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308 Lasani Town, Sargodha Road, Faisalabad - Pakistan  
Mob: +92 300 3008585, Fax: +92 41 8815544  
E-mail: [editorpjn@gmail.com](mailto:editorpjn@gmail.com)

## Nutrition Knowledge and Food Choices of Primary School Pupils in the Niger – Delta Region Nigeria

L.O. Eboh and T.E. Boye

Department of Health and Physical Education, Faculty of Education, Delta State University, Abraka, Nigeria

**Abstract:** The study investigated the effect of a 3 – week school based nutrition education programme on nutrition knowledge and healthy food choices of 197 primary six pupils (197 sixth grades) randomly divided into a control (n = 102) or an experimental group (n = 95). The control group received no nutrition education while the experimental group received 40 minutes of nutrition education, 4 days a week for 3 weeks nutrition knowledge scores and 3 day food records were collected at the beginning of the study and after 3 weeks. Food records were used to evaluate healthy food choices (i.e Dietary Guideline's recommended intake for macronutrients and the recommendations of the Food Guide Pyramid for each food group). In the experimental group there was a significantly greater increase in nutrition knowledge score (p = 0.001) and significantly change in compliance in meeting the Dietary Guidelines (p = 0.0001) and the Food Guide Pyramid's recommendations (p = 0.0001). This study showed the effectiveness of a nutrition education programme on nutrition knowledge scores and healthy primary six pupils (children in sixth grade).

**Key words:** Dietary habits nutrition intervention, malnutrition, healthy food choices

### Introduction

The healthy life for the adults, the children needs must be targeted at their earlier age for dietary interventions. (Okorodudu and Okobiah, 2004). According to Lytle *et al.* (1996), schools provide an excellent setting for positively influencing children. If sound nutrition education programmes are included in the curriculum, children have opportunities to expand their nutrition knowledge and learn to select healthy food choices at schools, homes and in restaurants. In addition, education programmes may enable children to grasp the significance of health related problems (Winter *et al.*, 1999). Nutrition messages developmentally appropriate and gives specific behavioural directives, will positively affect the food choices of children (Lytle *et al.*, 1997).

Children in the neglected Niger – Delta region of Nigeria, where the wealth (oil) of the nation is being produced, are facing diseases, some of which manifest from poor growth and malnutrition. It was reported in some Nigeria studies (Jeroh, 2003, Ajiduah, 2002 and Ogbe, 2005), that children appear to be progressively stunted during adolescent years and the children in the Niger – Delta area demonstrate little or no nutritional wasting. Ataire (2001) state that in Nigeria most children are under weight and stunted for their age. Literatures (Otiono, 2005); Murphy *et al.* (1994); and Winter *et al.*, 1999) have it, that behavioural pattern become more resistant to change after grade six; therefore, nutrition intervention is most successful prior to the Junior high school years. The optimum time for nutrition education has been identified as between the ages of 8 and 12 years of development, preventive measures such as nutrition education may encourage children to improve their

dietary habits (Murphy *et al.*, 1995).

Therefore, the main thrust of this study was to investigate effects of a three – week, school – based nutrition education programme on the nutrition knowledge and healthy food choice of primary six school children.

### Materials and Methods

Sixth grade (primary six) children from three (metropolitan / urban primary public schools in the Niger – Delta region Warri, Yanegoa and Port Harcourt), with similar socio – economic status were recruited. The children were from six schools of middle income (parents are civil servants i.e. held white collar jobs) and were ethnically homogeneous. Each school consisted of a class of sixth grades and the class had between 35 and 45 children per class. Selection of schools was purposeful and was based on the availability, interest and popularity of the schools to the people of Niger – Delta, based on the school discipline, popularity for being located centrally and well provided infrastructure in term of provision of fence.

Upon recruitment, children from school "A" in each town were assigned as the control group (c), i.e. 3 school s, while children from school "B" from each town, served as the experimental group (E). The "C" group received no nutrition education while the "E" group received 40 minutes of nutrition education, three days a week for three weeks. At the start of the study (pretest) and after three weeks (post test) both groups completed a valid and reliable nutrition knowledge questionnaire consisting of 25 multiple choice questions and kept three – day food records which were used to measure

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healthy food choices.

The research instrument used for this study was the nutrition knowledge questionnaire developed by Davies and Olojoba (1999), with the help of the Nutrition in a Changing World Curriculum model (Brigham Young University, 1994), was accepted after content validity was approved by five nutrition professionals at Delta State University, Abraka Nigeria. A test of internal consistency using Cronbach's alpha coefficient resulted in a value of 0.74 on 25 nutrition knowledge questions. Reliability was pilot tested on the 25 nutrition knowledge questions by administering the questionnaire to 30 primary six children who did not participated in the study.

Crawford *et al.* (1994) stated that, three – day food records are a valid and reliable instrument to assess dietary intakes of children. To encourage accuracy of food records, simple, understandable instructions and demonstrations depicting portions sizes were provided to all participants. All food records were reviewed with each pupil by the researchers.

After explanation of the study protocol to the classroom teachers, the researchers administered and collected pre and post tests (nutrition knowledge and dietary records) from the "C" and "E" groups. Instructions for the knowledge questionnaire were read aloud to the pupils, and they were told to answer the questions to the best of their ability.

Testing required approximately 30 minutes of class time with an additional 40 minutes at pretest spent on teaching the pupils how to record amounts and portion sizes of foods.

To group "E", nutrition instruction was given, which was based on six general topics, including the Food Guide Pyramid (U.S. Department of Agriculture, 1992; foods, portion sizes, number of servings), functions and food sources of macronutrients (carbohydrate, fat and protein), 1995 Dietary Guidelines for American (U.S. Departments of Agriculture and Human Services), healthy snacks (preparation, food labels); and vegetarianism (types, foods benefits). An assortment of educational tools (lectures, games, puzzles, video, role play and various hands of activities) was used to impart nutrition education. As suggested by Baker (1971), to eliminate the variables of subject interest, personality, and back ground among teachers and to apply strict controls of research to the projects, the curriculum was taught by the investigators.

Nutritionist V software (version 2.1.1 windows 1995, First Bank, San Bruno, CA) was used for analyzing diets, to determine healthy food choices under each food group, which were based upon two criteria; (i) energy consumption, i.e. percentage of total calories from carbohydrate, fat and protein and (ii) number of servings pea food group eaten. A two – tailed t – test was performed on knowledge score and compliance of the two groups in meeting the Dietary Guidelines for

macronutrients and with recommendations in the Food Guide Pyramid (FGP). Data were analyzed using the statistical package for the social sciences (SPSS – X for Vax / VMS, version 4.1, 1987). Significance levels were set at  $p < .05$ .

### Results and Discussion

One Hundred and Ninety-Seven (C = 102, and E = 95) primary six (Sixth-grade) pupils completed (pre and post) nutrition knowledge tests and three-day food records. Mean age for the C and E groups were  $10.4 \pm 0.5$  years and  $10.4 \pm 0.6$  respectively. Although the group was slightly heavier than the "C" group, there were no significant differences in their weight or heights. T-test on the pre-post difference scores on the nutrition knowledge test between C and E groups showed increase in nutrition knowledge was significantly greater for the E group:  $t(94) = 5.35, p < .001$ . mean scores for E group increased from  $10.8 \pm 2.7$  to  $14.6 \pm 2.7$ , (59%) while mean scores for the C group increased only slightly from  $10.1 \pm 2.5$  to  $10.1 \pm 2.2$  (4.1%). This finding was similar to that reported by Akindele (1996).

These were also significant differences in changes in compliance between the "C" and "E" groups in meeting the Dietary Guidelines' recommended intake for macronutrients  $t(94) = 3.45, p = 0.0001$ , with means E = 0.32 and C = -0.16, and the FGP recommended number of servings for the various food groups  $t(95) = 3.80, p = 0.0001$ , with means E = 0.40, and C = -0.24. In both instances, the "E" group improved more than the "C" group.

Pre and post three-day food records for all participants were analyzed to measure the distribution of energy from carbohydrate, fat and protein, which were then compared with the Dietary Guidelines. See Table 1, C group from pre to post nutrient intervention, there was decreased intake of carbohydrate (-1.98) and increased intake of fat (+1.32%) and protein (+0.66%). However, in the "E" group there was increased intake of carbohydrate (+3.41%), and protein (+0.25%) and decreased intake of fat (-3.66%) from pre to post nutrition intervention. Percentage of total calories from fat decreased from  $32.9 \pm 3.7\%$  to  $29.2 \pm 3.9\%$  respectively. Findings observed in the intervention group were very similar to those of the CATCH study, which showed the efficacy of a school – based intervention in lowering total fat intake of elementary school children (Lytle *et al.*, 1996).

Comparison of food records with the FGP showed the C group to have decreased intake in the mean number of servings of grains (-1.0), fruits (-1.4) and vegetables (-1.1) from pre to post intervention (Fig. 1). In the E group, nutrition intervention had a positive influence in the mean number of servings for grains (+1.5), fruits (+0.6), milk (+0.6) and vegetables (+0.3), although after intervention the E group had higher intake of fruits and vegetables, they still ate fewer than the recommended

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Table 1: Mean percent intake of macronutrients consumed by control and experimental groups at the pre and post nutrition intervention

Variables	Control Group			Experimental Group		
Carbohydrate	52.20	50.14	- 1.98	51.93	55.34	+3.41
50 – 60 %	(7.34)	(7.62)		(7.45)	(7.32)	
Fat (≤ 30%)	31.44	32.76	+1.32	32.86	29.20	-3.66
	(3.56)	(3.89)		(3.67)	(3.86)	
Recommended % of nutrients	Pre	Post	Change	Pre	Post	Change
Pre-post protein (≤20%)	16.44	17.10	+0.66	15.21	15.46	+0.25
	(3.45)	(3.78)		(2.78)	(2.12)	

Control Group (n=102), Experimental Group (n=95),SD in parenthesis

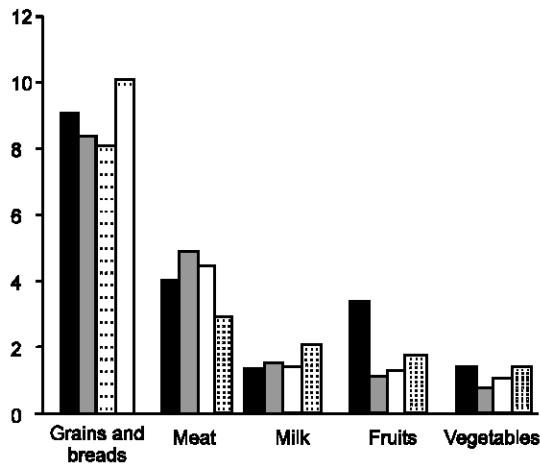


Fig. 1: Intake in the mean number of servings of grains (-1.0), fruits (-1.4) and vegetables (-1.1) from pre to post intervention

amount of the FGP servings.

Other researchers have also shown the reluctance of elementary school children to eat fruits and vegetables (Otono, 2005, Murphy *et al.*, 1995 and Lytle *et al.*, 1994). The greatest change observed in the E group as a result of nutrition education was the high intake of grains (10.2 servings /d). This positive change along with reduction in the mean number of servings / day of meat (-2.1), fats, oils and sweets (-0.7) contributed to an overall decrease in the percentage of calories from fat. Interestingly, in the C group, there was higher intake of meat, (+1.1) fats, oil and sweets (+0.4) which may be attributed to lack of nutrition education.

In conclusion, this study showed the effectiveness of a nutrition education programme on nutrition knowledge scores and healthy food choice (based on the FGP) on sixth grade (primary six pupils) children. The research demonstrated that the FGP could be used as an excellent instructional tool by teachers in providing school – based nutrition education to primary school children. Integration of nutrition into the primary school curriculum through structured (lectures, reading assignments) and unstructured (food preparations, demonstrations videos and simple hands on classroom activities); instructional methods would be ways of

educating pupils about healthy eating. Although research suggests education involving parents may be more likely to result in long term behaviour change (position of the American Dietetic Association, 1996). Results of this indicate that teachers can also be a powerful influence in improving the nutritional status of children.

**References**

Ajduah, A., 2002, Girl Scouting: An Effective Channel for Nutrition Education. *J. Nutr. Edu.*, 1: 36-41.

Akindele, S., 1996. Longitudinal Tracking of Adolescent Smoking, Physical Activity, and Food Choice Behaviours. *Nig. J. Pub. Hlth Edu.*, 2: 141-146.

Ataire, F., 2001. Tree – year Tracking of Children’s Fruit and Vegetable Intake, *Delta State J. Diet. Assoc.*, 1: 61- 66.

Baker, M.J., 1971. Influence of Nutrition Education on Fourth and Fifth Grades. *J. Nutr. Edu.*, 4: 55-58.

Brigham Young University, 1994. *Nutrition in a Changing World*. Provo, UT: Brigham Young University, Press.

Crawford, P.B., E. Obarzariek, J. Morrison and Z.I. Sabry, 1994. Comparative Advantage of 3 – day Food Records Over 24 Hours Recall and 5 – day Food Frequency Validated by Observation of 9 and 10 years girls. *J. Am. Diet. Assoc.*, 94: 626-630.

Davies, F. and A. Olojoba, 1999. Promoting Wellness among Primary School Children. *J. Counselling and Dev.*, 3: 72-79.

Jeroh, E.J., 2003. Nutrition Education Needs and Preferences for Delta State Student in Primary School. *J. School Hlth. Anambra Chapter*, 1: 17-21.

Lytle, L.A., E.J. Stone and M.Z. Knichaman, 1996. Changes in Nutrient Intakes of Elementary School Children following a School Based Intervention: Results from the CATCH Study. *Prev. Med.*, 25: 465-477.

Lytle, L.A., A.L. Eldridge, K. Kotz, J. Piper, S. Williams and B. Kalina, 1997. Children’s Interpretations of Nutrition Messages. *J. Nutr. Edu.*, 29: 128-136.

Murphy, A.S., J.P. Youatt, S.L. Hoerr, C.A. Sawyer and S.L. Andrew, 1994. Nutrition Education Needs and Learning Preferences of Michigan Student in Grades 5,8 and 11. *J. School Hlth.*, 64: 273-278.

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- Murphy, A.S., J.P. Youatt, S.L. Hoerr, C.A. Sawyer and S.L. Andrew, 1995. Kindergarten Students' Food Preferences are not Consistent with Knowledge of the Dietary Guidelines. *J. Am. Diet. Assoc.*, 95: 219-223.
- Ogbe, J., 2005. School based Nutrition Programmes and Serving. Paper read at Health Week at the Delta State College of Sports and Science Education, Mosogar. Unpublished.
- Okorodudu G.N. and O.S. Okobiah, 2004. Child Abuse and Parental Neglect: A COG in the wheel of development in Nigeria. *Delsu J. Edu. Res. Dev.*, 4: 125-138
- Otiono, A., 2005. An Investigation into the Socio – Cultural Health Practices and Beliefs Among Women in Delta State Ph.D thesis. Delta State University, Abraka. Unpublished.
- U.S. Department of Agriculture, 1992 Food Guide Pyramid: a Guide to Daily Food Choices. Washington D.C: Human Nutrition Information Serving; Home and Garden Bulletin no. 232.
- U.S. Department of Agriculture and Health and Human Services, 1995. Nutrition and your Health: Dietary Guidelines for Americans (4<sup>th</sup> ed) Hyaltsville; MD; Home and Garden Bulletin No. 252.
- Winter, M.M., L. Stanton and C. Bousley, 1999. The Effectiveness of a Food Preparation and Nutrition Education Programme for Children. *Topics in Clin. Nutr.*, 14: 48-59.