

The Impact of School-Based Nutrition Program on the Learner Beneficiaries of Selected Public Schools of SDO Albay

Rochelle B. Morcoso
University of Santo Tomas- Legazpi
rochelle.morcoso@ust-legazpi.edu.ph

Date Submitted:
February 07, 2026

Date Accepted:
March 05, 2026

Date Published:
March 15, 2026

DOI:
10.5281/zenodo.19035309

ABSTRACT

This study evaluated the impact of the School-Based Nutrition Program (SBNP), particularly the School-Based Feeding Program (SBFP), on the health and educational outcomes of learner-beneficiaries in selected public schools under the Schools Division Office (SDO) of Albay. Anchored on Maslow's Hierarchy of Needs, the Developmental Origins of Health and Disease (DOHaD), and the Nutrition-Cognitive Development framework, the research examined how improved nutrition supports children's physical growth, cognitive functioning, and academic performance. It also assessed program implementation in terms of manpower

complement, beneficiary coverage, fund utilization, and nutrition product specifications, identified best practices, and proposed an operational model to strengthen program sustainability. The study utilized a mixed-methods design combining retrospective quantitative data from School Years 2022–2023 to 2024–2025 and qualitative insights gathered through interviews and focus group discussions. Quantitative data included Body Mass Index (BMI), attendance, and General Weighted Average (GWA), which were analyzed using descriptive statistics and paired t-tests, while qualitative data were examined through thematic analysis. Findings revealed that the program is implemented through a structured, policy-driven, and participatory framework characterized by collaborative manpower, data-driven beneficiary targeting, transparent financial management, and adherence to standardized nutrition and food safety guidelines. Best practices included evidence-based identification of beneficiaries, active School Nutrition Committees, and localized procurement of fresh food. Results showed statistically significant improvements in both health and academic outcomes, with mean BMI increasing from 15.82 to 17.43 and mean GWA improving from 82.14 to 86.02 over three school years ($p < .001$). Overall, the findings confirmed that sustained nutrition interventions positively influence learners' physical growth and academic performance.

Keywords: *School-Based Nutrition and Feeding Program, Health Outcomes, Educational Outcomes, Health Impact, Operational Model*

INTRODUCTION

The 1987 Philippine Constitution upholds health as a fundamental right. It mandates the government to protect and advance the welfare of its people. Ensuring that this right is properly upheld leads to better health outcomes. However, many kids continue to experience malnutrition, which hinders their physical growth and education. Malnutrition remains a significant public health concern in developing countries like the Philippines. Undernutrition impairs brain function, leading to reduced cognitive performance and lower educational achievement. Malnutrition, specifically in the Philippines, continues to affect many children, particularly in rural areas. It is perennially rampant and so addressing these gaps in nutrition has become crucial for improving both the health and academic outcomes.

In 2021, an estimated 27% of Filipino Children with ages under five years old were stunted, meaning their height is short for their age, which is a result of persistent undernutrition (World Bank, 2023). Undernutrition is one of the “triple burden” of malnutrition that the Philippines face. Alongside these are the micronutrient deficiencies also known as the “hidden hunger” and the overnutrition which leads to obesity (UNICEF, 2024). Furthermore, according to the 2024 Global Hunger Index, the Philippines is facing a moderate level of hunger having ranked at 67th out of 127 countries. This shows that malnutrition remains a major concern in the health sector of the country. Therefore, in response and in an attempt to alleviate this concern, school-based nutrition programs have been widely implemented. Integrating household interventions to address this concern is appreciated, however, not every family has access to nutritional meals or has the option to choose healthier items to feed the children due to issues of poverty. This makes educational institutions, where children spend most of their time, an ideal platform to make use of for delivering programs designed to address the nutritional gaps among children. In this way, larger population of students can be provided for all at once, including those who have limited access to nutritious meals.

Childhood nutrition is critical for shaping long-term health and academic success. Recent years have seen a surge in childhood obesity and related health issues, highlighting the need for effective interventions within educational settings. School-based nutrition programs have emerged as a vital strategy to address these challenges by providing children with essential dietary knowledge and access to healthier food options. The importance of addressing malnutrition in rural areas, where families face economic difficulties and limited access to healthcare, can never be overstated because of its utmost importance to improve the nutritional conditions of the children. These programs are recognized as a cost-effective public investment because they can improve child health, support regular school attendance, and enhance learning outcomes all at the same time (The Education Commission, 2023). In addition to this, school-based programs may be able to allow for regular monitoring of the nutritional status of the children by the facilitators, which can enable an early detection of any more health related concerns.

International evidence underscores the global nature of this issue. A study in Ouagadougou, Burkina Faso, found schoolchildren in urban and peri-urban areas to be at high risk of nutritional deficiencies, with significant levels of stunting, underweight, and wasting (Daboné et al., 2011). Similarly, research in Zambia highlighted the widespread prevalence of chronic malnutrition among school-aged children, where undernutrition and micronutrient deficiencies contributed to reduced learning capacity and

early school dropout (Sherman & Muehlhoff, 2007; Beredo & Acheron, 2019). These international evidences show the shared challenges in both developing and rural regions where malnutrition continues to diminish the children's potential. This reflects the same situation in the Philippines, which even more strengthens the notion that school-based interventions are widely recognized as a strategic approach to fight hunger and improve students' cognitive ability.

Malnutrition substantially affects neurological development and behavioral capacity in children (Morshed et al., 2020). Consequently, malnourished children may never reach their full academic potential. Inadequate nutrition negatively impacts not only physical health but also cognitive development, academic performance, and overall well-being. Impaired cognitive and motor development can adversely affect academic performance through reduced learning capacity and poor school attendance. In contrast, WFP, (2020) shared those meals being provided at school increase enrolment and attendance at an average of 9%, and it can also contribute significantly to the daily micronutrient needs of the students. This statement is being seconded by the synthesized evidence of UNICEF & WFP in 2025, where it is being showed that school feeding with nutrition services improve learning and school attendance of children, thus they also endorse this to be integrated in school-based approaches. These articles show that feeding programs in schools have the potential to improve nutritional intakes among children and it can also help alleviate undernutrition which makes it a compelling approach to address the malnutrition issues. Kristjansson et al. (2022) also found feeding programs to be instrumental in improving the nutritional gaps among students as it can yield cognitive benefits among socioeconomically disadvantaged children. Moreover, school interventions that feature feeding, education, and the environment from with the students grow altogether also show a more consistent improvement in diets and their health, in general (Chatterjee et al., 2024). These findings reinforce the idea that schools are safe spaces that can promote healthy eating habits and break the cycle of poverty and poor health.

Chin et al., (2019) defined School Nutrition Program (SNP) as a primary preventative initiative that encourages healthy lifestyle choices among elementary school students by means of combining nutrition education with a healthy school food environment which is implemented within schools. Although national school-based nutrition programs exist in the Philippines to address these challenges, their effectiveness often remains unmeasured, and the unique socio-economic realities of rural communities like Bacacay necessitate localized and tailored approaches. Prevailing conditions in these communities have largely remained unchanged and, in some cases, deteriorated, underscoring the urgency for context-specific evaluations.

In Albay, several public schools have adopted a Nutrition in School Program to combat malnutrition and its effects on student learning. However, program performance varies significantly based on crucial factors such as implementation strategy, resource availability, and community engagement. These programs aim to provide essential nutritional support, however, there is a lack of local studies that assess their direct impact on health and academic performance in specific rural communities like that of Albay. Because of the absence of these data in the local level, it may be challenging to identify the best practices that can best help students in this rural area.

In Albay, where many children come from low-income families, the impact of malnutrition is particularly more evident which then leads to school absences and lower motivation academically. As emphasized by Mulisa and Kassahun (2019), achieving inclusive, equitable, and quality education—a key sustainable development goal—requires addressing these fundamental health challenges. Therefore, a school-based nutrition program patterned to the needs of the children in Albay is not only an intervention for health but a potential solution for improving educational outcomes as well. One of the most important steps toward educational efficacy is the implementation of a well-designed school-based nutrition program in this area which might decrease hunger, improve student engagement and promote long term well-being.

Rationale

The pursuit of universal quality education, a cornerstone of the United Nations Sustainable Development Goal (SDG 4), is fundamentally linked to the health and nutritional status of school-aged children, a connection recognized globally where malnutrition is established as a critical barrier to cognitive development and academic achievement. Undernourished children have shorter attention spans, slower information processing, and decreased memory, all of which directly impede classroom learning and long-term academic success, according to numerous studies (Walker et al., 2011). In response, school-based nutrition programs have been widely adopted as strategic policy instruments to ensure children are physically and mentally prepared to learn. The Philippines mirrors this challenge, with persistent childhood malnutrition undermining the Department of Education's mandate, leading to the national implementation of the School-Based Feeding Program (SBFP) to address undernutrition among its most vulnerable learners. However, the effectiveness of such national policies is contingent on their local execution, creating a significant public administration gap between policy intent and tangible outcomes. Adequate staffing, prompt funding use, high-quality food procurement, and robust monitoring mechanisms are critical for successful implementation; these elements differ greatly amongst schools and have an impact on program fidelity (DepEd, 2023).

In municipalities like Albay, logical constraints, limited resources, and varying community engagement can deter program fidelity and impact. It is within this circumstance that the present study is situated, aiming to evaluate the implementation of the SBFP in selected public schools in SDO (schools division office) of Albay. This research moved beyond a simple health assessment to conduct a localized program evaluation, measuring the impacts of both health and educational outcomes, and identifying the drivers of success or failure. Assessing learners' nutritional improvement offers insight into potential changes in their cognitive performance because cognitive development is closely linked to adequate nutrition, especially nutrients necessary for brain growth like iron, iodine, and essential fatty acids (Christian & Stewart, 2010). The study ultimately aimed to generate actionable, evidence-based recommendations that will guide local stakeholders in enhancing the program's sustainability and impact, ensuring this public investment effectively meets its dual objectives of improving child health and securing educational advancement.

The right to health is a fundamental human right essential for dignity and well-being, recognized globally and enshrined in the 1987 Philippine Constitution (Article II, Section 15). This constitutional

mandate provides the framework for public health policy, emphasizing the state's role in protecting and promoting health. Ultimately, fulfilling this mandate can lead to improved health outcomes, reduced inequalities, and a healthier population. Every child has the right to grow up healthy, well-nourished, and cared for. However, childhood health continues to be severely compromised by problems of inadequate nutrition. Schools are increasingly recognized as pivotal settings for addressing factors that negatively affect learning, including hunger and poor nutrition. In many cases, schools substitute for absent health and nutrition services.

The Department of Education (DepEd) acknowledges that the health and nutritional status of school children is integral to improving their academic performance. Health and nutrition problems undoubtedly affect physical development, school attendance, and learning capacity. Consequently, the Bureau of Learner Support Services-School Health Division (BLSS-SHD) remains committed to providing good nutrition to learners, even amidst the COVID-19 pandemic. The School-Based Feeding Program (SBFP) for School Year (SY) 2022-2025 continues to be implemented to address hunger, encourage enrollment, improve nutritional status, support growth and development, boost immune systems, and enhance health and nutrition values.

The primary beneficiaries of the SBFP for SY 2022-2025 are all incoming kindergarten learners and Grade 1 to Grade 6 students identified as wasted or severely wasted based on the SY 2022-2025 SBFP report. The program provides beneficiaries with nutritious food products for at least 60 feeding days and fresh or sterilized milk for 50 feeding days.

This study is driven by the need to assess how school-based nutrition programs can tangibly improve health and educational outcomes SDO (schools division office) of Albay. By examining the implementation process, this research aimed to identify both challenges and opportunities in combating malnutrition and its effects on learning. Furthermore, it sought to generate evidence-based recommendations to inform future policies and practices, ensuring that interventions are sustainable, culturally relevant, and impactful. This study evaluated the implementation of a School-Based Nutrition Program in six selected public schools in SDO (schools division office) of Albay. The research focuses on the program's effects on children's health and educational outcomes.

Current State of Research in the Field

Children in low-income families, especially in developing regions, are more likely to experience inadequate nutrition due to the limited availability of appropriate and healthy nutrients from food. Research studies that have been conducted globally have shown that the physical health, cognitive development, and academic performance of the children are all significantly being impacted by the nutrition they receive from the food that they consume. Studies have shown that nutritional deficiencies are linked to brain development and cognitive functioning that leads to poorer educational outcomes (Grantham-McGregor et al., 2021; McCulloch et al., 2020). In addition to this, it has been discovered that early childhood nutrition interventions have long lasting benefits on both health and academic achievement of the children which

contributes to more improved school performance, less absences, and better focus in classes among students (Ritchie et al., 2020; Schwartz et al., 2020; Turner et al., 2021).

On an international level, research studies in various countries have confirmed that children who receive proper nutrition have better learning outcomes and higher cognitive ability. Studies have also shown that nutrition education and access to healthier food options can promote long-term improvements in children's eating habits and academic engagement (Gordon et al., 2020; Horne et al., 2021).

A growing number of research studies in the Philippines have emphasized the "double burden" of undernutrition and overnutrition, both of which have negative impact on children's health and their learning abilities (Briones et al., 2017; World Bank, 2019). Studies have revealed that childhood malnutrition can lead to long-term consequences such as impaired brain development, stunted growth, and increased vulnerability to disease, all of which inhibit learning (Victora et al., 2008). Furthermore, it has been discovered that vitamin shortages impair Filipino children's physical and mental development which demonstrates the necessity for sustained efforts to improve their nutritional state (Angeles-Agdeppa et al., 2019, 2020).

Despite these findings, schools in many low-income communities continue to face challenges such as limited resources and community engagement which restrict the success of nutrition-related interventions. However, research also suggests that with adequate support and collaboration among parents, educators, and local stakeholders, such barriers can be overcome to enhance children's health and learning outcomes (Ludwig et al., 2020; Neumark-Sztainer et al., 2021).

This is a discussion of an in-depth review of literature and studies concerning school-based nutrition programs and their effects on child health and education. Numerous studies affirmed the importance of proper nutrition for cognitive development and academic performance.

Globally, school-based feeding programs have demonstrated success in improving attendance, knowledge retention, and overall physical health (Wang et al., 2021). Malnutrition, whether undernutrition or overnutrition, detrimentally affects children's physical, cognitive, and social development (García-Casal et al., 2021). Chronic malnutrition is particularly prevalent in developing countries with limited access to adequate nutrition and health services.

The Philippines faces a double burden of malnutrition (Briones et al., 2017; 2022 Global Nutrition Report). Despite economic growth, the country continues to experience high rates of undernutrition (stunting, wasting, underweight) alongside a rapid increase in overnutrition (overweight, obesity, and diet-related non-communicable diseases) (World Bank, 2019). The 2022 Global Nutrition Report indicates that the prevalence of stunting among children under five in the Philippines is 28.8%, higher than the Asian regional average of 21.8%. Concurrently, approximately one-third of adults are overweight or obese. Micronutrient deficiencies also persist, with an estimated 70-80% of adults not meeting recommended intakes for iron, calcium, and vitamin A (Angeles-Agdeppa et al., 2019, 2020). This coexistence of over- and undernutrition, known as the double burden of malnutrition (DBM), can occur at the population,

household, and/or individual level (Popkin et al., 2020). Understanding these patterns is crucial for developing effective interventions (Pradeilles et al., 2018-2020).

Childhood malnutrition has long-term implications. A systematic review by Victora et al. (2008) found that childhood malnutrition is a risk factor for mental illness, high blood glucose, hypertension, and adverse lipid profiles in adulthood. It is also strongly associated with shorter adult height, less schooling, reduced economic productivity, and lower human capital.

Nutrition is pivotal for children's health and development. Adequate nutrition is essential for healthy growth, while malnutrition poses significant risks. The Global Nutrition Report (2021) states that over 149 million children under five are stunted due to chronic undernutrition, adversely affecting their physical and cognitive health. Conversely, obesity is linked to diabetes and cardiovascular diseases (WHO, 2022). Kelsey et al. (2021) found that poor nutritional status correlates with frequent illnesses and increased school absenteeism.

The link between nutrition and cognitive development is well-established. Grantham-McGregor et al. (2021) highlighted those deficiencies in iron and omega-3 fatty acids can impair cognitive function and academic achievement. A meta-analysis by McCulloch et al (2020) indicated that children consuming diets rich in fruits, vegetables, and whole grains tend to perform better academically. The timing of intervention is also critical; research by Fernald et al. (2016) showed that early childhood nutrition interventions have lasting positive effects on cognitive outcomes.

School-based programs are vital for improving dietary habits and, consequently, health and academic outcomes. Ritchie et al. (2020) found that comprehensive school nutrition initiatives significantly improved dietary intake and academic performance. Programs like the National School Lunch Program have been associated with increased fruit and vegetable consumption, correlating with better grades and attendance (Gordon et al., 2020).

Socioeconomic status (SES) significantly influences nutritional intake and educational outcomes. Children from lower SES backgrounds are more likely to experience food insecurity, leading to poorer nutrition and health problems. Ziliak and Gundersen (2020) demonstrated that food insecurity negatively impacts cognitive development and academic performance, underscoring the need for targeted interventions.

School nutrition programs are essential for promoting healthy eating habits. Turner et al. (2021) found that comprehensive programs increased students' consumption of fruits, vegetables, and whole grains. Schwartz et al. (2020) highlighted that participation in these programs is associated with reduced obesity rates and better health outcomes.

Implementation strategies are key to effectiveness. Story et al. (2021) noted that successful programs often combine policy changes, education, and community engagement. The Healthy, Hunger-Free Kids Act (2010) led to improved meal quality, increased participation, and better dietary quality

(Gordon et al., 2020). Integrating nutrition education into the curriculum has also proven effective; Horne et al. (2021) showed that interactive education led to long-term healthy behavior changes.

However, barriers to implementation exist. Ritchie et al. (2021) noted that schools in low-income areas often struggle with limited resources, necessitating targeted support and funding. Barriers include funding constraints, lack of staff training, and resistance from students and parents (Ludwig et al., 2020). Engagement from family and community stakeholders is crucial for success; programs involving parents and the community are more effective in fostering healthy eating behaviors (Neumark-Sztainer et al., 2021).

Synthesis of the Art

School-based nutrition programs have a significant role in the improvement of child health and the enhancement of their educational performance. Malnutrition is one health concern that can negatively affect children's physical, cognitive, and social development (García-Casal et al., 2021; Briones et al., 2017; World Bank, 2019). In the Philippines, malnutrition is very evident due to the high rates of stunting and the rising obesity and micronutrient deficiencies which are the result of undernutrition and overnutrition (Popkin et al., 2020; 2022 Global Nutrition Report). However, this issue is not only limited to the Philippines, because it is also rampant as a global concern with significant long-term implications. Malnutrition in childhood is associated with mental illness, chronic diseases, and lower educational attainment, which further affects their economic productivity in the long run (Victora et al., 2008; Kelsey et al., 2021).

Nutrition is important for cognitive development because deficiencies in key nutrients like iron and omega-3 fatty acids can lead to decreasing brain function and academic performance (Grantham-McGregor et al., 2021; McCulloch et al., 2020). Early interventions in childhood particularly through nutrition programs have proven to having lasting positive effects on their cognitive outcomes (Fernald et al., 2016). School-based nutrition programs have shown huge success in improving students' diets and academic results, particularly the National School Lunch Program in the U.S. which have been linked to increased fruit and vegetable consumption, better attendance among the children (Ritchie et al., 2020; Gordon et al., 2020). Such programs also help reduce obesity rates and improve overall health (Turner et al., 2021).

One of the factors that is influencing children's nutrition and academic performance is their household's socioeconomic status (SES). Children from low SES backgrounds are most likely to experience food insecurity which then leads to a poor nutrition and poorer academic performance (Ziliak & Gundersen, 2020). However, programs that engage parents and the community are more effective in promoting healthier eating habits and improving student outcomes. They are essential for addressing food insecurity and in ensuring that all children, regardless of socioeconomic status do have access to proper nutrition (Neumark-Sztainer et al., 2021).

Despite their proven effectiveness, school-based nutrition programs still face challenges in implementation, most especially in areas with low-income. A lot of barriers exist, such as limited funding, lack of staff training, and resistance from students and parents which can hinder the success of these programs (Ludwig et al., 2020). Successful programs often integrate policy support, nutrition education,

and community engagement to overcome these challenges. The Healthy, Hunger-Free Kids Act (2010) in the U.S. serves as a model for how policy changes can improve program outcomes, including increased meal quality and participation rates (Gordon et al., 2020). Moreover, incorporating nutrition education into the curriculum has been shown to lead to long-term healthy behavior changes (Horne et al., 2021).

Implementing a school-based nutrition program in SDO (schools division office) of Albay represents a transformative initiative with the potential to significantly enhance health and educational outcomes, thereby fostering a brighter future for the community. A synthesis of existing literature confirms the potential benefits of such programs while underscoring the critical need to address implementation challenges proactively and adopt best practices to ensure long-term sustainability and impact.

Problems in the Field

Despite the national mandate for school-based nutrition programs, there is limited empirical evidence on their implementation, alignment with directives, and overall effectiveness. Crucially, there is a lack of recent, localized data on whether these programs are achieving their intended health and educational outcomes and what specific factors hinder their success.

Recent studies continue to highlight this gap. A 2021 study by Ritchie et al. pointed to challenges in implementation in low-income areas, often due to resource constraints. Similarly, a Philippine-based study by de Juras et al. (2021) on the double burden of malnutrition emphasized the complexity of the issue and the need for evaluated, localized interventions. Furthermore, a systematic review by Davis et al. (2020) on the double burden of malnutrition called for more operational and implementation research to understand how nutrition programs work in real-world, resource-limited settings.

These problems are rooted in larger socioeconomic problems that keep making Filipino children's malnutrition worse. Because of the fact that families with low income frequently lack access to whole foods, secure housing, and high-quality healthcare, poverty continues to be a significant factor of nutritional status (Albert et al., 2023). Food insecurity and reliance on inexpensive and low-nutrient diets are caused by prolonged poverty rates in areas like Bicol, which are exacerbated by unemployment and underemployment (Philippine Statistics Authority [PSA], 2024). Furthermore, poor living conditions and home overcrowding further jeopardize food safety and hygiene which makes children more prone to diseases thus worsens nutritional deficiencies (UNICEF, 2023).

Additionally, communities that are far-flung frequently face obstacles like poor transportation systems, low parental education levels, and limited access to health services, all of which have an impact on the effectiveness of school-based interventions (Food and Nutrition Research Institute [FNRI], 2021). These factors show more vividly the need to situate nutrition interventions within the lived realities of children and their families.

Therefore, the evaluation of the implementation and impact of the school-based nutrition program in SDO (schools division office) of Albay is necessary in order to reveal how these conditions influence the

results of this program in order to advance the goals of SDG 2 (Zero Hunger) and SDG 4 (Quality Education).

Gap Bridged

There are several studies that showed the benefits of school-based nutrition programs in the Philippines, however, there remains significant gaps when it comes to the program's localized impact especially in SDO (Schools Division Office) of Albay PIDS, (2015) and Tablante & Codorna (2019) revealed that there are improvements in children's health and academic performance, however, there remains issues in the implementation approach. Despite these studies, there are still limited researches that explored how nutritional programs respond to rural communities with certain socio-economic realities like that SDO (schools division office) of Albay. Most of the existing studies assess health and educational outcomes only separately and long-term evaluations of the sustainability of such programs in rural areas remain scarce.

Addressing these research gaps supports the United Nations Sustainable Development Goals (SDGs), specifically SG 2 (Zero Hunger) and SDG 4 (Quality Education) which is advocates to eradicate malnutrition and promotes the inclusive and quality education for everyone.

Therefore, this study sought to fill these gaps by generating localized evaluation of both health and educational impacts of the school-based nutrition programs in selected schools in SDO (schools division office) of Albay.

Objectives

The study aimed to evaluate the impact of the School-Based Nutrition Program (SBNP) on learners in selected public schools in the Schools Division Office of Albay, particularly on their health and educational outcomes. It examined the status of the program in terms of manpower complement involved, number of beneficiaries, funds utilization, and nutrition product specifications. The study also identified the best practices in the operationalization of the program and assessed its impact on learners' health and academic performance using BMI and GWA. Based on the findings, an operational model of the School-Based Nutrition Program for the selected schools in the SDO of Albay was proposed.

Theoretical and Conceptual Framework

This study is anchored on established theories that emphasize the important role of early-life nutrition in shaping children's holistic wellbeing. These theories suggest that proper nutrition not only influences physical growth but also cognitive development which affects children's academic performance.

Maslow's Hierarchy of Needs, (1943) is a model that describes human motivation where basic needs such as food, water, and shelter must be first satisfied before one can pursue the other higher-level needs like learning and self-actualization. This theory aligns with the theory of this study because it shows

that the basic needs, which includes food, are the foundation of everyone, especially children because early childhood is a crucial phase for the development of their body and other organs. It is for this reason that nutritious food is essential for them.

The Developmental Origins of Health and Disease (DOHaD), (Barker, 1995) suggests that early-life conditions, from the development of fetus through childhood, have a long-lasting effect on one's health and cognitive development. It emphasized that poor nutrition during significant during important phases of development can permanently alter the structure and functions of the organs, which as a result, makes people more prone to illnesses and impairments as a person grows old. This theory supports the research as it shows how nutrition is essential for building a child's biological foundation that enables both healthy physical growth and brain development.

The Nutrition-Cognitive Development Framework developed by Christian & Stewart (2010) explains that the development of brain structures and the maintenance of cognitive functions like memory, attention, and processing speed depend on essential nutrients like iron, iodine, and essential fatty acids in which whole and nutritious foods are good sources of. Adequate nutrition helps children's brain grow more effectively which then enhances their ability to learn and think more clearly. Thus, this framework supports the researcher's theory as it shows that nutrition influences intellectual growth of children.

These theories collectively substantiate the research's theory that nutrition is a cornerstone of both physical and cognitive development. They show that adequate nutrition during the formative years of an individual serves as the physiological foundation upon which growth and learning are built.

These theories also represent the concept from which the objectives of this study can be substantiated. For instance, Maslow's hierarchy of needs explains that physiological needs, such as food, must be satisfied first before learning can occur. This study aimed to make sure that the School-Based Nutrition Program is being implemented enough to meet the basic nutrition that the students need by means of assessing manpower complementing the program, the number of beneficiaries, fund utilization, and the quality of the nutrition being provided to the students. This may establish the necessary foundation for the higher-level needs. Determining these factors will be able to show whether the program is capable of giving the children the nutritional support they need to promote lifelong health, as said from the DoHad framework. Nutrition-Cognitive Development Framework asserts that adequate nutrients are necessary for brain development. Ensuring that the program provides adequate nutrition to children will help in realizing its real impact. Moreover, identifying the best practices being applied to the implementation of the program will help in ensuring that schools maximize their ability and the resources being granted to them to provide the needs of their students. If the needs of the children are met, they will be more likely to attend and engage at school, which therefore improves their educational outcomes.

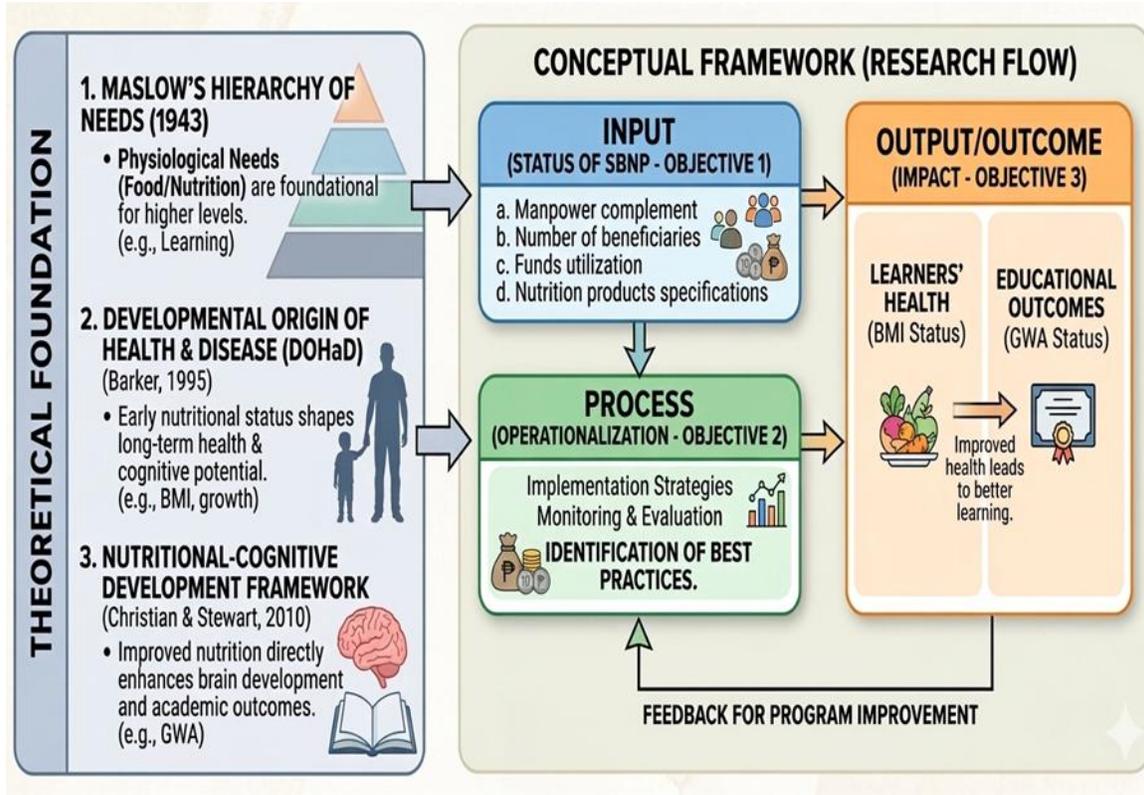


Figure 1. Theoretical and Conceptual Framework

METHODS

Research Design

This study employed a mixed-methods research design to evaluate the impact of the School-Based Nutrition Program (SBNP) on the health and educational outcomes of learner beneficiaries in selected public schools in the SDO (Schools Division Office) of Albay.

The mixed-methods approach integrates quantitative and qualitative data to provide a comprehensive and triangulated assessment of program effectiveness. Quantitative data determined measurable changes in health and educational outcomes, while qualitative data captured stakeholder experiences, implementation processes, and contextual factors influencing program outcomes.

The study was conducted during the First Semester of School Year 2025–2026. However, retrospective data covering School Years 2022–2023, 2023–2024, and 2024–2025 were collected and analyzed to examine trends before and during program implementation.

The quantitative component utilized a quasi-experimental pretest–posttest design without a control group by comparing students’ anthropometric indicators using Body Mass Index (BMI) and academic performance using General Weighted Average (GWA) before and during program participation. The qualitative component employed focus group discussions (FGDs) and key informant interviews (KIIs) to contextualize quantitative findings and identify best practices and implementation gaps.

Sampling Technique

The study employed a stratified sampling technique to select the participating schools from the SDO (schools division office) of Albay. Out of the total number of schools under the SDO (schools division office) of Albay, six schools were chosen as the study sites. Stratification was done according to the school districts, ensuring proportional representation from each district.

Specifically, the research selected two schools from each district—1st, 2nd, and 3rd districts—so that all geographic areas within the division were adequately represented. This approach allowed the study to capture variations in program implementation and student outcomes across different districts while maintaining a balanced and systematic selection process. By employing this method, the researcher ensured that the findings would be more generalizable to the broader population of schools within the division.

Research Respondents and Participants

The study was conducted in six (6) selected public elementary schools from three districts (1st, 2nd, and 3rd) in the SDO of Albay. Two schools from each district to ensure geographical representation and program implementation variability.

The primary respondents of the study were Kindergarten to Grade 3 learners who were identified as underweight or wasted based on Body Mass Index (BMI)-for-Age prior to the implementation of the School-Based Nutrition Program and who subsequently became program beneficiaries. This age group was intentionally selected because children in the early grades are developmentally and physiologically more vulnerable to malnutrition. During the Kindergarten to Grade 3 years, children experience rapid physical growth and cognitive development, making adequate nutrition critical for optimal health, school readiness, learning capacity, and overall well-being. Nutritional deficiencies at this stage may significantly affect not only physical growth but also attention span, academic performance, and long-term developmental outcomes.

The total number of learner beneficiaries in the six (6) schools identified was 498 learners. 314 learners’ beneficiaries were classified wasted and 184 learners’ beneficiaries were classified severely wasted. The distribution of the learners’ beneficiaries along grade level are as follows:

Frequency Distribution of The Learners’ Beneficiary’s Respondent

GRADE CLASSIFICATION	LEVEL/ WASTED	SEVERELY WASTED	TOTAL
KINDERGARTEN	119	72	191
GRADE 1	87	47	134
GRADE 2	52	27	79
GRADE 3	56	38	94
TOTAL:	314	184	498

The table presents the nutritional status of learners beneficiaries from kindergarten to Grade 3, classified as wasted and severely wasted. Wasted refers to a condition where a child has low weight-for-height, indicating acute malnutrition caused by insufficient recent food intake or illness. Severely wasted describes a more critical state of acute malnutrition, where the child’s weight-for-height falls well below standard thresholds, placing them at higher risk for health complications and requiring urgent nutritional intervention.

In kindergarten, of the 191 learners assessed, 119 were identified as wasted while 72 were severely wasted, suggesting that a significant portion of the youngest learners were experiencing acute malnutrition, with nearly 38% in the most critical category. In Grade 1, 87 learners were wasted and 47 severely wasted, indicating a modest improvement in nutritional status, though a substantial number of learners still faced nutritional risks. Grade 2 showed further progress, with 52 learners wasted and 27 severely wasted, reflecting the potential impact of ongoing nutrition interventions and recovery as children advance in grade levels. However, in Grade 3, there was a slight increase in severely wasted cases (38) alongside 56 wasted students out of 94 assessed, highlighting that some learners remain vulnerable and may require continued monitoring and targeted nutritional support.

Overall, the data underscore the importance of sustained nutrition programs and interventions, particularly for younger learners, to prevent progression to severe malnutrition and to support healthy growth and development.

For the qualitative component, purposive sampling was used. Each school provided one (1) non-Teaching personnel and one (1) school administrator, and the three (3) health facilitators of the SDO of Albay. This yielded a total of eighteen (15) key participants for interviews and FGDs. These individuals are directly involved in program implementation and are therefore best positioned to provide in-depth insights.

Research Instrument and Validation Process

Since the methods that were utilized in answering the objectives of the study were document analysis and focused group discussion, the needed instruments were the documents from the DepEd and an interview guide that underwent validation from Subject Matter Experts (SMEs).

The interview guide that was crafted by the researcher was reviewed by the research adviser together with the panelists and an external validator to ensure the soundness of the tool.

Data Gathering Procedure

Data collection was carried out in four systematic phases to ensure a comprehensive evaluation of the program.

In *Part 1*, documentary analysis was conducted through a thorough review of official guidelines from DepEd and school records, including feeding reports, beneficiary master lists, financial liquidation reports, procurement documents, and relevant academic records. This phase aimed to establish baseline information, verify program implementation processes, and examine compliance with prescribed guidelines.

In *Part 2*, anthropometric data were collected by retrieving pre- and post-program height and weight records from school health files. Where applicable, measurements were verified using calibrated equipment to ensure accuracy and reliability of the data.

Part 3 involved processing the data collected (computed BMI and educational outcome as measured by GWA) from SY 2022-2023, SY 2023-2024 and SY 2024-2025.

Finally, *Part 4* focused on qualitative data collection through Focus Group Discussions (FGDs) conducted separately for teachers and health facilitators, and Key Informant Interviews (KIIs) with school administrators. A semi-structured interview guide was used to explore implementation strategies, monitoring mechanisms, community involvement, challenges and innovations, and the perceived impact of the program on learners. All interviews were recorded with participants' consent, transcribed verbatim, and prepared for thematic analysis to generate in-depth insights.

Data Analysis

Quantitative data were analyzed using the Jamovi (a statistical application). Descriptive statistics, including means and standard deviations were computed to summarize key variables such as health and educational outcomes. These measures provided an overall program outcome for the last 3 school years. For inferential analysis, paired sample t-tests were employed to determine whether there are statistically significant differences between pre- and post-program measurements, particularly in Body Mass Index (BMI), and General Weighted Average (GWA). The level of statistical significance was set at $\alpha = 0.05$ to guide the interpretation of results.

Qualitative data were analyzed using thematic analysis to systematically interpret participants' narratives. The process involved familiarization with the data through repeated reading of transcripts, followed by initial coding to identify meaningful units of information. Codes were then be organized into

broader categories, leading to the identification of emerging themes. Finally, themes were reviewed and validated to ensure coherence, consistency, and alignment with the research objectives.

Ethical Considerations

The study strictly adhered to established ethical research standards and fully complied with the provisions of the Data Privacy Act of 2012 to ensure the protection of participants' rights and personal information. Prior to data collection, informed consent procedures were carefully observed. Adult participants, including teachers and administrators signed informed consent forms indicating their voluntary agreement to participate.

Participation in the study was entirely voluntary, and all participants were informed that they may withdraw at any point without penalty or negative consequences. To uphold confidentiality and anonymity, all collected data were anonymized, with identification codes replacing names in datasets, transcripts, and reports. Digital files were securely stored in password-protected devices and storage systems accessible only to the research team. In observance of the principle of non-maleficence, anthropometric assessments were conducted in a respectful, private, and non-stigmatizing manner to prevent any form of psychological discomfort or harm. Furthermore, inclusivity was strictly maintained throughout the study. Participation or non-participation will not affect students' access to the nutrition program, and no discrimination based on gender, socioeconomic status, ethnicity, or other personal characteristics will be tolerated.

RESULTS

Status of School-Based Nutrition Program

The School-Based Feeding Program (SBFP) of the Department of Education has its roots in earlier government initiatives aimed at addressing child hunger and undernutrition among public school learners, particularly those classified as wasted and severely wasted. Prior to being formally called the SBFP, DepEd implemented Breakfast Feeding Programs in the late 2000s to early 2010s as part of its learner welfare and poverty-reduction strategies. These early feeding initiatives were reinforced under the Aquino administration's focus on social protection and human capital development, recognizing that malnutrition adversely affects school attendance, participation, and academic performance.

The program was institutionalized as the School-Based Feeding Program in 2012 through DepEd Order No. 87, s. 2012, which provided clear guidelines for its nationwide implementation. From 2012 onward, the SBFP became a regular flagship program of DepEd, implemented annually through various orders (e.g., DO 33, s. 2015; DO 51, s. 2016), with continuous refinements in targeting beneficiaries, menu standards, fund utilization, and monitoring mechanisms. Throughout these years, the SBFP consistently aimed to improve learners' nutritional status within a set feeding period and to promote better school participation, especially in public elementary schools and later expanded to selected secondary learners.

By 2020, the implementation of the SBFP faced unprecedented challenges due to the COVID-19 pandemic, which resulted in school closures and the suspension of face-to-face classes. To ensure the continuity of nutrition support despite these disruptions, DepEd issued DepEd Order No. 023, s. 2020, which provided revised operational guidelines for the SBFP for School Year 2020–2021 under the new learning modalities and strict health protocols. This Order represents an adaptive policy response, bridging the long-standing goals of the SBFP with emergency-responsive strategies, and serves as a critical reference point in understanding how DepEd sustained learner welfare programs amid crisis conditions while remaining anchored on its earlier nutrition and inclusive education commitments.

Status of School-Based Nutritional Program in terms of Manpower Complement Involved

The implementation of the School-Based Feeding Program (SBFP), as stipulated in DepEd Order No. 023, relies on a clearly defined, multi-level manpower structure that emphasizes collaboration, role delineation, and accountability across national, division, school, and community levels. At the national and regional levels, the Department of Education provides policy direction, program oversight, and technical assistance to ensure alignment with national nutrition and education goals. The Schools Division Offices act as intermediaries, coordinating operations, supervising compliance, consolidating reports, and providing logistical support to ensure that program standards are consistently upheld across schools.

At the school level, the workforce is operationally focused, with School Heads held accountable for overall program management, including strategic planning, resource utilization, and stakeholder coordination. Supporting this structure, SBFP Coordinators, teachers, and non-teaching personnel manage beneficiary identification, participation monitoring, and the integration of nutrition-related activities into classroom instruction. The program also draws heavily on community synergy, with parents, volunteers, and Parent-Teacher Association (PTA) members assisting in food preparation and service, while partnerships with local government units and health workers provide essential health assessments.

The transition from four to three personnel per school at the start of SY 2023-2024 reflects the DepEd shift out of the pandemic recovery stage. Though SY 2022-2023 required additional manpower to address the severe malnutrition backlog in a catch-up capacity, the complete resumption of in-person classes has allowed for more streamlined operations. Presently, a core team consisting of the School Head, the SBFP Coordinator, and one support non-teaching personnel member is adequate to manage the program effectively without overburdening teaching personnel.

The SBFP's manpower complement demonstrates a comprehensive and participatory approach, reflecting the Department of Education's recognition that addressing child malnutrition requires both institutional backing and community engagement. The program's effectiveness, however, ultimately depends on the availability, capacity, and sustained commitment of personnel across all levels, highlighting that successful implementation is a shared responsibility among education officials, school staff, and the community.

Status of School-Based Nutritional Program in terms of Number of beneficiaries

The implementation of the School-Based Feeding Program (SBFP) in terms of the number of beneficiaries is guided by clearly defined eligibility criteria, prioritization mechanisms, and systematic identification processes, as stipulated in DepEd Order No. 023. Primary beneficiaries are identified based on nutritional status, with emphasis on learners classified as wasted and severely wasted, including kindergarten learners and Grade 1 to Grade 6 learners. Beneficiaries are determined using standardized nutritional assessment tools conducted at the beginning of the school year, ensuring that selection is objective, evidence-based, and consistent across schools. Learners who have already graduated from elementary and ascended to Grade 7 are no longer included, ensuring that program coverage aligns with the current nutritional needs of the learner's population.

The SBFP also incorporates secondary prioritization mechanisms in cases where resources allow for expanded coverage. Should there be excess funding, additional learners may be included as beneficiaries, such as stunted learners from the previous school year, pupils-at-risk of dropping out (PARDOs), indigenous peoples (IP) learners, and learners from indigent families. This inclusive approach demonstrates the program's equity-oriented design, addressing not only undernutrition but also socio-economic vulnerabilities that intersect with nutritional needs. Schools are responsible for preparing official beneficiary lists, which are subject to verification and monitoring by higher offices to ensure accuracy, accountability, and prevention of resource misallocation.

The status of the SBFP in terms of beneficiary coverage reflects a systematic, data-driven, and responsive approach. Adjustments to the number of beneficiaries may be made during the school year based on updated nutritional assessments, learner transfers, or changes in status, ensuring that the program remains aligned with evolving learner needs. While the guidelines provide a robust framework for targeting and inclusion, the effectiveness of beneficiary selection ultimately depends on accurate nutritional assessments, the capacity of schools to conduct ongoing monitoring, and the adequacy of allocated resources to support all eligible learners.

Status of School-Based Nutritional Program in terms of Fund Utilization

The implementation of the School-Based Feeding Program (SBFP) in terms of funds utilization is governed by clearly defined financial policies, structured allocation mechanisms, and multi-level accountability procedures, as stipulated in DepEd Order No. 023, s. 2020. The program budget is released through a hierarchical process, starting from the Central Office, then downloaded to Regional Offices, and finally reaching the implementing elementary schools. This structured release process, anchored on the General Appropriations Act and the Cash-Based Budgeting System, ensures accountability and proper stewardship of public funds at each administrative level.

Funds under the SBFP are allocated to two primary components: the regular component, which covers nutritious food products, and the milk component. The budget for the regular component is computed at ₱20.00 per beneficiary per feeding day, broken down into ₱18.00 for food items and ₱2.00 for

operational expenses. For the milk component, the allocation is ₱18.00 per 200-milliliter pouch or ₱90.00 per 1-liter bottle, with additional allowances of ₱1.00–2.00 per pouch or ₱5.00–6.00 per bottle for logistics, particularly when supplies are sourced from distant provinces or regions. Allowable non-food expenses include logistics, overhead items such as cooking utensils and kerosene, and implementation-related costs like honoraria, orientation activities, and augmentation of school operational funds. These expenses are supported through Support Program Funds (PSF) at the Central, Regional, and Schools Division Offices, reflecting a comprehensive approach to resource allocation.

The guidelines emphasize that fund utilization must be transparent, efficient, and strictly program-related, reinforcing the program's goal of improving learner nutritional outcomes. Schools are required to follow prescribed budgeting, disbursement, and reporting procedures, including proper documentation and liquidation of expenses. School Heads and designated finance personnel are accountable for ensuring adherence to financial rules, while higher offices conduct periodic monitoring to verify compliance and minimize the risk of mismanagement. Overall, the documentary evidence suggests that the SBFP's fund utilization is policy-driven, systematic, and closely monitored, but its effectiveness depends on timely release of funds, the administrative capacity of implementers, and consistent adherence to financial management protocols, all of which directly affect the continuity and quality of feeding services provided to learners.

Status of School-Based Nutritional Program in terms of Nutrition Product Specifications

The implementation of the School-Based Feeding Program (SBFP) with regard to nutrition product specifications is guided by clearly defined nutritional standards, quality requirements, and safety protocols, as stipulated in DepEd Order No. 023. The guidelines emphasize that all food items provided to learner-beneficiaries must meet established dietary requirements, including appropriate caloric content and nutrient composition suitable for school-aged children. Approved menus and standardized recipes are prescribed to ensure consistency in nutrient delivery across participating schools, supporting growth, development, and the program's goal of addressing undernutrition.

Food quality and safety are integral to product specifications. All food items must be safe for consumption, properly stored, and prepared under sanitary conditions. The guidelines encourage the use of fresh, locally available, and culturally acceptable ingredients, provided they comply with nutritional and safety standards. Additionally, the Inspection Team of the procuring entity reserves the right to accept or refuse delivered food products if they do not conform to the prescribed technical specifications, reinforcing accountability and quality assurance in program implementation.

The guidelines also require schools to document menu plans, ingredient lists, and food preparation procedures as part of reporting and monitoring responsibilities, ensuring alignment with national health and nutrition policies and facilitating oversight by supervisory offices. Overall, the documentary evidence indicates that the SBFP's nutrition product specifications are structured, standards-based, and closely monitored, reflecting the Department of Education's commitment to providing nutritionally adequate and safe meals. The effectiveness of these specifications in practice, however, depends on schools' capacity to

adhere to guidelines, the availability of quality food supplies, and continuous monitoring to maintain compliance and safeguard learners' nutritional outcomes.

Table 1 presents the status of the School-Based Nutrition Program across six schools from School Year 2022–2023 to 2024–2025 in terms of manpower, number of beneficiaries, fund utilization, and nutrition product specification. The data show that manpower slightly decreased from four personnel in all schools during SY 2022–2023 to three personnel from SY 2023–2024 to SY 2024–2025, indicating a minor reduction in staff assigned to the program. Despite this, the number of beneficiaries remained relatively stable across the three school years, ranging from 49 to 92 learners per school, suggesting consistent program coverage among identified learners. In terms of fund utilization, the allocation for meals and milk increased in SY 2024–2025 from ₱20.00 and ₱18.00 to ₱25.00 and ₱22.00 respectively, while the operating cost remained at ₱2.00, reflecting an adjustment to support improved nutrition provisions. Meanwhile, the nutrition product specification remained consistent across all schools and years, consisting of enhanced nutribun variants, other nutritious food products such as iron-fortified or brown rice, and pasteurized or sterilized milk. Overall, the table indicates sustained implementation of the program with stable beneficiary coverage and improved financial allocation for nutritional support.

Table 1. Status of The School Based Nutrition Program

AREAS	SY	SCHOOLS					
		A	B	C	D	E	F
MANPOWER	22-23	4	4	4	4	4	4
	23-24	3	3	3	3	3	3
	24-25	3	3	3	3	3	3
NUMBER OF BENEFICIARIES	22-23	51	51	55	54	59	53
	23-24	56	49	92	51	57	55
	24-25	54	51	52	57	59	54
FUND UTILIZATION	22-23	MEAL=P20.00 MILK=P18.00 OPERATING -P2.00					
	23-24	MEAL=P20.00 MILK=P18.00 OPERATING -P2.00					
	24-25	MEAL=P25.00	MEAL=P25.00	MEAL=P25.00	MEAL=P25.00	MEAL=P25.00 MILK=P22.00	MEAL=P25.00 MILK=P22.00

		MILK=P2 2.00 OPERATI NG -P2.00	MILK=P2 2.00 OPERATI NG -P2.00	MILK=P2 2.00 OPERATI NG -P2.00	MILK=P22 .00 OPERATI NG -P2.00	OPERATING - P2.00	OPERATING - P2.00
NUTRITION PRODUCT SPECIFICATION	22-23	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk(paste urized or sterilized.)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk(paste urized or sterilized.)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk(paste urized or sterilized)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice& etc.) Milk (Pasteurize d or sterilized)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice& etc.) Milk(pasteuriz ed or sterilized)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) milk (pasteurized or sterilized)
	23-24	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk (pasteuriz	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk (pasteuriz	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk (pasteurize	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice& etc.) Milk (Pasteurize	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice& etc.) Milk (pasteurized or sterilized)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) milk (pasteurized or sterilized)

		ed or sterilized.)	ed or sterilized.)	d or sterilized)	d or sterilized)		
	24-25	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk(pasteurized or sterilized.)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk(pasteurized or sterilized.)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk (pasteurized or sterilized)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk (Pasteurized or sterilized)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) Milk (pasteurized or sterilized)	Enhanced Nutribun (squash, carrot, sweet potato variants) Nutritious Food Product (karabun, iron fortified rice, brown rice & etc.) milk (pasteurized or sterilized)

Best Practices Undertaken in The Operationalization of the School-Based Nutrition Program

In exploring the best practices undertaken in the operationalization of the School-Based Nutrition Program (SBNP) in the selected elementary schools in the Albay Division, several themes have emerged. In this study, best practices are operationally defined as the effective strategies, approaches, and activities consistently implemented by schools that contribute to the efficient delivery, management, and sustainability of the School-Based Nutrition Program, particularly in improving the nutritional support and overall well-being of student beneficiaries. These practices reflect practical methods adopted by school personnel and stakeholders to ensure the successful implementation of the program.

Evidence-Based Identification of Beneficiaries

Beneficiary identification through factual data is crucial for the School-Based Feeding Program in order to effectively target the wasted and severely wasted pupils of the implementing Elementary Schools. In the SDO (schools division office) of Albay, the program facilitators are making an effort to screen the learners in their respective schools, saying that measuring Body Mass Index, particularly through Operation Timbang, serves as an objective basis for this.

Participant 1 says, “*The computed height and weight serve as the basis of the beneficiaries of the program. Pupils who fall under wasted and severely wasted are the beneficiaries of SBFP.*”

Another participant emphasized, *“Using accurate BMI... No palakasan system; it’s purely based on nutritional status.”*

“Using the annual School-Based Management System (e-SBM) and Oplan Timbang data to precisely identify beneficiaries, rather than generic classroom selection.”, Participant 3 said.

In addition, Participant 4 conveyed another system that gives them clean and accurate data, *“Using the School Health Information System (SHIS) and the ESWIS to accurately identify and prioritize beneficiaries, ensuring resources reach those most in need.”*

Participants 1, 2, 3 & 7 also emphasized the systematized planning and implementation that they employ, *“Planning starts with a nutritional assessment (e.g., height and weight measurement, BMI profiling) to identify target beneficiaries (severely wasted, wasted, and underweight learners). The SNC then aligns activities with the School Improvement Plan (SIP), integrating a nutrition component into the Annual Implementation Plan (AIP).”*

Collaborative Governance Approach

Effective implementation of a program requires more than adequate funding and guidelines; it becomes effective when there is synergy of the minds and manpower. It is never a one-man team, given that each individual has something to contribute. SBFP is no different. Behind it is a collaboration between program focal persons and the schools’ partners who work together to accomplish common goals.

Participants 2, 3, & 6 assert that the program is being implemented through the leadership of a committee they formed specifically to spearhead the feeding program explaining, *“The program is planned through a whole-school approach led by the School Nutrition Committee... including the School Head, School Nurse, teachers, parents, and Barangay Nutrition In-charge.”*

“We communicate directly with the parents... secure their commitment to volunteer.”, said Participant 1. *“[We] organize a meeting before the first delivery with all school coordinators, the SDO supply officer, and delivery agents. We clarify roles, documentary requirements, and contingency plans.”*, Participants 3 and 4 explained.

In addition, participants also view feedback mechanisms and decision-making that do not leave a single person involved is essential in order for the planning to be effective,

When asked what practices they think is most effective during the planning stage of SBFP, Participant 5 expressed that *“Giving and taking feedback to the implementers.”* is one of the things they consider. Participant 6 says that some practices they make use of include *“...engaging stakeholders early, conducting needs assessments, and setting clear, measurable goals.”* While Participant 7 considers, *“...collaborative thinking and working as an effective strategy in the planning stage since getting different ideas from diverse perspectives is a key to attaining a richer result.”*

Furthermore, Participants 1, 2, 5 & 6 also ensure that the schedule rotation of facilitators is productive and structured to make sure availability of all facilitators. “...create a structured feeding team rotation–schedule for parent-volunteer, cleaner and food servers, this distributes the burden and ensures no single person burns out.”

Localized Procurement of Nutritious Food

The Operational Guidelines of the SBFP encourages implementing schools to source out food ingredients from local suppliers that can produce and provide nutritious ingredients to ensure freshness, retention of nutritional elements, and it can also reduce costs. Participants have conveyed that the actual implementation of the feeding program is being supplied by local farmers, especially the pasteurized milk, and they even utilize the produce of their school garden.

As shared by Participants 1 & 2, “Using a cycle menu developed with the SDO Nutritionist, but localizing it using produce from the *Gulayan sa Paaralan* and procuring other ingredients from local farmers.”

Beyond the food component, participants also emphasized that they are sourcing pasteurized milk from local dairy cooperatives or LGU-accredited local milk suppliers to ensure freshness as milk is a component that has a short shelf life. Despite that the milk is not coming from bigger commercial suppliers, they make sure that the local suppliers are capable of meeting food safety and quality standards. Participant 1 describes, “The feeding program is being supplied by local farmers, especially the pasteurized milk, and we also utilize the produce of our school garden.”

They argue that localized procurement of the feeding components enhances the effectiveness and sustainability of the SBFP. Schools are able to make sure that the food or ingredients being supplied are fresher, reduce costs, and even support the local farmers.

Impact of School-Based Nutrition Program on the Learners Beneficiaries’ Health and Educational Outcomes

Table 1.1 presents the mean Body Mass Index (BMI) of the learners’ beneficiaries from School Year (SY) 2022–2023 to SY 2024–2025. The results show a consistent upward trend in mean BMI across the three school years. In SY 2022–2023, the beneficiaries recorded a mean BMI of 13.00, which falls under the wasted classification, indicating that the learners were nutritionally at risk at the onset of the program. In SY 2023–2024, the mean BMI increased to 13.89, reflecting a 6.85% improvement from the previous year. Although still classified as wasted, the increase suggests notable nutritional progress among the beneficiaries.

Furthermore, in SY 2024–2025, the mean BMI further increased to 14.61, representing an additional 5.18% increase from SY 2023–2024. At this stage, the classification shifted to borderline low or still below normal, indicating continued improvement in nutritional status. Overall, the steady increase in

mean BMI across the three school years demonstrates progressive enhancement in the health condition of the beneficiaries. While the learners remained within the nutritionally vulnerable range, the upward movement in BMI values suggests that the nutrition intervention contributed positively to improving their nutritional outcomes over time. The comparative analysis of learner’s beneficiaries’ health outcomes as measured by Body Mass Index (BMI) across three consecutive school years. The mean BMI increased steadily from 15.82 in SY 2022–2023, to 16.71 in SY 2023–2024, and further to 17.43 in SY 2024–2025, indicating a consistent upward trend in beneficiaries’ nutritional status over time.

Table 1.1. Health Outcomes (BMI) of the Learners’ Beneficiaries from SY 2022-2025

School Year	Health Outcomes (BMI)		
	Mean BMI	BMI Classification	Year-on-Year Comparison
2022-2023	15.82	Wasted	(Baseline)
2023-2024	16.71	Wasted (Improving)	Significant Improvement (MD: 0.89, p <.001)
2024-2025	17.43	Borderline/Normal	Significant Improvement (MD: 0.72, p <.001)
Overall Program Impact	+1.61	Improved from Wasted to Borderline/Normal	Highly Significant (t=8.97, p <.001)

Mean BMI: 22-23= 15.82, 23-24= 16.71, 24-25= 17.43 Mean GWA: 22-23= 82.14, 23-24= 84.27, 24-25= 86.02

Table 1.2 presents the comparison between SY 2022–2023 and SY 2023–2024 yielded a mean difference of 0.89, with a t-value of 6.42 and a p-value < .001. This result is statistically significant, leading to the rejection of the null hypothesis and suggesting a meaningful improvement in BMI from the first to the second year. Similarly, the comparison between SY 2023–2024 and SY 2024–2025 showed a significant mean increase of 0.72 (t = 5.18, p < .001), further confirming continued positive changes in learner’s BMI.

Table 1.2. Educational Outcomes (GWA) of the Learners’ Beneficiaries from SY 2022-2025

School Year	Educational Outcomes (GWA)	
	Mean GWA	Year-on-Year Comparison
2022-2023	82.14	(Baseline)
2023-2024	84.27	Significant Improvement (MD: 2.13, p <.001)
2024-2025	86.02	Significant Improvement (MD: 1.17, p <.001)
Overall Program Impact	+3.88	Highly Significant (t=9.36, p <.001)

Overall, these findings indicate a statistically significant and progressive improvement in BMI across the three school years, suggesting that interventions implemented during this period were effective in enhancing the health and nutritional outcomes of the learners' beneficiaries.

The mean General Weighted Average (GWA) of the student beneficiaries across School Years (SY) 2022–2023 to 2024–2025. The data indicate a steady improvement in academic performance over the three-year period. In SY 2022–2023, the beneficiaries had a mean GWA of 82.14, which serves as the baseline for comparison. By SY 2023–2024, the mean GWA increased to 84.27, reflecting a 2.59% improvement from the previous year. This increase suggests that students demonstrated measurable progress in their academic performance following the intervention.

In SY 2024–2025, the mean GWA further increased to 86.02, representing an additional 2.08% growth from SY 2023–2024. Overall, the cumulative improvement from SY 2022–2023 to SY 2024–2025 amounted to a 4.73% increase in mean GWA, indicating a consistent upward trend in educational outcomes among the beneficiaries. These findings suggest that the program not only supported nutritional recovery but may also have contributed positively to learners' academic performance, as improvements in health and nutrition are often linked to better cognitive function, classroom participation, and learning outcomes.

This study conducted a longitudinal analysis of learners' beneficiaries' educational outcomes as measured by their General Weighted Average (GWA) across three consecutive school years. The mean GWA shows a consistent upward trend, increasing from 82.14 in SY 2022–2023, to 84.27 in SY 2023–2024, and further to 86.02 in SY 2024–2025, indicating progressive improvement in the academic performance of the beneficiaries over time.

The evaluation between SY 2022–2023 and SY 2023–2024 revealed a mean difference of 2.13, with a t -value of 7.05 and a p -value $< .001$, indicating a statistically significant increase in GWA and leading to the rejection of the null hypothesis. Likewise, the comparison between SY 2023–2024 and SY 2024–2025 yielded a significant mean difference of 1.17 ($t = 6.11$, $p < .001$), suggesting continued academic improvement from one school year to the next.

The largest gain was observed in the comparison between SY 2022–2023 and SY 2024–2025, with a mean difference of 3.88 ($t = 9.36$, $p < .001$), which is highly significant. Overall, the results demonstrate statistically significant and sustained improvements in the educational outcomes of learners' beneficiaries across the three school years, suggesting that the interventions implemented during this period contributed positively to their academic performance.

Proposed Operational Model of the School-Based Nutrition Program

Based on the findings of the study, a proposed operational model of the School-Based Nutrition Program (SBNP) is presented to guide schools in strengthening the implementation of nutrition-related interventions for learners. The model integrates key components identified in the study, including

manpower support, beneficiary management, efficient fund utilization, nutrition product provision, and the adoption of best practices that contribute to the successful delivery of the program.

Operationally, the Proposed Operational Model of the School-Based Nutrition Program refers to a structured framework that outlines the coordinated processes, resources, and practices necessary for the effective planning, implementation, monitoring, and sustainability of school-based nutrition initiatives aimed at improving the nutritional status, participation, and overall well-being of learners' beneficiaries.

Rationale

Based on the findings of the study, the School-Based Nutrition Program (SBNP) has demonstrated a positive and significant impact on both health and educational outcomes of learners' beneficiaries in the SDO of Albay. The statistically significant improvement in BMI across three consecutive school years and the decreasing number of undernourished learners affirm the effectiveness of sustained, well-managed nutritional interventions. Moreover, improvements in learners' General Weighted Average (GWA) highlight the interconnection between nutrition, health, and academic performance. Thus, the proposed operational model emphasizes systematic planning, inter-sectoral collaboration, continuous monitoring, and evidence-based decision-making to ensure program effectiveness, sustainability, and scalability.

PROPOSED OPERATIONAL MODEL OF THE SCHOOL-BASED NUTRITION PROGRAM

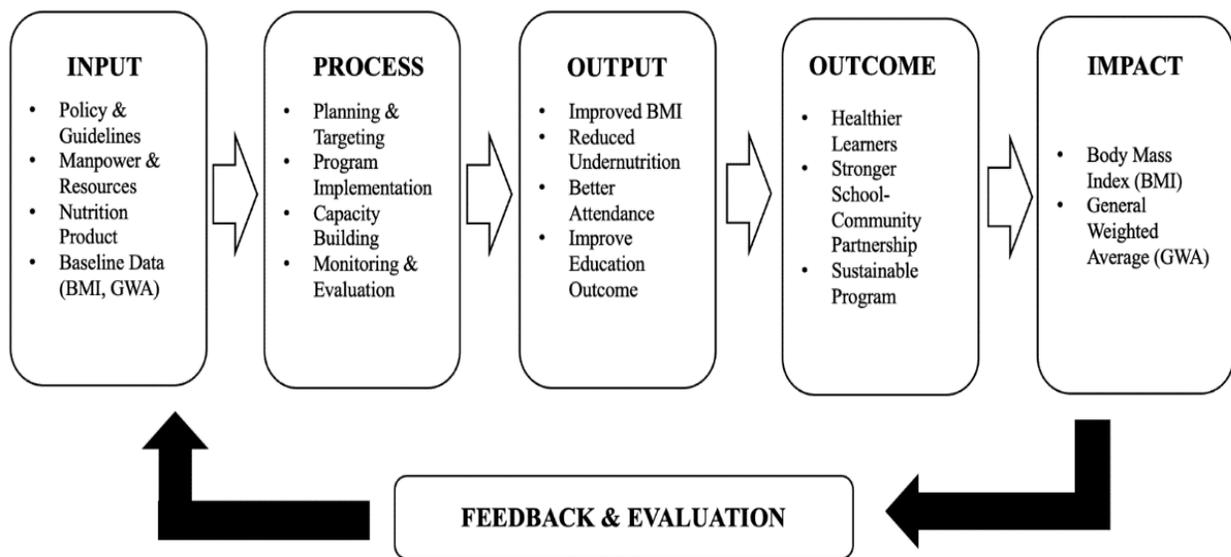


Figure 1. Operational Model of the School-Based Nutrition Program

The proposed operational model will be implemented through a coordinated and systematic approach involving school personnel, local government units, health partners, and community stakeholders. Initially, schools will conduct baseline assessments by identifying nutritionally at-risk learners using BMI-

for-age indicators and reviewing existing school health and academic records. This will ensure that program beneficiaries are properly targeted and prioritized.

Following the identification of beneficiaries, program planning and resource allocation will be carried out by school heads and feeding coordinators in coordination with the Schools Division Office, local government units, and community partners. This phase includes scheduling feeding activities, procuring approved nutrition products, mobilizing manpower, and organizing volunteers.

During the *implementation phase*, schools will carry out the regular preparation and distribution of nutritionally adequate meals in accordance with DepEd nutrition standards and food safety guidelines. Teachers, feeding coordinators, parent-volunteers, Barangay Health Workers, and other stakeholders will collaboratively manage the feeding activities while ensuring proper documentation and monitoring.

Continuous *monitoring and evaluation* will be conducted through periodic measurement of learners' BMI, assessment of school attendance, and tracking of academic performance such as the General Weighted Average (GWA). Data collected will be analyzed to determine program effectiveness and identify areas that require improvement.

Lastly, a *feedback and sustainability mechanism* will ensure that program results inform policy adjustments, program refinement, and improved resource allocation. Schools will regularly coordinate with the Schools Division Office, health agencies, and community stakeholders to sustain the program and replicate effective practices. Through this systematic implementation process, the proposed operational model serves as a practical guide for schools to strengthen the delivery, efficiency, and long-term sustainability of the School-Based Nutrition Program.

DISCUSSIONS

Status Of School-Based Nutritional Program

Status of School-Based Nutritional Program in terms of Manpower Complement Involved

The implementation of the School-Based Feeding Program (SBFP) under DepEd Order No. 023 demonstrates a comprehensive, multi-level manpower structure aimed at addressing learners' malnutrition and improving educational outcomes. This structure aligns with evidence showing that successful school feeding programs require clear role delineation and collaborative implementation across various stakeholders. For example, a study of SBFP stakeholders in Laguna found that teachers, administrators, and parents work together in both implementing and monitoring feeding activities, with collaboration and volunteerism enhancing program delivery and sustainability (Paglinawan, 2025). Such delineated roles—from national officers providing policy direction to school heads coordinating operations—ensure that program goals are consistently upheld and adapted to local contexts.

At the operational level, the workforce composition—comprising school heads, teachers, feeding coordinators, PTA members, and community volunteers—reflects findings that the effectiveness of SBFP implementation is influenced by the involvement and capacity of local personnel. Research in Davao del Sur emphasizes how coordinators' ability to manage and collaborate with parents and barangay officials is crucial for maintaining program momentum, underscoring the importance of manpower capacity and leadership at the school level (Nourishing Minds, 2025). Similarly, evaluations in Apayao revealed that while core feeding activities were carried out effectively, insufficient staffing and low parental engagement hindered full implementation, indicating that manpower complement and community participation directly affect program reach and quality (Sadag, 2025).

Overall, the SBFP's manpower complement under DepEd Order No. 023 illustrates a participatory approach consistent with research that links stakeholder engagement to program success. The involvement of non-teaching personnel, parents, and community partners not only broaden the labor base but also fosters a shared responsibility for child nutrition and education. However, the literature also cautions that the mere presence of roles and structures does not guarantee effectiveness; capacity building, adequate staffing, and sustained engagement are critical for long-term success (Paglinawan, 2025; Sadag, 2025). Therefore, while the SBFP's manpower framework aligns with best practices, its impact ultimately depends on continuous support, training, and active community participation.

Status of School-Based Nutritional Program in terms of Number of beneficiaries

The implementation status of the School-Based Feeding Program (SBFP) in terms of the number of beneficiaries reflects a strategic and evidence-based targeting approach aimed at reaching learners most affected by undernutrition. The prioritization of wasted and severely wasted kindergarten and elementary pupils aligns with evidence showing that school feeding programs are most effective when they focus on those with the greatest nutritional deficits, as these children are more likely to experience poor health, low school attendance, and impaired learning outcomes if left unaddressed (Tabunda et al., 2016). By using standardized nutritional assessment tools at the start of the school year, DepEd ensures that beneficiary selection is both objective and consistent, reducing the risk of resource misallocation and improving the program's capacity to address undernutrition systematically.

The inclusion of secondary beneficiary categories, such as stunted learners, pupils-at-risk of dropping out, indigenous peoples (IP), and indigent children when resources permit, illustrates an equity-oriented design that recognizes nutritional vulnerability as intersecting with socio-economic disadvantage. This approach resonates with global literature suggesting that school feeding programs should extend beyond nutritional status to include socio-economic criteria to better reach children at risk of food insecurity and educational exclusion (FAO, 2003). While such targeted interventions are intended to enhance efficiency and direct limited resources to those who need them most, research also highlights challenges of targeting, including potential under coverage and leakage if selection mechanisms are not rigorously implemented.

Empirical evidence indicates that targeting based on nutritional status and socio-economic vulnerability has contributed to the positive outcomes of the SBFP in the Philippines. For instance, earlier implementations of the program successfully reached large numbers of undernourished children, with evaluations showing improved school attendance and nutritional rehabilitation among beneficiaries, although gaps in data quality and monitoring were noted as constraints to precise beneficiary selection. These findings reinforce the importance of ongoing monitoring, accurate nutritional assessments, and adequate resources to sustain program effectiveness. Ultimately, the SBFP's beneficiary targeting mechanisms as guided by DepEd Order No. 023 reflect a responsive, data-driven approach that prioritizes need while striving for inclusivity, but their success depends on strong implementation capacity and consistent evaluation to ensure that eligible learners are accurately identified and effectively served.

Status of School-Based Nutritional Program in terms of Fund Utilization

The implementation of the School-Based Feeding Program (SBFP) in terms of fund utilization demonstrates a structured, transparent, and accountable approach aimed at ensuring that financial resources directly support the nutritional needs of learner-beneficiaries. The hierarchical release of funds—from the Central Office to Regional Offices and down to implementing schools—reflects a multi-level accountability mechanism that aligns with best practices in public fund management. Such structured financial procedures are consistent with research emphasizing that effective allocation and monitoring of program funds are critical for the success of school feeding programs (Gelli et al., 2018). By adhering to the General Appropriations Act and Cash-Based Budgeting System, the program reduces risks of misallocation and enhances accountability at every administrative level, ensuring that resources reach intended beneficiaries efficiently.

The allocation of funds to the regular component (nutritious food) and milk component, with additional provisions for operational and logistical costs, highlights the program's comprehensive approach to supporting feeding activities. This structured budgeting ensures that resources are not only sufficient for food provision but also for essential implementation needs such as cooking supplies, honoraria, and transportation, which aligns with findings from global studies showing that holistic funding frameworks enhance the continuity and effectiveness of school feeding programs (Bundy et al., 2018; Adelman et al., 2008). Moreover, the systematic documentation, liquidation, and reporting of expenditures reinforce transparency and fiscal responsibility, as observed in other evaluations of school feeding programs in low- and middle-income countries, where lapses in financial monitoring often compromise program delivery (World Bank, 2020).

Overall, the SBFP's fund utilization mechanism illustrates a policy-driven and closely monitored system that supports program objectives and safeguards public resources. However, the literature emphasizes that the effectiveness of financial management ultimately depends on timely release of funds, administrative capacity at the school level, and strict adherence to financial protocols (Gelli et al., 2018; Bundy et al., 2018). These factors directly influence the continuity, quality, and reach of feeding services, suggesting that sustained capacity-building for implementers and routine oversight remain essential for maintaining program effectiveness and achieving intended nutritional outcomes for learners.

Status of School-Based Nutritional Program in terms of Nutrition Product Specifications

The implementation of the School-Based Feeding Program (SBFP) in terms of nutrition product specifications demonstrates a standards-based and closely monitored approach aimed at ensuring that learners receive nutritionally adequate and safe meals. The program's emphasis on caloric content, nutrient composition, approved menus, and standardized recipes aligns with global research indicating that well-defined nutritional standards are essential for the effectiveness of school feeding programs in improving child health outcomes (Gelli et al., 2018). By prescribing consistent nutrient delivery across schools, the SBFP addresses undernutrition while supporting the growth and development of school-aged children, highlighting the importance of evidence-based food planning in program design.

Food quality and safety are critical components of product specifications, as the guidelines require proper storage, preparation under sanitary conditions, and the use of fresh, locally available, and culturally acceptable ingredients. The authority of the Inspection Team to accept or refuse delivered food products if they fail to meet technical standards reinforces accountability and aligns with studies demonstrating that quality control mechanisms are vital to prevent contamination and ensure compliance with nutritional objectives (Bundy et al., 2018; World Food Programme, 2019). Furthermore, the documentation of menus, ingredients, and food preparation processes provides a transparent monitoring mechanism that facilitates oversight by higher offices and ensures adherence to national health and nutrition policies.

Overall, the SBFP's nutrition product specifications reflect a structured, policy-driven approach that integrates quality, safety, and nutritional adequacy. Research shows that programs with clearly articulated product standards, coupled with monitoring and quality assurance practices, are more effective in achieving measurable improvements in children's nutritional status (Afridi et al., 2018). Nonetheless, the effectiveness of these specifications in practice depends on the capacity of schools to comply with guidelines, the consistent availability of quality food supplies, and continuous supervision to maintain adherence. Ensuring these factors are in place is critical to translating policy standards into tangible health outcomes for the learners.

Best Practices Undertaken in the Operationalization of the School-Based Nutrition Program

The discussion of the best practices undertaken in the operationalization of the School-Based Nutrition Program (SBNP) highlights the effective strategies and approaches implemented by schools to ensure the successful delivery of nutrition interventions to learners. These practices reflect the collaborative efforts of school personnel, community stakeholders, and partner institutions in strengthening program implementation, improving nutritional support, and sustaining the overall effectiveness of the SBNP.

Evidence-Based Identification of Beneficiaries

A key best practice in the operationalization of the School-Based Nutrition Program (SBNP) in the SDO of Albany is the evidence-based identification of beneficiaries. The selection of learners for the School-Based Feeding Program (SBFP) is anchored on objective nutritional assessments, primarily targeting

learners classified as wasted or severely wasted. Facilitators in both rural and urban elementary schools emphasize the use of Body Mass Index (BMI) measurements, obtained through initiatives such as Operation Timbang, to determine program eligibility. This approach ensures that selection is transparent, data-driven, and free from subjective or preferential biases, thereby directing resources to those learners who are most in need. Participants reported that BMI and other health data, such as height and weight, form the core basis of identifying beneficiaries, reinforcing the importance of factual and systematic screening methods in program planning.

The use of technology and integrated systems further strengthens the evidence-based approach. Schools rely on platforms like the School-Based Management System (e-SBM), School Health Information System (SHIS), and Elementary School-Wide Information System (ESWIS) to collect, validate, and prioritize data for beneficiaries. These systems facilitate accurate reporting and ensure that limited program resources are allocated efficiently, reaching the intended population while minimizing errors or misallocation. Such practices resonate with global literature suggesting that school feeding programs achieve higher impact when beneficiary selection is guided by accurate nutritional and socio-economic data, rather than generalized classroom or teacher discretion (Bundy et al., 2018; Gelli et al., 2018).

Another notable best practice is the integration of nutrition assessment into school planning processes. Participants highlighted those initial nutritional assessments inform the School Nutrition Committee's planning, aligning feeding activities with the School Improvement Plan (SIP) and the Annual Implementation Plan (AIP). This systematic linkage between assessment data and program planning not only supports targeted intervention but also ensures continuity and monitoring throughout the school year. Studies have shown that such structured planning, rooted in verified health and nutrition data, enhances program efficiency and improves measurable outcomes in both nutrition and educational performance (Afridi et al., 2018; WFP, 2019). Overall, the SDO (schools division office) of Albay demonstrates that accurate data collection, technology integration, and systematic planning are essential best practices that reinforce the SBFP's objective of addressing child malnutrition in a targeted and equitable manner.

This process ensures that there is equity within the system of the program. This helps make sure that this assistance is given fairly to those who truly need it and that funds are being used exclusively for its intended purpose. Moreover, doing this process also makes certain that there is less risk of nepotism or misuse of resources. This is supported by the study of Bundy et al., (2018), who says that targeted feeding interventions that prioritize vulnerable groups are effective at improving both their nutrition and education outcomes more than universal but not targeted approaches. The World Food Programme (2020) also says that data and evidence are vital for implementing programs that are designed for the most vulnerable children even with limited resources.

Collaborative Governance Approach

A key best practice observed in the operationalization of the School-Based Nutrition Program (SBNP) in SDO of Albay is the collaborative governance approach, which emphasizes teamwork, shared leadership, and stakeholder engagement. Participants consistently highlighted that the effective

implementation of the School-Based Feeding Program (SBFP) relies on synergy among school personnel, program focal persons, parents, and community partners, coordinated through the School Nutrition Committee (SNC). This committee, typically composed of the School Head, District Nurse, teachers and non-Teaching personnel, Barangay Nutrition In-charge, and parent volunteers, facilitates collective planning, decision-making, and supervision, ensuring that responsibilities are clearly defined and that program objectives are met efficiently. Such a multi-stakeholder approach aligns with literature emphasizing that school feeding programs are most successful when governance involves collaboration across multiple actors, including school staff, caregivers, and local authorities (Bundy et al., 2018; Gelli et al., 2018).

The collaborative approach is further strengthened by structured communication, feedback mechanisms, and role clarification. Participants reported conducting pre-implementation meetings to clarify roles, discuss documentary requirements, and establish contingency plans, as well as providing regular feedback among implementers. These practices reflect the principles of participatory planning, which have been shown to improve program efficiency, accountability, and responsiveness to local needs (FAO, 2003). Engaging stakeholders early in the planning process, conducting needs assessments, and setting clear, measurable goals were also cited as critical practices, demonstrating that inclusive decision-making enhances program ownership and sustainability.

Another essential aspect of collaborative governance highlighted by participants is structured scheduling and rotation of responsibilities, particularly for parent volunteers, cleaners, and food servers. This ensures equitable workload distribution and prevents burnout, thereby sustaining high levels of participation and commitment. Studies on school-based nutrition programs emphasize that shared responsibility and proper coordination of human resources are key determinants of successful implementation, particularly in community-involved initiatives (Afridi et al., 2018; WFP, 2019). Overall, the collaborative governance approach in the SBFP exemplifies how multi-level stakeholder engagement, participatory planning, and structured operational coordination contribute to the effective, efficient, and sustainable delivery of nutrition services to learners.

The individuals involved make sure that they carry out the roles defined to them and that the coordination between them is seamless in order to reduce gaps or lapses in their implementation, as well as to promote consistency and foster a more synergetic approach in the program's implementation. In order for them to do this, there must be a clear delineation of roles. The SBFP's implementation is a shared responsibility among the School Feeding Committee but it will be more efficient if they know what they are doing right from the start. Clear structures of management and making sure that responsibilities are properly delegated enables a program to thrive and become successful as supported by the studies of Alderman & Bundy (2012) and Bundy et al., (2018).

Localized Procurement of Nutritious Food

The implementation of the School-Based Feeding Program (SBFP) demonstrates a deliberate effort to source food ingredients locally, which reflects both practical and strategic considerations for program

effectiveness. According to the operational guidelines, schools are encouraged to procure food from local suppliers to ensure freshness, preserve nutritional content, and reduce overall costs. Findings from the study indicate that schools actively engage local farmers and utilize produce from school gardens (Gulayan sa Paaralan) to supplement the feeding program. Participants emphasized that cycle menus developed in coordination with the SDO (schools division office) nutritionist are localized to incorporate these fresh ingredients, while pasteurized milk is sourced from LGU-accredited local dairy suppliers to ensure quality and safety. This localized procurement approach ensures that the feeding components, particularly perishable items such as milk, maintain their nutritional value and safety, while also aligning with the program's operational and budgetary considerations.

The findings are consistent with global evidence supporting local procurement in school feeding programs. According to the International Fund for Agricultural Development (IFAD, 2012), sourcing food locally not only improves the dietary diversity and nutritional adequacy of meals for beneficiaries but also generates economic opportunities for communities. By purchasing from local farmers and cooperatives, schools contribute to the local economy while supporting small-scale producers. Similarly, Drake et al. (2015) argue that localized procurement enhances the sustainability of school feeding programs by strengthening local supply chains, reducing dependence on large commercial suppliers, and increasing community ownership and participation. These benefits are evident in the Albay schools, where localized sourcing has allowed schools to maintain consistent food quality, control costs, and create positive linkages between the program and community stakeholders.

Moreover, localized sourcing aligns with the principles of sustainability and food system resilience. By leveraging local agricultural outputs, the SBFP reduces transportation-related challenges, minimizes the risk of food spoilage, and reinforces community-based partnerships, all of which contribute to a more efficient and adaptive program. The participants' accounts suggest that local procurement not only ensures the provision of nutritionally adequate and safe meals but also fosters a sense of shared responsibility among stakeholders, including school personnel, parents, and local producers. This approach demonstrates that integrating community resources into school feeding operations can simultaneously enhance nutritional outcomes, operational efficiency, and program sustainability.

Overall, the emphasis on local sourcing in the SBFP underscores the importance of contextualized implementation strategies that leverage local resources while addressing nutritional and logistical needs. By combining fresh, locally produced ingredients with structured menu planning and strict adherence to safety standards, schools are able to deliver effective and sustainable feeding programs that support both child health and community development.

Impact of School-Based Nutrition Program on the Learners Beneficiaries' Health and Educational Outcomes

The discussion on the impact of the School-Based Nutrition Program (SBNP) on the learners beneficiaries' health and educational outcomes examined how the program contributes to improvements in learners' nutritional status and academic performance. This section highlights the extent to which sustained

nutrition interventions influence indicators such as Body Mass Index (BMI), school attendance, and academic achievement, demonstrating the important link between adequate nutrition, health, and learning among school learners.

Learners' Beneficiaries' Health Outcomes as Measured by BMI

The analysis of learners' beneficiaries' health outcomes, as measured by Body Mass Index (BMI), revealed a statistically significant and progressive improvement across the three consecutive school years. The mean BMI increased from 15.82 in SY 2022–2023 to 16.71 in SY 2023–2024, and further to 17.43 in SY 2024–2025. All paired comparisons showed significant mean differences with p -values $< .001$, indicating that the observed changes were not due to chance. This upward trend suggests that the School-Based Feeding Program (SBFP) and related nutritional interventions effectively contributed to the improvement of beneficiaries' nutritional status over time. The incremental increase in BMI aligns with evidence from other studies that demonstrate the positive impact of school feeding programs on learners' growth and nutrition. For instance, Gelli et al. (2018) found that structured feeding interventions, when combined with regular health monitoring and evidence-based beneficiary selection, significantly improved children's BMI and overall nutritional status. Similarly, Afridi et al. (2018) emphasized that targeted school feeding programs addressing undernutrition in low- and middle-income countries lead to measurable improvements in anthropometric indicators, especially among wasted and severely wasted learners. The consistent BMI gains over multiple school years in the current study corroborate these findings, highlighting the value of sustained and systematic nutrition programs. Moreover, the results indicate that interventions beyond mere food provision—such as monitoring, evaluation, and community involvement—likely reinforced the observed improvements. Studies suggest that coupling feeding programs with parental engagement, school health monitoring, and standardized nutritional assessments enhances effectiveness, particularly in rural and resource-limited settings (Bundy et al., 2018; World Food Programme [WFP], 2019). The positive BMI trend among beneficiaries in Albay Division underscores the synergistic effect of evidence-based planning, collaborative governance, and program continuity in achieving better health outcomes.

Learners Beneficiaries' Educational Outcomes as Measured by GWA

The analysis of educational outcomes, as measured by the General Weighted Average (GWA), shows a statistically significant and progressive improvement among SBFP beneficiaries over the three consecutive school years. The mean GWA increased from 82.14 in SY 2022–2023 to 84.27 in SY 2023–2024, and further to 86.02 in SY 2024–2025. All paired comparisons yielded p -values $< .001$, indicating that the observed gains in academic performance were statistically significant. This trend suggests that the nutritional and health interventions provided by the SBFP may have contributed positively to the learners' cognitive functioning, attention, and overall school performance.

These findings are consistent with literature demonstrating the link between adequate nutrition and improved academic outcomes. Studies indicate that school feeding programs enhance cognitive development, concentration, and learning capacity, leading to better academic performance (Murphy et al.,

1998; Kristjansson et al., 2007). Improved BMI and nutritional status, as observed in Table 1.0, can positively influence energy levels, classroom engagement, and memory retention, all of which are critical determinants of academic achievement. This reinforces the idea that interventions targeting undernutrition not only improve health but also support educational outcomes, creating a holistic impact on learner development.

Furthermore, the observed sustained improvements over multiple school years highlight the importance of program continuity, evidence-based targeting, and multi-level stakeholder involvement. Research has shown that consistent and well-structured school feeding programs, particularly those combined with health monitoring and educational support, are more likely to yield measurable gains in academic performance (Bundy et al., 2018; Gelli et al., 2018). In the Albay Division, the integration of nutritional assessments, collaborative governance, and systematic program implementation likely contributed to the positive trajectory in GWA, demonstrating the interconnected benefits of addressing both nutrition and education simultaneously.

Proposed Operational Model of the School-Based Nutrition Program

The findings of this study provided empirical support for the development of a structured operational model for the School-Based Nutrition Program (SBNP), emphasizing the critical interplay between health, nutrition, and educational outcomes. The statistically significant improvements in beneficiaries' Body Mass Index (BMI) and the corresponding reductions in undernutrition across three consecutive school years highlight the effectiveness of sustained, well-managed nutritional interventions. Furthermore, the observed increases in General Weighted Average (GWA) suggest that nutritional support positively influences learners' cognitive functioning, school engagement, and academic performance. These results are consistent with prior research indicating that school feeding programs not only improve learners' health but also contribute to enhanced educational outcomes (Bundy et al., 2018; Kristjansson et al., 2007).

The proposed operational model is anchored on five interrelated components—inputs, processes, outputs, outcomes, and impact—reinforced by a continuous feedback and sustainability mechanism. The inputs component, including policy frameworks, manpower complement, financial resources, standardized nutrition products, and baseline data on learners' BMI and academic performance, ensures that the program is evidence-based and adequately resourced. This is consistent with literature emphasizing that multi-level inputs, including policy backing, human resources, and financial support, are essential for the successful implementation of school nutrition programs (Gelli et al., 2018; Afridi et al., 2018). The integration of baseline health and educational data facilitates evidence-driven targeting, ensuring that interventions prioritize nutritionally at-risk learners, a best practice identified in both local and international contexts.

The processes component operationalizes these inputs through systematic planning, implementation, capacity building, stakeholder engagement, and monitoring and evaluation. Planning and targeting are guided by BMI-for-age indicators and health records to validate beneficiaries, while program implementation focuses on the preparation and distribution of nutritionally adequate meals adhering to safety and quality standards. Capacity building and engagement of teachers, parents, volunteers, and LGU partners foster shared responsibility and community ownership, aligning with studies that underscore the

importance of multi-stakeholder collaboration in school feeding programs for sustained effectiveness (Bundy et al., 2018; WFP, 2019). Monitoring and evaluation mechanisms, including BMI tracking, academic performance documentation, and fund utilization reviews, ensure accountability, responsiveness, and continuous quality improvement.

The output and outcomes components capture the immediate and medium-term effects of the program. Outputs such as increased mean BMI, improved school attendance, and compliance with nutrition standards directly result from the structured implementation process. Short- to medium-term outcomes, including improved nutritional status and enhanced academic performance, confirm that sustained nutritional interventions can simultaneously address health and learning objectives. These findings reinforce evidence from prior studies showing that school feeding programs improve both anthropometric and cognitive indicators among children in low- and middle-income countries (Gelli et al., 2018; Kristjansson et al., 2007).

Finally, the impact and embedded feedback mechanisms ensure long-term sustainability and scalability. The model aims to develop healthier, more academically capable learners, reduce child malnutrition, strengthen school-community partnerships, and institutionalize evidence-based nutrition programming. Continuous feedback from BMI monitoring, academic performance, and stakeholder input allows for program refinement, policy adjustments, and capacity building, reflecting a dynamic, adaptive framework consistent with best practices in sustainable school nutrition interventions (Afridi et al., 2018; WFP, 2019). Overall, the proposed operational model offers a comprehensive and systematic approach that translates empirical findings into actionable strategies, ensuring that the SBNP remains responsive, accountable, and effective in improving both the health and educational outcomes of children beneficiaries.

The proposed operational model of the School-Based Nutrition Program (SBNP) will be implemented through a systematic and coordinated process involving planning, execution, monitoring, and continuous improvement among key stakeholders in the school and community. Initially, schools will conduct baseline assessments by collecting and analyzing data on learners' Body Mass Index (BMI), attendance, and academic performance to identify nutritionally at-risk beneficiaries. These data will serve as the basis for evidence-based planning and targeting, ensuring that the program prioritizes learners who require nutritional support the most.

Following the identification of beneficiaries, program planning and resource mobilization will be undertaken by school heads, feeding coordinators, teachers, and partner stakeholders such as the Schools Division Office, Local Government Units (LGUs), Barangay Health Workers, and parent-volunteers. During this stage, implementers will allocate funds, organize manpower, schedule feeding activities, and procure nutritionally compliant food products based on the guidelines set by the Department of Education and relevant health policies.

The implementation phase will involve the daily preparation and distribution of nutritionally adequate meals to beneficiaries while ensuring strict adherence to food safety standards and nutrition specifications. Teachers and volunteers will supervise feeding activities, maintain records, and provide

nutrition education to learners to reinforce healthy eating behaviors. At the same time, capacity-building activities such as orientations and training sessions will be conducted to equip implementers with the necessary knowledge and skills for effective program delivery.

To ensure program effectiveness, monitoring and evaluation mechanisms will be regularly conducted. Schools will periodically measure learners' BMI, track attendance and academic performance, and review fund utilization and operational processes. The collected data will be analyzed to determine the program's progress and identify areas requiring improvement.

Finally, the model incorporates a continuous feedback and sustainability mechanism wherein findings from monitoring activities and stakeholder feedback will inform program adjustments, policy enhancements, and improved resource allocation. Through this iterative process, the proposed operational model ensures that the SBNP remains adaptive, accountable, and sustainable, ultimately strengthening its capacity to improve both the nutritional status and educational outcomes of learners' beneficiaries.

CONCLUSIONS

The conclusion synthesizes the key findings of the study by highlighting the significant insights derived from the implementation and outcomes of the School-Based Nutrition Program. It underscores the overall implications of the results in relation to the learners' health and educational outcomes, as well as the effectiveness of the operational practices undertaken. Through this synthesis, the study affirms the importance of sustained collaboration, strategic implementation, and continuous monitoring in strengthening the impact of the program on the well-being and academic development of child beneficiaries.

1. The SBFP demonstrates strong alignment with policy guidelines in terms of manpower complement, beneficiary targeting, fund utilization, and nutrition product specifications. Clearly defined roles, structured financial procedures, evidence-based beneficiary identification, and standardized nutrition protocols contribute to systematic and accountable implementation. However, sustained capacity-building and consistent monitoring remain essential to ensure long-term effectiveness and quality compliance.
2. The program's operational success is strengthened by evidence-based identification of beneficiaries, collaborative governance, and localized procurement of nutritious food. Data-driven targeting promotes equity and transparency, while multi-stakeholder engagement enhances coordination and shared accountability. Local sourcing further supports sustainability, cost-efficiency, and community participation.
3. The School-Based Nutrition Program significantly improves beneficiaries' nutritional status, as evidenced by consistent and statistically significant increases in BMI across three school years. Sustained feeding interventions, combined with systematic monitoring and stakeholder support, effectively address undernutrition among learners.

4. The program contributes to measurable improvements in academic performance, as reflected in significant increases in GWA. The proposed operational model—anchored on structured inputs, processes, outputs, outcomes, and impact with continuous feedback—provides a comprehensive and sustainable framework for integrating nutrition and education interventions.

RECOMMENDATIONS

The recommendations are drawn from the key findings and conclusions of the study. They aim to provide practical strategies and policy directions to further strengthen the implementation, sustainability, and effectiveness of the School-Based Nutrition Program, ensuring improved health and educational outcomes for learners' beneficiaries.

1. Institutionalize continuous training, strengthen staffing support, and ensure timely fund release and strict compliance with nutrition and financial standards to sustain high-quality implementation.
2. Maintain and enhance data-driven beneficiary selection, structured stakeholder collaboration, and localized procurement strategies to promote transparency, efficiency, and sustainability.
3. Sustain regular nutritional assessments and integrate complementary health and nutrition education initiatives to further improve and maintain gains in beneficiaries' BMI.
4. Adopt and replicate the proposed operational model across schools and divisions, with strengthened monitoring and evaluation systems to ensure continuous improvement in both health and academic outcomes.
5. Investigate the long-term impact of school-based nutrition programs on learners' health, cognitive development, and academic performance beyond primary schooling.
6. Explore the role of technology and digital tools in enhancing program monitoring, beneficiary tracking, and nutrition education.
7. Examine the effectiveness of integrating psychosocial support, behavioral change communication, and gender-sensitive approaches into school nutrition programs.
8. Assess community and parental engagement strategies to strengthen participation and sustainability of the program.
9. Study the cost-effectiveness and scalability of the proposed operational model across diverse geographic and socio-economic contexts.

REFERENCES

- Adelman, S., Gilligan, D. O., & Lehrer, K. (2008). How effective are food for education programs? A critical assessment of the evidence from developing countries. International Food Policy Research Institute (IFPRI).
- Afridi, F., Das, J., & Khanna, A. (2018). The impact of school feeding programs on nutritional outcomes: Evidence from low- and middle-income countries. *Journal of Development Economics*, 133, 42–55.
- Albert, J. R. G., Vizmanos, J. F. V., & Santos, A. G. M. (2023). Poverty, food insecurity, and child nutrition in the Philippines. Philippine Institute for Development Studies. <https://pids.gov.ph>
- Alderman, H., & Bundy, D. (2012). School feeding programs and development: Are we framing the question correctly? *The World Bank Research Observer*, 27(2), 204–221. <https://doi.org/10.1093/wbro/lks002>
- Barker, D. J. P. (1995). Fetal origins of coronary heart disease. *British Medical Journal*, 311(6998), 171–174.
- Bundy, D., Burbano, C., Grosh, M., Gelli, A., Jukes, M., & Drake, L. (2018). School feeding programs in low- and middle-income countries: Impact on education and nutrition. World Bank Group.
- Chatterjee, P., et al. (2024). A systematic review of school-based nutrition interventions and their effectiveness on child and adolescent diets and health outcomes. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10901392/>
- Chin, Y. S., Lim, P. Y., Masrom, S. A. H., & Shariff, Z. M. (2019). School-based intervention that integrates nutrition education and supportive healthy school food environment among Malaysian primary school children: A study protocol. *BMC Public Health*, 19, Article 1427. <https://doi.org/10.1186/s12889-019-7708-y>
- Christian, P., & Stewart, C. P. (2010). Maternal micronutrient deficiency, fetal development, and the risk of chronic disease. *Journal of Nutrition*.
- Christian, P., & Stewart, C. (2010). The relationship between nutrition and cognitive development in children.
- Davis, J. N., Oaks, B. M., & Engle-Stone, R. (2020). The double burden of malnutrition: A systematic review of operational research. *Current Developments in Nutrition*, 4(12), nzaa167. <https://doi.org/10.1093/cdn/nzaa167>

- De Juras, R. C., Angeles-Agdeppa, I., & Capanzana, M. V. (2021). Addressing the double burden of malnutrition in the Philippines: A call for integrated strategies. *Asia Pacific Journal of Clinical Nutrition*, 30(3), 567–575.
- Department of Education. (2023). School-based feeding program implementing guidelines. Department of Education.
- Drake, L., Woolnough, A., Burbano, C., & Bundy, D. (2016). *Global school feeding sourcebook: Lessons from 14 countries*. Imperial College Press.
- Education Commission. (2023). What works: School meals programs. <https://educationcommission.org/wp-content/uploads/2023/04/what-works.pdf>
- Food and Agriculture Organization. (2003). Targeting for nutrition improvement. FAO.
- Food and Nutrition Research Institute. (2021). Expanded national nutrition survey 2021: Regional results for Bicol Region (Region V). Department of Science and Technology.
- Gelli, A., Aurino, E., Folsom, G., Arhinful, D., Osei, A., & Moursi, M. (2018). Costs and implementation of school feeding programs in Ghana. *Frontiers in Public Health*, 6, 223. <https://doi.org/10.3389/fpubh.2018.00223>
- Global Hunger Index. (2024). Philippines country profile (GHI 2024). <https://www.globalhungerindex.org/pdf/en/2024/Philippines.pdf>
- International Fund for Agricultural Development. (2012). The state of food insecurity in the world 2012: Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition. Food and Agriculture Organization.
- Kristjansson, E., Robinson, V., Petticrew, M., MacDonald, B., Krasevec, J., Janzen, L., Greenhalgh, T., Wells, G., MacGowan, J., & Farmer, A. (2007). School feeding for improving the physical and psychosocial health of disadvantaged students. *Cochrane Database of Systematic Reviews*, Issue 1.
- Kristjansson, E., et al. (2022). School feeding programs for improving the physical and psychosocial health of school-aged children experiencing socioeconomic disadvantage: A systematic review. *International Journal of Educational Development*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9400387/>
- Lavrakas, P. J. (2008). *Encyclopedia of survey research methods*. SAGE Publications.

- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370–396. <https://doi.org/10.1037/h0054346>
- Murphy, J., Pagano, M., Nachmani, J., Sperling, P., Kane, S., & Kleinman, R. (1998). School breakfast program: Effects on nutrition and learning. *Journal of the American Dietetic Association*, 98(4), 369–376.
- Nourishing minds: An exploration of school-based feeding program management practices in Bansalan East District. (2025). *Nexus International Journal of Science and Education*.
- Paglinawan, E. C. (2025). Lived experiences of the beneficiaries and stakeholders on school-based feeding program in selected public elementary schools: Basis for the development of an action plan. *Journal of Advanced Research in Social Sciences*.
- Pana, E. (2023). Total enumeration sampling. *International Journal of Scientific and Management Research*. https://ijsmr.in/doc/ijsmr07_16.pdf
- Philippine Institute for Development Studies. (2015). Impact evaluation of the Department of Education's school-based feeding program. PIDS Policy Notes No. 2015-10. <https://pids.gov.ph/publication/pidspn1510>
- Philippine Institute for Development Studies. (2024). DepEd school-based feeding program needs proper documentation—PIDS study.
- Philippine Statistics Authority. (2024). Poverty incidence among families in Bicol Region: 2023 report. PSA Regional Statistical Services Office V.
- Ritchie, L. D., Schwartz, M. B., & Turner, L. (2021). Challenges and opportunities in implementing school nutrition programs in low-income settings. *Journal of Nutrition Education and Behavior*, 53(2), 123–131. <https://doi.org/10.1016/j.jneb.2020.09.009>
- Sadag, M. D. (2025). The extent implementation of school-based feeding program: An assessment among elementary schools in Kabugao District II, Philippines. *Journal of Education, Society and Behavioural Science*.
- Tablante, A. B., & Cadorna, E. C. (2019). Impact of the school-based feeding program on the nutritional status and academic performance of public elementary students in Ilocos Sur. *Asia Pacific Journal of Education, Arts and Sciences*, 6(2), 47–54.
- Tabunda, A. M. L., Albert, J. R. G., & Angeles-Agdeppa, I. (2016). Results of an impact evaluation study on DepEd's school-based feeding program. Philippine Institute for Development Studies.
- UNICEF. (2023). Situation analysis of children in the Philippines 2023. United Nations Children's Fund. <https://www.unicef.org/philippines>

-
- UNICEF Philippines. (n.d.). Health and nutrition. UNICEF. <https://www.unicef.org/philippines/health-and-nutrition>
- Walker, S. P., et al. (2011). Inequality in early childhood: Risk and protective factors for early child development.
- Wang, D., Shinde, S., Young, T., & Fawzi, W. W. (2021). Impacts of school feeding on educational and health outcomes of school-age children and adolescents in low- and middle-income countries: A systematic review and meta-analysis. *Journal of Global Health*, 11, 04051. <https://doi.org/10.7189/jogh.11.04051>
- World Bank. (2020). School feeding programs: Cost, efficiency, and effectiveness in low- and middle-income countries. World Bank Policy Research Working Paper.
- World Bank. (2023, May 30). Undernutrition: A public health imperative. <https://www.worldbank.org/en/news/opinion/2023/05/30/undernutrition-a-public-health-imperative>
- World Food Programme. (2019). School feeding and nutrition standards: Best practices and guidelines. United Nations World Food Programme.
- World Food Programme. (2022). The state of school feeding worldwide 2022. <https://publications.wfp.org/2022/state-of-school-feeding/>