

Case Study

School Lunch Consumption Pattern, Academic Performance, and Nutritional Status of Preschool Children in Bwari, Federal Capital Territory (FCT), Nigeria.

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Abstract: This study investigated the school lunch consumption pattern and its relationship with the academic performance and nutritional status of preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari, FCT, Nigeria. The study was guided by three research questions and adopted a descriptive research design. The population comprised all 60 Nursery 2 pupils in the two selected schools, consisting of 25 pupils from Deeray Springfield School and 35 pupils from LEA Primary School (ECCE Centre). The entire population was used for the study. Data were collected through a researcher-designed interview, school records, four-week observation of school lunch consumption, anthropometric measurements, and pupils' academic records for three consecutive terms. Frequency and percentage were used to analyse school lunch consumption patterns and academic performance, while WHO-based Z-scores were used to determine nutritional status. The findings revealed that most preschool children consistently came to school with cooked foods, predominantly high in carbohydrates, whereas fewer children brought snacks, mainly sugary substances such as biscuits, snacks, and juice. The nutritional assessment showed that 60% of the children were underweight, 30% were normal, while 10% had low BMI or were stunted. Most children who brought cooked food were categorized as normal, whereas most children who brought snacks were underweight. The findings further showed little or no difference in academic performance between children who brought food and those who brought snacks, indicating that school lunch consumption did not influence their academic performance. The study recommends the introduction of a school meal policy promoting diverse and balanced meals, periodic assessment of children's weight and height, and nutrition education for parents to discourage excessive reliance on sugary snacks.

Keywords: School Lunch Consumption, Academic Performance, Nutritional Status, Preschool Children, Bwari

Introduction

Adequate nutrition is essential to the growth, development and general well-being of children. School-aged children spend a considerable part of their day in school; consequently, the type and quality of food consumed during school hours may contribute substantially to their nutritional well-being. Food quality is influenced by the diversity of food types, the pattern of consumption and nutritional balance. Inadequate dietary diversity and poor food consumption patterns may contribute to nutritional problems, including malnutrition.

Food consumption patterns are influenced by physiological and social factors, including food preferences, ethnicity, values, habits and food availability. The type and quantity of food consumed can affect an individual's well-being and nutritional status. Adequate food intake is particularly important during childhood because this period is characterized by rapid physical growth and cognitive development. Poor nutrition during childhood may therefore have consequences for health, growth and learning.

Nutritional status has been identified as an important factor associated with children's learning ability and school performance. Access to nutritious meals during school hours may help alleviate short-term hunger, improve attention and support children's overall development. Children who experience nutrient deficiencies or protein-energy malnutrition may not have the same learning potential as healthy and well-nourished children. Furthermore, hungry children may experience difficulty concentrating and participating effectively in academic activities.

School lunch is therefore expected to contribute to children's nutrient requirements. A balanced lunch should ideally contain a variety of foods capable of providing carbohydrates, proteins, vitamins, minerals and healthy fats. However, in many Nigerian schools, parents are primarily responsible for providing lunch for their children, and there may be no clear guidelines regarding the type and nutritional quality of foods to be packed. Parents may consequently select foods based on children's preferences, affordability, availability, convenience and ease of storage. This may result in some children coming to school with nutritionally inadequate meals or snacks such as biscuits and sugary drinks.

The preschool period is particularly important because adequate nutrition supports optimal growth and development. Nutritional inadequacy may affect weight, height and other anthropometric indicators of children's health. Since children may spend several hours in school, including additional hours for extra lessons, there is a need to understand the food they consume during school hours and its relationship with their nutritional status and academic performance.

This study, therefore, investigated school lunch consumption patterns and their influence on the academic performance and nutritional status of preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari, FCT. Nigeria. The study was based on the following research questions:

1. What is the school lunch pattern of preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari?
2. What is the nutritional status of preschool children in relation to their school lunch consumption?
3. How does the school lunch consumption pattern influence the academic performance of preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari?

Methodology

Research Design

The study adopted a descriptive research design. The design was considered appropriate because it enabled the researcher to systematically obtain information describing the school lunch consumption pattern, nutritional status and academic performance of the preschool children.

Population and Sample

The population comprised all the Nursery 2 pupils in the two selected schools: 25 pupils from Deeray Springfield School and 35 pupils from LEA Primary School (ECCE Centre), Bwari, giving a total population of 60 pupils. The entire population was used as a sample because of its relatively small size. Cohen and Manion (2022) recommended that about 10-60 subjects per group are ideal for any type of structured experimental study.

Instruments and Data Collection

A researcher-designed interview and school records were used for data collection. The school lunch consumption pattern of the Nursery 2 pupils was recorded by the researcher over a period of four weeks. Pupils who brought cooked food and those who brought snacks were recorded.

The pupils' height was measured using a measuring tape, while their weight was measured using a scale. The anthropometric measurements were used to determine weight-for-height Z-score (WHZ), height-for-age Z-score (HAZ), weight-for-age Z-score (WAZ) and BMI-for-age Z-score (BAZ), in order to ascertain nutritional status.

Academic performance records were obtained for three consecutive periods: Nursery One cumulative result, Nursery Two first-term cumulative result, and Nursery Two second-term cumulative result.

The instruments were subjected to content validation by the supervisor and two other experts in the Departments of Home Economics and Agricultural Education, School of Vocational and Technical Education, FCT College of Education, Zuba, Abuja. Reliability was determined through a test-retest procedure involving two schools outside the study

group, with an interval of two weeks. Pearson Product-Moment Correlation Coefficient was used to establish the reliability of the instrument.

Method of Data Analysis

Frequency and percentage were used to answer Research Questions One and Three, while WHO-based Z-scores were used to determine the nutritional status of the children for Research Question Two.

Results

The results presented below retain the findings, figures and interpretations of the original study.

School Lunch Pattern of Preschool Children

The results showed that preschool children in the two schools were more consistent in bringing food than snacks to school. The highest percentage of children who brought food was 80%, while the study reported that fewer children brought snacks. This implies that most of the preschool children in Deeray Springfield School and LEA primary (ECCE Centre) always came to school with cooked food, which was predominantly high in carbohydrates, while the few children who came to school with snacks were mainly fed sugary substances such as biscuits, snacks and juice.

Nutritional Status of Preschool Children

Table 1: Analysis of the school lunch pattern of preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari FCT.

WEEK 1 6th-10th	Monday	Tuesday	Wednesday	Thursday	Friday
No. of pupils who brought food	48(80%)	43(71.6%)	32(53.3%)	35(58%)	29(48%)
No. of pupils who brought snacks	12(20%)	17(28%)	28(46%)	25(41%)	31(51%)
WEEK 2 18th-17th	Monday	Tuesday	Wednesday	Thursday	Friday
No. of pupils who brought food	48(80%)	39(65%)	39(65%)	40(66%)	34(56%)
No. of pupils who brought snacks	12(20%)	21(35%)	21(35%)	20(33%)	26(43%)
WEEK 3 20th- 24th	Monday	Tuesday	Wednesday	Thursday	Friday
No. of pupils who brought food	35(58%)	36(60%)	42(70%)	32(53%)	31(51%)
No. of pupils who brought snacks	25(41%)	24(40%)	18(30%)	28(46%)	29(48%)
WEEK 4 27th- 31st	Monday	Tuesday	Wednesday	Thursday	Friday
No. of pupils who brought food	40(66%)	31(51%)	31(51%)	34(56%)	39(65%)
No. of pupils who brought snacks	20(33%)	27(48%)	27(48%)	26(43%)	21(35%)

Source: World Health Organization, 2007

Table 2: Analysis of the nutritional status of school lunch of preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari, FCT.

Variable	Weight	Height	WHZ	HAZ	WAZ	BAZ	Nutritional Status
Male Children	20	120	-1.38	2.38	0.7	-1	Normal
Children who consume food for lunch at school	10.6	110.5	-5.9	0.36	-3.81	-5.85	Underweight
	10.4	107.4	-5.57	1.26	-3.26	-5.85	Underweight
	10.5	110	-5.9	1.87	-3.19	-6.17	Underweight
	10.4	107.4	-5.57	1.08	-3.33	-5.81	Underweight
	10.7	105.4	-4.99	-0.73	-3.75	-4.94	Normal
	10.6	105.4	-5.07	-0.74	-3.82	-5.02	Underweight
	10.7	109.22	-5.62	0.05	-3.76	-5.57	Underweight
	10.4	102	-4.67	-0.06	-3.28	-4.85	Normal
	10.4	102	-4.67	-0.07	-3.29	-4.85	Normal
	10.7	112	-6.04	0.62	-3.77	-5.99	Underweight
	10	99	-4.53	-0.78	-3.57	-4.64	Normal
	10.5	109	-5.74	1.56	-3.22	-6.01	Underweight
	10.5	102	-4.58	-0.08	-3.22	-4.75	Normal
	10.8	110.7	-	-	-	-	Underweight, stunted, wasting
	10.7	110	-5.74	1.8	-3.07	-6.01	Underweight
	10.8	115	-	16.33	1.54	7.31	Underweight stunted
	10.3	102.9	-4.92	0.08	-3.39	-5.1	Low BMI
	10.7	107	-5.26	-0.51	-3.8	-5.2	Underweight
	10.6	104	-4.83	-0.71	-3.67	-4.82	Normal
	10.4	100	-4.31	0.66	-3.35	-4.41	Normal
	10.7	110.5	-5.82	0.28	-3.79	-5.76	Underweight
Female	Weight(kg)	Height	WHZ	HAZ	WAZ	BAZ	Nutritional Status
Children who consume food for lunch at school	10.6	115	-6.47	1.14	-3.85	-6.95	Underweight
	10.5	105.4	-5.55	0.55	-3.48	-5.75	Underweight

	20	102	2.62	-1.7	0.65	2.5	Normal
	10.7	112	-6.27	0.43	-3.99	-6.64	Underweight
	20	122	-3.27	2.59	0.64	-1.44	Underweight
	10.8	115	-6.54	2.81	-3.29	-7.08	Underweight
	10.8	115	-6.54	1.12	-3.91	-7.03	Underweight
	10.4	104	-5.43	0.2	-3.55	-5.58	Underweight
	10.7	100	-4.47	-2.13	-3.98	-4.33	Normal
	10.5	102	-5.02	-0.22	-3.46	-5.1	Underweight
	10.4	100.3	-4.83	-0.63	-3.53	-4.84	Normal
	10.4	102	-5.11	-0.29	-3.56	-5.19	Underweight
	10.2	94	-3.89	-2.12	-3.65	-3.59	Normal
	10.4	100	-4.78	0.67	-3.51	-4.78	Normal
	20.2	115.6	-0.22	1.2	0.7	0.06	Normal
Male Children	Weight (kg)	Height(cm)	WHZ	HAZ	WAZ	BAZ	Nutritional Status
Children who consume snacks as lunch	10.6	110	-6.09	1.63	-3.42	-6.47	Underweight
	10.8	115	-6.54	1.12	-3.91	-7.03	Underweight
	10	104	-5.81	-1.23	-4.38	-5.88	Underweight
	10.9	115	-6.47	1.11	-3.86	-6.95	Underweight
	-	104	-	0.16	-	-	Underweight, wasting
	10.5	104	-5.33	0.18	-3.49	-5.48	Underweight
	10.8	115	-6.54	2.85	-3.27	-7.09	Underweight
	20	122	-	2.66	0.67	1.48	Underweight
	10.7	112.5	-6.33	0.57	-3.97	-6.72	underweight
	10.4	109.4	-6.18	1.42	-3.58	-6.54	Underweight, stunted
	10.6	110.5	-	32.39	12.11	4.7	Wasting
	10.4	110.5	-6.32	1.88	-3.5	-6.73	Underweight
Female Children	Weight	Height	WHZ	HAZ	WAZ	BAZ	Nutritional Status
Children who consume snacks as lunch	10.3	102.9	-4.92	0.15	3.35	-5.12	Low BMI
	10.2	94	-3.4	-1.92	-3.42	-3.3	Normal
	10.6	107	-5.34	0.51	-3.86	-5.28	Underweight
	10.5	104	-4.92	0.39	-3.22	-5.13	Low BMI
	10.4	109	-5.82	1.54	-3.3	-6.09	Underweight
	10.4	112	-6.27	2.26	-3.29	-6.59	Underweight

	10.4	110.5	-6.05	1.068	-3.39	-6.28	Underweight
	10.7	107.11	-5.28	-0.44	-3.78	-5.22	Underweight
	10.7	115	-6.46	1.22	-3.78	-6.41	Underweight
	10.4	102	-4.67	0.02	-3.2	-4.87	Normal
	10.7	110.5	-5.82	0.25	-3.79	-5.76	Underweight

Source: World Health Organization, 2007

School Lunch Consumption Pattern and Academic Performance

Table 3: Analysis of the influence of school lunch pattern on the academic performance of preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari, FCT.

Variables	Mean of Nursery one cumulative result	1 st term nursery two cumulative result	2 nd Term in nursery two cumulative result
Variable 1			
Children who bring lunch to school	37(69%)	37(66%)	37(69%)
Variable 2			
Children who bring snacks to school	23(67%)	23(77%)	23(73%)

Discussion of Findings

School Lunch Consumption Pattern of Preschool Children

The results of this study showed that most of the preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari, FCT always came to school with cooked food, which was high in carbohydrate, while a few of the children who came to school with snacks were mainly fed sugary substances such as biscuits, snacks and juice. This finding is in agreement with Ibeanu, Okechukwu and Eme-Okafor (2023), who reported that in Nigeria, most pupils went to school with home-packed lunches such as jollof rice, while fewer pupils brought noodles, spaghetti, biscuits and pastries.

The finding is also in agreement with Henry-Unaeze (2023), who reported that preschool children in a rural Nigerian population moderately consumed rice, biscuits, meat, beans, yams, cassava, cocoyams, potatoes, plantain, banana, garden egg, spinach leaves and palm oil, but had low consumption of milk and milk products. Similarly, the finding agrees with Olumakaiye, Atinmo and Olubayo-Fatiregun (2020), who found that the consumption of snacks, pastries and other junk foods was a common practice among Nigerian children.

The finding further agrees with Ikujenlola and Adekoya (2020), who reported that the food consumption pattern of many students was poor because they were fond of eating outside the home, consuming junk foods and preparing convenient meals such as noodles, rice and spaghetti, as well as consuming soft drinks and biscuits as meals. The finding is also consistent with Gbolahan (2020), who reported that household food consumption

patterns were somewhat poor because of poor eating habits and inadequate food budgeting skills.

Nutritional Status of School Lunch Consumption of Preschool Children

The results revealed that most children who brought food to school in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari were categorized as normal because they had appropriate weight and height for their age, while a few were underweight. Conversely, most children who brought snacks were underweight, while only a few were categorized as normal.

The finding supports Dusa (2024), who reported that school meals rich in essential nutrients contribute to improved cognitive abilities. It is also in line with Ibeanu, Okechukwu and Eme-Okafor (2023), who found that pupils consuming home-packed lunches met approximately one-half of their carbohydrate, vitamin B and zinc requirements; one-third of protein, iron and potassium requirements; one-twentieth of vitamin A; one-twenty-second of calcium; and one-fifth of vitamin C requirements.

The finding also supports Gibson et al. (2024), who found that children consuming school lunches from home had higher intakes of fruits, vegetables and dairy products than those who brought only snacks from home. This is important for ensuring adequate intake of essential vitamins and minerals such as calcium and vitamins A and C. The finding is also in consonance with Alderman et al. (2023), who highlighted that well-planned school meal programmes containing fruits, vegetables, whole grains, lean proteins and dairy products are associated with better nutritional outcomes among children. The finding further supports Ayeni (2020), who noted that school lunch patterns play an important role in shaping the nutritional status of preschool children.

The finding is in agreement with Akinlade, Ajibade, Gbadamosi, Ani and Adeyeye (2020), who found that school meals contained inadequate nutrients except carbohydrates and iron, which could contribute to poor nutritional status. However, the finding contradicts Ugochukwu, Onubogu, Edokwe and Okeke (2024), who reported that pupils with lunch packs had balanced meals and fruits or vegetables in their lunch packs and that some lunch packs of Primary School pupils contained poor-quality food, particularly in public schools.

School Lunch Consumption Pattern and the Academic Performance of Preschool Children

The results of this study indicated that school lunch consumption does not influence the academic performance of preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari, FCT. The children who consistently brought food and those who brought snacks had little or no difference in their recorded academic performance.

The finding supports Mbogbe (2023), as presented in the source study, regarding the relationship between school lunch patterns and students' academic performance. It also supports the findings of Al-kotb Mohamed and Farg (2023), who reported that less than half of school children took breakfast before going to school and that scholastic

achievement was average among more than two-thirds of boys and less than two-thirds of girls.

The finding further supports the discussion of Raveenthiranathan, Ramanarayanan and Thankappan (2024), which reported mixed findings regarding the effect of school meal programmes on academic outcomes. However, the present finding does not support Cohen, Amelie, McLoughlin, Turner and Schwartz (2021), who reported positive associations between school lunch snacks and pupils' academic performance. It also contradicts Isiko (2022), whose findings indicated an influence of school feeding on pupils' academic performance, and Adeoye (2024), whose study reported that school meal quality affected pupils' academic performance.

The absence of a clear difference in academic performance in the present study may be associated with factors outside the school lunch consumed by the children. As observed in the original study, some children who brought snacks may have been adequately fed at home, while some children who brought cooked food may not necessarily have received adequate nutrition before arriving at school. Therefore, school lunch alone may not fully represent the children's total dietary intake.

Conclusion

Based on the findings, it was concluded that most preschool children in Deeray Springfield School and LEA Primary School (ECCE Centre), Bwari brought cooked meals to school, predominantly meals high in carbohydrates, while a smaller number brought snacks that were mainly sugary foods such as biscuits and juice.

The findings showed differences in nutritional status according to the type of lunch consumed. Children who brought cooked meals were largely categorized as having normal weight and height for their age, although some were underweight. In contrast, most children who brought snacks were underweight, while only a few had a normal nutritional status.

The study also established that school lunch consumption had no direct influence on the recorded academic performance of the preschool children because there was little or no difference between the performance of children who brought food and those who brought snacks. The findings nevertheless underscore the importance of improving the nutritional quality and diversity of foods consumed by preschool children during school hours.

Recommendations

1. The Ministry of Education should introduce a school meal policy that encourages parents to pack more diverse meals containing a balance of carbohydrates, proteins and healthy fats. Parents should also be enlightened on the importance of balanced diets that include adequate proteins, vitamins and healthy fats.
2. The education authorities should consider conducting periodic weight and height assessments to monitor and track children's nutritional status.
3. A structured school feeding programme should be considered, incorporating nutrient-rich foods such as fish, eggs, fruits and vegetables to support children's growth and cognitive development. Parents should also be educated on the

importance of packing wholesome meals, while excessive reliance on sugary snacks and junk foods should be discouraged.

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