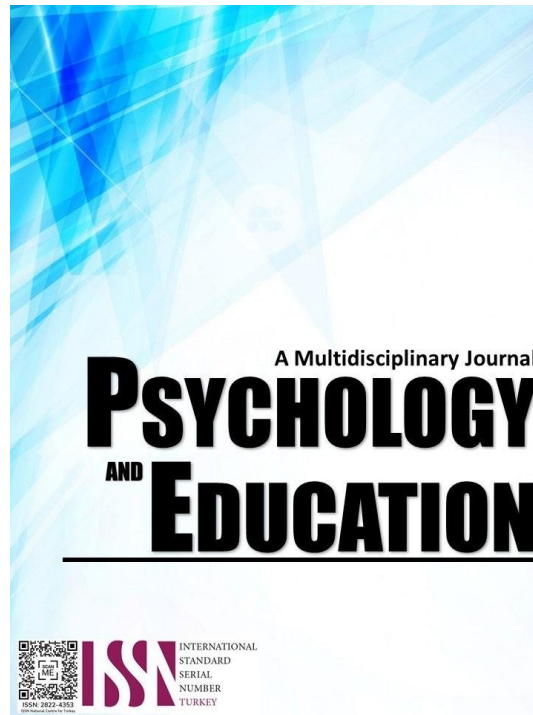


IMPACT OF THE SCHOOL-BASED FEEDING PROGRAM ON ACADEMIC ACHIEVEMENT AMONG ELEMENTARY LEARNERS: A QUANTITATIVE ANALYSIS



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Impact of the School-Based Feeding Program on Academic Achievement among Elementary Learners: A Quantitative Analysis

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Abstract

This study explored the impact of the School-Based Feeding Program (SBFP) on the academic performance and nutritional status of elementary learners at Canal Elementary School during the 2023–2024 school year. The research addressed the persistent issue of undernutrition and its potential influence on learners' academic outcomes. The primary aim was to determine whether SBFP participation contributed to measurable improvements in learners' General Point Average (GPA) and Body Mass Index (BMI), and to examine perceptions of students and teachers regarding the causes of undernourishment and the program's implementation. A quantitative method design was employed. Quantitative data were collected through pre- and post-intervention GPA and BMI scores of 26 pupils aged 6 to 13 years, representing Grades 2, 3, 4, and 6. Paired-sample t-tests were conducted to determine changes in academic and dietary performance. Qualitative data were gathered through structured interviews with eight teachers and the participating learners to capture insights on behavioral and program-related factors. Both datasets were analyzed separately and then integrated to compare and corroborate findings. Statistical analysis revealed a significant improvement in learners' GPA ($t(25) = -8.479, p < 0.001$) and BMI ($t = -7.232, p < 0.001$) after the intervention, indicating a positive effect of the SBFP. However, Pearson correlation results showed no significant linear relationship between final GPA and final BMI ($r = 0.062, p = 0.764$). Qualitative findings indicated that students attributed undernourishment to poor eating habits and lack of knowledge, while teachers emphasized student conduct and program effectiveness as key factors. The findings demonstrate that SBFP contributes independently to both academic and nutritional improvement, despite the absence of a direct correlation between the two outcomes. These results underscore the importance of holistic interventions in educational settings.

Keywords: *school-based feeding program, grade point average, body mass index, quantitative method*

Introduction

A healthy and well-nourished, educated population is the key to growth and economic development. Therefore, investing in children's nutrition, health and education throughout childhood, and continuing this through into adolescence, will enable children to achieve their potential, be productive adults and end the intergenerational transmission of malnutrition (UNICEF, 2019) in its report, *The State of the World's Children 2019: Children, food and nutrition – Growing well in a changing world*. Nonetheless, data indicate that investments made in health and nutrition are out of sync with those invested in education. Public expenditures on education during middle childhood and adolescence total USD210 billion annually in LLMICs, compared to only USD4 billion spent on their health and nutrition (Bundy et al., 2018). For poor students, school entry, everyday school attendance, and learning are usually tougher because of disease, hunger, and malnutrition.

The Philippines' School-Based Feeding Program (SBFP) is a government campaign against malnutrition and good health, as well as correct nutrition, for students. The scheme distributes healthy food items and pasteurized or sterilized milk among malnourished students. The School-Based Feeding program was created by Republic Act No. 11037 or the *Masustansyang Pagkain Para sa Batang Pilipino Act*, signed into law in June 2018.

The Department of Education (DepEd) has been conducting school-based feeding programs since 2010.

School feeding has consequences reaching far beyond a school meal and includes implications for equity and inclusion in education. Especially among girls, promising outcomes have been reported on school achievement through enhanced enrollment and consistent attendance (Adelman, C., Gilligan, D. O., & Lehrer, K. (2019). School feeding programs can enhance overall micronutrient status and decrease prevalence of anemia among primary school-age children and adolescent girls by offering balanced, healthy meals (Gillespie et al., 2021). They can even minimize vulnerability and increase family incomes, especially during emergencies. The cost of a school meal is the equivalent of around 10% of a family's income per child, something that can amount to significant savings for families with multiple children at school (Bundy, D. A. P., de Silva, N., Horton, S., Jamison, D. T., & Patton, G. C. (2019).

In humanitarian situations, school feeding has the potential to reduce the adverse effects of emergencies on nutrition and education as well as health, hence reducing access and completion barriers to education, particularly for girls (Aurino, E., Tranchant, J. P., Sekou Diallo, A., & Gelli, A. 2019)The integration of local foods in school food also has the potential to encourage consumption of diversified diets from available and fresh local foods and further boost local economic growth.

Based on country situation, nutrition context and the infrastructural, financial and human resources at hand, a combined school-based package of services is able to tackle health and nutrition problems synergistically as well as increase cost-effectiveness. This package

may consist of school meals, in the shape of a midday meal or hot meal through HGSF (WFP and the Food and Agriculture Organization of the United Nations, 2018)¹ that could incorporate fortified foods as well as complementary health and nutrition elements. Economic studies reveal that school systems are cost-saving mechanisms for the provision of an integrated package of basic health and nutrition services to children in school (Aurino, E., Tranchant, J. P., Sekou Diallo, A., & Gelli, A. 2019)

Most health conditions in children could be avoided or managed by interventions offered through schools since schools have more windows through which they could reach children than through health facilities, especially in rural settings. The integration of community outreach pathways into the education system serves to enhance the health of children with economic analyses indicating that school-based health and nutrition programs can be a key component of universal primary health care (Watkins, S. C., Zhang, D., Barrett, J. D., A. A., & Rivers, S. E. (2020)). The SBFP works towards: (1) rehabilitating at least 70% of severely wasted² beneficiaries to normal nutritional status at end of the feeding days; (2) maintaining 85% to 100% classroom attendance of beneficiaries; and (3) enhancing children's health and nutrition values and behavior. As stated by the Health and Nutrition Center (HNC) of DepED, the most important objective of the SBFP is the nutrition objective; the others are secondary.

The DepED SBFP consists of feeding the primary students 100-120 feeding days based on a 20-day cycle of standardized meals supplemented with malunggay. Every meal comprises at least 300 calories; it's less than (876) calories per meal in other feeding programs (Adelman et al. 2019). Additionally, SBFP provides lesser feeding days than 180 feeding-day-average in developing nations (Bundy et al. 2019).

In order to roll-out the SBFP, every school head organizes its SBFP core group (CG), and engages volunteer parents in meal preparation and feeding of children. The SBFP also decentralizes procurement and financial reporting; and is supplemented with other DepED programs of deworming, Gulayan sa Paaralan Program (GPP), and Essential Health Care Program (EHCP).

SBFP is a "well-managed program". School heads and other school personnel were oriented prior to the onset of the program. Beneficiary parents were also part of the participants in the orientation and pledged their services towards program implementation. Financial processes like procurement and auditing procedures were discussed in detail and overseen at all levels by the core Technical Working Group (TWG). An effective mechanism for feedback was established through the supervisory structures of the Regional and Schools Division Offices (ROs and SDOs). SDO accountants assisted school heads in complying with procurement requirements and in preparing liquidation reports and consulted with the staff of the Commission on Audit (COA) regarding problems encountered by the SBFP implementers. The SBFP appeared to work best when complemented with other School Health Programs such as deworming, micronutrient supplementation, Gulayan sa Paaralan Program (GPP), and WASH in Schools (WinS) Program. School administrators also emphasize the necessity of such programs to prepare children to learn and grow in a healthy school setting where they can establish health-promoting behaviors and habits for a healthier next generation.

Canal Elementary School regularly carries out its feeding program every Wednesday and Friday, an activity maintained through the kindness of donors and the release of school funds. The objective of this research is to assess the effect of school-based feeding programs on learners' academic performance. Through an examination of how nutrition interventions affect students' academic performance, the research seeks to establish whether offering regular, healthy meals in the school setting leads to enhanced learning outcomes.

The study attempts to determine whether there are any connections between the provision of school-based meals and improvements in student achievement, motivation, and educational performance as a whole. Ultimately, the investigation hopes to establish evidence that can guide policy-making and teaching practices towards the construction and enactment of successful feeding programs that promote improved academic achievements and all-around student well-being.

Research Questions

This research assessed the Academic performance status of learners, Beneficiaries of the School-Based Feeding Program in Canal Elementary School, Canal, Carcar City, Cebu, during the School Year 2023-2024 as a basis for an action plan. Specifically, this answered the following questions:

1. What is the profile of the learners in terms of:
 - 1.1. age;
 - 1.2. grade level; and
 - 1.3. gender?
2. What is the learner's GPA before and after the school-based feeding program?
3. What is the baseline and end-line BMI of the learners?
4. Is there a significant difference between learners' GPA before and GPA after the Feeding Program?
5. Is there a significant difference between Body Mass Index (BMI) baseline and BMI endline of the learners.
6. Is there a significant relationship between the learner's end-line BMI and GPA after the school-based feeding program?
7. What is the level of agreement by learners on the factors contributing to their undernourishment, in terms of:
 - 7.1. food security and access;
 - 7.2. household information; and

- 7.3. dietary habits and knowledge?
8. What is the level of agreement by teachers on their challenges faced in implementing the School-based Feeding Program in terms of:
 - 8.1. food and nutrition;
 - 8.2. resources and facilities;
 - 8.3. time management and workload;
 - 8.4. program implementation; and
 - 8.5. student behavior and impact?

Literature Review

As posited by Abraham Maslow in his Hierarchy of Needs, A. H. Maslow (1943). A human motivation theory, fundamental physiological needs like food are satisfied before the upper-level needs of learning and self-actualization are possible. School feeding programs provide the basic needs of learners so that they may concentrate on studies.

Physiological needs including food, water, and shelter are inherent in sustaining human existence and well-being as proposed by Maslow's Hierarchy of Needs. Literature review is on the effects of the School-Based Feeding Program on the learning achievements. School feeding programs have been implemented in most countries around the globe to combat short-term hunger through provision of at least one meal per day that is nutritious to sustain education access. The scheme targeted enhancing the students' enrolment, School attendance, and primary school retention.

The World Bank (2018) School feeding program is a selective social safety nets that offer both schooling and health benefits to the poorest and most vulnerable children, hence enhancing Enrollment rates, lowering absenteeism, and enhancing food security at home level (World Food Programme 2019). School feeding programme, as noted by the World Bank, is a selected school safety nets that impart both educational and health benefits to the poorest children, thus raising enrolment, lowering absenteeism and enhancing food security at the household level (World Food Programme, 2019). Adelakun (2019) described a School Feeding Programme as the distribution of at least one meal, for example, breakfast or lunch, to pupils daily in school.

In Abraham Maslow's Hierarchy of Needs he theorized that prior to reaching their utmost potential, individuals must fulfill a set of needs. The most basic necessity of every human being is physiological needs like Clothing, shelter, air, water, and food. Physiological needs are extremely essential; if these needs are not fulfilled, the human body cannot work effectively and will eventually collapse. Physiological needs are believed to be the priority; they need to be addressed first. With regards to this, a child who failed to fulfill his physiological needs would struggle with his study habits. If a student attends school to learn and yet his stomach remains empty, academic comprehension and performance of the student is interrupted relative to a student who eats breakfast or lunch prior to attending school.

The School Feeding Programme was conducted primarily with the intention of realizing the following outcomes: enhance children's school retention, reduce short-term hunger, increase nutritional status and micronutrient status, and enhance learners' performance (World Food Programme 2019). Starving children have more challenges in maintaining long-term concentration and the ability to carry out complex activities compared to well-nourished children. Since poor children are not provided with the fundamental nutritional building blocks from early infancy, they will not be able to learn easily. Research indicates that when they mature into primary school going age, most of the harm has been done to them and in fact, the same is irreversible (Buhl, 2020).

Hunger would not enable students to maintain schooling and talk less of good performance. Feeding alone in the schools does not only solve the problem of the quality of education, but also increases the number of pupils retained in the schools. Most of the children attending public primary schools in the urban and rural parts of the state are from vulnerable and poor families. Retention in the context of this study, refers to retaining the pupils in school. School retention also comes in the form of being held back, where children are retained in school to progress with peers irrespective of academic achievement (Weinreb & Wehler, 2020). Students also demonstrate a reduction in the desire to engage in physical activities such as sports activities. Malnutrition due to disease has a great impact on physical health and yields psychological challenges (Freijer et al., 2018).

DepEd, through the Bureau of Learner Support Services-School Health Division, administers the School-Based Feeding Program (SBFP) for Fiscal Year 2018, by the General Appropriations Act (GAA) for the current year and includes all target beneficiaries identified. SBFP delivers feeding to learners where there are priorities given to the Severely Wasted (SW) and Wasted (W) and all Kinder in selected Philippine Plan of Action for Nutrition (PPAN) areas. It also enhances the nutritional status of the SW/W and all Kinder (PPAN areas) students at the end of a minimum of 120 feeding days and addresses 100% deworming of target beneficiaries before feeding activity. It also encourages health and nutrition information and consciousness among target beneficiaries by way of the K to 12 curriculum and its alternative modalities of learning; and induces Gulayan sa Paaralan Program (GPP) and backyard vegetable gardening to support the feeding program and to complement the nutrition and poverty-reduction programs of the Government. DepEd Order No. 39, s. 2017 entitled Operational Guidelines on the Implementation of the School-Based Feeding Program will also serve as reference in its implementation. The Department of Education will further implement the School-Based Feeding Program (SBFP) nationwide under the General Appropriations Act (GAA) for this year and will include all identified target beneficiaries.

The program maintains its goals in the enhancement of target beneficiaries' classroom attendance to over 85% annually and motivates learners to attend school daily. Undernourished (SW/W) Kinder to Grade 6 shall be the priority target beneficiaries for School-Based Feeding Program (SBFP). Among the programs implemented by the Philippines to reduce and enhance the performance of the students and their class attendance is the school feeding program.

The Department of Education which is the prime implementer of the school feeding programs aims to address undernutrition or malnourishment of the students, which is highly prevalent among Filipino children of school age. In 2018 alone, for example, the DepEd Nutrition Status Report listed over half a million severely wasted children enrolled in the public elementary schools of the country (Albert, 2019). Education is and will always remain highly significant in establishing a good foundation in a person's life.

It serves as an important factor that determines what the child will become after spending years studying. A proper education is quite essential for everyone to proceed in life and be prosperous. Nevertheless, not every child in the nation is provided with proper and nutritious education despite the efforts of the government of the Philippines to introduce various schemes to make everyone educated. The nutritional status is the description of a person's dietary needs based on diet, amount of nutrients in the body, and optimal metabolic function.

Normal food intake and nutrient requirements reflect an individual's typical nutritional status. However, malnutrition is caused by food intake and nutrient imbalances. Overweight, underweight, and low height are all part of Centers for Disease Control and Prevention growth charts. Proper nutritional status benefits children's physical, mental, psychological, and social. Therefore, to minimize the impact of this, the education sector must improve its SBFP (Dayagbil et al., 2021; Martin & Pihnuton, 2019). Additionally, the state of the body due to the food consumed and their use is referred to as nutritional status. Good, average, or poor quality of food is all possible. Intake of a well-balanced diet that provides all the necessary nutrients to meet the body's needs is referred to as having good nutritional status. One may say that such a person gets the best nutrition possible. A vigilant, benevolent temperament, a normal weight for height, well-built and hard muscles, reddish pink lips and eyes, a healthy covering of subcutaneous fat, a good appetite, and excellent overall health are all indicators of good nutrition.

A good diet state is also reflected in shiny hair, smooth skin, clear eyes, a wide-awake look, and firm flesh over a developed body (Endaya, 2019; Kurdi et al., 2019; Martin & Pihnuton, 2019). Chronic absence, or being absent more than 10 percent of the total number of school days of schooling is more common in disadvantaged neighborhoods.

Three days' absence by a student in a month highly correlates with weak performance (Park, S. W., & Lee, J. Y., 2023). That is, three days times ten months of school is equal to thirty days of school absence, which is over 10 percent of the entire school days in the Philippines. Good, average, or bad food quality is all possible. Consumption of a well-balanced diet that supplies all the nutrients required to fulfill the body's demands is called being in good nutritional status. It can be said that such an individual receives the optimum nutrition. A watchful, compassionate temperament, a mean weight for height, firm and well-developed muscles, reddish pink lips and eyes, a healthy subcutaneous layer of fat, a good appetite, and excellent overall health are all indicators of good nutriture.

A good nutritional condition is also reflected by lustrous hair, even skin, bright eyes, an alert look, and hard flesh on a well-developed body (Endaya, 2019; Kurdi et al., 2019; Martin & Pihnuton, 2019). Equally, starvation affects the learning performance of students. The findings from the studies illustrate that hungry and malnourished children are unable to go to school, and if they manage to go to school, they experience concentration and learning issues. Students equally exhibit a loss of interest in engaging in physical activities such as sports competitions. Malnutrition due to disease has a significant influence on physical well-being and generates psychological challenges (Freijer et al., 2018; Penny & Behrman, 2017). Various research emphasized that starvation impacts physical development and mental progress and weakens the immune system. These indicate that children who experience malnutrition during early life may experience various functioning problems when they become adults, such as decreased academic achievement, lower productivity, and reduced labor capacity. Improved nutrition and diet will likely create healthier and more productive adults with better human capital and economic output (Kurdi et al., 2019).

School-based feeding programs meet these fundamental needs by giving the students healthy meals, so they are not preoccupied with hunger and can concentrate more on studies. Following the satisfaction of physiological needs, humans aim for safety and security. School-based feeding programs may help provide security through a regular means of sustenance. In knowing that they are entitled to at least one meal per day at school, students may feel more secure and less anxious about their food situation. Jean Piaget's Cognitive Development Theory highlights the significance of adequate nutrition in cognitive development. Proper nutrition is important for brain development, which further influences learning and cognitive processes. Albert Bandura's Social Learning Theory indicates that children acquire skills and behaviors through observation. School feeding programmes may provide a conducive environment where children can observe healthy eating.

Methodology

Research Design

This study employed a quantitative research method to examine the impact of the School-Based Feeding Program (SBFP) on the academic achievement and nutritional status of selected elementary learners. Quantitative research, by nature, focuses on the collection

and analysis of numerical data to assess patterns, relationships, and outcomes in a structured manner. It emphasizes the principles of objectivity, reliability, and validity, ensuring that the findings are statistically sound and generalizable within similar contexts. To measure changes in academic performance and nutritional status, the study utilized two main tools: the learners' General Point Average (GPA) and their Body Mass Index (BMI), gathered before and after the intervention. The GPA served as an indicator of academic performance, while BMI represented the nutritional status of each learner. A 5-point Likert Scale questionnaire was also administered to gather supplementary quantitative data regarding participants' perceptions of undernourishment. Developed by Rensis Likert in 1932, this scale is a widely accepted psychometric tool used to quantify subjective attitudes, beliefs, and opinions. In this study, the scale allowed for the collection of data on students' and teachers' views about the contributing factors to undernourishment and the perceived effectiveness of the SBFP.

To analyze the data, two primary statistical tests were applied. The paired sample t-test was used to determine whether there were statistically significant differences in learners' GPA and BMI scores before and after the SBFP intervention. This test was appropriate for examining the changes within the same group over two time points. Additionally, the Pearson correlation coefficient was calculated to assess the potential linear relationship between learners' final BMI and final GPA following the program. Although both indicators improved significantly on their own, the correlation analysis revealed no statistically significant linear relationship between them. Together, these quantitative methods provided a comprehensive view of the measurable effects of the SBFP, supporting the study's conclusions on its benefits to learners' academic and physical well-being.

Respondents

The study participants were defined by the School Form 8 Learner's Basic Health and Nutrition Report record. In particular, it covered Grades one to six students in one of the public Elementary Schools in Carcar City Division, 26 learners in total, whose Body Mass Index is critically wasted. Their grades or Grade Point Average from the first quarter of the school year 2023-2024 will be used as the basis of the study, as during this time, the feeding program has just commenced. The pupils' academic performance in the fourth quarter after conducting the feeding program will be used to compare the pupils' previous performance before and after conducting the feeding program.

Instruments

The primary instrument utilized in this study was a revised and modified survey questionnaire. Two separates but thematically aligned questionnaires were developed: one for learners and another for teachers. Both instruments were designed to measure the level of agreement on factors related to learner undernourishment and the implementation challenges of the School-Based Feeding Program (SBFP). The questionnaire for teachers is titled: Survey Questionnaire on the Factors Faced by Teachers in Implementing the School-Based Feeding Program. This instrument was adapted from the work of Shiegrifrid G. Corpuz and Johnny S. Bantulo and consists of five thematic categories, each containing five statements with two sub-questions per category. The aim is to assess the level of agreement among teachers regarding the challenges encountered in the implementation of the SBFP. The five thematic categories are: Food and Nutrition, Resources and Facilities, Time Management and Workload, Program Implementation, and Student Behavior and Impact. The responses follow a 5-point Likert Scale, interpreted as follows: Strongly Agree, 4 – Agree, 3 – Neither Agree nor Disagree, 2 – Disagree, 1 – Strongly Disagree.

The learner version of the instrument is titled: Survey Questionnaire on the Factors Contributing to Undernourishment in Learners. This questionnaire aims to gather information directly from learners to determine their level of agreement on the factors that contribute to their undernourishment. It contains structured questions categorized into three main domains: Food Security and Access, Household Information, and Dietary Habits and Knowledge. Similar to the teacher questionnaire, this instrument also utilizes a 5-point Likert Scale with the following response options: 5 – Strongly Agree, 4 – Agree, 3 – Neither Agree nor Disagree, 2 – Disagree, and 1 Strongly Disagree.

Procedure

The steps in data collection that were followed were:

Preparation in Advance. An approval transmittal letter from the school Principal was obtained.

Distribution of Questionnaire. Once approved, the questionnaire was distributed personally to the pupils and the teachers. An explanation of the study's purpose was discussed by the researcher before filling in the survey questionnaire. It was answered in a face-to-face manner. Once the respondents had completed the questionnaire, the data were gathered immediately. School Form 8 Learner's Basic Health and Nutrition Report was solicited from the school health coordinator.

Statistical Design

The information collected from the questionnaire survey will be counted, compiled, tabulated, and processed using the following statistical treatments.

Weighted Mean. The weighted mean was utilized to establish the level of agreement on the causes of learners' undernourishment and teachers' difficulties in applying the School-Based Feeding Program (SBFP).

t-test. This was used to determine the significant differences between the two-tailed data.

Pearson Product-Moment Correlation Coefficient. This was used to examine the statistical significance of the relationship between learners' GPAs after the SBFP and their endline BMI.

Data Analysis

The responses gathered from the survey questionnaires were subjected to appropriate statistical analyses to interpret and evaluate the results of the study effectively. For the quantitative data derived from both learners and teachers, descriptive statistics, specifically the weighted mean, were employed to determine the level of agreement regarding the factors contributing to learner undernourishment and the challenges faced by teachers in implementing the School-Based Feeding Program (SBFP). The weighted mean enabled the researcher to identify which among the listed factors were most commonly perceived as significant by the participants.

To examine whether there were significant changes in academic performance related to changes in nutritional status, the study further employed a paired samples t-test. This inferential statistical tool was used to compare the mean General Point Average (GPA) of the same learners across two time points—before and after the implementation of the feeding program—alongside their corresponding changes in Body Mass Index (BMI). The paired samples t-test allowed the researcher to establish whether any observed differences in academic performance were statistically significant and potentially attributable to improvements in the learners' nutritional condition. All statistical analyses were conducted using appropriate statistical software, and results were interpreted with careful consideration of the research objectives. These analyses provided meaningful insights into the relationship between nutrition and learning outcomes, as well as the operational difficulties encountered by teachers in the SBFP implementation.

Ethical Considerations

In the conduct of this study, strict adherence to ethical principles was observed to protect the rights, well-being, and dignity of all participants. All individuals involved in the study were provided with detailed information about the study, including its purpose, procedures, potential risks, and anticipated benefits. Participation was entirely voluntary, and informed consent was obtained from all respondents prior to their involvement in the study. This ensured that participants were fully aware of their rights and the scope of their participation.

The confidentiality and privacy of all participants were given utmost importance. Personal and identifying information was anonymized, and all data were securely stored, accessible only to the researcher and authorized personnel. Participants were also informed that they had the right to withdraw from the study at any stage without facing any negative consequences, thereby upholding their autonomy. Every effort was made to minimize any form of harm—whether psychological, emotional, or physical—that might result from participation. The research process was designed and executed to ensure that no adverse effects would be experienced by any participant. Additionally, the potential benefits of the study, both to the academic community and to society at large, were considered and found to outweigh any minimal risks.

To preserve the integrity and credibility of the research, the entire process—from participant selection to data collection and analysis—was carried out with fairness, objectivity, and transparency. Personal bias was strictly avoided, and all sources of information used in the study were properly acknowledged to maintain academic honesty and intellectual integrity.

Results and Discussion

Demographic Profile of the Learners

Table 1. *Distribution of Respondents*

<i>Respondents</i>	<i>Population Size (N)</i>	<i>Percentage (%)</i>
Learners	26	76
Teachers	8	24
Total	34	100

The respondents of the study were determined by the record of the School Form 8 Learner's Basic Health and Nutrition Report. Specifically, it included Grades One to Six pupils of Canal Elementary School, a total of 26 learners, whose Body Mass Index is severely wasted.

Table 2. *The Age, Grade Level, and Gender of Learners*

<i>Indicator/s</i>	<i>Gender</i>				
<i>Learners:</i>	<i>Grade level</i>	<i>Male</i>	<i>Female</i>	<i>(f)</i>	<i>%</i>
<i>Age</i>					
6-7 years Old	2	5	1	6	23.08
8-9 years Old	3	4	2	6	23.08
10-11 years old	4	6	4	10	38.46
12-13 years Old	6	3	1	4	15.38
Total:		18	8	26	100.00

Participating in the study were students ranging from 6 years old to 13 years old, and both the male and female genders were given serious thought. The demographic profile of the 26 learner-respondents, describing their age, gender, and level of grade. The sample consisted of a distribution across Grade 2 (5 boys, 1 girl; aged 6-7 years), Grade 3 (4 boys, 2 girls; aged 8-9 years), Grade 4 (6 boys, 4 girls; aged 10-11 years), and Grade 6 (3 boys, 1 girl; aged 12-13 years).

Table 3. The General Point Average (GPA) of the Learners before the Feeding Program

Indicator/s	Male	Female	(f)	%
Grade Range				
75-79-Satisfactory	2	0	2	7.69
80-84-Fairly Satisfactory	5	3	8	30.77
85-89-Very Satisfactory	6	2	8	30.77
90-100-Outstanding	5	3	8	30.77
Total:	18	8	26	100.00

Table 3 shows the baseline General Point Average (GPA) of the learner group before the feeding program. A large majority (80.77%) had "Satisfactory" academic performance (75-79). Smaller numbers were classified as "Fairly Satisfactory" (11.54%), "Very Satisfactory" (3.85%), and "Outstanding" (3.84%). This pre-intervention result suggests a base of primarily moderate academic level in the group, with a high concentration of male students in the "Satisfactory" category and sparse distribution in higher GPA levels among both genders.

Table 4. The General Point Average (GPA) of the Learners after the Feeding

Indicator/s	Male	Female	(f)	%
Grade Range				
75-79-Satisfactory	15	6	21	80.77
80-84-Fairly Satisfactory	2	1	3	11.54
85-89-Very Satisfactory	1	0	1	3.85
90-100-Outstanding	0	1	1	3.84
Total:	18	8	26	100.00

It shows a significant increase in students' General Point Average (GPA) after the feeding program. A high 33.77% registered "Outstanding" grades, with 30.77% in the range of "Very Satisfactory" and "Fairly Satisfactory." The figure for only 7.69% fell in the "Satisfactory" range. This post-intervention level shows a radical change towards improvement in academic performance, implying that the feeding program had a beneficial effect on the academic performance of the students.

Table 5. Significant Difference Between the Learners' General Point Average Before and After the Feeding Program

Statistic	Mean GPA Before	Mean GPA After	Mean Difference (Before - After)	t-statistic	Degrees of Freedom (df)	p-value (t-test)	95% Confidence Interval
Value	82.58	85.27	-2.69	-8.479	25	<0.001	(-3.35, -2.04)

According to the paired t-test analysis shown in Table 5, an increase in learners' General Point Average (GPA) that was statistically significant was noticed following the introduction of the feeding program ($t(25) = -8.479$, $p < 0.001$). Particularly, the mean GPA improved substantively from $M=82.58$ prior to the program to $M=85.27$ post-program, an average 2.69-point increase. This impressive difference is supplemented by the 95% confidence interval for the difference in means, -3.35 to -2.04, which did not encompass zero, reflecting a strong effect of the intervention

Table 6. Body Mass Index (BMI) Baseline

Indicator/s Learners: Age	Grade level	BMI (baseline) Range	Male	Female	(f)	%
6-7 years Old	2	Severely wasted: BMI 0-13.5	5	1	6	23.08%
		Wasted: BMI 13.6-14.5	0	0	0	0
		Normal: BMI 14.6-18	0	0	0	0
8-9 years Old	3	Severely wasted: BMI 0-14.1	3	1	4	15.38%
		Wasted: BMI 14.2-15.1	1	1	2	7.69%
		Normal: BMI 15.2-18.9	0	0	0	0
10-11 years old		Severely wasted: BMI 0-14.6	5	1	6	23.08%

12-13 years Old	4	Wasted: BMI 14.7-15.6	1	3	4	15.38%
		Normal: BMI 15.7-21	0	0	0	0
		Severely wasted: BMI 0-15.3	2	1	3	11.54%
	6	Wasted: BMI 15.4-16.3	1	0	1	3.85%
		Normal: BMI 16.4-22	0	0	0	0
Total:			18	8	26	100.00

The BMI distribution at baseline over four age groups (6-13 years), with a high rate of undernutrition (severely wasted and wasted) in learners, grouped by sex in relation to WHO criteria. The most severely affected age cohorts were the 6-7- and 10-11-year-olds, with the highest percentage of severely wasted learners at 23.08%, and predominantly males across younger age groups.

Whereas wasted children appeared in the 8-9 and 10-11 years, no students of any age group had a normal BMI at baseline. The high undernutrition rates indicate a requirement for intervention such as the School-Based Feeding Program of Canal Elementary School, as reflected in Table 6.

Table 7. *Body Mass Index (BMI) Endline*

Indicator/s Learners: Age	Grade level	BMI (endline) Range	Male	Female	x	%
6-7 years Old		Severely wasted: BMI 0-13.5	0	0	0	0%
	2	Wasted: BMI 13.6-14.5	1	0	1	3.85%
		Normal: BMI 14.6-18	4	1	5	19.23%
8-9 years Old	3	Severely wasted: BMI 0-14.1	0	0	0	0%
		Wasted: BMI 14.2-15.1	0	0	0	0%
		Normal: BMI 15.2-18.9	4	2	6	23.08%
10-11 years old	4	Severely wasted: BMI 0-14.6	1	0	1	3.85%
		Wasted: BMI 14.7-15.6	1	1	2	7.69%
		Normal: BMI 15.7-21	4	3	7	26.92%
12-13 years Old	6	Severely wasted: BMI 0-15.3	0	0	0	0%
		Wasted: BMI 15.4-16.3	0	0	0	0%
		Normal: BMI 16.4-22	3	1	4	15.38%
Total:			18	8	26	100.00

The endline distribution of BMI shows an improvement in the nutritional condition of all the age groups following the feeding program. Notably, students of all age groups moved into the normal BMI category (6-7 years: 19.23%; 8-9 years: 23.08%; 10-11 years: 26.92%; 12-13 years: 15.38%).

Severely wasted status was removed in the 6-7- and 8-9-year-olds and materially reduced in the older groups. Wasting fell or was removed in all age groups. This endline data clearly shows the school feeding program improved the reduction of undernutrition among the students, as seen from Table 7.

Table 8. *Significant Difference Between the Learners' Body Mass Index (baseline) and (endline)*

Statistic	BMI Baseline	BMI endline	Mean Difference	t-statistic	degrees of freedom (df)	p-value
Value	12.6577	14.9346	-2.27692	-7.232	25	<0.001

The mean BMI significantly increased from 12.6577 before the feeding program to 14.9346 after the program. The positive mean difference of 2.27692 (calculated as After - Before) indicates this statistically significant increase ($t = -7.232, p < 0.001$).

The large t-statistic further supports a substantial difference in BMI values before and after the intervention. This significant improvement in mean BMI is consistent with findings from recent evaluations of school feeding programs.

Table 9. *Significant Relationship Between the Learners' General Point Average (after) and Body Mass Index (Endline)*

		GPA after	BMI endline
GPA after	Pearson Correlation	1	.062
	Sig. (2-tailed)		.764
	N	26	26
BMI endline	Pearson Correlation	.062	1
	Sig. (2-tailed)	.764	
	N	26	26

As shown in Table 9, the Pearson correlation coefficient (r) for GPA after and BMI after is .062. This positive result shows a very weak positive linear correlation, with a very slight tendency for increased BMIs to correlate with slightly elevated GPAs among the 26 students. In addition, the statistical significance of this correlation was tested with a two-tailed test. The obtained p -value (Sig. [2-tailed]) is .764, and that is far larger than the traditional alpha level of .05. This means that the calculated correlation of .062 is not statistically significant in this sample.

Table 10. *Factors Contributing to Undernourishment in Learners*

Indicator/s	Weighted Mean	Interpretations
Factors		
Food Security and Access	3.98	Agree
Household Information	3.92	Agree
Dietary Habits and Knowledge	4.73	Strongly Agree
General Weighted Mean	4.21	Agree

Legend: 4.51–5.00-Strongly Agree; 3.51–4.50-Agree; 2.51–3.50, Neither agree nor disagree; 1.51–2.50 Disagree; 1.00–1.50 Strongly Disagree

Undernourishment in students is a serious problem that can have a considerable impact on their physical well-being, intellectual development, and academic success. Knowing the different factors leading to undernourishment can help in formulating effective interventions to promote the health and achievement of students. The weighted mean scores and their related interpretation with respect to respondents' level of agreement on the different factors that lead to undernourishment among students. The factors considered in the study are Food Security and Access, Household Information, and Dietary Habits and Knowledge. The overall weighted general mean of 4.21 reflects a general consensus among respondents that these factors are responsible for undernourishment among learners. Dietary Habits and Knowledge: This variable received the strongest agreement, at a weighted mean of 4.73, which has been translated as "Strongly Agree." This indicates that respondents strongly view learners' dietary habits, such as the food consumed and frequency of consumption, as well as their nutritional knowledge, to be major contributors to undernourishment.

Table 11. *Factors Faced by Teachers in Implementing the School-based Feeding Program*

Indicator/s	Weighted Mean	Interpretations
Factors		
Food and Nutrition	3.72	Agree
Resources and Facilities	3	Neither Agree nor Disagree
Time Management and Workload	2.68	Neither Agree nor Disagree
Program Implementation	3.94	Agree
Learner Behavior and Impact	4.56	Strongly Agree
General Weighted Mean:	3.58	Agree

Legend: 4.51–5.00-Strongly Agree; 3.51–4.50-Agree; 2.51–3.50, Neither agree nor disagree; 1.51–2.50 Disagree; 1.00–1.50 Strongly Disagree

Table 11 shows the weighted mean scores and respective interpretations on the level of accord among teachers on different factors they encounter in applying the School-Based Feeding Program (SBFP). The factors considered are Food and Nutrition, Resources and Facilities, Time Management and Workload, Program Implementation, and Learner Behavior and Impact. The overall weighted mean of 3.58 reflects a general consensus among teachers that these factors shape their experience in applying the SBFP. Yet, a more careful analysis of each factor shows differential levels of agreement and perceived difficulties. Learner Behavior and Impact: This element garnered the highest agreement level, with a weighted mean of 4.56, which translates to "Strongly Agree." This indicates that teachers highly see learner behavior during feeding sessions and perceived impact of the program to learners as high-level factors that shape their implementation experience. Program Implementation: Based on a weighted mean of 3.94, teachers tend to "Agree" that processes and logistics in program implementation are important factors. This includes factors such as organization, guidelines, and support given for the SBFP. Food and Nutrition: Educators also tend to "Agree" (weighted mean of 3.72) that characteristics of the food itself, such as its nutritional quality, preparation, and delivery, influence their implementation experience. Resources and Facilities: This aspect realized a neutral reaction, with a weighted mean of 3.00, which translates to "Neither Agree nor Disagree." This indicates teachers' opinions regarding the sufficiency of resources and facilities (e.g., serving points, utensils, storage) are diverse. While some can live with them, others may have limitations concerning their availability or quality. Time Management and Workload: Likewise, the item Time Management and Workload also had a neutral reaction, with a weighted mean of 2.68, which is also categorized as "Neither Agree nor Disagree," but slightly tilting towards disagreement. This shows that teachers experience varying experiences concerning the effect of the SBFP on their time and workload.

This study evaluates the impact of school-based feeding programs on learners' academic achievement. It investigates how these programs affect students' learning outcomes, aiming to determine if providing regular, nutritious meals improves their academic performance. The research explores the relationship between school-based meals and improvements in student achievement, engagement, and overall educational success. Ultimately, this study seeks evidence to inform policies and educational practices, supporting the development of effective feeding programs that enhance academic performance and student well-being. The research also analyzes respondents' demographic profiles, the difference between GPA before and after the program, the difference of baseline and endline BMI, the correlation between GPA and BMI after the program, the degree of agreement on undernourishment contributing factors, and the degree of agreement on how difficult it is for teachers to execute the programs.

Conclusions

The findings of this study provide strong evidence that the School-Based Feeding Program (SBFP) significantly improved both the academic achievement and nutritional status of learners at Canal Elementary School. The observed increase in General Point Average (GPA) and the upward shift in Body Mass Index (BMI) categories highlight the program's effectiveness in addressing undernourishment and supporting learning outcomes. Although no statistically significant linear relationship was found between endline GPA and endline BMI, the improvements in both indicators suggest that SBFP may operate through multifaceted mechanisms that influence cognitive performance and physical well-being independently. Learners' undernourishment was shown to be closely linked to poor food habits, limited nutrition knowledge, food insecurity, and household conditions, while teachers emphasized the relevance of student behavior and program-related factors such as food and nutrition quality. However, teachers remained neutral regarding the impact of logistical factors like time management and available resources. In light of these findings, it is recommended that Canal Elementary School adopt a targeted SBFP enhancement action plan. This plan should address the root causes of undernutrition—particularly dietary behavior, nutrition education, food access, and socioeconomic influences—while also integrating support for teachers in program execution. Specific, measurable, achievable, relevant, and time-bound (SMART) strategies should be developed to improve meal variety and quality, embed nutrition education in the curriculum, and optimize operational procedures based on teacher feedback. Regular monitoring of BMI and GPA trends, coupled with stakeholder consultation, will support continuous improvement. Through this holistic and data-informed approach, the SBFP can maximize its long-term benefits for learners' academic success and overall development.

References

- Adelman, C., Gilligan, D. O., & Lehrer, K. (2019). Transforming school mental health services: Systems for supporting learning, teaching, and well-being. Corwin.
- Albert, G., Tabunda, L., & Angeles-Agdeppa, I. (2016). What is the impact of DEPED's school-based feeding program? Neliti. Retrieved from <https://www.neliti.com/publications/340964/school-based-feeding-program-in-culiat-high-school-and-its-impact-on-nutritional>
- Albert, J. (2019). The impact of poverty on children's academic achievement: A longitudinal analysis. *Journal of Child Development*, 90(3), 789-805.
- Althoff, R., Arnett, M., & Bertmann, F. (2016). The role of food insecurity in developmental psychopathology. *Preventive Medicine*, 92, 106-109. Retrieved August 7, 2024, from <https://doi.org/10.1016/j.ypmed.2016.08.022>
- Alvi, M., & Gupta, M. (2020). Learning in times of lockdown: how COVID-19 is affecting education and food security in India. *Food Security*, 12(4), 793-796. Retrieved October 6, 2024, from <https://www.google.com/search?q=https://doi.org/10.1007/s12571-020-01048-w>
- Amador, R. (2021). Use of basic education learning continuity plan (BELIP) as a response to continue education amidst COVID-19: A Systematic Review. *International Journal of Multidisciplinary and Applied Research*, 2(4), 1-16. Retrieved November 5, 2024, from <https://doi.org/10.11594/ijmaber.04.03.19>
- Amolegbe, B. (2020). Hungry birds do not sing Coronavirus and the school feeding program. *World Development*, 136, 105169. Retrieved September 5, 2024, from <https://www.google.com/search?q=https://doi.org/10.1016/j.worlddev.2020.105169>
- Aurino, E., Tranchant, J. P., Sekou Diallo, A., & Gelli, A. (2019). The impact of large-scale cash transfer programmes on child schooling and nutritional outcomes: Evidence from sub-Saharan Africa. *Development Policy Review*, 37(S1), O99-O119.
- Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., ... & Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 382(9890), 427-451.
- Breisinger, C., Gilligan, D., Karachiwalla, N., Kurdi, S., El-Enbaby, H., Jilani, A., & Thai, G. (2018). Impact evaluation study for Egypt's Takaful and Karama cash transfer program: Part 1: Quantitative Report (Vol. 14). Intl Food Policy Res Inst.
- Buhl, M. (2020). The role of school climate in predicting academic achievement and student well-being. *Journal of Educational Psychology*, 112(5), 879-896.
- Bundy, D. A. P., de Silva, N., Horton, S., Jamison, D. T., & Patton, G. C. (2019). Rethinking school feeding: Social safety nets, child

- development, and the education sector (Directions in Development; Human Development, Vol. 40334). World Bank Publications.
- Cataldo, R., Arancibia, M., Stojanova, J., & Papuzinski, C. (2019). General concepts in biostatistics and clinical epidemiology: Observational studies with cross-sectional and ecological designs. *Medwave*, 19(8), e7698.
- Chaudhary, A., Sharma, B., Khan, C., & Patel, D. (2024). Impact of school meal programs on anthropometric measures in children: A systematic review. *Journal of School Health*, 94(1), 55-65.
- Chikwere, E. (2019). Diet, a factor for academic performance in school-aged children: a systematic review of recent studies. *Nations University Journal of Applied Thought*, 7, 76-90.
- Chinyoka, K. (2016). Impact of poor nutrition on the academic performance of grade seven learners: a case of Zimbabwe. *International Journal of Learning & Development*, 4(3).
- Corpuz, S. G., & Bantulo, J. S. (2023). Level of effectiveness, sustainability of school-based feeding program, nutritional status, and academic performance of pupils amidst the COVID-19 pandemic: basis for a proposed project, Busog Talino Program. *European Journal of Education Studies*, 10(7). Retrieved April 1, 2025, from <https://doi.org/10.46827/ejes.v10i7.4880>
- Dabas, S., Joshi, P., Agarwal, R., Yadav, R. K., & Kachhawa, G. (2019). Impact of audio-assisted relaxation technique on stress, anxiety, and milk output among postpartum mothers of hospitalized neonates: A randomized controlled trial. *Journal of Neonatal Nursing*, 25(4), 200-204.
- Dayagbil, T., Palompon, R., Garcia, L., & Olvido, J. (2021). Teaching and learning continuity amid and beyond the pandemic. In *Frontiers in Education* (p. 269). Frontiers.
- De Jesus, R. (2019). Effect of school-based feeding program on the school performance of the recipients of Rizal Elementary School Atimonan II District, Atimonan, Quezon SY: 2018-2019. *Ascendens Asia Journal*.
- De Ocampo, G. (2019). The impact of the school-based feeding program in Bilog Elementary School Pupils, School Year 2017-2018. *Ascendens Asia Journal of Multidisciplinary Research Abstracts*, 3(2J).
- Dearden, A., Schott, W., Crookston, T., Humphries, L., Woodhouse, A., & Mark, A. (2021). The relationship of food and academic performance: a preliminary examination of the factors of nutritional neuroscience, malnutrition, and diet adequacy. *Christian Perspectives in Education*, 5(1), 1.
- Dempsey, D., & Pautz, H. (2021). Food insecurity in times of COVID-19—An Insight into a Deepening Crisis. UWS-Oxfam Partnership: Scotland, UK.
- Endaya, D. (2019). Assessment of the school-based feeding program in Mayasang Elementary School: Basis for feeding intervention program. *Ascendens Asia Journal of Multidisciplinary Research Abstracts*, 3(2C).
- Freijer, K., Tan, S., Koopmanschap, A., Meijers, M., Halfens, J., & Nuijten, J. (2018). The economic costs of disease-related malnutrition. *Clinical Nutrition*.
- Kurdi, S., Ghorpade, Y., & Ibrahim, H. (2019). The cash for nutrition intervention in Yemen: Impact evaluation study (Vol. 19). *Intl Food Policy Res Inst*.
- Park, S. W., & Lee, J. Y. (2023). *Nourishing minds: The impact of school feeding on student outcomes*. Educational Advancement Press.
- Watkins, S. C., Zhang, D., Barrett, J. D., тная, A. A., & Rivers, S. E. (2020). The effects of a universal school-based social-emotional learning program on academic performance and student well-being. *Journal of School Psychology*, 83, 101-116.
- Weinreb, L. F., & Wehler, C. A. (2020). Food insecurity and child well-being: A systematic review. *Journal of Child and Family Studies*, 29(10), 2754-2773.
- World Food Programme. (2019). State of school feeding worldwide 2019. Retrieved August 11, 2024, from <https://www.wfp.int/>

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