

Micronutrient Intakes and the Health Implications Among Displaced Adolescents in Kogi State

Okadigwe John Chukwujekwu

Department of Home Economics and Hospitality Education, Nwafor Orizu College of Education Nsugbe in Affiliation with University of Nigeria Nsukka

ABSTRACT

The study examined micronutrient intakes and the health implications among adolescents in Edo State. There were three specific objectives and hypotheses. This study adopted a survey design. The population of the study comprised all the 725 adolescents who were displaced and settled in the IDP camps in Kogi State. The simple random sampling technique was used to select 100 adolescents (50 boys and 50 girls). The instrument for this study was a structured questionnaire developed by the researcher titled, "Micronutrient Intake Questionnaire (MIQ) which had a category of four point rating scale ranging from Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The mean and standard deviation were used to analyze the research questions while t-test was used to test the hypotheses at 0.05 level of significance using statistical package for social sciences (SPSS) version 17. Some of the findings are that: the adolescents had low awareness on how if vitamins are vital for energy and immune functions; fruits and vegetables are rich in vitamins; they consumed less meat and fish; and took inadequate milk and green vegetables; while ways to promote access to nutrients include providing adequate nutrition education for parents; economic empowerment for parents. Among the recommendations are that families should be empowered by government and relevant agencies for economic self-reliance in order to be economically stable to provide their children with essential micronutrients, and nutrition education should be made available to parents and other caregivers responsible for adolescent and other children's feeding.

*Corresponding author

Okadigwe John Chukwujekwu, Department of Home Economics and Hospitality Education, Nwafor Orizu College of Education Nsugbe in Affiliation with University of Nigeria Nsukka, Nigeria.

Received: April 01, 2023; **Accepted:** April 11, 2023; **Published:** April 15, 2023

Keywords: Adolescents, IDPs, Micronutrients, Health Implications

Introduction

In the past decade, an alarming number of people nationwide have had to abandon their homes and livelihoods in the face of violent conflicts, natural or economic disasters, or other threats. As they do not cross an international border, they are considered 'internally displaced persons' (IDPs). The forced displacement of civilians remains one of the most pressing humanitarian problems in developing countries. The displaced lose their social, legal and economic ties and thus suffer considerable physical and psychological hardship. They often face special difficulties not shared with other conflict-affected groups that make their livelihoods insecure. Specifically these are difficulties related to re-establishing livelihoods in areas of temporary settlement or reintegration in unstable areas when traditional means of livelihoods are no longer viable. A major dilemma in situations of displacement is ensuring that humanitarian assistance, in particular food aid, reaches the most vulnerable and has the greatest impact while adhering to basic principles of neutrality and impartiality. Assistance programmes for allocating humanitarian resources and for censusing (counting and registering) internally displaced persons (IDPs) often lack the information needed to appropriately tailor assistance to the specific conditions and needs of different IDP groups [1]. However, a commonly overlooked aspect of humanitarian assistance is focus on vulnerable populations which include children, pregnant/nursing women, the sick, elderly and young adolescents.

Adolescence is the transition period between childhood and adulthood, a time of life that begins at puberty [2]. For girls, puberty typically occurs between ages 12 and 13, while for boys it occurs between ages 14 and 15. It is one of the fastest growth periods of a person's life. During this time, physical changes affect the body's nutritional needs, while changes in one's lifestyle may affect eating habits and food choices. Nutritional health during adolescence is important for supporting the growing body and for preventing future health problems [3]. Healthy eating in childhood and adolescence is important for proper growth and development and to prevent various health conditions. Adolescent food habits often run counter to the special nutritional needs of this age group.

The micronutrients are a group of dietary constituents characterized by the low amounts in which they are found in the diet, but which nevertheless are the key to optimal macronutrient metabolism, and by the interdependent role of many of them in metabolism and functions [4]. Micronutrients are essential for growth and development, utilization of macronutrients, maintenance of adequate defences against infectious diseases and for many other metabolic and physiological functions [5]. The micronutrients classically considered as essential comprise just 13 vitamins and around 16 minerals, although our diet includes a multitude of other compounds, some of which most likely, but not definitely, are responsible for actions that are beneficial to the human body [6].

Adequate calcium intake is essential for development of strong and dense bones during the adolescent growth spurt. Inadequate

calcium intake during adolescence and young adulthood puts individuals at risk for developing osteoporosis later in life. In order to get the required 1,200 milligrams of calcium, teens are encouraged to consume three to four servings of calcium-rich foods each day [7]. Good sources include milk, yogurt, cheese, calcium-fortified juices, and calcium-fortified cereals. As adolescents gain muscle mass, more iron is needed to help their new muscle cells obtain oxygen for energy. A deficiency of iron causes anemia, which leads to fatigue, confusion, and weakness [8]. Adolescent boys need 12 milligrams of iron each day, while girls need 15 milligrams [9]. Good sources of iron include beef, chicken, pork, legumes (including beans and peanuts), enriched or whole grains, and leafy green vegetables such as spinach, collards, and kale [10].

In general, the amounts of micronutrients considered as 'needs' are lower than those estimated as requirements which, in turn, are lower than the recommendations, especially when we refer to cationic minerals and fat-soluble vitamins. Iron deficiency anaemia was the second leading cause of years lost by adolescents to death and disability in 2016 [11]. Iron and folic acid supplements are a solution that also helps to promote health before adolescents become parents. Regular deworming in areas where intestinal helminths such as hookworm are common is recommended to prevent micronutrient (including iron) deficiencies. Developing healthy eating habits in adolescence are foundations for good health in adulthood. Reducing the marketing of foods high in saturated fats, trans-fatty acids, free sugars, or salt and providing access to healthy foods are important for all, but especially for children and adolescents [12].

Many studies had examined the challenges of nutrition for adolescents however, little is known about how micronutrients contribute to the health of adolescents amongst people of special concern [13, 14]. In this study, the researcher focused on adolescents in emergencies who face daunting tasks to access basic nutrients due to their inability, and that of their families to access quality foods. It focused on the level of nutrition awareness among this population where the farmer/herders clashes have let families and their children in serious need of nutrition aid.

Statement of the Problem

The disruption to the normal way of life orchestrated by the sudden means of livelihood of families in some parts of Kogi State by the clashes between herders and farmers has imposed serious nutrition and food challenges on adolescents, especially those in their early teens. It is no doubt that low intakes of micronutrients, including calcium, folate, magnesium and potassium, have been previously reported in developing societies as being common in adolescents. Similarly, adolescent diets in camps have been associated with low intakes of calcium, vitamin D, iron, folate and zinc. This is basically due to the rising cases of food insecurity among majority of the population which has been compounded by crisis in the area which resulted in forced migration of families. Many aid agencies may not care about the nutrient access by these children. Assessing micronutrient awareness in adolescents is therefore important due to the contribution of micronutrients to disease prevention in order to promote adequate growth and development.

Aim and objectives of the Study: The aim of the study was to examine micronutrient intakes in adolescents and the health implications among adolescents affected by the crisis in Kogi State. Specifically, the study:

1. Determined the extent of awareness on micronutrient intakes and its health implications among adolescents affected by the crisis in Kogi State;
2. Determined micronutrient intakes among adolescents affected by the crisis in Kogi State; and
3. Determined ways of promoting intake of essential micronutrients among adolescents affected by the crisis in Kogi State.

Research Questions: The study was guided by the following research questions:

1. What is the extent of awareness on micronutrient intakes and its health implications among adolescents affected by the crisis in Kogi State?
2. What is the extent of micronutrient intakes among adolescents affected by the crisis in Kogi State?
3. What are the ways of promoting intake of essential micronutrients among adolescents affected by the crisis in Kogi State?

Methodology

Design of the Study: This study adopted a survey design.

Population for Study: The population for the study comprised all the 725 adolescents who were displaced and settled in the IDP camps in Kogi State.

Sample and Sampling Techniques: The sample for the study was 100 IDP adolescents. The simple random sampling technique was used to select 100 IDP adolescents (50 boys and 50 girls) who were displaced and settled in the IDP camps in Kogi State.

Instrument for Data Collection: The instrument for this study was a structured questionnaire developed by the researcher titled, "Micronutrient Intake Questionnaire (MIQ) which elicited information on research questions. The structured questionnaire had a category of four point rating scale ranging from Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD), and contained a total of 37 items.

Administration of the Instrument: The researcher visited the IDP camps in Kogi State with the help of three research assistants to administer the questionnaire using direct contact approach, while monitoring the process. To ensure maximum returns of the questionnaire, 100 copies of the questionnaire were administered and collected on the spot.

Method of Data Analysis: The mean and standard deviation were used to analyze the research questions while t-test was used to test the hypotheses at 0.05 level of significance using statistical package for social sciences (SPSS) version 17. The micronutrient intake of adolescents and its health implications among the adolescents in the IDP camps in Kogi State was determined using the real limit shown below:

Responses Options	Values	Real limit
Strongly Agree (SA)	4	3.50-4.00
Agree (A)	3	2.50-3.49
Disagree (D)	2	1.50-2.49
Strongly Disagree (SD)	1	1.00-1.49

Based on the 4 point rating scale, a 2.50 cut-off mean was set as the minimum acceptance level. Any item below this mean score was rejected, while any item with mean score of 2.50 and above was accepted.

Results: The results are presented in the following tables:

Research Question 1: What is the extent of awareness on micronutrient intakes and its health implications among adolescents affected by the crisis in Kogi State?

Table 1: Mean and standard deviation on the extent of awareness on micronutrient intakes and its health implications among adolescents affected by the crisis in Kogi State

Statements Decision	Boys n=50		Girls		n=50	
	\bar{X}	SD	RMK	\bar{X}	SD	RMK
1. I know vitamins are vital for energy and immune functions	2.74	0.63	A	2.67	0.66	A
2. Fruits and vegetables are rich in vitamins	3.53	0.76	A	3.00	0.71	A
3. Vitamins B components can be gotten from meat, grains	3.73	0.72	A	2.68	0.67	A
4. Minerals are essential for brain development	2.64	0.64	A	2.81	0.81	A
5. Iron is an essential mineral needed for the formation of hemoglobin	3.00	0.72	A	2.71	0.65	A
6. zinc is an essential mineral required for normal growth and development, healthy skin	2.88	0.71	A	2.83	0.64	A
7. Zinc is found in red meat, poultry	2.79	0.69	A	2.63	0.59	A
8. Iron is present in red meat, liver, poultry, salmon, tuna, egg yolk	3.01	0.71	A	3.06	0.72	A
Grand Mean	3.04	0.70	A	2.80	0.68	A

Key: \bar{X} = Mean score; SD = Standard Deviation; A = Agree

The Table 1 above showed the mean ratings and standard deviation on the extent of awareness on micronutrient intakes and its health implications among adolescents affected by the crisis in Kogi State. The data showed that all items (1-8) were accepted because they had mean scores of 2.50 and above. Also, the standard deviation ranged between 0.59 and 0.81 indicating that the respondents were not far from their opinions. The highest mean score was 3.73 (item 3), while the lowest mean score was 2.63 (item 7). The grand means are 3.04 and 2.88 respectively.

Research Question 2: What is the extent of micronutrient intakes among adolescents affected by the crisis in Edo State?

Table 2: Mean and Standard Deviation on the extent of micronutrient intakes among adolescents affected by the crisis in Kogi State

Statements	Boys n=50		Decision	Girls n=50		Decision
	\bar{X}	SD		\bar{X}	SD	
1. I don't eat fruits and vegetables at least three times a week	3.14	0.71	#	3.08	0.73	#
2. I consume less meat and fish	3.03	0.73	#	2.98	0.71	#
3. I don't like eating beans (white)	3.73	0.82	#	3.27	0.79	#
4. I take inadequate milk and green vegetables	2.74	0.62	#	3.01	0.85	#
5. I have adequate sweet potatoes, carrots, spinach	3.82	0.76	#	3.51	0.82	#
6. I rarely have access to good food	2.81	0.68	#	2.78	0.72	#
7. I take snacks in-between meals	3.16	0.93	#	2.90	0.81	#
Grand Mean		3.20	0.75	#	3.07	0.77

Key: \bar{X} = Mean score; SD = Standard Deviation; # = High Extent

The Table 2 above showed the mean and standard deviation on the extent of micronutrient intakes among adolescents affected by the crisis in Kogi State. The mean scores showed that items 1-7 were accepted because they had mean scores of 2.50 and above. Also, the standard deviation ranged between 0.62 and 0.93 indicating that the respondents were not far from their opinions. The table also showed that the highest mean score was 3.82 (item 5), while the lowest mean score was 2.74 (item 4).

Research Question 3: What are the ways of promoting intake of essential micronutrients among adolescents affected by the crisis in Kogi State?

Statements	Boys n=50		Decision	Girls n=50		Decision
	X	SD		X	SD	
1. I don't eat fruits and vegetables at least three times a week	3.52	0.93	A	3.57	0.94	A
2. I consume less meat and fish	3.23	0.91	A	3.02	0.89	A
3. I don't like eating beans (white)	3.14	0.84	A	3.23	0.85	A
4. I take inadequate milk and green vegetables	3.44	0.71	A	3.01	0.79	A
5. I have adequate sweet potatoes, carrots, spinach	3.34	0.79	A	3.44	0.81	#
6. I rarely have access to good food	3.32	0.93	A	3.40	0.94	A
Grand Mean	3.02	0.84	A	3.07	0.83	A

Key: \bar{X} = Mean score; SD = Standard Deviation; # = High Extent

The Table 3 above showed the mean and standard deviation on the ways of promoting intake of essential micronutrients among adolescents affected by the crisis in Kogi State. The data revealed that the respondents accepted items 1-6 because these items had mean scores of 2.50 and above which was the cut-off mark. The standard deviation ranged between 0.79 and 0.98 indicating that the respondents were not far from their opinions. The table also showed that the highest mean score was 3.82 (item 7) while the lowest mean score was 3.02 (item 2).

Discussion of the Findings

From the research question one on the extent of awareness on micronutrient intakes and its health implications among adolescents affected by the crisis in Kogi State, the findings include: I know vitamins are vital for energy and immune functions; fruits and vegetables are rich in vitamins; Vitamins B components can be gotten from meat, grains; minerals are essential for brain development; Iron is an essential mineral needed for the formation of hemoglobin; zinc is an essential mineral required for normal growth and development, healthy skin; Zinc is found in red meat, poultry; Iron is present in red meat, liver, poultry, salmon, tuna, egg yolk.

These findings are supported by Waters et al, [15]. who noted that nutrition education as taught in schools exposes college students vital nutrition information such as basic nutrients for healthy living. Since nutrition education is taught in schools, it is assumed the students became aware of the micronutrients.

From research question two on micronutrient intakes among adolescents affected by the crisis in Kogi State, the findings are that the respondents had low intake of micronutrients as revealed by their response which include: I don't eat fruits and vegetables at least three times a week; I consume less meat and fish; I don't like eating beans (white); I take inadequate milk and green vegetables; I have adequate sweet potatoes, carrots, spinach; I rarely have access to good food; I take snacks in-between meal.

These findings could be as a result of the low or lack of nutrition education for parents or other caregivers, or increasing food insecurity that deny families access to quality nutrition. Scaglioni et al, [16]. are in consonance with these findings when they noted that many children in rural areas lack access to micronutrients; and as reported by WHO and Davies who noted that chronically malnourished adolescents are more likely to remain undernourished during adolescence and adulthood [17, 18]. Epidemiological studies from both developing and industrialized countries show evidence that suggest a link between foetal under-nutrition and increased risk of various adult chronic diseases [19]. Adolescents are particularly vulnerable to malnutrition because they grow faster [18].

Finally, from research question three, the findings on the ways of promoting intake of essential micronutrients among adolescents affected by the crisis in Kogi State include: Addressing inadequate nutrient absorption problems through prioritization of adolescent nutrition; Providing adequate nutrition education for parents; Economic empowerment for parents; Sensitization on the importance of micronutrients; encourage the adolescents to eat at least five portions of a variety of fruit and vegetables every day; Promoting access to foods rich in vitamins and minerals. These findings are in agreement with Harris & Bargh who noted that nutrition education – whether formal or informal, is significant to promoting quality nutrient intake [19]. Parents and caregivers can be identified as target groups for this nutrition education [20].

Conclusion

The study revealed that the adolescents were aware of the importance and role micronutrients and the health implications, however, they had little intakes of these nutrients basically because of their status. Thus, the researcher concludes that the lack of adequate nutrients for the adolescents subjects their health to great risks of several avoidable ailments and growth impairments.

Recommendations: The following recommendations are therefore made:

1. Displaced families should be empowered by government and relevant agencies for economic self-reliance in order to be economically stable to provide their children with essential micronutrients.
2. Nutrition education should be made available to parents and other caregivers responsible for adolescent and other children's feeding.
3. Cheap and indigenous foods rich in micronutrients such as white beans, fruits, vegetables and poultry should be encouraged for subsistence farming.

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