

Research Article

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Impact of Nutrition Education on the Nutritional Status and Dietary Habits of Selected Secondary Schools Students within Yaba, Lagos State

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Abstract

Health and nutrition education can thus play an important role in addressing malnutrition. Hundreds of millions suffer from disease caused by malnutrition, and to prevent this, individuals need to be educated on eating the right foods. This study was conducted to assess the impact of nutrition education on nutritional status and dietary habits of secondary school students. A six (6) week nutrition education program was carried out, and the topic discussed was divided into sections such as food, nutrients, and hygiene and physical activities. Each nutrition education program lasted for about forty-five (45) minutes. A simple random sampling procedure was employed to recruit 160 participants in the pre and post nutrition education, and a validated questionnaire was used to gather information on demographics, anthropometric, nutrition knowledge and eating pattern (FFQ). Data was computed and analyzed using descriptive statistics. The pre-nutrition knowledge score of the participants were; (3.75%) had low knowledge score, (15%) had moderate knowledge score and (81.25%) had high knowledge score while the post-nutrition knowledge score were; (1.25%) had low knowledge score, (12.5%) had moderate knowledge score and (86.25%) had high knowledge score. The Body Mass Index (BMI) of the participants at pre-intervention study were; underweight (18.8%), normal BMI (48.8%), overweight (11.3%) and obese (21.3) while the post-intervention study was; underweight (13.8%), normal BMI (66.9%), overweight (16.3%) and obese (3.1%). The dietary diversity score (DDS) for the eating pattern of the participants before nutrition education were; low (28.8%), moderate (18.1%) and high (53.1%), while after the nutrition education were; low (24.4%), moderate (20.6%) and high (55%). There was a significant difference between the pre and post nutrition education at ($p < 0.05$). The impact of nutrition education was felt on both the nutritional knowledge and status, determined by the BMI and eating pattern among the studied secondary school students. There was a positive impact of nutrition education on the nutritional knowledge and status among the studied secondary school students within Yaba, Lagos. Participants with low nutrition knowledge (3.75%) at pre-intervention were reduced at post-intervention (1.25%). The prevalence of malnutrition at the pre-intervention were (51.2%) which was reduced to (33.1%) at post-intervention. It is recommended that every institution should incorporate nutrition education program into the school curriculum, and makes provision for healthy meals during meal time and aimed at improving students' nutritional status, learning ability and form-

ing good dietary habits. In the long run, this practice would become the usual habits of the students.

Keywords: Nutrition Education; Nutritional Status; Dietary Habits; Secondary School

Introduction

Nutrition education plays an important role in addressing malnutrition most especially among the school students [1]. Hundreds of millions suffer from disease caused by malnutrition, and to prevent this, individuals need to be educated on eating the right foods. Nutrition education is the combination of education strategies, accompanied by environmental support, designed to facilitate voluntary adoption of food choices and other food and nutrition related behaviour, conducive to health and well-being. Recently, the American Dietetic Association (ADA) published a position paper regarding the nutritional needs of teenagers. This paper stated that the health of adolescent is dependent on normal dietary intakes and that the provision of food that contains adequate energy and nutrients was essential for physical, social and cognitive growth and development [2].

Schools are excellent position to promote healthy eating as most children spend most of their time at school. Moreover school-based nutrition education is ideal as children can be engaged in healthy eating and physical activity programs that reinforces the messages of nutrition education [3]. Children are also effective change agents, transferring what they learn at school to the communities where they live. Providing children with nutrition education in school is therefore, an effective investment that should be supported by governments and funding agents, as this can address the nutritional problems of communities over the short and long term [4].

There are more than 900 million people who are under nourished and approximately 170 million underweight children. Hundreds of millions suffer from disease caused by excessive or unbalanced diets, In order to be well nourished, individuals needs to be educated on eating the right foods not just more or less foods, they need to know what constitutes a healthy diet and how to make good food choices. Problems of

undernutrition, vitamin and mineral deficiencies, obesity and chronic diseases increasingly exist side by side across the world. Nutrition education is attracting ample of interest and concern for curbing health problem during childhood but it is yet to be incorporated in the School curriculum nationwide. Currently, it is estimated that there are about 69.7 million adolescent girls constituting about 7.0% of the total population. Physical growth of adolescence occurs earlier and is more rapid than during pre-adolescence. In India, the proportion of adolescents getting married before completion of their growth is very high (23.0%). Therefore, there is a need to develop a database on the diet and nutritional status of the adolescents from different parts of the country to enable the governments and other non-governmental agencies to formulate policies and initiate strategies for the well-being of adolescent children. Malnutrition on the other hand has long lasting effects on children's health and therefore should be properly checked through nutritionally adequate diets and optimal eating pattern. Nutrition education is attracting ample of interest and concern for curbing health problem during childhood but it is yet to be incorporated in the School curriculum nationwide [5].

Materials and Method

This research study adopted an experimental design showing the pre-test and post-test. Focus group discussion approach was adopted, where all the selected students were gathered in their various school halls, while the researchers discussed some nutrition topics with the students and the intervention study lasted for six weeks. The total population of students in the four selected secondary schools was two thousand and thirty-seven, while one hundred and sixty students participated in the research study (Tables 1 and 2).

The sampling procedure employed for this research study was descriptive sampling. Systematic sampling procedure was

adopted to select the students based on their age and simple random sampling procedure was also used between the genders. All the students from age 13 to 16 years and in junior secondary school one (1) to senior secondary school three (3) were randomly selected and represented. The participants were selected based on the required number of students in each secondary school.

A structured questionnaire was constructed to obtain information from the students. The questionnaire was administered to the participants on face-to-face contact before the nutrition education program to gather information from the participants on socio-demographic characteristics (such as sex, age etc); nutrition knowledge information; anthropometric measurements (such as height, weight, BMI) and Dietary habits (Food frequency table) and same questionnaire was also administered to the same group of students that were enrolled for the study at the end of the nutrition education program to determine the impact of the nutrition education program.

Anthropometric measurements taken from the students was weight, measured with a digital weighing scale and recorded to the nearest kilogram; height measured with stadiometer and recorded to the nearest metre, and they were used to determine body mass index of the participants. A six (6) week nutrition education program was carried out within the four (4) secondary schools mentioned, and the topic discussed was divided into sections such as definition of food and nutrient, food classes and food groups, food nutrients, food hygiene, personal and environmental hygiene, kitchen safety and components of physical activity. All the sections were discussed in the first week and repeated throughout the six (6) weeks. Each nutrition education program lasted for about forty-five (45) minutes.

Descriptive statistics such as frequency and percentage were used to describe the nutrition knowledge information, anthropometric measurement and dietary habit information of the participants. Difference between quantitative variables was performed using the independent sample t-test. All the statistical tests were two-tailed, and *P* value of 5% or less was considered statistically significant. A statistical difference was con-

ducted on the pre and post nutrition education program.

Result and Discussion

Findings from this research study showed that the nutritional knowledge of the secondary school student was very good (81.25%) before the nutrition education intervention and the post nutrition education intervention also revealed that the nutritional knowledge of the secondary school students was also excellent (86.25%) with a considerable increase between the post and pre-nutrition education as a measure of positive impact of nutrition education intervention. Studies in line with this present study on nutrition education to children and adolescents as one of the intervention strategies, reported an increase in their subjects' nutritional knowledge and healthy food attitudes [6,7]. Other researchers reported a significant impact on students' food knowledge and eating behavior, emphasizing lower intake of high-sodium and high-sugar foods. This result differs from a study carried out in Sokoto Metropolis, where 71% of the students performed poorly [8]. Another study on poor nutrition knowledge among students in rural QwaQwa in South African was also reported [9].

This however, still necessitate the need for adequate nutrition education at secondary school level, which go a long way in enhancing the ability to make right food choices and will positively influence their dietary habits. Numerous studies have shown that well-planned nutrition education can significantly influence the quality of nutrition knowledge of children. Hence, ensuring excellent nutritional status. Nutrition education, which may take various forms of formal and informal education, can also significantly change nutrition behaviour and dietary habits of school children [10]. Findings from this study showed that the frequency of consumption of all the food groups was optimal. The post intervention study shows a significant increase across all the food groups at $p < 0.05$ except in meat, fish and dairy product which showed a decline of intervention, and the decrease in the frequency of fat and oil consumption shows a positive impact of intervention, because healthy food consumption is characterised with limited fat and oil and sweet and sugar. This finding indicates the need of informing this group about the importance of reduc-

ing sugar intake since sugar increases energy intake significantly, contributing to weight gain and to the development of diseases associated with the metabolic syndrome. In this context, sugar intake currently recommended by the WHO, including the intake of glucose and fructose, decreased from 10 to 5% of the total daily energy intake, which affects the intake of beverages, and even the sugar naturally present in juice and fruits [11]. A similar research on fruit intake by Gabriel *et al.* also reported a significant increase in fruit intake by students after an intervention [12].

Another research finding on vegetable consumption revealed

that higher vegetable intake was also reported by Jaime *et al.* in a study of low-income Brazilian families after an intervention. However, in most cases vegetable intake was still short of the recommended intake, despite the higher intake promoted by interventions. Studies conducted in the United States, England, and Australia with children and adolescents report that food and nutrition education actions at school increase students' intake of fruits and vegetables and their knowledge on these subjects. These effects seem even greater when schools have gardens and/or include these foods in their meals [13].

Table 1: The total population of the students in the four secondary schools is shown below

School	Number
School A	537
School B	163
School C	691
School D	646
Total	2037

Determination and Distribution of Sample Size

$$n = N/1 + Ne^2, n = 160 \text{ participants.}$$

Table 2: Distribution of sample size among the secondary schools

Schools	Frequency	Percentage
School A	42	26.3
School B	13	8.1
School C	54	33.8
School D	51	31.9
Total	160	100

Note: School A: Yaba College of Technology Secondary School, Yaba, Lagos State. School B: MbariMbayo Private Secondary School, Yaba, Lagos State. School C: Zumratul Islamiyyah Senior High School, Yaba, Lagos State. School D: Mainland Senior High school, Yaba, Lagos State.

The prevalence of obesity among the secondary school students in this present study was 21.3% before intervention and after series of periodical sections of nutrition education intervention, it reduced drastically to 3.1% after intervention. This is lower than the prevalence reported by the national representative survey conducted in 2008-2009 with adolescents aged 16 to 17 years (17.5%) and adolescents aged 18 to 19 years (19.2%). Overweight was 11.3% before intervention, but increased to 16.3% after the intervention, this increase may be due to the impact of nutrition education intervention, which brought about the changes in the nutritional status of the obese students to drop to the category of overweight within this study. There was also a considerable change observed within the underweight, where 18.8% of the participants were underweight before the intervention and later reduce significantly to 13.8% after the nutrition education intervention. Likewise, the normal BMI of the participant before the nutrition education was 48.8%, which increased to 66.9% after the intervention. This shows that the impact of nutrition education was effective amongst the studied participants. Although, the rate of malnutrition among the studied population is still

very high but there was a significant change in the rate of malnutrition from 51.2% to 33.1%. These results deserve attention, since overweight and obese adolescents tend to maintain this nutritional status throughout adulthood, increasing their risk of NCD. Changing the weight of most of these adolescents significantly, especially when excessive, requires an ongoing, long-term, and multidisciplinary intervention [14]. Moreover, the obstacles and limiting factors in the treatment of excess weight also have to be considered, such as genetic factors, which influence individuals' susceptibility to obesity. This susceptibility manifests in favorable environments, where lifestyle also plays an important role. On the other hand, ideological, cultural, and emotional factors influence the formation of adolescents' food habits and their perception of hunger, appetite, and satiety. Most adolescents have some typical food behaviors and habits, such as skipping breakfast, high intake of energy-dense foods, and high vulnerability to the pressure exerted by the media and society for the attainment of often unattainable appearance or underweight, possibly increasing their odds of developing eating disorders (Tables 3,4,5,6,7 & 8) [6].

Table 3: Nutritional knowledge for pre and post intervention studies

N.k classification	Pre-intervention		Post-intervention	
	N	%	N	%
1 – 10marks (Low)	6	3.75	2	1.25
11 – 20marks (Moderate)	24	15	20	12.5
21 – 30marks (High)	130	81.25	138	86.25
Total	160	100	160	100

Note: N.K means Nutritional knowledge

Table 4: Food frequency for Pre and Post-intervention

Food groups	Pre-intervention Frequent	Post-intervention Frequent
	Total (%)	Total (%)
Cereal	88.2	93.2
Roots & tubers	77	83.8

Meat, fish & dairy	87.5	85.6
Fruits	78.1	85
Vegetable	65.1	68.1
Fat & oil	78.7	76.3
Pastries & fried food	84.4	91.3
Beverages	83.2	85.6
Sweet candy	49.5	52.5

Note: >3 times per week were frequently consumed food, <3 times per week were infrequent consumption. 'A' means more than once per day, 'B' means once per day, 'C' means more 3 times per week, 'D' means less than 3 times per week, 'E' means once per month, 'F' means once per year and 'G' means Never.

Table 5: Eating pattern for Pre and Post-intervention studies

Observation	Pre-intervention Percent (%)	Post-intervention (%)
Frequent consumption	76.9	80.1
In-frequent consumption	23.1	19.9
Total	100	100

Table 6: Dietary Diversity Score for pre and post intervention

	Pre-intervention		Post-intervention	
	N	%	N	%
Low	46	28.8	39	24.4
Moderate	29	18.1	33	20.6
High	85	53.1	88	55

Table 7: Anthropometric characteristics for pre and post intervention

BMI classification	Pre-intervention		Post-intervention	
	N	%	N	%
Underweight	30	18.8	22	13.8
Normal weight	78	48.8	107	66.9
Overweight	18	11.3	26	16.3
Obese	34	21.3	5	3.1

Total	160	100	160	100
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Table 8: Nutritional status score for pre and post intervention studies

Classification	Pre-intervention score (%)	Post-intervention score (%)
Well-nourished	48.8	66.9
Malnourished	51.2	33.1
Total	100	100

Note: Under-nutrition and over-nutrition were sum and categorized as malnourished.

Nutritional status score: Low (0 - 39%), fair (40 – 59%), moderate (60 – 79%) high (80 - 100%).

Conclusion

There was a positive impact of nutrition education intervention on nutritional status and dietary habit of the selected secondary school students, which brought about the reduced rate of malnutrition among the students after the intervention program.

Recommendation

Further study is however recommended to investigate other factors such as family habits and culture that could militate an effective intervention on long term food practices, which appears to be the case of excessive intake of high calorie, high fat and high sugar foods. It is also recommended that every institution should incorporate nutrition education program into the school curriculum, and makes provision for healthy meals during meal times and aims to improve students' nutritional status, learning ability and forming good dietary habits in the long run.

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