



Impact of Breakfast on Students' Level of Cognition in Ebonyi State University, Nigeria.

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ABSTRACT:

The study examined the impact of breakfast on students' level of cognition with particular reference to students of Ebonyi State University Abakaliki, Nigeria. The research objectives were set to determine if breakfast has an effect on students' level of comprehension, to ascertain if breakfast has an impact on students' level of attention and to determine if breakfast has an effect on students' level of memory retention. Three research questions were formulated in line with the research objectives. The descriptive survey design was adopted. The population of study consisted of the 5071 students of Ebonyi State University. The sample size comprised of 200 undergraduate students from four faculties of the university. The sample size was selected using the simple random sampling technique. The instrument for data collection was a structured questionnaire. Mean and standard deviation were used for data analysis. The findings showed that breakfast has a positive impact on the comprehension level, attention level and the memory retention level of students. From the findings, it was recommended that undergraduate students of Ebonyi State University should endeavor to consume well-balanced breakfast meal, teachers (lecturers) should ensure they periodically give students proper advice and orientation on breakfast consumption, dieticians and nutritionist should create awareness on the importance of breakfast consumption, parents should also try to teach their children healthy habits such as breakfast consumption and the school authorities should from time to time organize orientation courses, seminars, workshops etc., on the importance of breakfast consumption, its effects and how it affects academic achievement.

Keywords: Breakfast, Cognition, Students, Comprehension, Attention, Memory-retention.

1. Introduction:

Breakfast is commonly referred to as the first meal of the day after a night's time rest. Merriam- Webster dictionary (1828) asserted that the word breakfast was first known in the 15th century and the meaning states that it is the first meal of the day especially when taken in the morning. Breakfast has been perceived to be a very important meal. A large growing body of scientific knowledge now supports the claim that breakfast is an essential meal for a day. However, the failure to eat something at the start of the day can have unexpectedly serious health consequences. For example, Leah Cahell, Stephanie Chiuve, Rania Mekary, Majken Jensen, Alan Flint., (2013) documented a 27% increase in coronary heart diseases amongst those North American men who regularly failed to eat a meal at the start of the day. Although we experience a huge cultural variation in the kinds of food that different people like to eat for breakfast, the general advice from health experts remain that one should eat a substantial well-balanced breakfast. The failure to eat a well-balanced breakfast has been documented to have a deleterious impact on cognitive performance, with the academic performance of school-aged children being the focus of much of the research in this area (Mahoney, Taylor, Kanarek and Samuel, 2005; Wesnes, Pincock and Richardson 2003). A well-balanced breakfast consists of foods from at least three out of the five food groups. Whole grain breads and cereals; low-fat dairy products, and fruit are typical breakfast choices. Breakfast in Nigeria vary due to some common factors such as culture, occupation, location, socio-economic factors, age and availability of food resources.

Breakfast aids cognition or mental process because the food taken in is converted to glucose which is supplied as energy for effective brain work. Cognition is an abstract term that studies mental functions such as reasoning, knowledge comprehension, assimilation etc. Cognition lays emphasis on the study of conscious and unconscious mental processes involved in gaining knowledge and comprehension. There are many different types of cognitive processes. These includes; attention, learning, memory and thought. Attention is a cognitive process that allows people to observe and be attentive to a specific stimulus in the environment while learning is a cognitive process that involves acquiring new experiences, skills, values and synthesizing of information. Memory is an important cognitive process that involves encoding, storing, and retrieving of information and thought is an aspect of cognitive process that allows people to engage in thinking, reasoning, decision-making and problem-solving.

Impact of Breakfast on Students' Level of Cognition refers to the results obtained when students partake of the first meal of the day which is used in measuring their height of comprehension and assimilation in classroom activities. Recent studies have reported that breakfast intake enhances concentration, improves thinking and aids comprehension. Breakfast has been considered as an important meal of the day whose nutritional contribution would not be met by any other meal of the day (Adolphus, Lawton, Dye 2013). Breakfast is recommended as part of a healthy diet because it is associated with healthier macro and micronutrient intakes, Body Mass Index (BMI) and lifestyle. Breakfast is also widely promoted to improve cognitive function and academic achievements, Therefore, assumptions about the benefits of breakfast for undergraduate student's learning are based on evidence demonstrating the acute effects of breakfast on undergraduate student's cognitive test performance from laboratory-based studies.

Breakfast consumption could be a useful public health and education enhancing intervention. Skipping breakfast has detrimental effect on cognitive test like problem solving (Pollitt, Lewis, Garza, & Shuman, 1983), short-term memory (Corder, Van Sluijs, Steele, Stephen, Dunn & Bamber 2011) attention and logical reasoning (Marquez 2001). Hoyland (2009) suggested that high carbohydrate and low-glycemic breakfast provides a continuous supply of glucose and is known to facilitate better cognitive performance (Ingwersen, Defeyter, Kennedy, Wesnes, and Scholey, (2007); Micha, Rogers, & Nelson, (2010). Despite the continuous efforts made by researchers and nutritionists' to educate students on the effects of breakfast skipping, there has been a recorded increase of breakfast skipping amongst students. Skipping breakfast is related to adverse effects on class attendance, academic achievement, and emotional performance in undergraduate students. Also, skipping breakfast may reduce body glucose which translates to energy for the duration of the day and it is difficult to compensate for this morning energy by taking nutrients for the rest of the day. This may affect the ability to concentrate on work and performance of mental function as well as a decrease in physical activity. Breakfast is the most commonly skipped meal more than lunch and dinner specifically by young adults in the university. Lack of time is the main reason behind skipping meals in general. Others are lack of appetite, inability to cook, fasting/religion, and not being hungry. Afolabi, Towobola, Oguntona & Olayiwola (2013) reported that 48%, 19%, and 13% of Nigeria university students skipping meals due to lack of time, appetite, and inability to cook, respectively, while fasting/religion and money accounted for about 20% and 15% of Nigerian University students as a reason for skipping breakfast respectively.

Katie Adolphus, Clare Lawton and Louise Dye (2013) conducted a study on the effects of breakfast on behavior and academic performance in children and adolescents at the Human Appetite Research Unit, Institute of Psychological Sciences, University of Leeds, United Kingdom. This review identified 19 studies that examined the effects of breakfast on behavior in children and adolescents of which 11 studies demonstrated a positive effect of breakfast on behavior. The evidence suggests a mainly positive effect of breakfast on on-task behavior in the classroom. This review also stated 21 studies that demonstrated suggestive evidence that habitual breakfast (frequency and quality) and school breakfast programs' are associated with children and adolescents' academic performance. Increased intake of habitual breakfast was consistently positively associated with improved academic performance. For academic performance outcomes, evidence suggests a positive association between habitual breakfast consumption frequency and quality on school grades or achievement test scores behavior which are integrally subjective in nature. Also, evidence from school breakfast programs' suggest a positive effect on academic performance, particularly mathematics grades and arithmetic scores and in undernourished children or children from deprived or low socio-economic status backgrounds.

However, from the reviewed literatures the level of breakfast consumption amongst students is relatively low. Secondly, there's little or no study done on breakfast consumption as regards students' level of cognition with a reference to students in Ebonyi State University. It is this gap that led to this study and upon this background, this study was undertaken. Therefore, this study calls for an investigation into the impact of breakfast on student's level of cognition in Ebonyi State University Abakaliki of Ebonyi State, Nigeria.

2. Materials and Methods:

The methodology or procedure adopted by the researcher in carrying out this study was discussed under the following sub headings: research design, area of the study, population of the study, sample and sampling techniques, instrument for data collection, validation and reliability of the instrument, method of data collection and method of data analysis.

2.1 Research Design of the Study:

The study adopted descriptive research design.

2.2 Area of the Study:

The study was carried out in Ebonyi State University Abakaliki, Nigeria. Abakaliki is located at latitude 6° 20'N and 8° 06'E and covers the area of 64 kilometers south-east, Enugu State. Ebonyi State University is situated within Abakaliki metropolis and made up of four campuses such as, Presco, Ishieke, Cas and Permanent Site. The University is situated within Abakaliki Capital Development Territory and has eight (8) faculties. Faculty of Natural Science, Faculty of Law, Faculty of Management and Social Sciences, Faculty of Education, Faculty of Arts and Humanities, Faculty of Agriculture, Faculty of Basic Science and Faculty of Health and Technology.

2.3 Population of the study:

The population of the study consisted of 5071 undergraduate students across the eight faculties that make up Ebonyi State University based on the numbers of students admitted in 2018/2019 academic year. Source: students' Enrollment booklet, Ebonyi State University Abakaliki, Nigeria.

2.4 Sample and Sampling Technique:

The simple random sampling technique was used to select 200 students from (4) faculties namely Faculty of Education, Faculty of Management and Social Sciences, Faculty of Arts and Humanities and Faculty of Agriculture. Fifty students were selected from each of the faculty and this gave a total of 200 respondents as the sample size.

2.5 Instrument for Data Collection:

The instrument used for data collection in this study was structured questionnaire. The questionnaire had two sections, section A and section B. Section A focuses on the demographic characteristics of the respondents' while section B centers on the thematic of the study. Section B has three clusters of statements to elicit the respondents' opinion on the variables of the study. Cluster 1 centered on the impact of breakfast consumption students' level of comprehension in Ebonyi State University. Cluster 2 focuses on the impact of breakfast consumption on students' level of attention in Ebonyi State University. Cluster 3 seeks to ascertain the impact of breakfast consumption on students' memory retention in Ebonyi State University. The questionnaire was rated in a Four points Likert scale, thus: Strongly Agree (SA) = 4 points, Agree (A) = 3 points, Disagree (D) = 2 points and Strongly Disagree (SD) = 1 point.

2.6 Validity of the Instrument:

The face and content validity of the instrument was assessed by two (2) experts from department of Science education of the faculty of education in Ebonyi State University Abakaliki and another expert from measurement and evaluation of the department of Science education in the Faculty of education, Ebonyi State University Abakaliki. The developed instrument was submitted for assessment in terms of feasibility, readability, clarity and relevance. In line with the recommendations of the experts, the instrument was restructured to accurately measure data.

2.7 Reliability of the Instrument:

To ensure reliability and internal consistency of the instrument, Cronbach Alpha Statistics was used to test the reliability. The instrument was administered to a small group of respondents (students) in different faculties of Ebonyi State University. The data collected was analyzed. The reliability index was found to be 0.73 which shows that the instrument was reliable.

2.8 Method for Data Collection:

The questionnaires developed for this study were administered to the students of Ebonyi State University, Abakaliki during their lecture periods in their various faculties. The questionnaires were filled and returned back to the researcher that same day.

2.9 Method of Data Analysis:

The method of data analysis is mean and standard deviation. Research questions were answered on individual item basis. Four points Likert scale rating was used, thus: Strongly Agree (SA) = 4 points, Agree (A) = 3 points, Disagree (D) = 2 points and Strongly Disagree (SD) = 1 point. Therefore, using mean formula:

$$\bar{x} = \frac{\sum fx}{n}$$

Where;

$$\bar{x} = \text{mean}$$

Σ =sum of the population

f =frequency

x = data value

n = Number of items in the population Therefore,

$$\frac{4+3+2+1}{4} = \frac{10}{4} = 2.5$$

The mean score of the rating scale is 2.5, hence the decision rule is, any mean score of given question that is 2.5 and above was regarded as accepted while any mean score below 2.5 was regarded as rejected.

3. Results and Discussion:

The presentation and analysis of data collected by the researcher are presented in a tabular form. The tables are prepared to address each research question as shown below:

3.1 Research Question One:

What is the Impact of breakfast on comprehension level of students in Ebonyi State University?

Table 1: Mean rating of the respondents on the impact of breakfast on the comprehension level of students in Ebonyi State University

S/N	Items statement	SA	A	D	SD	NO	\bar{x}	SD	Decision
1	I have a high level of comprehension when I take breakfast.	100	70	20	10	200	3.3	1.8	Accepted
2	Breakfast does not have an effect on my comprehension level.	40	30	60	70	200	2.2	1.3	Rejected
3	Breakfast boost my level of comprehension.	50	30	70	50	200	2.7	1.6	Accepted
4	I do have breakfast every morning.	60	40	50	50	200	2.5	1.6	Accepted
5	I am used to skipping breakfast.	10	50	90	50	200	2.1	0.7	Rejected

Grand Mean= 2.56

The results in table 1 shows that respondents in items 1, 3 and 4 accepted that breakfast has a positive impact on the comprehension level of students in Ebonyi State University. This is explained by the mean scores of 3.3, 2.7 and 2.5 for respondents in items 1, 3 and 4. Since the individual mean scores are not less than the average mean of 2.5, it shows that the respondents accepted that frequent consumption of breakfast each morning sequel to daily resumption of academic activities has a positive impact on their comprehension level. Breakfast consumption increases brain glucose which is needed for comprehension (understanding) of educational texts, materials, journals and learning from academic tutors or lecturers.

On the other hand, respondents in item 2 and 5 rejected that breakfast has no positive impact on the comprehension level of students in Ebonyi State University. This is explained by a mean score of 2.2 and 2.1. Since the mean score is less than the average mean score of 2.5, it was rejected that breakfast does not have any impact on the comprehension level of students in Ebonyi State University and students are used to skipping breakfast sequel to daily resumption of academic activities. The grand mean 2.56 shows that breakfast has a positive impact on the comprehension level of students in Ebonyi State University.

3.2 Research Question Two:

What is the impact of breakfast on the attention level of students in Ebonyi State University?

Table 2: Mean rating of the respondents on the impact of breakfast on the attention level of students in Ebonyi State University

S/N	Items	SA	A	D	SD	NO	\bar{x}	SD	Decision
6	Breakfast helps me maintain a high level of attention	90	20	40	50	200	2.8	1.7	Accepted
7	My level of attention does not have any link to intake of breakfast	20	30	100	50	200	2.1	0.8	Rejected
8	Breakfast intake enhances concentration, improves thinking and aids comprehension.	60	50	30	80	200	2.6	1.6	Accepted
9	I will not pay proper breakfast if I do not take breakfast	80	60	30	50	200	2.9	1.7	Accepted
10	Morning lectures are usually dull because students do not have time to make breakfast	50	60	40	50	200	2.6	1.6	Accepted

Grand Mean= 2.60

The result in table 2 shows that respondents in items 6, 8, 9 and 10 accepted that breakfast has a positive impact on the attention level of students in Ebonyi State University. This is explained by the mean scores of 2.8, 2.6, 2.9, and 2.6. Since the individual mean scores are not less than the average mean score of 2.5, it shows that respondents in items 6, 8, 9 and 10 accepted that breakfast helps student maintain a high level of attention. The students who consume breakfast experiences enhanced concentration, thinking and understanding during daily academic activities. On the other hand, respondents in item 7 rejected that breakfast has no positive impact on the attention level of students in Ebonyi State University. This is explained by a mean score of 2.1. Since the individual mean score is less than the average mean of 2.5, it shows that respondents in item 7 rejected that breakfast has no positive impact on the attention level of students in Ebonyi State University. The Grand mean of 2.60 shows breakfast has a positive impact on the attention level of students in Ebonyi State University.

3.3 Research Question Three:

Does breakfast have any impact on the memory retention level of students in Ebonyi State University?

Table 3: Mean rating of the respondents on the impact of breakfast on the memory retention level of students in Ebonyi State University

S/N	Items	SA	A	D	SD	NO	\bar{x}	SD	Decision
11	My memory level retention is high due to intake of breakfast	60	50	30	80	200	2.6	1.6	Accepted
12	Without breakfast, I can not Recall information being taught	70	50	30	50	200	2.6	1.6	Accepted
13	I feel fatigued whenever I take breakfast	40	30	60	70	200	2.2	1.3	Rejected
14	I perform better in class whenever I take breakfast	80	60	30	50	200	2.9	1.7	Accepted
15	Breakfast does not play any role in my memory retention level	50	30	50	70	200	2.3	1.4	Rejected

Grand Mean= 2.52

The results in table 3 shows that respondents in items 11, 12 and 14 accepted that breakfast has a positive impact on the memory retention level of students in Ebonyi State University. This is explained by the mean scores of 2.6, 2.6 and 2.9 for respondents in items 11, 12 and 14. Since the individual mean scores are not less than the average mean of 2.5, it shows that the respondents accepted that frequent consumption of breakfast each morning improves and enhances memory retention level thereby helping students achieve high performance in academic activities.

On the other hand, respondents in item 13 and 15 rejected that breakfast makes them feel fatigued during classroom activities and breakfast does not play any role in memory retention level. This means that when they consume breakfast, breakfast provides them with adequate energy for academic work and also helps them in retaining information being taught. This is explained by a mean score of 2.2 and 2.3. Since the mean score is less than the average mean score of 2.5, it was rejected that breakfast makes the students feel fatigued and plays no role in memory retention. The grand mean 2.52 shows that breakfast has a positive impact on the memory retention level of students in Ebonyi State University. The findings of the study were discussed under the following sub headings:

3.4 The Impact of Breakfast on the Comprehension Level of Students in Ebonyi State University

The results in table 1 shows that respondents in items 1, 3 and 4 accepted that breakfast has a positive impact on the comprehension level of students in Ebonyi State University. This is explained by the mean scores of 3.3, 2.7 and 2.5 for respondents in items 1, 3 and 4. Since the individual mean scores are not less than the average mean of 2.5, it shows that the respondents accepted that frequent consumption of breakfast each morning sequel to daily resumption of academic activities has a positive effect on their comprehension level. Breakfast consumption increases brain glucose which is needed for comprehension (understanding) of educational texts, materials, journals and learning from academic tutors or lecturers.

On the other hand, respondents in item 2 and 5 rejected that breakfast has no positive impact on the comprehension level of students in Ebonyi State University. This is explained by a mean score of 2.2 and 2.1. Since the mean score is less than the average mean score of 2.5, it was rejected that breakfast does not have any impact on the comprehension level of students in Ebonyi State University and students are used to skipping breakfast sequel to daily resumption of academic activities. The grand mean 2.56 shows that breakfast has a positive impact on the comprehension level of students in Ebonyi State University. The result is in line with the findings of Zainab Taha, Ayesha Rashed (2017), Postulated on the fact that the regular consumption of

breakfast as well as increased intake of healthy food is associated with increased learning outcomes and high school achievements in students. Katie Adolphus, Clare Lawton and Louise Dye (2013) noted that increased intake of habitual breakfast was consistently positively associated with improved academic performance. These findings agree with the researcher that breakfast consumption has a positive impact on the comprehension level of students in Ebonyi State University.

3.5 The Impact of Breakfast on the Attention Level of Students in Ebonyi State University:

The result in table 2 shows that respondents in items 6, 8, 9 and 10 accepted that breakfast has a positive impact on the attention level of students in Ebonyi State University. This is explained by the mean scores of 2.8, 2.6, 2.9, and 2.6. Since the individual mean scores are not less than the average mean score of 2.5, it shows that respondents in items 6, 8, 9 and 10 accepted that breakfast helps student maintain a high level of attention. The students who consume breakfast experiences enhanced concentration, thinking and understanding during daily academic activities. On the other hand, respondents in item 7 rejected that breakfast has no positive impact on the attention level of students in Ebonyi State University. This is explained by a mean score of 2.1. Since the individual mean score is less than the average mean of 2.5, it shows that respondents in item 7 rejected that breakfast has no positive impact on the attention level of students in Ebonyi State University. The Grand mean of 2.60 shows that breakfast has a positive impact on the attention level of students in Ebonyi State University. The result is in line with the findings of Nitin Gajre, Sylvia Fernandez- Rao, Nagalla Balakrishna & Shahnaz Vazir (2008) which indicated that regular habit of eating breakfast increases attention-concentration, memory and school achievement. This finding collaborate with the result of the researcher that breakfast consumption has a positive impact on the attention level of students in Ebonyi State University. The result of the researcher also agrees with Simon Cooper, Stephan Bandelow & Mary Nevill (2015) that breakfast consumption enhances cognitive function in adolescent population when compared to breakfast omission.

3.6 The Impact of Breakfast on the Memory Retention Level of Students in Ebonyi State University

The results in table 3 shows that respondents in items 11, 12 and 14 accepted that breakfast has a positive effect on the memory retention level of students in Ebonyi State University. This is explained by the mean scores of 2.9, 2.6 and 2.9 for respondents in items 11, 12 and 14. Since the individual mean scores are not less than the average mean of 2.5, it shows that the respondents accepted that frequent consumption of breakfast each morning improves and enhances memory retention level thereby helping students achieve high performance in academic activities.

On the other hand, respondents in item 13 and 15 rejected that breakfast makes them feel fatigued during classroom activities and breakfast does not play any role in memory retention level. This means that when they consume breakfast, breakfast provides them with adequate energy for academic work and also helps them in retaining information being taught. This is explained by a mean score of 2.2 and 2.3. Since the mean score is less than the average mean score of 2.5, it was rejected that breakfast makes the students feel fatigued and plays no role in memory retention. The grand mean 2.52 shows that breakfast has a positive effect on the memory retention level of students in Ebonyi State University. The result is in line with the findings of Tang, Z., Zhang, N., Liu, A. *et al* (2017) which proposed an advantage to consuming breakfast for memory. Breakfast consumption has a positive impact on memory retention especially in the lack of ability to recall information which is seen across the majority number of studies carried out by researchers. The study clearly shows that breakfast has a positive effect on memory retention level of students in Ebonyi State University. Breakfast consumption helps in recalling of information being taught in class room activities which in turn improves school achievement.

4. Conclusion:

The specific purposes of this study were set to determine the impact of breakfast on comprehension level of students in Ebonyi State University, the impact of breakfast on the attention level of students in Ebonyi State University and the impact of breakfast on the memory retention level of students in Ebonyi State University. The findings of the study showed that breakfast has a positive impact on the comprehension level, attention level and memory retention level of students. From the findings of the study, the following recommendations were made:

Undergraduate Students should endeavor to consume well-balanced breakfast meals. This can be done by accessing healthy meal plans from dieticians and nutritionists. Students should reduce intake of processed foods and carbonated drinks. They should aim at eating healthy vegetables, fruits and snacks. Teachers (lecturers) should also ensure that they periodically give students proper advice and orientation on breakfast consumption and its effect on their health and academic achievement. Dieticians and nutritionist should create awareness on the importance of breakfast consumption, create meal plans that are beneficial to the students with regards to finance, age and environment of the students. The school authorities should from time to time organize orientation courses, seminars, workshops etc., on the importance of breakfast consumption, its effects and how it affects academic achievement. They should also set up facilities that can provide the students with healthy meals such as cafeterias and canteens.

Based on the results of the study, it is evident that more research is needed on the breakfast consumption and its impact as regards to students and academic achievement. While this study focuses on the impact of breakfast consumption on undergraduate students, the practice of breakfast omission are largely situational based which is something dieticians and nutritionist do not always have the ability to control. The most that can be done to eradicate breakfast omission among students is to educate them and to provide resources or facilities that can be beneficial such as meal plan design, a canteen or cafeteria.

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