that to raise a healthy baby, mothers need good nutrition and rest, adequate antenatal care, and a clean environment. Together, these ingredients for a healthy pregnancy can help to prevent, identify and treat the conditions that cause low birthweight. A newborn's weight at birth is an important marker of maternal and fetal health and nutrition. Abhadionmhen et al. (2023) stated coordinated efforts have continuously initiated various intervention programs in resolving the demoralizing nature of malnutrition around the world. In Nigeria, the National Plan of Action on Food and Nutrition was instigated to strengthen health and community systems through the integration of nutrition programs into all aspects of the primary health care (PHC) system, with a particular focus on Infant and Young Child Feeding (IYCF) interventions among others.

Out of the dietary habits, family mealtime becomes the main social context in which children can eat with their parents, who are considered as their main role-models. Sharing meals with children, having breakfast together regularly and encouraging children to have healthy snacks with moderate restrictions have shown positive impacts on children's dietary behaviors (Mahmood et al., 2021). Yau et al. (2020) stated that food-based dietary guidelines (FBDG) are essential for maintaining good health and preventing chronic diseases. They provide advice on foods, food groups, and dietary patterns, considering cultural preferences. The European Food Safety Authority recommends a stepwise approach, testing and optimizing iteratively. Computerized diet optimization models have been used to reduce subjective decision-making. The Health Council of the Netherlands derived FBDG based on systematic reviews and expert judgment.

Correct dietary patterns are important for a child's health from birth to adulthood. Correct dietary patterns during preconception, pregnancy, and infancy are important for a child's long-term health and development (Pollyanna et al., 2022). Factors such as the mother's lifestyle, culture, and socioeconomic status play a crucial role in shaping these dietary patterns (Jossie & Rogacion, 2023). Understanding a child's health as a state of physical, mental, and social

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well-being is essential, and reaching adulthood in a healthy state is determined by feeding and dietary habits during these early stages (Andrea & Maier-Nöth, 2023). Infancy dietary patterns have long-term associations with health and can influence growth and development (Hildreth et al., 2022). However, more research is needed to fully understand the specific associations between dietary patterns during infancy and long-term health outcomes (Alexandra et al, 2022). Different factors, such as the mother's lifestyle, culture, and socioeconomic status, play a crucial role in infancy dietary patterns and their long-term associations with health, development, and growth (Qiaoyu et al., 2023). High-income countries tend to promote high-calorie foods, leading to rising obesity problems among children (Khaled & Hosny, 2023). On the other hand, undernutrition is a global health issue in low- and middle-income countries, highlighting the importance of parental socioeconomic status in early life for children's health and development (Alexandra et al., 2022). Biological, social, and environmental influences are increased risk factors for chronic diseases in children (Hildreth et al., 2022). This review aims to collect evidence for early nutritional intervention and future disease prevention (Kebede et al., 2022). Dietary diversity and variety significantly improve the nutritional status of children under 60 months of age in Nelson Mandela Bay Metro, South Africa (Clarke et al., 2023). Therefore, this study is aimed to assess the dietary pattern of mothers for their under five children in Ilorin metropolis Kwara State.

Aim of the Study

The objectives of the study are to:

1. assess the dietary pattern of mothers for their under five children in the Ilorin metropolis;
2. determine the influence of mother dietary practices on the nutritional status of their under-five year children; and to
3. determine the influence of socio-demographic data on the dietary practices of children less than 5 years old**.**

Hypotheses

$H0_1$: There is no significant association between mother dietary practices on the nutritional status of their under-five year children.

HO2: There is no significant association between socio-demographic data and dietary practices of children less than 5 years old**.**

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METHOD

Study Setting

The research was carried out at Ilorin metropolis, Kwara State, between 15th of February to 31st of March,2024. It is the capital of Kwara State and consists of three local governments which are Ilorin east, Ilorin west and ILORIN south Local Government, the study was carried out with the aim of assessing the dietary pattern of mothers for their under five children in Ilorin metropolis Kwara State.

Study Design

The study was a descriptive study by using a multistage sampling technique to select a total number of 225 children of under-five age from the three local governments that make up the city.

Sample Size and Sampling Technique

The study participants included all children within the Ilorin metropolis and their mothers' sociodemographic characteristics. 225 questionnaires were administered purposely using cluster sampling technique and 225 children were anthropometrically measured. The sample size that was used for the study was determined by using Leslie Kish multistage formula to determine the sample size. The instrument for data collection was the use of questionnaires, weighing scale for children, and meter rule.

Data Collection Tools

The instrument that was used for data collection in the research study was a self-structured administered questionnaire to mother and the children's socio demographic data as well the recording of the anthropometric measurement for each under five children.

Data Analysis and Management

Data analysis was done using SPSS 25.0 windows which was firstly analyzed before presented using frequency distribution table, percentages, and chi-square multivariate regression statistical method.

Ethics

The researcher submitted a research proposal to seek permission and introduction from the ethical review committee of the Ministry of Health Ilorin, Kwara State to carry out the study and a written informed consent of each participant was obtained.

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RESULT

Socio-Demographic Data of Respondents

Table 1 shows the sociodemographic characteristics of respondents. The overall mean age of mothers was 2.24±0.61 years. More than half 151(67.1%) of the respondents were 25-34 years old, less than half 74(32.9%) and 73(32.4 %) of the respondents had secondary and college education (post-secondary school), respectively. Also, half 131(58.2%) of mother's households had 1-4 members. Majority 173(76.9%) of mothers were self-employed. About half 126(56%) mothers had a borehole as their primary source of water. Majority (61.3%) had a family income per month in Naira between 0-50000. Majority (80.4%) practice Islam as a religion. Likewise, the majority (98.7%) were married, and the majority (88.4%) of respondents were Yoruba. average (50.2%) of respondent had their first intercourse at age 25-40 years of age while majority (73.3%) had their first births between 20-27 years of age. An average (59.1%) of the respondents had one to two children alive. Similarly, an average (51.1%) of the respondents' children were within 6-23 months old.

Table 1: Socio-demographic characteristics of respondents

Variables	Category	Frequency (n=225)	Percent (%)	Age(yrs) Mean ±SD
Mothers age	15-24	14	6.2	2.24±0.61
	25-34	151	67.1	
	35-44	53	23.6	
	45 and above	7	3.1	
Mothers' education	No formal education	9	4	
	Primary education	15	6.7	
	Secondary education	74	32.9	
	College (Post secondary)	73	32.4	
	University	54	24	
Total number of household members	1-4	131	58.2	
	5-8	82	36.4	
	9-13	8	3.6	
	13 and above	4	1.8	
The primary occupation of the mother	Self-employee	173	76.9	
	Unemployed-looking for job	16	7.1	
	Retired	1	0.4	

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	Worker	33	14.7	
	Students	1	0.4	
	Others	1	0.4	
Primary source of water for household	Pipe water	38	16.9	
	Filtered water	30	13.3	
	Borehole	126	56	
	Well	31	13.8	

Table 2 above shows the result obtained from the 24 h dietary recall information used to calculate Dietary Diversity Score where the foods mentioned were then grouped into the eight main food groups which are grains, roots and tubers; legumes and nuts; vitamin-rich fruits and vegetables; other fruits and vegetable; dairy products; and flesh foods and eggs. To measure the nutritional status of under-five children, 102 respondents had about 1-3 food group dietary intakes while 93 respondents had at least 4 food group dietary intakes, only 30 respondents had dietary intake of 5-8 food groups within 24 hours.

Table 2: Distribution of dietary score for under five children (6 months-5 years)

dietary practices	Category	Frequency	Percent	Mean±SD
Poor	1-3	102	45.3	-
Moderate	4	93	41.3	-
High	5 -8	30	13.3	-
	Total	225	100	1.68±0.70

From Table 3, findings show that 45.3% of respondents practice poor dietary intake for their under-five while 54.6% of respondents do practice high dietary intake of under-five children**.**

Table 3: Overall dietary intake practices of mothers for under five living in Ilorin metropolis Kwara state

		Descriptive statistics			
dietary practices(n=225)	**Frequency**	**Percent**	**Mean±SD**	**mini**	**Max**
Low dietary intake	102	45.3	1.68±0.70	1	3
High dietary intake	123	54.7			
Total	225	100			

Hypothesis 1: There is no significant association between the dietary practices of mothers for their under-five children and the nutrition outcomes of children under 5 years.

Table 4 shows there seems to be no significant association between mothers' dietary practices and children's weight for height. This is because the p-value (0.189) is greater than 0.05, the level of significance. Similar to weight for height, there is no significant association between mothers' dietary practices and children's weight for age. The p-value (0.072) is greater than

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0.05; also, there is no significant association between mothers' dietary practices and children's height for age. The p-value (0.675) is greater than 0.05, while the body mass index is the only category where there seems to be a significant association between mothers' dietary practices and children's nutritional outcomes at p-value (0.035) less than 0.05, $x^2 = 11.302$, which means we can reject the null hypothesis (H_0) that there is no association. Here, children whose mothers fall into the 1-3 dietary practices group are more likely to be underweight, undernourished and thin for weight compared to those in the 4 or 5-8 dietary practices groups.

Table 4: Chi-Square result showing dietary practices of mothers for them under-five children and nutrition outcomes of less than 5 years

Nutritional Status	**Dietary Practices**			x^2	**p-value**
	1-3 food group	4food group	5-8 food group		
Nutritional status B.M.I for Age					
overweight (+1 to +2)	18	8	7	11.302	0.035
obsess (+3 to +4)	4	3	1		
normal (-0.99 to 0.)	18	19	6		
undernutrition (-0.001 to -3)	57	61	16		
thin (underweight (-4 to -5))	5	2	0		

χ^2: Chi square test; *: *p* value < 0.05; Level of confidence (α) = 95% (0.005), Decision Criteria: Reject the null hypothesis if the P-value < α-value, otherwise accept the null hypothesis.

Hypothesis 2: There is no significant association between socio-demographic data and dietary practices of children less than 5 years old.

Table 5 above shows that all the socio-demographic variables have no statistically significant relationship (influence/effect) with the joint distribution of dietary pattern/intake of under five children at P>0.05, with the exception of mother's age at first birth in years having a significant effect/influence on the joint distribution of dietary intake/practices of under-five at (f =3.312, p=0.039). The null hypothesis for mother's age at first birth in years had a p-value less than 0.05, therefore the null hypothesis is rejected. While the null hypothesis on other items in the sociodemographic variables had p-value greater than 0.05, therefore the null hypothesis is supported for this variable with p-value greater than 0.05.

Table 5: Univariate regression distribution of dietary practices(dependent) to be predicted from sociodemographic variables (independent)

Tests of Between-Subjects Effects						
Dependent Variable. : dietary practices						
Independent	R_3^2	Df	R^2	F	Sig.	Remark
Socio demographic variable						
Mothers age	2.515	3	0.838	1.77	0.155	Non sig
Child's age	0.118	1	0.118	0.249	0.618	Non sig
Mothers educational level	0.964	4	0.241	0.509	0.729	Non sig
Husbands level of education	1.476	4	0.369	0.779	0.54	Non sig
Number of household members	0.715	3	0.238	0.503	0.68	Non sig

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Mothers Occupation	1.335	4	0.334	0.705	0.59	Non sig
House head occupation	2.339	4	0.585	1.234	0.298	Non sig
Source of water	2.262	3	0.754	1.592	0.193	Non sig
Family income	0.182	4	0.045	0.096	0.984	Non sig
Religion	2.858	3	0.953	2.011	0.114	Non sig
Marital status	0.691	1	0.691	1.458	0.229	Non sig
Ethnicity	0.095	3	0.032	0.067	0.977	Non sig
Mothers age at first sex/intercourse	0.123	2	0.061	0.13	0.879	Non sig
Mothers age at first birth in years	3.138	2	1.569	3.312	0.039*	Sigf*
Number of children	0.06	2	0.03	0.063	0.939	Non sig
Age of child in months/years.	3.241	4	0.81	1.71	0.15	Non sig

***significant at P<0.05**

DISCUSSION OF FINDINGS

From the findings of this study above, the total participants in the study were 225 mothers and 225 under five children. Table 1 showed the socio-demographic characteristics of respondents. The overall mean age of the respondent is 2.24±0.61. More than half (67.1%) of the respondents were within the age of 25-34 years old, and the majority (32.9 and 32.4 %) of the respondents had secondary and college education, respectively. Also, the majority (58.2%) had 1-4 household members. Majority (76.9%) of mothers were self-employed. Likewise, the majority (98.7%) are married; majority (88.4%) respondents were Yoruba. While the majority (73.3%) had their first birth between 20-27 years of age, more than average (59.1%) of respondents had one to two children alive. More than average (51.1%) respondents' age were within 6-23 months old. The majority (61.3%) have a family income per month in Naira between 0-50000; this is a sign that there are more mothers who have secondary and college education and their wealth index is poor. This implies that the mothers might not have adequate financial capacity to tackle the poor nutritional outcome of their under five children that is associated with the economic empowerment and poor dietary intake pattern, while those with average income above 51,000 naira might be empowered to practice a high dietary intake pattern. The majority (73.3%) of husbands were self-employed; the majority (73.3%) had their first birth between 20-27 years of age, more than average (59.1%) of respondents had one to two children alive. More than average (51.1%) respondents' age were within 6-23 months old. Also, the majority (58.2%) had 1-4 household members. This is an implication that the mothers might be affected by their family's income, for the number of their household might affect under five children dietary intake practice/pattern and their nutritional outcome.

The findings of this study from table 2 show result obtained from the 24 hours dietary recall information was used to calculate Dietary Diversity Score where the foods mentioned were then grouped into the eight main food groups which are grains, roots and tubers; legumes and nuts; vitamin-rich fruits and vegetables; other fruits and vegetable; dairy products; and flesh foods and eggs. to measure the nutritional status of under-five children. 102 respondents had about 1-3 food group dietary intake while 93 respondents had at least 4 food group dietary intake, only 30 respondents had dietary intake of 5-8 food groups within 24 hours. From

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Table2b. findings show that 45.3% of respondents practice poor dietary intake for their under-five while 54.6% of respondents do practice high dietary intake of under-five children.

Table 3 presents results on anthropometric measurement of under five children. The result obtained on nutritional status weight for height/length showed a mean score of 1.94±1.26, with more than half (59.6%) respondents were wasting, and few (10.2%) of respondents were severely wasting. The result obtained on nutritional status weight for age shows the mean score of 1.55±0.94, with Majority (66.7%) respondent being underweight, followed by less than quarter (21.8%) of respondents being severely underweight and few (10.2%) having a normal weight. This finding is in contrast with the study of Maheri et al. (2022), who asserted in a study finding that the prevalence of wasting, underweight, stunting, and overweight, were respectively 6, 4.3, 7.9, and 9.2% among the studies of children less than 5 years old. Also, another study conducted by Motedayen et al. (2020), showing the prevalence of wasting, underweight and stunting were respectively 6, 7 and 11% among the Iranian children less than 5 years old. Globally, in 2020, 149.2 million children (22%) under the age of 5 were stunted, 45.4 million (6.7%) were wasted, and 38.9 million (5.7%) were overweight (Motedayen et al., 2020)..

Moreso, findings on the nutritional status scoring height/length for age have a mean score of 1.51±0.70, with more than half (60.9%) of the respondents found stunting, followed by quarter (27.1%) respondents severely stunting while few (12%) respondents have normal height. In addition, findings on the nutritional status scoring Body Mass Index for age have a mean score of 3.33±1.11, with few (14.7%) of the respondents were overweight and few (3.6%) were obessed, below quarter (19.1%) respondent had normal body mass index, highest (59.6%) respondent had undernutrition and 7(3.1%) respondent were thin-underweight. This finding is in contrast with the study of Rahmani et al. (2023); the findings reported that the prevalence of childhood obesity in Iran is greater than in South East Asia, Africa, and Europe, accounting for 8% of children under five years of age in 2019. Based on the findings of the present study, the prevalence of wasting (6%), overweight (9.2%), underweight (4.3%), and stunting (7.9%) were obtained. Maheri et al. (2022) asserted the prevalence of wasting, underweight, and stunting were respectively 7.8, 10.5, and 12.4%.

Table 4 shows that all the socio-demographic variables have no statistically significant relationship (influence/effect) with the joint distribution of dietary pattern/intake of under five children at P>0.05, only mothers age at first birth in years was found to have a significant effect on the dietary practices of under-five at (f =3.312, p=0.039). Therefore, the null hypothesis for mothers age at first birth in years had a p-value less than 0.05, therefore the null hypothesis is rejected. While null hypothesis for other sociodemographic variables had p-value greater than 0.05, therefore the null hypothesis is supported for this variable with p value greater than 0.05

The table **5** shows there seems to be no significant association between mothers' dietary practices and children's weight for height. This is because the p-value (0.189) is greater than 0.05, the level of significance. Similar to weight for height, there is no significant association between mothers' dietary practices and children's weight for age. The p-value (0.072) is greater than 0.05; also, there is no significant association between mothers' dietary practices and children's height for age. The p-value (0.675) is greater than 0.05, while Body Mass Index is the only category where there seems to be a significant association between mothers' dietary practices and children's nutritional outcomes. The p-value (0.035) is less than 0.05, $x^2 = 11.302$, which means we can reject the null hypothesis (H_0) that there is no association. Here, children

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whose mothers fall into the 1-3 dietary practices group are more likely to be underweight compared to those in the 4 or 5-8 dietary practices groups. Findings supported by Mahmood et al. (2021) evaluated these practices and found that they were associated with higher consumption of dairy products, fruits and vegetables (FV), along with healthier breakfast patterns among children. Also, the same review stated that encouraging practice gives children a chance of making decisions, whereas the moderate restriction practice helps parents to imply clearer instructions to their children. Therefore, it was recommended to use a combination of the two practices, so that both parents and children would have the ability to contribute to determining food choices. In this narrative review, it focuses on the effect of parental dietary habits on children's eating behaviors, including family meals, breakfast routine and snacking habits (Mahmood et al., 2021). Nicodemo et al. (2021) argue that a sedentary lifestyle and poor eating habits are frequently associated with childhood obesity, which is a global health issue. Since kids had to stay at home during the COVID-19 lockdown, their anxiety and terror levels went up. According to research done at the Children's Hospital Bambino Gesù in Rome, 64.3% of children ate fruit as a midday snack, while 85.2% of patients routinely ate breakfast. However, 50.0% of respondents reported feeling hungrier "sometimes" compared to 21.6% who just "often" worked out at home. The study discovered a strong correlation between gender, age, and hunger with breakfast consumption and cooking. For outpatients, maintaining a healthy lifestyle during lockdown was challenging, mostly because of the rise in sedentary behavior and increased hunger. Rahmani et al. (2023) who stated that parents, especially mothers, play a very important role in the development of children's diets, as they are responsible for transmitting dietary patterns and habits as well as making food available. The environment that parents create for their children can promote healthy eating habits and appropriate weight, or it can lead to overweight and unhealthy eating. Mothers serve as role models for children's eating behaviors.

This implies that the findings could be caused by socio economic indicators such as mothers' educational level, number of households and family income. This effect might be seen on how frequently they feed their under five children as well as their level of understanding the nutritional requirement information of them under five children from doctors. Therefore, more efforts should be made on increasing under five nutritional outcomes by mothers.

CONCLUSION

In conclusion, the majority of the mothers in this study are not gainfully employed to combat the poor nutritional outcome observed in the majority under five children such as wasting, stunting and under weights. This could have been a resultant's effect of poor family income resulting from poor dietary practices of mothers as shown in mothers' socio demographic status and level of dietary practices which influence poor nutritional outcome of under five children as reported in the findings.

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RECOMMENDATION

In view of the findings from the study, the following recommendations are made:

- Seminars and workshops should be organized for mothers and husbands in order to add to their knowledge on the right dietary practices and the impacts on their child's nutritional outcome.
- Community nurses should be enlightened on the dangers and risks of not educating the public on the need to monitor their children's growth through regular check of nutritional status of their under five children.
- Government and NGO should collaborate to empower women by designing programs and guidelines that will empower mothers financially in order to enhance their feeding practices positively and in turn improve the nutritional status of their children.

LIMITATION

The study was limited to only under five children and their mothers within Ilorin Metropolis Kwara state. A more comprehensive inference could have been drawn by exploring the possibility of expanding the target population to each senatorial district in Kwara state. However, such an adventure would have been financially burdensome. For future research, the study can be expanded to cover each senatorial district in order to draw a reliable inference comparatively from results obtained from each district.

IMPLICATION OF THE STUDY TO COMMUNITY NURSING PRACTICE

There is a high degree of malnutrition among under five children due to economic challenges faced by mothers.This has been attributed to a host of factors such as low income, lack of knowledge about nutritional diet and feeding time. There is the need to however utilize the recommendations suggested herein as this will help to eradicate the identified factors in order to promote good and healthy nutritional outcomes of under children by mothers in Nigeria.

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CONFLICT OF INTERESTS

The authors declare that no conflict of interests exists.

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