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Breakfast Intake and Associated Factors among Primary School Students in Selected Private and Public Schools, Kakata City, Margibi County- Liberia

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ABSTRACT

Breakfast consumption has been shown to positively affect children's cognitive performance. The objective of this study was to compare the breakfast intake of primary school students attending private and public schools. This was a cross-sectional study conducted in Kakata City, Margibi County among 129 private and public school students in the 4th, 5th, and 6th grades. Private and public-school students were compared based on their religious practices, age range, educational and employment status of parents, and gender using the Chi-square test. The study found that 42% of private-school children and 35 percent of public school children ate breakfast prepared at home by parents. Private school children ate their breakfast most often at home, regardless of whether it was prepared at home or elsewhere (92% vs. 89%). On average, private school children added fruits (36% vs. 18%) and vegetables (35% vs. 14%) to their breakfast more than their public-school counterparts. Sugar was regularly added to 58% of private school children and 44% of public school children's breakfasts. Private school children consumed milk during breakfast more than public school children (50% vs. 40%). Furthermore, private school children ate less oil during breakfast compared with public school children (64% vs. 83%). Finally, private school children consumed breakfast more regularly than public school children (49% vs. 38%). In conclusion, Private school children appeared to consume more diverse food during breakfast than their public-school counterparts. Nutrition promotion intervention should be aimed at extending free school feeding programs to all public and private primary schools.

INTRODUCTION

As outlined in sustainable development goal 4, all children should have access to quality education ((Bernstein, 2017). To achieve this goal, children all over the world must receive a quality education in a conducive learning environment. The provision of a conducive learning environment includes the provision of a nutritious diet before, during, and after the classroom learning period. Ending hunger and malnutrition (SDG 2) in any country will be the most cost-effective and appreciated step toward reaching the fourth sustainable development goal (Gil *et al*, 2019). Although universal education will reduce global poverty, hunger among schoolchildren remains a global challenge.

In Malawi, hunger in both primary and secondary school children were found to be a major social problem (Mwambene, Muula, & Leo, 2013). Hunger was associated with high rates of truancy among Tanzanian schoolchildren (Seidu, Dadzie, & Ahinkorah, 2021). The objective of this study was to compare the breakfast intake of primary school students attending private and public schools in Kakata City, Margibi County, Republic of Liberia.

Importance of Breakfast for School Children

Kids need breakfast to obtain their daily nutrient and energy intake, as it is the most important meal of the day. The nutrient and energy intake of school children who regularly consume breakfast is significantly higher

than that of children who skip breakfast (Intiful & Lartey, 2014). Breakfast-eating children perform better academically than breakfast-skipping children (Littlecott *et al*, 2016). Children's cognitive performance was reported to be positively impacted by breakfast consumption (Widenhorn-Muller *et al*, 2008). In childhood and adolescence, breakfast consumption helps prevent excess adiposity (Blondin *et al*, 2016). Ramsay *et al*. (2018) also found that skipping breakfast was associated with significantly lower fiber consumption, folate intake, iron intake, and calcium intake.

Inadequate Breakfast Intake among School Children and Associated Factors

A study found that School children with highly educated mothers consumed more breakfast compared with children with mothers not highly educated (ALBashtawy, 2015). Breakfast consumption was found to be low among boy children in public schools compared with boy children in private schools (Al-Hazzaa *et al*, 2020). Income status of parents had been identified to be one of the factors related to breakfast skipping among primary school children (Tee *et al*, 2018). A study among Saudi School children found that children in private schools consumed breakfast more frequently than those attending public school. The study also found that mothers prepared breakfast at home most of the time for their school children (84.5%). Additionally, Parents appeared mostly satisfied with the breakfast consumed by their child at

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home and placed high importance on breakfast compared to lunch or dinner (Al-Hazzaa *et al.*, 2020).

Breakfast Intake among Liberian School Children

Secondary data on the breakfast intake among primary school children in Liberia is limited. However, the socioeconomic profile of the country may give some clues as to what is happening with breakfast intake among school children. School feeding is an essential component of the Liberian government's efforts to improve the education, health, and nutrition of school-age children. However, the program remains donor funded with no or limited budgetary input from the government, creating serious challenges when donor funds run dry. Mary's Meals currently serves school meals to 151,968 children in 669 schools across Liberia. However, these meals are not intended to be consumed as breakfast. As indicated in the comprehensive food security assessment report (2018), Liberia continues to experience household food insecurity, with 41% in 2010, 49% in 2012, 16% in 2015, and 18% in 2018. There has been some improvement since 2015, but a large number of Liberians remain hungry and undernourished. Schoolchildren are also affected by this hunger crisis in terms of diet quality. Among 121 countries, Liberia ranks 113th in the 2022 Global Hunger Index. Having a score of 32.4, Liberia has a serious level of hunger.

METHODOLOGY

Subject and Study Area

This study was a cross-sectional study conducted in Kakata City, Margibi County among 66 private and 63 public-primary school students. A random selection of three private and three government schools was made in Kakata City from a list of 20 Schools. The number of schools selected was based on available funding. Schools were also selected based on the principals, and teachers' willingness to have their students participate. In each school, children in the 4th, 5th, and 6th grades were eligible to participate. To conduct this study in Kakata, the County Educational Officer (CEO) of Margibi County was officially contacted through written communication. The communication was written by administration of the School of Health Sciences of the Cuttington University Schools of Graduate & Professional Studies. The CEO gave us the go-ahead to meet with the principals and teachers of the selected schools to ask them to allow us

to use their schools for this study. The principals and teachers of the schools selected, permitted us to conduct the study. Kakata's economic activities are dominated by trade, petty business, casual labor, salaried employment, and to a lesser extent agriculture.

Sample Size and Sampling Methods

Multisampling was used in this study in three stages. The district education officer's (DEO) office in Kakata City provided a list of all public and private primary schools in stage one. Using the list of public and private primary schools, a simple random sampling was used to select three public and three private schools (6 schools in totality). A list of all 4th, 5th, and 6th graders in the selected schools was obtained from their registrar's offices in the final stage. Using a systematic sampling method, every second student on the list was selected for the sample of 129 students.

Data Collection

This study's data was gathered entirely through the use of structured questionnaires. The questionnaires were designed to collect the following information: student ages, gender, religion, parental educational status, parental job status, student understanding of breakfast, parental behaviors toward breakfast, breakfast composition, and types of food eaten by students for breakfast.

Data Analysis

The Chi-square test was used to evaluate if pupils' capacity to enroll in private and public schools was connected to their religious practices, gender, age range, and educational and work level of parents. We utilized logistic regression to determine the association between pupils in private and public schools in terms of breakfast habits and knowledge.

RESULTS

Age, Gender, and Religion of Students

More than half of the students in private schools were female (55%) compared with those in public schools (44%). In terms of religious practices, more than half of the students in both public and private schools were Christians. However, private schools had more Christian students compared with public schools (94% vs. 70%). More than half of the students in both private and public schools were the age of 10 years and above (Table 1).

Table 1: Social Demography Profiles of Participants

Variables and Category		Private School n = 66		Public School n = 63		Chi-Square p-value
		N	%	N	%	
Gender	Male	30	46	35	56	1.31 (0.251)
	Female	36	55	28	44	
Religion	Christian	62	94	44	70	12.77 (0.000)
	Muslim	4	6	19	30	
Age	8-10 years	10	15	3	5	3.83 (0.050)
	≥10 years	56	85	60	95	

Parental Education and Employment Status

The prevalence of non-formal education was high among mothers (41% vs. 12%) and fathers (22% vs. 9%) of public-school children compared with private school children. More than half of the households of the students in both public and private schools were headed by males.

More than half of the mothers (64%) and fathers (57%) of students in public schools were unemployed compared with mothers (47%) and fathers (30%) of children in private schools. More than half of the households of students earned less than 15,000 (equivalent to \$81.1 USD) Liberian dollars per month (Table 2).

Table 2: Parental education and employment Status

Variables and Category		Private School n = 66		Public School n = 63		Chi-Square p-value
		N	%	N	%	
Educational status (mothers)	Non-formal education	8	12	26	41	14.10 (0.000)
	Formal education	58	88	37	59	
Educational status (fathers)	Non-formal education	6	9	14	22	4.24 (0.039)
	Formal education	60	91	49	78	
Household Head	Mother	5	8	11	18	2.89 (0.089)
	Father	61	92	53	83	
Employment status of mothers	Unemployed	31	47	40	64	3.55 (0.059)
	Employed	35	53	23	37	
Employment status of fathers	Unemployed	20	30	35	57	9.45 (0.002)
	Employed	46	70	27	43	
Monthly Household Income (LRD)	<15,000 (\$81.1 USD)	45	68	51	81	2.76 (0.097)
	≥15,000 (\$81.1 USD)	21	32	12	19	

Students' Knowledge About Breakfast

Table 3 showed that 99% of the private school children and 94% of the public school children knew the importance of breakfast (OR, 4.40; 95% CI, 0.47-40.55). Students in both public and private schools knew that

breakfast can be eaten first thing in the morning (OR, 1.33; 95%CI, 0.34-5.22). Nevertheless, more private school students (91%) agreed that vegetables and fruits should be added to breakfast than public school students (71%) (OR, 4.0; 95%CI, 1.46-10.89).

Table 3: Comparing Students' Knowledge of Breakfast

Response	Private School n = 66		Public School n = 63		Odd Ratio (95%CI)
	N	%	N	%	
Knowledge about the importance of breakfast for schoolchildren	65	99	59	94	4.40 (0.47-40.55)
Breakfast is eaten first thing in the morning	62	94	58	92	1.33 (0.34-5.22)
Include vegetables and fruits in breakfast	60	91	45	71	4.0 (1.46-10.89)

Comparing Breakfast Composition between Private and Public-School Students

Students were asked where their breakfasts are usually prepared. Table 4 shows that 35% of public school students and 42% of private school students ate breakfast prepared at home (OR, 1.37; 95% CI, 0.67-2.79). In

addition, students were asked to locate where they usually ate breakfast. It was found that 92% of private school children and 89% of public school children typically ate breakfast at home, regardless of whether the food was prepared at home or purchased elsewhere. (OR, 1.52; 95% CI, 0.45-5.08). In terms of dietary diversification,

Table 4: Comparing Breakfast Composition Between Private and Public-School students

Response	Private School n = 66		Public School n = 63		Odd Ratio (95%CI)
	N	%	N	%	
Eat Breakfast prepared at home	28	42	22	35	1.37 (0.67-2.79)
Eat Breakfast at home	61	92	56	89	1.52 (0.45-5.08)
Add fruits to breakfast	24	36	11	18	2.70 (1.18-6.14)
Breakfast is available regularly	32	49	24	38	1.52 (0.75-3.08)
Add vegetables to breakfast	23	35	9	14	3.20 (1.34-7.65)

Add sugar to breakfast	38	58	28	44	1.69 (0.84-3.40)
Add milk to breakfast	33	50	25	40	1.52 (0.75-3.05)
Add oil to breakfast	42	64	52	83	0.37 (0.16-0.84)

the study revealed that 36% of private school and 18% of public-school children had fruits usually added to their breakfast (OR, 2.70; 95% CI, 1.18-6.14) and 35% of private and 14% of public-school children usually had vegetables added to their breakfast (OR, 3.20; 95% CI, 1.34-7.65). Additionally, 58% of private and 44% of public school children usually had sugar added to their breakfast (OR, 1.69; 95% CI, 0.84-3.40), 50% the private and 40% in the public school children had milk usually added to their breakfast (OR, 1.52; 95% CI, 0.75-3.05), and 64% in the private and 83% in the public schools added oil to their breakfast (OR, 0.37; 95% CI, 0.16-0.84).

Finally, the study showed that breakfast was frequently offered for 49% of private school kids and 38% of public-school students (OR, 1.52; 95% CI, 0.75-3.08).

Breakfast Eaten Day before the Questionnaires were Administered

According to Table 5, the majority of pupils in both private and public schools (41% vs. 59%) ate rice with soup for breakfast the day before the surveys were administered. Additionally, 39% of private school students and 24% of public-school students ate bread with butter, mayonnaise, or eggs.

Table 3: Comparing Students’ Knowledge of Breakfast

Frequently Consumed foods during breakfast	Private School n = 66		Public School n = 63		Chi-square Test p-value
	N	%	N	%	
Rice (boiled) with soup	27	41	37	59	
Bread (added butter, mayonnaise, or eggs)	26	39	15	24	4.61 (0.100)
Roots/tuber	13	20	11	18	

DISCUSSION

In terms of social demography, more than half of private school children (55%) were female, compared to 44% of public-school children. Private school students were more likely to identify with Christianity than public school students. In terms of age distribution, more than half of the children in both private and public schools were 10 years old or older. There was a significant gap in educational attainment between parents of children attending public and private schools. In terms of comparing the educational attainment of parents (mothers & fathers) of private and public school children, the findings of the study indicated that mothers and fathers of children in private schools were more likely to have obtained formal education than their counterparts in the public schools. School children with highly educated mothers consumed more breakfast compared with children with mothers not highly educated (ALBashtawy,2015).

Most importantly, compared to their private-school counterparts, more than half of mothers and fathers of public-school children were unemployed. A household’s ability to purchase food is reduced as a result of unemployment. Children raised by unemployed parents are more likely to experience hunger or food insecurity during the school day. The study also showed the income disparity between families with children in private and public schools. Thirty-two percent (32%) of private school children’s households earn 15,000 Liberian dollars per month, compared to 19% of public school children’s households. Income disparities among parents of primary school children can have serious consequences for the quality of children’s diets.

Children in both private and public schools were more likely to agree that breakfast is important for school children and that breakfast should be eaten first thing in the morning. However, children in private schools were more likely than children in public schools to agree that fruits and vegetables should be included in breakfast. Children from both private and public schools were asked to demonstrate where their parents typically prepare their breakfast. According to the study, 42% of private-school children and 35% of public school children eat breakfast prepared at home, by parents. The children were also asked to indicate where they usually ate breakfast. According to the findings, 92% of private school children and 89% of public school children typically ate breakfast at home. Students at both schools prefer to eat their breakfast at home rather than on campus or elsewhere. Breakfasts were regularly available at home for 49% of private school children and 38% of public-school children. Private school children were more likely than public school children to eat breakfast before going to school (Al-Hazzaa *et al.*, 2020). The difference may be attributed disparity between parents of private and public-school children in term of employment and educational attainment. Private school children were privileged to have parents who were formally educated and employed compared with parents of public-school children. Children in private schools were found to be three times more likely than those in public schools to have vegetables and two times more likely to have fruits in their breakfast. Furthermore, more children in private schools (64%) added sugar and milk to their breakfast than those in public schools. Children in private schools,

on the other hand, consumed less oil in their breakfast than those in public schools (83%). On the day before the questionnaires were administered, 41% of the private school children and 59% of the public-school children ate cereal (rice), 39% of the private and 24% of the public-school children ate bread (added butter, mayonnaise, or eggs), and 20% of the private and 18% of the public-school children ate tubers or roots (cassava, potatoes, yam).

CONCLUSION

In this study, it was found that, there is a significant disparity between parents of private school children and parents of public-school children in terms of their educational attainment and employment status. The parents of children who attended private schools were more likely to be educated and employed than those of their public-school counterparts. Private schools had more female students than public schools, which had more male students. Compared to public schools, private schools had a greater number of students from Christian backgrounds. Both private and public-school students were knowledgeable about when breakfast should be eaten and the importance of consuming breakfast while attending school. However, students in private schools were more likely to agree that fruits and vegetables should be included in breakfast than their public-school counterparts. Fewer than half of the students in both public and private schools ate breakfast prepared at home by their parents. It should be noted, however, that more than half of the children who had their breakfast prepared at home preferred eating it at home rather than outside. Even though private school children's breakfasts contained more vegetables and fruits than public school children's breakfasts, less than half of students in both public and private schools consumed fruits and vegetables. When compared to public school children, private school children had less oil in their breakfast. The majority of the children ate rice for breakfast the day before the questionnaires were administered.

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