The Impact of Nutritional Knowledge on Academic Performance of Selected Secondary School Science Students in Ondo State, Nigeria

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Abstract

The study assessed the impact of Nutritional Knowledge on Academic Performance of Selected Secondary School Science Students in Ondo State, Nigeria. Three schools were selected for this purpose, 150 respondents within the age ranged of 10-16 years were randomly selected as sample. An academic performance of the students for 2nd term was used as well as self-constructed questionnaire to determine the nutritional knowledge of the students. The retrieved questionnaire form were analysed by screening and counting. The data collected was expressed in percentage. The result showed that eating habit has impact on academic performance and also female students are more familiar with nutrition education than the male students. Based on the findings of this stud, appropriate recommendations were made. One of such recommendation is that school base nutritional programme should be established to educate students on the health risk associated with overweight and bad eating habits in other to achieve better food habit and practices and eating habit has an impact on academic performances

Keywords: *Nutritional Status, Nutritional Knowledge, Eating habit and Academic performance.*

Introduction

There is a great connection between eating healthy and academic achievement, Researchers found that students who ate more fast food overall had slower growth in academic achievement while students who reported eating fast food once a day had slower growth in Mathematics, reading and science than students who ate no fast food (Svokes, 2014).

Research has also shown that students are able to learn better when they are well nourished and eating healthy meals has been linked to higher grades, better memory and alertness and faster information processing. The reason been that foods that are rich in fiber, protein and healthy fats such as eggs, yogurt, apples and eat meal keep the body feeling full longer and it provides enough energy to focus and stay alert throughout the entire day (options for youth, 2021).

According to CDC, healthy students are better learners, poor nutrition lack of physical activity and an overall unhealthy lifestyle can lead to poor academic achievement in children. Studies have also shown that healthy children get better grades, attend school more often and behave better in class carried out a research on the academic performance of Revter, Forster & Brister (2020) and find out that there is a positive correlation between healthy eating habits especially daily almost daily breakfast consumption

Chen (2020) said many of the food students are taken now are full of sugar, chemicals sodium which is causing a lot of harm to the students leaving theme tried, unfocused, sick etc which influence students go and performance negatively and also affects then behavior and moods.

In the study conducted by Philips (2005) he found out that students who eat some type of breakfast before exam had a higher passing rate than those, who did not while on the other hand Benton and Parker showed that recall of items while counting backwards for students who do not eat in the morning and ability to remember word lists and lectures is difficult for such students.

Majority of students having bad eating habit also reported adverse effects on then academic performance as well as an inability to concentrate which always lead to failure in exams or withdrawing from the subject.

Hungry and malnourished students have difficulty in learning due to poor concentration and lack of energy and motivation (Massey-stokes, 2002 and Youssi, 2005).

Nutrition and Academic Learning Achievement

Academic success is an excellent indicator for the overall well being of children and nutrition and physical activity should not be considered a distraction from academics.

Nutritional Education

Nutrition education is very important aspect of learning that empowers students with knowledge and skills to make healthy food choices and it improve wellness good eating habit (content, 2011). Nutrition knowledge is essential to life and well-being, Ibukun –Olu (2010) stated that nutrition is a branch of science that deals with foods, the nutrients and other substances therein. Also, earliest knowledge of nutrition as reported by Hippocrates, the father of medicine (460-364BC) stated that stomach was a land of stew-pot that food get cooked or stewed by body heat' and that children produce more heat, therefore, need more food than adults. Inadequate healthy eating habit and lack of nutrition knowledge can lead to public health issues with serious health implications especially in developing countries (Andere & Kyallo, 2013). Studies showed that, nutrition knowledge on choice of food can help boost student's

psychosocial well-being, reduce childhood obesity thus reducing chronic disease risks and lower future health challenges that can transit from childhood to adulthood (Brown et al., 2008).

According to Levi, Segal Laurent, Lang ^ Rayburn (2012) who reported that childhood obesity affects approximately 17% of youth ages 2-19 years old and have the potential to lead into adulthood (Steinbeck, 2010; Boulet, 2013). Health professionals in schools have the ability to reach large numbers of students and provide nutrition education to help reduce the increasing rates of obesity. Therefore, the purpose of this study is to assess the nutrition status and knowledge of school children and to find out whether it has effect on academic achievement of the students

Research Questions

The following research questions were raised to guide the study:

1) What is the nutritional assessment of the selected student?
2) What is the body mass index of the 'selected students?
3) What is the nutritional status of the respondents as grouped by sex?
4) What is the eating habit of the selected students?
5) What is the relationship between eating habit and their academic achievement?

Methodology

The study adopted a descriptive research design of the survey type it involved the use of questionnaire as a method of data collection for the purpose of describing and interpreting the nutritional knowledge of the students. To get the body mass index of the students, there was a one on one measurement, the researchers also made use of achievement test to measure academic performance in chemistry.

The population of the study comprised selected science students within the age range of 10-17 years were randomly selected as sample from three selected schools that was used in Ondo State.

Out of the population, the researchers made use of one hundred and fifty students from different classes. Each of the sample schools was selected through a stratified sampling technique

Result and analysis of finding the results were presented in answer to research questions that were raised.

Research Question 1

What is the nutritional assessment of the students?

Table 1: The nutritional assessment of the students

S/N	Question on Nutrition knowledge	Answer	Gender		Total	X^2	P-values
			Female	male			
1	You reflect what you eat?	True	43 947.78%)	21 (35%)	64 (42.67%)	2.403	0.121
		False	47 (52.22%)	39 (65%)	86 (57.33%)		
2	Eating too much of food has side effect	True	37 (41.11%)	35 (58.33%)	72 (48%)	4.278	0.039
		False	53 (58.89%)	25 (41.67%)	78 (52%)		
3	A well-balanced diet from varieties of food is refers to	True	27 (30%)	42 (70%)	69(46%)	23.188	0.000

	as a single mean?	False	63 (70%)	18 (30%)	81(54%)		
4	Eating more Fruit/vegetables are good	True False	60 (66.67%) 30 (33.33%)	38 (63.33%) 22 (36.67%)	98 (65.33%) 52 (34.67%)	0.177	0.67
5	Eating regular meal aid good academic performance	True False	58 (64.44%) 32 (35.56%)	43 (71.67%) 17 (28.33%)	101 (67.33%) 49 (32.67%)	0.854	0.356
6	Heavy consumption of stareby staples has bad effect on the body	True False	44 (48.89%) 46 (51.11%)	32 (53.33%) 28 (46.7)	76 (50.67%) 74 (49.33)	0.285	0.594
7	Meat, fish and eggs are good sources of protein	True False	72 (80) 18 (20)	38 (63.33) 22 (36.67)	110 (73.33) 40 (26.67)	5.114	0.024
8	Eating too much of oily and fatty food can lead to cardiovascular diseases	True False	51 (56.67) 39 (43.33)	31 (51.67) 29 48.33)	82 (54.67) 68 (45.33)	0.363	0.547
9	Skipping meals helps to lose weight quickly (F)	True False	49 (54.44) 41 (45.56)	32 (53.33) 28 (46.67)	81 (54)	0.018	0.894
10	Milk and milk products are the good source of calcium (T)	True False	64 (71.11) 26 (28.89)	39(65) 21 (35)	103 (72.67) 47 (31.33)	0.625	0.429
11	Vitamins are good sources of energy (F)	True False	56 (62.22) 34 (37.78)	42(70) 18(30)	98 (65.33) 52 (34.67)	0.962	0.327
12	Bananas are good source of potassium (T)	True False	45 (50) 45 (50)	32(53.33) 28 (46.67)	77(51.33) 73 (48.67)	0.160	0.689

Research Question 2

What is the body mass index of the selected students?

Table 2: Mean anthropometric values

School	**Height (m^2)**	**Weight (kg)**	**BMI (kg/m^2)**
School 1	1.59	51.23	20.26
School 2	1.41	47.25	23.62
School 3	1.53	45.15	19.32
Average	**1.51**	**47.88**	**21.08**

Research Question 3

What is the nutritional status of the respondents as grouped by sex

Table 3: Nutritional status of the respondents as grouped sex

Sex	Underweight	Normal	Overweight
Female	26 (28.89)%	56 (62.22%)	8 (8.89%)
Male	10 (16.67)%	39 (65.00%)	11 (18.33%)
Total	**36 (24.00%)**	**95 (63.33%)**	**19 (12.67%)**

Research Question 4

What is the eating habit of the selected students?

Table 4: Eating habits of the respondents

Food consumption	Respondent	Percent (%)
Food eat per day		
Once	6	4.00
Twice	82	54.67
Thrice	56	37.33
More than 3 times	6	4.00
Total	150	100
Skipping Meal		
Yes	58	5.9%
No	62	58.66%
Total	150	41.33%
Skipped Meal		
Breakfast	66	44.00
Lunch	37	24.67
Dinner	24	16.00
Breakfast and Lunch	14	9.33
Breakfast and dinner	5	3.33
Lunch and dinner	4	2.67
Total	150	100
Reason for skipping meal		
I don't like the food	27	18.00
No time to eat	45	30.00
No food to eat	36	24.00
Fasting for religious reason	12	8.00
Just a habit	16	10.67
To maintain shape	9	6.00
Total	150	100
Source of Food		
Home	61	40.67
Food vendors along the street	59	39.33
School premises	30	20.00
Total	150	100
Snacking		
Yes	123	82
No	27	18
Total	150	150
Reason for snacking		
I like it	53	35.33
Hunger	32	21.33
Habit	17	11.33
To make up for skipped meal	26	17.33

Busy schedule of parent	22	14.67
Total	150	100

Research Question 5

What is the relationship between eating habit and the students' academic achievement?

Overall subjects the students offered were given at the end of the term (second term) 202, the annual average score was compared and from the eating habit table. We could see that 88 (38. 66%) Respondents are not eating well (they always skip meal they either eat once or twice per day while 62 (41.33%) don't skip meal, they eat trice or more than trice per day, their results was compared with their academic performance, it was actually shown here that those who don't eat well do not perform well unlike this others that eat well, and one thing that was significant about this research is that those who skipped breakfast, breakfast Lunch do not perform well at all compare to those who skipped either lunch or dinner.

A lot of the student love to eat snack because some like it. This is not too good enough, there is certain nutrient that helps the child to grow cognitive and nutrients that are needed in the body and this might not be found in snack. This fall in line with the research of Svokos (2014) who said student in this category always have a slower growth rate in academic achievement

Discussion

Gender differences in nutrition knowledge interest

A total number of one hundred and fifty (150) volunteer from secondary school students were used for this study as presented in Table 1, this comprise of 90 females (60%) and 60 males (40%). School 3 had the highest number of female student 34 (37.78%) and was observed to be higher than the male counterpart.

Anthropometric values

The height, weight and body mass index of the students are shown in table 2. Mean height of the students ranged from 1.41 to 1.59m^2 for school 2 and school 1 student respectively and were not significantly different *($p<0.00$)* from each other. This showed that students of school (1) were not significantly taller than students of the other selected school. A total mean height of 1.51m^2 was recorded. The mean weight of the students ranged from 45.15kg for students in school (3) to 51.23kg for students in school (1) with significant difference *($p<0.00$)* and the average weight recorded was 47.88kg. The body mass index (BMI) values, indicating the nutritional status index of the students were observed to be significantly different *($p<0.00$)* from other selected students, the values ranged from 19.32 to 23.62$kgm^{-2.}$ The total mean of BMI value was 21.08kgm^{-2} with the highest value 23.62kgm^{-2} recorded for school (2) and lowest value (19.32kgm^{-2}) for school (3). Anthropometric data obtained estimated the nutritional status of students. The height and weight of a child are useful indices of development and growth (WHO (1995).

Nutritional status of the respondents as grouped by sex

The nutritional status of the respondents is presented in Table 3. It was observed that 24% of the respondents were underweight, 12.67 overweight and 63.33% normal BMI status and were significantly different *($p<0.00$)* from each other. The results showed that females students have

higher values (28.89%) of underweight than the male students (16.67%), while the male students (18.33%) was observed to be higher numbers of overweight than the male student (8.89%).

Eating habits of the respondent

One hundred and fifty (150) volunteered secondary school students comprising of 90 females and 60 males students from three selected schools. The results from Table 3, showed that higher number (54.67%) of respondents ate twice daily compared to the (37.33%) who ate three times daily, while (4%) ate more than three time daily. The total number of respondents that skipped meal was (77.33%) and was significantly higher than those that did not skipped their meals (22.67%). It was observed that most skipped meal was Breakfast (40%) compared to Lunch (24.67%) and Dinner (16.00%), the major reasons for skipping meal was because they have no time to eat their breakfast (30%), while others (24.00%) have time to cook but there was no food to eat. A total number of 27 (18.00%) did not like the food prepared and 10.67% found skipping meals as a habit. The major source of food was home (40.67%) and was not significantly different *($p<0.00$)* from the food vendors along the street (39.33%) while 20.0% obtained their food from the school premises. Snacks consumption among the students was observed to be high (82%) and reasons gave by the student are: like (35.33%), hunger (21.33%), habit (17%), to make up for skipped meal (17.33%) and busy schedule of parent (14.67%).

Nutrition knowledge score of the students

The students were assessed using multiple- choice questions as shown in Table 4. The responses observed by students showed that there was significant difference *($p<0.05$)* from the assessment. The students performed excellently well in their response to questions 4,5,7,10 and 11, having scores above 60% for both the female and male student respectively. The students performed poorly in their response to questions 1, 2, 6 and 12 with score below 50%, however, the female students failed question 3 (A well-balanced diet from varieties of food is refers to as a single mean). Generally, female students perform brilliantly well compared to the male counterpart.

The result showed that female students are more interested in nutrition education than the male students. This could be as a result of familiarities of female student to be more thoughtful abut food and health issues than male, also they have more ethical about eating certain foods than male (Teratanavat & Hooker, 2006: Verbeke & Vackier, 2004). Similarly, Gough and Conner, (2006) reported that women are frequently engaged in health-promoting behaviours than men and have healthier lifestyle patterns (Shahsanai*et al*, 2018).

There is a link between diet-related behaviours and body mass index (BMI) as reported by Sanlier et al (2018). It was observed that the mean BMI of the student was within the range of normal (21.08kg/m^2) and if not properly checked it could aggravate to overweight thereby leading to health complications. A low body mass index or underweight status of the respondents showed the risk of malnutrition, mortality, the prevalence of underweight for the female and male were 28.89 and 16.67% respectively, which was higher than the findings of Adesina et al., (2012). In Nigeria today, malnutrition among secondary school students are as a result of socio economic conditions of the parent/guardian. Reasons for overweight from the nutritional status of the respondents could be as a results of some physical inactivity and sedentary daily habits (Kamtsios & Digelidis, 2008). Thus, student within this category require nutrition knowledge about the effects and importance of good eating habit on health than those with overweight.

The dietary pattern of the respondents reveals that (54.67%) ate twice daily compare to (34.33%) who ate thrice per day which is necessary for good health. This study showed that about 77.33% skipped their meals and the most skipped meal is breakfast (44%) while minority of them sometimes skip dinner this could be as a result of low income of the family, similar findings was reported by Essien et al. (2014) in the assessment of nutritional status of students in Sokoto State Nigeria. Also, Kawafhehet et. al (2014) reported the prevalence of breakfast skipping among adolescents to be within the range (20-55%). Breakfast meal is important because it provides the essential nutrients needed for the day's activities. Across the world, skipping breakfast was more frequently reported in female than male students. The reason for skipping meals could be that the social economic status of the family is poor, low family functioning and a single parenting. Some of the students most especially the female students will deliberately skip their breakfast because of the consciousness of their body weight and appearance. (ALBashtawy, 2014: Carmel & Camilleri, 2011). Some ate snacks in-between meals, possibly to enable them cope with the energy need of the body as they go about their normal academic activities and this expose them to unhealthy eating habit.

Generally, the student performance of the respondents in the nutrition knowledge shoed that they had poor understanding about nutritive values of food. Therefore, there us a need for an adequate nutrition education at various secondary school level, this will enhance the ability of the students to make good food choices and will positively influence their eating habits thereby ensuring better nutritional status (Essien et al, 2014). Powers et al (2005) reported that well-planned nutrition education can significantly influence the quality of nutrition knowledge of children. Nutrition education can significantly influence the quality of nutrition knowledge of children. Nutrition education at various forms either formal or informal can significantly change nutrition behaviour and dietary habits of school children (Worsley, 2002). Also, Harnack et al. (1997) stated that for an individual to have a lifelong healthy eating habit, nutrition education must be put into consideration at early stages of life. Nutrition education is an accessible effective tool in the promotion of health nutrition in education programmes with focus on healthy eating (Torkar et al, 2010).

Recommendations

Based on the result of the study the following recommendations were made:

1) Parents should try as much as possible to allow their wards to eat in the morning before going to school and also eat at least two times or day if not three times hence students should not be encourage to skip meal.
2) varieties of food should be made available at home and be made available for children to eat, this will help them develop mentally and physically
3) Parent should discourage their children from buying food outside the house.
4) Snaking should be discourage among the students, since most of them are used to these.
5) Teachers should also correct and monitor what the students eat in school and enlightened them on balance diet and composition of some of this food.
6) Parents should not be too busy to take care of their children nutrition.

7) School base nutritional programme should be established to educate students on the health risk associated with overweight and bad eating habits.

Conclusion

The overall evaluation of the nutrition knowledge of the respondents of the three selected schools were insufficient and inadequate. Also, nutritional status of the respondents showed that there is a need for adequate intervention on nutrition education for secondary school students, this will help in making right dietary choices and improve health. The results further revealed that the students were deficient in knowledge and understanding of the facts about energy and nutritive values of foods.

Therefore, adequate nutrition education is needed at the secondary school level; this will enable the students to make good food choices and positively influence their eating habits thereby ensuring better nutritional status and better performances in their academics.

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