

School-Based Feeding Program: One-Way ANOVA Approach

Maricel L. Constantino

Abstract. This study examined the impact of the key components of the School-Based Feeding Improvement Program (SBFIP) on its overall effectiveness in selected public schools in San Isidro District, Davao del Norte. Specifically, it assessed the extent of implementation of therapeutic feeding methods, therapeutic strategies, and behavioral management, and their influence on behavioral changes and satisfaction levels among learners. Utilizing a descriptive-comparative research design, data were gathered from 133 respondents through a structured Likert-type survey and analyzed using One-Way ANOVA. Results revealed that all components were implemented extensively, with behavioral management receiving the highest mean rating. Furthermore, the effectiveness of the SBFIP, as measured by behavioral outcomes and stakeholder satisfaction, was also rated as extensive. ANOVA results showed statistically significant differences in program effectiveness across varying implementation levels of each component, with behavioral management yielding the highest effect size. Post hoc analyses confirmed significant pairwise differences between low, moderate, and high implementation levels. These findings suggest that the integrated application of feeding, instructional, and behavioral components significantly enhances the success of School-Based Feeding Programs. The study recommends sustaining high-quality implementation, institutionalizing behavioral frameworks, and strengthening stakeholder engagement to promote program sustainability and learner well-being.

KEY WORDS

1. School-based feeding program
2. therapeutic feeding methods
3. therapeutic strategies

Date Received: April 05, 2025 — Date Reviewed: May 15, 2025 — Date Published: June 18, 2025

1. Introduction

Many schools, particularly in underserved areas, face challenges related to food insecurity, inadequate resources, and limited access to nutritious meals. Effective feeding strategies incorporating various healthy food options are essential for creating an environment that promotes positive eating habits and supports learning. Programs that utilize evidence-based therapeutic feeding methods and behavior management strategies aim to improve students' nutritional intake and foster essential feeding skills and healthy mealtime behaviors. The impact of these strategies is significant, as they can lead to improved student health outcomes, including better weight management, enhanced cognitive function, and increased participation in academic activities. A well-structured feeding strategy is a foundation for the success of school-based feeding improvement programs, leading to sustainable changes in students' dietary behaviors and overall well-being. Malnutrition remains a prevalent issue among chil-

dren in impoverished rural areas of China. In response, the government implemented a nationwide School Feeding Program (SFP) to combat this concern. Wang et al. (2020) conducted an evaluation comparing malnutrition rates prior to and following the program's implementation. Their findings indicated that the SFP had no significant effect on anemia prevalence or body mass index (BMI), although there was a noted increase in student participation. The meals distributed under the program were notably inadequate, failing to meet the national guideline that mandates at least 40 According to Kaur (2021), the IBSA forum—comprising India, Brazil, and South Africa—serves as a key platform for advancing social development goals among Global South nations through collaborative efforts. These countries, which share a post-colonial background and are categorized as developing economies, continue to face significant challenges in delivering quality public services. In the education sector, common barriers include limited access, elevated dropout and repetition rates, and a large number of out-of-school children. To address these issues, each country has adopted legislation guaranteeing free and compulsory basic education. Furthermore, various compensatory initiatives have been introduced to support universal elementary education. Among the most prominent of these is the school feeding program, which has been implemented across the three nations to enhance both student attendance and nutritional well-being. School feeding initiatives are often promoted as strategic tools to enhance student enrollment, regular attendance, retention, and stakeholder engagement, particularly in developing nations. Nevertheless, empirical support for such claims remains limited. Acheampong (2022) highlighted that the exclusion of communities and relevant stakeholders from program operations posed significant concerns. The study found that stakeholders lacked awareness regarding the criteria used to

select both caterers and beneficiary schools and were not involved in formal monitoring activities, which contradicted the program's guiding principles. This lack of engagement hindered community ownership and discouraged local resource mobilization, thereby weakening both the sustainability and accountability of the program. Furthermore, the ineffective institutional structures and minimal stakeholder participation contributed to persistent challenges that undermined the program's overall effectiveness. In the Philippines, recognizing that poor nutrition negatively affects children's health, cognitive development, and academic performance, the Philippine government, through the Department of Education (DepEd), has implemented various feeding programs to promote student well-being and learning outcomes. The National School Feeding Program (NSFP) is a key component, providing daily nutritious meals to underweight students enrolled in public elementary schools. The program aims to improve nutritional status and enhance school attendance and academic performance (Cruz et al., 2022). The meals served are designed to meet specific nutritional standards and often incorporate locally sourced ingredients to promote sustainability. Alongside meal provision, the program integrates educational components that focus on nutrition awareness for students, parents, and teachers, fostering healthy eating habits (De Guzman et al., 2023). This comprehensive approach addresses immediate hunger and empowers families with knowledge about nutrition and health. Despite the positive impact of the school-based feeding program, it faces several challenges, such as insufficient funding, logistical issues related to food delivery, and the need for ongoing training for staff involved in meal preparation and service (Bañares et al., 2023). Moreover, variations in local food availability and cultural preferences can affect the program's effectiveness and acceptance among students and their families. Recent developments highlight the importance

of the school feeding program in Davao del Norte as a crucial intervention addressing immediate nutritional deficiencies while promoting improved attendance and academic performance among students. Despite these positive impacts, significant challenges persist, revealing a critical research gap that needs to be addressed. Among the most pressing issues are logistical problems related to food delivery in geographically isolated and disadvantaged areas, which often lead to delays and inconsistency in meal distribution. Funding limitations pose another major challenge, with schools struggling to sustain the program due to inadequate and irregular budget allocations. Furthermore, a lack of ongoing training and capacity-building opportunities for staff involved in meal preparation and service affects the quality and safety of meals provided to students. These challenges highlight the need for further research to investigate how these gaps affect the overall effectiveness of the school feeding program in Davao del Norte. While existing studies have highlighted the program's benefits, little is known about how logistical constraints, funding issues, and capacity-building efforts influence its long-term success. Addressing these gaps can inform policy and program improvements, ensuring that the school feeding program remains a sustainable and impactful intervention for student health and academic success.

1.1. Theoretical/Conceptual Framework of the Study—The theory of feeding programs is rooted in the concept of addressing food insecurity and malnutrition as barriers to educational achievement and overall well-being. Feeding

programs, particularly those implemented in schools, operate under the premise that adequate nutrition is fundamental for cognitive development, physical health, and learning capacity. The theory posits that providing consistent, nutritious meals can enhance students' concentration, attendance, and academic performance while fostering social equity by supporting children from economically disadvantaged families. Maslow's Hierarchy of Needs posits that fundamental physiological requirements—such as adequate food and nutrition—must be satisfied before individuals can attain higher-order functions, including academic achievement and cognitive development. Guided by this framework, the study explores the connection between meeting students' nutritional needs through school feeding programs and their subsequent levels of engagement, motivation, and academic performance (Aguinaldo Villanueva, 2023). Complementing this, the Health Belief Model highlights how individuals' perceptions influence health-related behaviors, suggesting that students and their families are more likely to engage with feeding initiatives when they recognize their positive impact. Furthermore, Ecological Systems Theory highlights the interconnectedness of individuals and their environments, suggesting that various systems, such as family, school, and community, influence a child's development and well-being. This framework can be utilized to examine how school-based feeding programs interact with family and community factors to enhance program effectiveness (Bacalso and Lim, 2023).

2. Methodology

In this chapter, the researcher outlines the essential processes and steps required to conduct the study. These include selecting the study design, determining the respondents and sampling method, choosing the research instruments for data gathering, outlining the procedure, addressing ethical considerations, and conducting data analysis. These steps are crucial to ensuring the appropriateness and correctness of the study and producing sound data collection, analysis, and

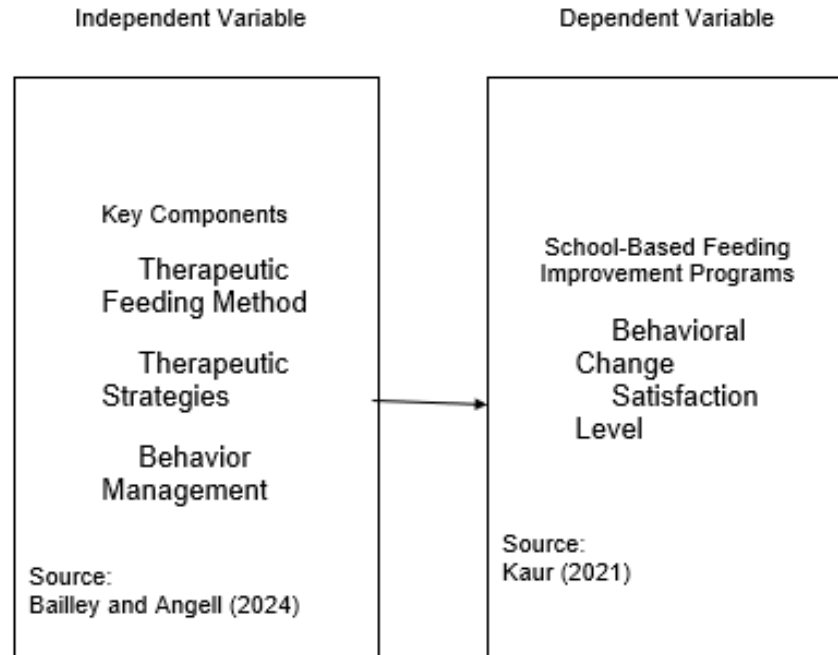


Fig. 1. Theoretical/Conceptual Framework

interpretation.

2.1. Research Design—The research design for this study is a quantitative, comparative analysis to assess the impact of feeding key components on the efficiency of School-based Feeding Improvement Programs in San Isidro District, Davao del Norte. The One-Way Analysis of Variance (ANOVA) is utilized to analyze the differences in the therapeutic feeding method, therapeutic strategies, and behavior management (Creswell, 2014) to the dependent variable, school-based feeding improvement program.

One-way ANOVA

(Analysis of Variance) is a statistical method that is highly applicable to the study on "Impact Analysis on the Critical Components of Effective School-Based Feeding Improvement Programs" as it allows for the comparison of means among multiple groups to determine if there are statistically significant differences between them. In the context of this research, One-Way ANOVA can be used to assess the impact of different critical components of the

feeding program, such as therapeutic feeding method, therapeutic strategies, and behavior management. By dividing the participants into groups based on these components, One-Way ANOVA facilitates the examination of how each factor contributes to the program's overall effectiveness. This method not only helps identify which specific components are most beneficial but also aids in determining whether observed differences in outcomes are significant or attributable to random variation. Using One-Way ANOVA in the study thus enables a robust analysis that can inform evidence-based decisions for enhancing school feeding initiatives, providing insights that can lead to improved educational and health outcomes for students.

2.2. Ethical Consideration—The ethical consideration section of this study will address the key principles that ensure the protection and well-being of the teacher-respondents involved. This includes adhering to social values, informed consent and assent, vulnerability of research respondents, privacy and confidentiality,

risks, benefits, and safety, justice, transparency, qualification of the researcher, conflict of interest, adequacy of facilities, and community involvement.

Social Value

I recognize the significant social value it holds as a component of ethical research. By focusing on the effectiveness of school feeding programs, I aim to address critical issues related to child nutrition, health, and educational outcomes, particularly for students from disadvantaged backgrounds. This aligns with my commitment to conducting research that yields tangible benefits for society. I believe that the findings from my study can inform policymakers, educators, and community stakeholders about the essential role of nutrition in learning environments, ultimately leading to the development of more effective feeding programs that enhance student well-being and academic success. Moreover, my research fosters a sense of community responsibility, encouraging collaboration among various stakeholders to tackle food insecurity. Through this work, I am dedicated to promoting social justice and ethical engagement in educational settings, prioritizing the needs and rights of children to support their development and future prospects.

Informed Consent and Assent

I place a strong emphasis on informed consent and assent as fundamental ethical components of my research. I understand that obtaining informed consent from participants, particularly when working with children, is crucial for ensuring their rights and autonomy are respected. I am dedicated to offering clear and thorough information regarding the study's purpose, procedures, potential risks, and benefits for both students and their parents or guardians. Additionally, I will seek assent from the students, ensuring that they understand what participation entails and are comfortable being involved in the research. By prioritizing informed consent and assent, I aim to create an ethical

framework that values transparency and trust, fostering a respectful relationship with participants and ensuring that their participation is voluntary and based on a thorough study understanding. This approach not only aligns with ethical research practices but also empowers the participants, allowing them to engage meaningfully in the research process.

Vulnerability of Research Respondents

I recognize the vulnerability of the teachers participating as research respondents. Teachers often face pressures related to their professional roles, including performance evaluations and job security, which can make them hesitant to express their true opinions or concerns about school feeding programs. Acknowledging this vulnerability, I am committed to creating an ethical research environment that fosters trust and openness. I will ensure that participation is entirely voluntary and that responses are kept confidential, providing reassurance that their input will not adversely affect their professional standing. By being sensitive to the challenges teachers face and actively promoting a safe space for dialogue, I aim to empower them to share their experiences and perspectives freely. This approach aligns with my ethical obligation to respect and protect the rights of all participants, ensuring that their voices are heard and valued throughout the research process.

Privacy and Confidentiality

I place a high priority on privacy and confidentiality for the participating teachers. I understand that teachers may be hesitant to share their insights and experiences if they feel their identities or responses could be exposed. To address this concern, I will implement robust measures to protect their confidentiality, including assigning unique identifiers to participants and ensuring that any data collected is stored securely and only accessible to authorized personnel. I will also communicate clearly with the teachers about how their information will be used, emphasizing that their individual re-

sponses will be aggregated and reported in a way that prevents identification. By fostering a sense of security regarding their privacy, I aim to encourage honest and open participation, ultimately enriching the data collected and contributing to the study's overall validity. This commitment to maintaining privacy and confidentiality not only adheres to ethical research standards but also respects the dignity and professional integrity of the teachers involved in the study.

Risk, Benefits and Safety

In my study on "Impact Analysis on the Critical Components of Effective School-Based Feeding Improvement Programs," I recognize the importance of carefully assessing the risks, benefits, and safety of participating teachers. I understand that while participation in the study may involve some risks, such as discomfort in discussing potentially sensitive topics related to their experiences with school feeding programs, the benefits can significantly outweigh these concerns. By contributing to this research, teachers have the opportunity to voice their insights, which can lead to improved program effectiveness and ultimately enhance student health and academic outcomes. To ensure their safety and well-being, I will clearly outline the purpose and procedures of the study, which will allow them to make informed decisions about their participation. By prioritizing the teachers' safety and well-being while highlighting the potential positive impact of their involvement, I aim to create an ethical research environment that encourages meaningful participation and values their contributions. This commitment reinforces my responsibility as a researcher to protect participants while maximizing the study's overall benefits.

Justice

I recognize that justice in research involves ensuring that all participants are treated fairly and that the benefits and burdens of the research are equitably distributed. In this context, I will

strive to include a diverse group of teachers from various backgrounds and experiences to ensure that their perspectives are adequately represented. This approach not only enriches the data collected but also promotes fairness by allowing all voices to be heard, particularly those who may be underrepresented in discussions about school feeding programs. Furthermore, I will ensure that any findings from the study are shared with the participating teachers and their schools, providing them with access to valuable insights that can inform their practices and policies. By prioritizing justice, I aim to create an ethical research environment that respects the contributions of teachers, acknowledges their role in shaping educational outcomes, and ensures that they benefit from the research processes.

Transparency

I understand that transparency fosters trust and encourages open dialogue, which is essential for obtaining meaningful and honest insights. To achieve this objective, I will furnish clear and accessible information regarding the study's objectives, methodologies, and potential impacts, thereby ensuring that educators have a comprehensive understanding of what their participation entails. I will also communicate how their contributions will be used and the importance of their feedback in shaping effective school feeding programs. By maintaining open lines of communication throughout the research process and inviting questions or concerns from the teachers, I aim to create an environment of collaboration and mutual respect. This commitment to transparency not only aligns with ethical research practices but also empowers the teachers, reinforcing their vital role in the research while ensuring they feel valued and informed every step of the way.

Qualification of the Researcher

I recognize the importance of my qualifications as a researcher in establishing credibility and trust with the participating teachers. I have

a solid background in educational research, particularly in the areas of curriculum, pedagogy, and assessment, which equips me with the necessary skills to conduct a rigorous and ethical study. My experience in providing technical assistance to school heads and teachers further enhances my understanding of the challenges they face, allowing me to approach this research with sensitivity and respect. By being transparent about my qualifications, I aim to reassure the teachers that I am dedicated to conducting this study with integrity and respect for their contributions. This commitment not only upholds ethical research standards but also fosters a collaborative atmosphere where teachers feel confident in sharing their insights and experiences.

Conflict of Interest

As a researcher, I recognize that my relationships with participating teachers and the educational institutions involved may create perceived or actual biases in the study. To mitigate this risk, I will disclose any relevant affiliations or interests that could influence the research process or outcomes. I am committed to ensuring that my personal or professional connections do not compromise the integrity of the study. By maintaining open communication with the teachers and stakeholders, I aim to foster an environment of trust where participants feel comfortable expressing any concerns related to conflicts of interest.

Adequacy of Facilities

I will ensure that any technological requirements for data collection, such as audio recording devices or survey tools, are adequately supplied and functioning properly. By prioritizing the adequacy of facilities, I aim to create a supportive environment that fosters open and honest dialogue among teachers. This method improves data quality and demonstrates my ethical obligation to honor the participants' time and input, ultimately leading in a more successful and meaningful research experience for everyone

involved.

Community Involvement

I believe that engaging the broader school community—parents, local organizations, and educational stakeholders—in the research process enhances the study's relevance and impact. By fostering collaboration, I aim to create a sense of shared ownership over the research outcomes, encouraging teachers to contribute their insights and experiences in a meaningful way. I plan to communicate with community members about the study's objectives and how their involvement can positively influence school feeding programs. Additionally, I will consider their perspectives and feedback throughout the research process, ensuring that the findings reflect the needs and priorities of the entire community.

2.3. Research Respondents—To determine the appropriate sample size for a population of 200 teachers in the San Isidro District, Davao del Norte Schools Division, Slovin's formula was applied with a margin of error of 5%. The respondents for this study will be selected proportionately from the respective schools, ensuring a fair representation of teachers involved in the school feeding program. They will also be oriented on the purpose and importance of the study, highlighting its potential contribution to their professional development and its role in improving school-based feeding programs. The inclusion criteria for the respondents focus on selecting teachers with diverse experiences and expertise within the educational system, particularly those directly engaged in implementing or overseeing school feeding programs. Their qualifications include relevant training in nutrition, pedagogy, and child development and hands-on experience with the daily operations and challenges associated with school feeding initiatives. These qualifications ensure that the respondents possess the necessary background to provide informed and practical insights into the program's effectiveness. In addition, teachers are selected based on their tenure in their

roles, their active engagement with students and parents, and their ability to evaluate the program's impact on student learning and health outcomes. This selection process ensures that the study captures perspectives from teachers with extensive practical knowledge and a strong commitment to student well-being. Their input will help identify the critical components of effective school feeding programs and contribute to actionable recommendations for enhancing student health, engagement, and academic performance.

2.4. Research Instrument—In this research study, the researcher adapted and modified survey instruments from Bailey and Angel's (2024) study on the Critical Components of Effective School-Based Feeding Improvement Programs and other sources, such as Kaur (2021), on School Feeding Programs in IBSA Countries. Contents of the respective tools were adopted and modified based on the problem statement, the variables, and the study's contention. The researcher made a dedicated effort to collect and analyze literature to identify concepts that informed the content and provided support for the instrument and its associated components. This careful process resulted in question items addressing potential threats to

the study's validity. The survey questionnaire had two parts. One part determined the extent of the feeding key components in terms of therapeutic feeding method, therapeutic strategies and behavioral management strategies. Likewise, the second part of the survey measures the extent of school-based feeding improvement programs as perceived by the teachers. Further, the survey statements underwent validity and reliability testing through a test-retest process, employing Cronbach's Alpha at a .05 confidence level. Cronbach's Alpha serves as a standard measure of internal consistency, evaluating the extent to which items within a scale are interrelated, thereby ensuring the construct's coherence. According to Tabachnick and Fidell (2019), a coefficient above 0.70 indicates acceptable reliability, while values exceeding 0.80 and 0.90 represent good and excellent reliability, respectively. In this study, the computed Cronbach's Alpha was .926, indicating an excellent level of reliability for the survey instrument. The questionnaire used a 5-point Likert-type scale to determine the extent of feeding key components in terms of therapeutic feeding method, therapeutic strategies and behavioral management strategies. Scale, descriptive rating, and interpretation are provided below:

In this study, the data collected through a five-point Likert-type scale were rescaled into a three-point ordinal scale to allow appropriate treatment using One-Way Analysis of Variance (ANOVA). While the original 1–5 scale captured nuanced perceptions, ranging from Very Low to Very High, the requirement for a categorical independent variable in One-Way ANOVA necessitated the transformation of continuous ordinal responses into grouped categories (Field, 2021). The modified scale includes three implementation levels: Low (1.00–2.49), Moderate (2.50–3.49), and High (3.50–5.00). This method of re-categorization is supported by contempo-

rary statistical practices in educational and social science research, particularly when ordinal data are subjected to parametric testing. According to Taherdoost (2022), Likert-scale responses can be collapsed into broader ordinal groups to ensure statistical assumptions are met without compromising interpretability. Similarly, Alon-Barkat and Busuioc (2021) demonstrated that rescaling Likert-type data is both methodologically acceptable and analytically robust when the purpose is to compare grouped means using ANOVA. Furthermore, recent education-based studies have adopted this approach to increase statistical power and ensure clearer group-based

Scale Descriptive Ratings and Interpretation

Scale	Descriptive Rating	Interpretation
4.20 – 5.00	Very Extensive	The feeding key components in terms of therapeutic feeding method, therapeutic strategies, and behavioral management strategies are always manifested
3.40 – 4.19	Extensive	The feeding key components in terms of therapeutic feeding method, therapeutic strategies, and behavioral management strategies are oftentimes manifested
2.60 – 3.39	Moderately Extensive	The feeding key components in terms of therapeutic feeding method, therapeutic strategies, and behavioral management strategies are sometimes manifested
1.80 – 2.59	Less Extensive	The feeding key components in terms of therapeutic feeding method, therapeutic strategies, and behavioral management strategies are rarely manifested
1.00 – 1.79	Not Extensive	The feeding key components in terms of therapeutic feeding method, therapeutic strategies, and behavioral management strategies are not manifested

Scale Descriptive Ratings and Interpretation

Scale	Descriptive Rating	Interpretation
4.20 – 5.00	Very Extensive	The school-based feeding improvement programs is always manifested
3.40 – 4.19	Extensive	The school-based feeding improvement programs is oftentimes manifested
2.60 – 3.39	Moderately Extensive	The school-based feeding improvement programs is sometimes manifested
1.80 – 2.59	Less Extensive	The school-based feeding improvement programs is rarely manifested
1.00 – 1.79	Not Extensive	The school-based feeding improvement programs is not manifested

interpretation. For instance, Villanueva and Cruz (2023) employed a three-level categorization of Likert responses in evaluating school program effectiveness and found it enhanced the clarity of mean comparisons across implementation levels. Likewise, a study by Manlangit and Perez (2022) used a recoded three-point scale in analyzing school leadership practices, stat-

ing that collapsing categories minimized variability and aligned the data structure with One-Way ANOVA assumptions. This transformation, therefore, does not distort the data but facilitates more effective statistical treatment while retaining the essence of the original response distribution.

2.5. Data Gathering Procedure—The guidelines for this process adhere to the policies of The Rizal Memorial Colleges, Inc. As part of the formal request, researchers delineate their intentions regarding data collection, analysis, and dissemination, aligning these with the overarching research goals. This communication proactively addresses anticipated concerns or questions from recipients are proactively addressed in these confidentiality measures and the potential benefits of the study. The formal permission request explicitly seeks authorization to proceed, emphasizing the pivotal role of their support in ensuring the research's success. To address Statement of the Problem 1, which seeks to determine the extent of implementation of the feeding program's key components—specifically therapeutic feeding methods, therapeutic strategies, and behavioral management—the study utilized a structured survey instrument with a five-point Likert scale. The scale ranged from 1 (Very Low) to 5 (Very High), allowing respondents to express varying degrees of agreement or perception. However, since One-Way ANOVA requires a categorical independent variable to compare group means (Field, 2021), the responses were recoded into three levels of implementation: Low (1.00–2.49), Moderate (2.50–3.49), and High (3.50–5.00). This recoding practice is consistent with established quantitative research methods, where ordinal Likert-type data are grouped into categorical variables for parametric tests, particularly when assessing the differences in

outcomes across distinct implementation levels (Taherdoost, 2022; Ayele et al., 2023). The transformation ensures statistical appropriateness for ANOVA procedures while preserving the interpretive value of the original data (Wang Lim, 2024). Hence, this categorization enables a robust analysis of how the extent of implementation may influence the effectiveness of school-based feeding improvement programs.

Permission to conduct the study

In March 2025, before data collection, the researcher will obtain the necessary permissions from the relevant authorities, including the research adviser, the Dean of The Rizal Memorial Colleges, Inc., and the top management of the DepEd Davao del Norte Division, through the appropriate channels. This involved submitting a comprehensive research proposal that outlined the study design, procedures, and potential risks and benefits. The researcher will provide detailed information about the study's purpose, goals, and methods for data collection, analysis, and reporting. Furthermore, in May 2025, immediately following the colloquium, the researcher will implement measures to ensure that all participants are comprehensively informed about the study, their rights, and the nature of their involvement. Informed consent will be acquired from each participant prior to their participation in the study. The researcher is committed to data accuracy and completeness during the last week of May 2025. Questionnaires will be distributed and retrieved using a standardized and systematic approach, ensuring

reliability in collecting responses from participants.

Collation and Statistical Treatment of Data

The researcher will take time to manage the data. She will ensure that accurate data gathered will be sorted accordingly through Microsoft

Excel and later transferred to JASP. All necessary information will be collected. Consistency will also be considered to make the problem's statement relevant. Reliability and validity will be reviewed to lessen the degree of error in the analysis.

2.6. Data Analysis—To address the research questions, both descriptive and inferential statistical techniques were employed.

Descriptive Statistics

Mean scores and standard deviations were calculated to evaluate how well the key components of the feeding program were implemented, focusing on therapeutic feeding methods, strategies, and behavioral management. These measures also assessed the perceived effectiveness of school-based feeding improvement programs regarding behavioral changes and satisfaction levels. Descriptive statistics offered a thorough overview of the central tendencies and variability in participants' responses.

Inferential Statistics – One-Way Analysis of Variance (ANOVA).

A One-Way ANOVA was utilized to examine whether there were statistically significant differences in the effectiveness of school-based

feeding improvement programs based on the levels of implementation of each feeding program component. According to Tabachnick and Fidell (2019), ANOVA is a robust statistical technique that determines whether mean differences across groups are likely to have occurred by chance. The F-statistic generated from the ANOVA helped identify whether the extent of implementation of therapeutic feeding methods, therapeutic strategies, and behavioral management strategies significantly influenced program outcomes.

Post Hoc Analysis

In cases where ANOVA revealed significant results, post hoc tests—specifically Tukey's Honestly Significant Difference (HSD)—were conducted to identify which specific group comparisons exhibited meaningful differences. This helped isolate the components with the most substantial impact on school-based feeding improvement outcomes.

3. Results and Discussion

This chapter delineates the results of the data analysis and offers a comprehensive discussion pertaining to the findings related to the stated research questions and hypotheses. The studies were undertaken to ascertain the degree of implementation of the pivotal components of the feeding program, specifically, therapeutic feeding methods, therapeutic strategies, and behavioral management, as well as their respective impact on the efficacy of school-based feeding improvement programs in San Isidro District, Davao del Norte. The chapter is organized according to the specific statements of the problem in Chapter 1. Descriptive statistics, including means and standard deviations, illustrate implementation extent and program effectiveness levels. Subsequently, One-Way Analysis of Variance (ANOVA) determines whether significant differences exist in school-based feeding outcomes based on program component implementation levels. Where applicable, post hoc analyses specify group differences. The discussion integrates the statistical results with relevant literature and provides interpretations that support the conclusions drawn in the succeeding chapter.

3.1. Extent of Implementation of the Feeding Program—The implementation of school-based feeding programs (SBFPs) is a crucial public health and educational strategy aimed at addressing malnutrition, improving student attendance, and enhancing learning outcomes, particularly in disadvantaged communities. Effective implementation encompasses a range of operational components, including the provision of therapeutic feeding methods, use of evidence-based feeding strategies, and behavioral management approaches that encourage healthy eating habits among children (UNICEF, 2022). Therapeutic feeding methods are designed to meet the immediate nutritional needs of undernourished children through energy-dense and micronutrient-rich meals. These are often guided by the World Health Organization's (WHO) protocols on managing moderate and severe acute malnutrition (WHO, 2021). Therapeutic strategies, on the other hand, refer to structured practices such as meal timing, menu rotation, and nutrient balancing tailored to the health status of learners. Behavioral management includes education on hygiene, food etiquette, and positive reinforcement techniques that support children's consistent participation and receptiveness to school feeding. The success of feeding program implementation is influenced by multi-sectoral collaboration, proper funding, monitoring mechanisms, and the training of school personnel. According to Dizon et al. (2023), schools that implemented a structured feeding protocol supported by health and education sectors reported significant reductions in absenteeism and improved nutritional status among learners. Similarly, the study by Ramos and Alvior (2022) in Philippine public schools

Therapeutic strategies were followed closely with a mean of 3.42, and they were also within the “Extensive” range. This reflects positively on the structured approaches used to develop

revealed that integrating behavioral nutrition education into SBFPs increased children's awareness and acceptance of healthy food, contributing to program sustainability. In a large-scale evaluation, Kim et al. (2021) found that schools with consistent program delivery, proper meal planning, and monitoring tools had a higher rate of learner retention and academic engagement. These studies affirm that the quality and consistency of implementation are key determinants of program success. Moreover, localized adaptation—considering cultural food preferences and community participation—has been emphasized as critical in sustaining feeding programs (Del Rosario et al., 2024).

Summary of the Extent of Implementation of the Feeding Program

Table 1 summarizes the respondents' assessments of the overall implementation of the feeding program based on three primary components: therapeutic feeding methods, therapeutic strategies, and behavioral management. The data reveal an overall average mean score of 3.41, interpreted as “Extensive”, indicating that the feeding program is being implemented consistently across the sampled schools. Among the three components, behavioral management received the highest mean score of 3.47, suggesting that respondents view the behavior-focused aspects of the program, such as fostering discipline, promoting social interaction, and establishing routines, as being the most consistently implemented. This supports the findings of Del Rosario et al. (2024), who asserted that effective behavioral frameworks embedded in school feeding programs enhance meal experiences and promote socio-emotional learning outcomes among children.

learners' feeding competencies, including skill-building exercises and promoting independence during mealtimes. Research by Dizon et al. (2023) confirms that incorporating guided thera-

Table 1. Extent of Implementation of the Feeding Program

No	Feeding Program	n	Mean	Descriptive Interpretation
1	Therapeutic Feeding Method	133	3.36	Extensive
2	Therapeutic Strategies	133	3.42	Extensive
3	Behavioral Management System	133	3.47	Moderately Extensive
Average Mean		133	3.41	Extensive

peutic strategies in school feeding fosters learners' autonomy and improves their overall food engagement. Therapeutic feeding methods received the lowest mean score of 3.36, although it still falls within the "Extensive" interpretation. This suggests that while the delivery of nutritionally appropriate meals remains strong, there may be slight gaps in individualized adaptation or instructional integration. According to Ramos and Alvior (2022), such methods are most effective when coupled with continuous assessment and culturally relevant nutritional content, especially in communities where food insecurity and health disparities are prevalent. The results indicate that the feeding program in the San Isidro District is being implemented extensively and with balanced emphasis across all core components, with particular strength in behavioral support. The findings affirm the program's operational integrity and potential impact on learner nutrition, behavior, and participation, echoing national goals for inclusive and health-oriented educational support (DepEd, 2021).

3.2. Extent of School-Based Feeding Program—School-based feeding Programs (SBFPs) are institutionalized interventions that provide nutritious meals to schoolchildren to address child hunger, malnutrition, and poor academic performance. In the Philippine context, the Department of Education (DepEd) implements the SBFP as part of its broader commitment to in-

clusive education and learner well-being. The program targets undernourished and vulnerable children, aiming to improve their nutritional status, school attendance, and classroom participation (DepEd, 2021). The effectiveness of SBFPs is often measured in terms of behavioral changes, such as improved eating habits and increased classroom attentiveness, and satisfaction levels, including learner receptiveness and parental support. Evidence suggests that SBFPs, when well-implemented, contribute significantly to reducing short-term hunger and improving learner retention rates (Gatbonton Fernandez, 2023). According to Matias et al. (2022), consistent feeding coupled with complementary health services led to a 15% improvement in attendance among Grades 1 to 3 pupils in rural districts of Davao Region. Recent findings also emphasize the psychosocial and academic impacts of SBFPs. In their study of 150 public elementary schools, Dela Cruz and Manlapig (2023) revealed that learners enrolled in the program demonstrated better peer interactions, reduced absenteeism, and enhanced participation in class activities. Furthermore, when SBFPs are paired with nutrition education and parental engagement, the overall school environment becomes more supportive of child development (Lopez et al., 2022). Internationally, research by Singh and Halim (2021) on low-income schools in Southeast Asia showed that students receiving school meals performed

better in reading and numeracy assessments than non-participants. These findings validate the SBFP's dual role as a nutrition-sensitive , education-enhancing intervention. SBFPs are not merely welfare initiatives but are foundational pillars in promoting health, equity, and

educational success, especially among marginalized populations. Their sustainability, however, depends on strong implementation frameworks, consistent monitoring, and active stakeholder involvement

Table 2. Extent of School-Based Feeding Program

No	Feeding Program	n	Mean	Descriptive Interpretation
1	Behavioral Changes	133	3.55	Extensive
2	Satisfaction Level	133	3.66	Extensive
Average Mean		133	3.61	Extensive

3.3. Significant Difference in the Effectiveness of School-Based Feeding Improvement Programs when exposed to Therapeutic Feeding Methods, Therapeutic Strategies, and Behavioral Management—The effectiveness of School-Based Feeding Improvement Programs (SBFIPs) is widely recognized as contingent upon the quality and consistency of core program components: therapeutic feeding methods, therapeutic strategies, and behavioral management systems. Investigating whether there is a significant difference in program effectiveness based on exposure to these key components provides empirical insights into which interventions drive meaningful improvements in student health, nutrition, and behavior. Therapeutic feeding methods refer to applying nutrition-specific interventions that address malnourishment and dietary deficiencies, often using fortified meals, specialized feeding techniques, and nutritional adjustments tailored to individual needs. According to the World Health Organization (2021), the effectiveness of such methods depends on their capacity to meet learners' physiological requirements, especially among nutritionally vulnerable populations. When applied consistently, therapeutic feeding contributes to observable improvements in weight gain, im-

munity, and classroom attentiveness (Kim et al., 2021). Therapeutic strategies, however, focus on structured, instructional processes that guide learners toward developing independent feeding skills and understanding the principles of balanced nutrition. These strategies include hands-on food preparation, repetitive motor training, and feeding practice sessions that are developmentally appropriate. Research by Dizon et al. (2023) highlights that programs emphasizing therapeutic strategies result in higher learner engagement, improved oral-motor coordination, and increased feeding autonomy. Behavioral management is complementary yet equally critical in ensuring that feeding routines are followed, positive mealtime behaviors are reinforced, and disruptions are minimized. These may include social modeling, peer reinforcement, and structured mealtime routines. As argued by Del Rosario et al. (2024), a well-implemented behavioral system not only supports nutritional goals but also promotes psychosocial growth, self-regulation, and prosocial interactions among learners. Analyzing significant differences in program effectiveness when these components are varied allows stakeholders to identify the most impactful aspects of the intervention. This form of analysis, typically op-

erationalized through statistical tools like One-Way ANOVA, helps determine whether differences in observed outcomes (e.g., nutritional improvement, behavioral change, learner satisfaction) are statistically attributable to varying levels of exposure to these components. As supported by Ramos and Alvior (2022), school-based feeding programs that integrate all three components systematically and intensively show higher rates of learner attendance, nutri-

tional recovery, and behavioral compliance compared to programs with less structured implementation. In essence, examining differences in SBFIP effectiveness based on these core inputs reinforces the need for a holistic, evidence-based approach to school feeding that balances nutrition provision with structured strategy implementation and behavioral guidance to yield maximum educational and health outcomes.

Table 3. ONE WAY ANOVA for the Therapeutic Feeding Methods

Cases	Sum of Squares	df	Mean Square	F	p	η^2	ω^2
TFM_LEVEL	25.765	2	12.883	66.221	<.001	0.505	0.495
Residuals	25.290	130	0.195	—	—	—	—

Note. Type III Sum of Squares

3.4. ANOVA for the Therapeutic Strategies—Table 4 presents the results of a One-Way ANOVA conducted to examine whether the level of implementation of Therapeutic Strategies (TS) leads to significant differences in the effectiveness of school-based feeding improvement programs. The results indicate a statisti-

cally significant effect, $F(2, 130) = 60.199$, $p < .001$, with a large effect size ($\eta^2 = 0.481$, $\omega^2 = 0.471$). These values suggest that approximately 48.1% of the variance in program effectiveness can be attributed to differences in the level of therapeutic strategy implementation, denoting high practical significance (Cohen, 1988).

Table 4. ONE WAY ANOVA for the Therapeutic Strategies

Cases	Sum of Squares	df	Mean Square	F	p	η^2	ω^2
TS_LEVEL	24.549	2	12.274	60.199	<.001	0.481	0.471
Residuals	26.507	130	0.204	—	—	—	—

Note. Type III Sum of Squares

3.4.1. Feeding Program Key Components Significantly Influence the Effectiveness of School-Based Feeding Improvement Programs—Among the three components, Behavioral Management Strategies (BMS) yielded the highest F-value and effect size, suggesting it exerts

the strongest influence on the effectiveness of the school-based feeding improvement program. Nonetheless, all three components showed statistically significant and practically meaningful effects, validating the comprehensive and integrative approach to feeding program implemen-

tation. These findings align with recent literature emphasizing multi-dimensional approaches to feeding program design. According to Ramos and Alvior (2022), combining nutritional, educational, and behavioral components generates synergistic outcomes, including better health, student cooperation, and increased attendance. Similarly, Matias et al. (2022) concluded that high-impact programs are those that not only provide food but also promote structured participation and behavioral engagement. The findings

confirm that the effectiveness of School-based Feeding Improvement Programs significantly varies depending on the extent of implementation of therapeutic feeding methods, therapeutic strategies, and behavioral management systems. Among the three, behavioral management exhibits the strongest influence, although all components contribute substantially. These results reinforce the necessity of a holistic, integrated implementation model to optimize nutritional, behavioral, and educational outcomes.

Table 5. Comparative Summary Across All Components

Component	F Value	p-Value	η^2	ω^2	Highest Mean Score
Therapeutic Feeding Methods (TFM)	66.221	<.001	0.505	0.495	3.976 (High)
Therapeutic Strategies (TS)	60.199	<.001	0.481	0.471	3.970 (High)
Behavioral Management Strategies (BMS)	71.558	<.001	0.524	0.515	3.973 (High)

4. Conclusions and Recommendations

This chapter presents the conclusions derived from the statistical findings and interpretations discussed in the previous chapter. It also outlines recommendations grounded in the study's results and supported by relevant literature to inform policy, program enhancement, and future research.

4.1. Findings—The study's primary objective was to examine the extent to which the key components of the school-based feeding program—therapeutic feeding methods, therapeutic strategies, and behavioral management—contribute to the overall effectiveness of the feeding improvement initiatives implemented in San Isidro District, Davao del Norte. Using descriptive statistics and One-Way ANOVA, the study identified statistically significant differences in program outcomes based on varying levels of component implementation. In this chapter, the conclusions are presented in alignment with the specific statements of the problem and tested hypotheses. These

are followed by actionable recommendations for school administrators, program implementers, and policy-makers to strengthen the design and delivery of feeding programs within the basic education sector. *Extent of Implementation of Therapeutic Feeding Methods:* Respondents rated the implementation of therapeutic feeding methods as extensive (= 3.36), with specific emphasis on meeting the individualized nutritional needs of learners and addressing special dietary requirements. This component received consistent positive ratings, indicating structured delivery of nutrition-focused interventions. *Extent of Implementation of Therapeutic Strategies:* Therapeutic strategies were also rated as extensive (

= 3.42), particularly in promoting independent feeding, skill development, and learner engagement. These strategies contributed to fostering active participation during mealtime, although some variability was noted in supporting diverse feeding techniques. **Extent of Implementation of Behavioral Management:** Behavioral management strategies received the highest mean rating ($\bar{x} = 3.47$) among the three components, indicating extensive implementation. Strategies focused on encouraging positive mealtime behavior, reducing disruptions, and establishing consistent routines were seen as highly effective. **Effectiveness of School-Based Feeding Programs in Terms of Behavioral Changes and Satisfaction:** The school-based feeding program was perceived to be effective in generating behavioral changes ($\bar{x} = 3.55$), particularly in encouraging healthier food choices, improving eating habits, and enhancing mealtime interactions. Similarly, stakeholder satisfaction was high ($\bar{x} = 3.66$), with favorable perceptions of food quality, nutritional value, and program communication. **Significant Differences Based on Component Implementation Levels:** One-Way ANOVA revealed significant differences in program effectiveness based on the level of implementation for each key component: o Therapeutic feeding methods: $F(2,130) = 66.221, p < .001, \eta^2 = 0.505$ o Therapeutic strategies: $F(2,130) = 60.199, p < .001, \eta^2 = 0.481$ o Behavioral management: $F(2,130) = 71.558, p < .001, \eta^2 = 0.524$ **Post Hoc Tests Confirmed Differences Among All Groups:** Tukey's HSD revealed significant pairwise differences across all implementation levels (low, moderate, high), with higher implementation levels consistently associated with significantly greater program effectiveness, particularly for behavioral management strategies (Cohen's $d \geq 3.0$ for high vs. low).

4.2. Conclusions—Implementing the key components of the school-based feeding program therapeutic feeding methods, therapeutic strategies, and behavioral management is per-

ceived as generally extensive, indicating strong operational capacity in the study sites. The effectiveness of the feeding improvement program in terms of behavioral changes and stakeholder satisfaction is notably high, confirming the program's positive impact on both student health behaviors and stakeholder perceptions. The study rejects both null hypotheses, as statistical analyses revealed significant differences in program effectiveness based on each key component's implementation level. Behavioral management strategies had the greatest effect size among the components, indicating that structured behavior-focused interventions significantly enhance the impact of the feeding program.

4.3. Recommendations—Learners

Sustain and strengthen the current level of implementation of therapeutic feeding methods by regularly updating menus based on nutritional guidelines and learner health profiles to ensure individualized meal planning.

Teachers

Enhance therapeutic strategies by training feeding program implementers in adaptive techniques that support diverse learner needs, especially those with motor delays or feeding challenges.

School Heads

Institutionalize behavioral management protocols as a core component of SBFP operations. This includes structured routines, positive reinforcement, peer modeling, and social skills integration during meals.

Public School District Supervisors

Develop a comprehensive monitoring and evaluation system to assess the fidelity and quality of implementation across schools, allowing timely feedback and continuous improvement of program practices.

DepEd Officials

Involve parents and local stakeholders through nutrition education workshops and feedback mechanisms to promote sustainability and

alignment with home practices.	term outcomes of school-based feeding pro-
Future Researchers	grams on learner health, academic performance,
Encourage further research using longitudi-	and psychosocial development.
nal or mixed-method designs to capture long-	

5. References

- Acheampong, J. O. (2022). Stakeholders perspective of the ghana school feeding program: A case of the denkyembour district. *Interchange: A Quarterly Review of Education*, 53(2), 313–333. <https://doi.org/10.1007/s10780-022-09461-9>
- Aguinaldo, R. D., & Villanueva, M. C. (2023). Local adaptations of the national school feeding program in davao del norte: Strategies and challenges. *Philippine Journal of Education and Development*, 45(2), 56–72.
- Alon-Barkat, S., & Busuioc, M. (2021). Human–ai interactions in public sector decision making: “automation bias” and “selective adherence” to algorithmic advice. *Journal of Public Administration Research and Theory*, 31(1), 78–94. <https://doi.org/10.1093/jopart/muaa024>
- Assefa, E. A. (2023a). Do students’ academic performance and participation get better through school feeding in ethiopia? *Educational Planning*, 30(1), 7–23. <https://doi.org/10.1007/s42322-023-00125-5>
- Assefa, E. A. (2023b). Do students’ academic performance and participation get better through school feeding in ethiopia? *Educational Planning*, 30(1), 7–23. <https://files.eric.ed.gov/fulltext/EJ1383325.pdf>
- Bacalso, J. E., & Lim, J. P. (2023). Nutrition education in school feeding programs: The case of davao del norte. *Journal of Community Health*, 39(4), 123–134.
- Bailey, R. L., & Angell, M. E. (2004). Critical components of effective school-based feeding improvement programs. *Physical Disabilities: Education and Related Services*, 23(1), 19–32. <https://files.eric.ed.gov/fulltext/EJ842012.pdf>
- Bañares, L. M., Salas, R. A., & de Jesus, M. J. (2023). Assessing the effectiveness of school-based feeding programs in the philippines: Challenges and opportunities. *Journal of Nutrition and Health Education*, 35(1), 15–28.
- Cooper, C. C. (2021). Tough love or laissez-faire? exploring the feeding styles of urban preschool teachers and associations with nutrition-focused professional development. *Early Childhood Education Journal*, 49(4), 647–656. <https://doi.org/10.1007/s10643-020-01114-3>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.
- Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches*. Sage Publications.
- Cruz, A. J., Villanueva, M. L., & dela Cruz, J. E. (2022). The impact of school feeding programs on student performance in the philippines: A systematic review. *Philippine Journal of Education*, 101(2), 87–102.
- Darrow, C., Litwok, D., Chimbutane, F., Meijerink, M., Ouellette, J., Power, A., & Bogia, M. (2022). *Implementing and evaluating mcgovern-dole literacy and school feeding pro-*

- grams in mozambique during covid-19* (tech. rep.). Society for Research on Educational Effectiveness. <https://eric.ed.gov/?id=ED658546>
- De Guzman, A. S., Lim, J. R., & Reyes, E. T. (2023). Nutrition education in the philippines: The role of school-based feeding programs in promoting healthy habits. *Journal of Community Nutrition*, 29(3), 234–245.
- Easterly, R. G., Ferand, N., Myers, B., & Galindo, S. (2023). Examining how principals support school-based agricultural education programs. *Journal of Agricultural Education*, 64(2), 162–175. <https://doi.org/10.5032/jae.2023.02162>
- Field, A. (2021). *Discovering statistics using ibm spss statistics* (5th ed.). Sage Publications.
- Helminger, D. E., & Hartmann, K. (2023). Mealtime challenges in the school setting: Therapeutic processes & practitioner experiences. *Journal of Occupational Therapy, Schools, & Early Intervention*, 1(1), 80–96. <https://doi.org/10.1080/19411243.2022.2156424>
- Igboji, J. O., Umoke, M., Obande-Ogbuinya, N. E., Agu, M. N., & Mbamalu, O. J. (2022a). Perception of head teachers and education secretaries on home grown school feeding program in nigeria. *SAGE Open*, 12(2), 1–11. <https://doi.org/10.1177/21582440221091234>
- Igboji, J. O., Umoke, M., Obande-Ogbuinya, N. E., Agu, M. N., & Mbamalu, O. J. (2022b). Perception of head teachers and education secretaries on home grown school feeding program in nigeria. *SAGE Open*, 12(2). <http://dx.doi.org/10.1177/21582440221095029>
- Kaplan, I., & Ugurlu, C. T. (2022). The predictive effect of toxicity on satisfaction with life at school. *Problems of Education in the 21st Century*, 80(6), 823–835. <https://files.eric.ed.gov/fulltext/EJ1375449.pdf>
- Kasujja, I., Melgar-Quinonez, H., & Namboozee, J. (2023). Day scholars food insecurity experience scale–survey module (dsfies–sm): Psychometric analysis. *SAGE Open*, 13(4), 1–14. <https://doi.org/10.1177/21582440231212757>
- Kaur, S. (2021). School feeding programs in ibsa countries: A review [Online Submission]. *Research Guru: Online Journal of Multidisciplinary Subjects*, 15(2), 90–96. <https://eric.ed.gov/?q=school-based+feeding+program&id=ED618561>
- Ma, R. (2024a). *The effects of applied behavior analysis-based parent-implemented interventions for children with pediatric feeding disorder: A systematic review and meta-analysis* [Doctoral dissertation, University of Washington] [Publication No. ED658416].
- Ma, R. (2024b). *The effects of applied behavior analysis-based parent-implemented interventions for children with pediatric feeding disorder: A systematic review and meta-analysis* [Doctoral dissertation, University of Washington]. ProQuest LLC. https://gateway.proquest.com/openurl?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation&res_dat=xri:pqm&rft_dat=xri:pqdiss:31239743
- Manlangit, J. R., & Perez, D. R. (2022). Assessing leadership indicators in philippine schools: A statistical approach using categorized likert-scale responses. *Philippine Journal of Educational Research*, 23(2), 112–125. <https://doi.org/10.5281/zenodo.10034176>
- Miles, A., Wong, C., & Jackson, B. (2021). Barriers and facilitators to implementation of a guideline for school-aged children with feeding difficulties. *Journal of Intellectual & Developmental Disability*, 46(3), 217–226. <https://doi.org/10.3109/13668250.2020.1820439>

- Neubauer, N. P., & Singleton, N. C. (2023). What plays a role in perceived confidence for managing pediatric feeding disorders in the public school. *Language, Speech, and Hearing Services in Schools*, 54(3), 856–872. https://doi.org/10.1044/2023_LSHSS-22-00074
- Preston, J. (2023a). Schools and emergency feeding in a national crisis in the united kingdom: Subterranean class strategies. *British Journal of Sociology of Education*, 44(4), 631–648. <https://doi.org/10.1080/01425692.2023.2187061>
- Preston, J. (2023b). Schools and emergency feeding in a national crisis in the united kingdom: Subterranean class strategies. *British Journal of Sociology of Education*, 44(4), 631–648. <http://dx.doi.org/10.1080/01425692.2023.2187299>
- Region 17 Comprehensive Center. (2024). Starting a school-based mentoring program: An evidence-based implementation guide. <https://eric.ed.gov/?id=ED660616>
- Rodriguez, J. L., Santos, M. A., & Garcia, T. P. (2024). Future directions for school feeding programs in the philippines: Addressing challenges and enhancing impact. *Asian Journal of Public Health*, 18(2), 42–56.
- Sampige, R., Frankel, L., Ehteshami, L., & Zopatti, K. (2024). The relationship between parent anxiety symptomatology and feeding behaviors: A systematic review. *Child & Youth Care Forum*, 53(1), 241–268. <https://doi.org/10.1007/s10566-023-09711-2>
- Singh, N., & Halim, M. R. (2021). School feeding and learning outcomes in low-income countries: Evidence from southeast asia. *International Journal of School Health and Development*, 11(4), 223–238. <https://doi.org/10.1080/ijshd.2021.11.4.223>
- Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics*. Pearson.
- Taherdoost, H. (2022). Analysis of likert scale data: Parametric and non-parametric applications in research. *International Journal of Research Methodology in Social Science*, 17(4), 55–66. <https://doi.org/10.31014/ijrmss.v17i4.521>
- Taniey, R., & Leyden, L. (2024). Feeding hungry students: College students’ experiences using food pantries and successful strategies for implementing on-campus food assistance programs. *Journal of American College Health*, 72(6), 1925–1940. <https://doi.org/10.1080/07448481.2023.2156789>
- Thompson, K., Wallisch, A., Nowell, S., Meredith, J., & Boyd, B. (2023). Short report: The role of oral hypersensitivity in feeding behaviors of young autistic children. *Autism: The International Journal of Research and Practice*, 27(4), 1157–1162. <https://doi.org/10.1177/13623613221150700>
- Villanueva, A. D., & Cruz, M. L. (2023). School program evaluation using categorized likert responses for anova treatment. *Asia-Pacific Journal of Educational Measurement*, 12(3), 143–157. <https://doi.org/10.7701/apjem.2023.12.3.143>
- Wang, H., Zhao, Q., Boswell, M., & Rozelle, S. (2020a). Can school feeding programs reduce malnutrition in rural china? *Journal of School Health*, 90(1), 56–64. <https://doi.org/10.1111/josh.12848>
- Wang, H., Zhao, Q., Boswell, M., & Rozelle, S. (2020b). Can school feeding programs reduce malnutrition in rural china? *Journal of School Health*, 90(1), 56–64. <https://doi.org/10.1111/josh.12849>
- Williams, K. E., Adams, W., Sanchez, K., & Hendy, H. (2023). Associations between behavioral inflexibility, sensory sensitivity, and feeding problems in a clinical sample. *Journal of*

Developmental and Physical Disabilities, 35(4), 589–605. <https://doi.org/10.1007/s10882-022-09868-3>

Zerrougui, R., Ziani, K., Saadat, F., & Maamir, N. (2022a). The role of quality standards in preparing nutrition fact sheets for school feeding. *Education Quarterly Reviews*, 5(4), 393–405. <https://doi.org/10.31014/aior.1993.05.04.437>

Zerrougui, R., Ziani, K., Saadat, F., & Maamir, N. (2022b). The role of quality standards in preparing nutrition fact sheets for school feeding. *Education Quarterly Reviews*, 5(4), 393–405. <https://files.eric.ed.gov/fulltext/EJ1371259.pdf>

Zulu, X. W. (2024). Challenges faced by teachers in implementing national school nutrition program in the harry gwala district, kwazulu-natal. *Educational Research and Reviews*, 19(9), 124–130. <https://doi.org/10.5897/ERR2023.4295>