Evaluating Level of Awareness and Food Security of Vulnerable Populations in Selectedbarangays:A Nutrition Advocating Program

Fernandez, Kyla D*, Piang, Baihanie P., Reyes, Grae Martha Frances D., Tutaan, Mary Ann P., Precy Padilla, Ed.D, RN, MAN

Mary Chiles College

***Corresponding Author**

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ABSTRACT

Aim: This study aimed to assess the level of food security and awareness of Department of Health (DOH) nutritional programs among vulnerable households with children aged 6 months to 5 years in selected barangays in Tondo, Manila, explored how demographic factors, socioeconomic status, nutritional awareness contribute to household food security and child nutrition outcomes, and to propose a nutrition advocacy program in accordance to the DOH Nutritional Programs to address identified gaps.

Background: Food insecurity remains a pressing public health issue in the Philippines, especially in poor communities where many families struggle to access healthy and affordable food. Despite existing DOH nutritional Programs, many vulnerable families continue to experience malnutrition and limited access to nutritious food. This study explores the relationship and differences between demographic factors, maternal awareness, and food security of the targeted population.

Methods: A descriptive-comparative correlational quantitative research design was used, utilizing a validated survey instrument administered to 100 biological mothers of children six (6) months to five (5) years old. Children's anthropometric data (age, sex, height, weight, and BMI percentile) were also gathered to determine their nutritional status. Food security was analyzed through four key pillars: availability, accessibility, utilization, and stability. Awareness was measured based on familiarity with key DOH initiatives, such as Pinggang Pinoy, the Expanded Garantisadong Pambata Program, Micronutrient Supplementation, Food Fortification, and the Barangay Nutrition Scholar (BNS) program. Data collected were analyzed using descriptive and inferential statistics, including frequency distributions, weighted means, ANOVA, and Pearson correlation.

Findings: Findings revealed a significant prevalence of food insecurity in low-income households, with many families demonstrating mild to moderate food insecurity, and exhibiting 84% of underweight children. Despite moderate awareness of DOH programs, barriers such as a lack of understanding, lack of access, and poor nutritional practices impede effective engagement. Statistical analysis indicated significant relationships between food security levels and children's profiles, as well as between mothers' awareness and their demographic characteristics. Awareness of DOH programs was positively associated with better food utilization and nutritional outcomes.

Conclusions: Socioeconomic factors significantly impact food security, and while awareness of DOH programs exists, deeper understanding and utilization are limited. There is a need for enhanced community-based education, economic support, and integrated nutrition programs to improve food security and nutritional outcomes in vulnerable populations.

Keywords: Food Security, DOH Nutritional Program, Vulnerable Populations, Tondo Manila, Child Nutrition

The Problem and Its Background

INTRODUCTION

Food insecurity is a critical problem that affects individuals and families worldwide due to the lack of reliable

access to sufficient and nutritious food. Because of this, vulnerable areas are much more susceptible to food insecurity, pressing a challenge that affects millions, undermining health, particularly in at-risk age groups: children's growth and development. In areas where access to nutritious food is limited, families face difficult choices that can sustain cycles of poverty and poor health.

According to a study by the World Health Organization (2020), global hunger rates have increased, and found that food insecurity affected 9.9% or 782 million of the global population in 2020, up from 664 million or 8.4% of the total population in 2019. This trend highlights a critical setback for Sustainable Development Goal (SDG) 2, which aims to end hunger and ensure access to safe, nutritious, and sufficient food for all by 2030. The continuous and alarming rise in hunger and food insecurity, driven by multiple crises, requires urgent, coordinated global action to address this escalating emergency (UN, 2025). According to the *National Unified Health Research Agenda (NUHRA, 2023)* 10th List, particularly under "Ensuring that all individuals have access to sufficient, safe, and nutritious food," with a focus on Nutrition and Food Safety, Addressing All Forms of Malnutrition Across Life Stages, and informing Multisectoral Nutrition Interventions providing reliable data to identify causes and develop targeted interventions to combat malnutrition in the studied population. During that year, the number of individuals experiencing hunger worldwide ranged from 720 to 811 million.

In the Philippine context, 44.7% of the population faced moderate to severe food insecurity in 2022, the highest rate in Southeast Asia, affecting nearly 51 million people. These high statistics highlight the need of addressing food insecurity in the country, as approximately 5.2% of the population is suffering from malnutrition (United Nations, 2023), with one in ten families experiencing food insecurity. Additionally, seven out of ten households are resorting to livelihood coping strategies to resolve food insecurity. Most of these families rely on borrowing money for food, buying food on credit, and spending savings (Cruz, 2022). Because of this, reliance on debt can lead to financial strain, forcing families to prioritize short-term survival over long-term financial stability. As debt accumulates, it may become challenging to cover other essential expenses such as housing, healthcare, and education (Mollenkamp, 2024). With limited financial resources, inadequate food intake may result in serious conditions such as malnutrition, which can have profound and lasting effects on vulnerable groups, particularly pregnant women and children. These populations are especially at risk because malnutrition can hinder a child's growth, physical and cognitive development (Sultan, 2023).

This study aimed to evaluate food security among targeted vulnerable populations in selected barangays in the Philippines. The research aimed to identify vulnerable groups of children six (6) months to five (5) years old, evaluate the four pillars of food security; accessibility, availability, utilization, and stability. By identifying the vulnerable populations within selected barangays and their food security status, the researchers were able to formulate interventions that addressed their specific needs.

Background of the Study

Food security is defined as a situation in which individuals have reliable access to enough safe and nutritious food to satisfy their dietary needs for an active and healthy life. For food security to be achieved, there must be an adequate availability of food, access to it, utilization, and stability. If any of these factors are lacking, it results in *food insecurity* (World Bank Groups, 2024). According to Guine et al. (2021), *availability* refers to the physical presence of sufficient quantities of food, either through local production or food aid in an area. *Accessibility*, on the other hand, refers to the ability of an individual or a household to obtain adequate food, through their economic, physical or social access. While *utilization* refers to the ability of individuals to make use of the acquired food they consume, to ensure that it meets their dietary needs. Lastly, *stability* refers to consistency and reliability of an individual or household to their accessibility, accessibility and utilization to their ability to withstand or recover from sudden disruptions concerning these dimensions.

National surveys and reports also document the prevalence of stunting, wasting, and underweight conditions among children, as well as the high rate of moderate to severe food insecurity in the Philippines.

However, gaps remain in research and implementation. Some studies highlight the presence of DOH nutritional programs but rarely examine the extent of community awareness and actual participation, particularly among mothers of children aged 6 months to 5 years. According to Mandano (2023), although people had a generally positive view of Pinggang Pinoy, actual knowledge was weak, and there was only a weak correlation between

awareness and dietary intake. Current literature often treats each DOH program (Pinggang Pinoy, EGP, Micronutrient Supplementation, Food Fortification, BNS) separately. Few studies like the Expanded Garantisadong Pambata (EGP) program, documented by the DOH (2020), provides immunization, deworming, and micronutrient supplementation, the Micronutrient Supplementation Program is highlighted by the Philippine Plan of Action for Nutrition (2022), focusing on Vitamin A, iron, and iodine distribution, and Barangay Nutrition Scholar (BNS) Program, detailed by Dodd et al. (2021) and Jimenez (2024), emphasizes monitoring, counseling, and grassroots-level health promotion. These programs have been studied in isolation, each emphasizing its specific goals. However, very little research examines how these programs overlap and integrate at the household level.

By examining these challenges, the researchers aimed to find ways to help families with children aged six (6) months to five (5) years old, facing food insecurity, achieve better nutritional health. The researchers focused on utilizing the Department of Health (DOH) Nutritional Health Programs designed to improve food security and nutritional status. These programs aim to prevent growth stunting due to malnutrition, and other health issues by promoting access to nutritious food and educating families on proper nutrition that can improve overall health outcomes of the children. The programs involved are *Pinggang Pinoy (Go, Grow, Glow),* a dietary guideline using a food plate model to show the recommended proportion of food groups needed to equip a balanced diet, *Expanded Garantisadong Pambata (EGP),* a program aimed at addressing undernutrition of children under five by implementing programs such as *Food Fortification Program and Micronutrient Supplementation*, which focuses on foods with essential vitamins and minerals to combat micronutrient deficiencies, and other interventions like vaccinations, feeding programs, and providing vitamins and minerals to the families. And lastly, *Barangay Nutrition Scholars (BNS),* a trained healthcare professional that is responsible for implementation of the programs, monitoring of underweight or overweight children, and improving the nutritional health of children under 5, in a community-based situation. These programs offer a wide range of benefits beyond just addressing nutrient gaps. They help improve overall health by boosting the immune system, promoting proper growth and development, and reducing the prevalence of malnutrition-related diseases and stunting. Lastly, the goal was to understand how these programs can improve access to nutritious food and empower families, individuals, and communities to overcome food insecurity, leading to better overall health and well-being.

Statement of the Problem

This study aimed to evaluate the factors that affect the nutritional status of vulnerable children within the families by assessing the background, food security status, and their level of awareness to the Department of Health's Nutritional Health Program. Specifically, the study seeks to answer the following questions;Sub-questions:

What is the profile of the biological mothers in terms of:

1. Age
2. Educational Attainment
3. Employment Status

a. Employed

b. Self- employed

c. Unemployed

Family Background

Number of family members

1. Number of working members in the family
2. Family Income Classification

What is the profile of children in the household in terms of:

1. Age
2. Sex
3. Height
4. Weight
5. BMI

What is the food security status of the respondents in terms of:

1. Availability
2. Accessibility
3. Utilization
4. Stability

What is the extent of the respondents' awareness regarding the Department of Health Nutritional Health Program?

Is there a significant difference between the food security status of the respondents and the profile of the children within the household?

Is there a significant difference between the extent of the respondents' awareness and the profile of the mother?

Is there a significant relationship between the level of awareness of the mother and the food security level of the children?

What program can be proposed based on the result of the study?

Statement of Hypotheses

Ho1: There is no significant difference between the food security status of the respondents and the profile of children in the household.

Ha1: There is a significant difference between the food security status of the respondents and the profile of children in the household.

Ho2: There is no significant difference between the extent of the respondents' awareness and the profile of the mother.

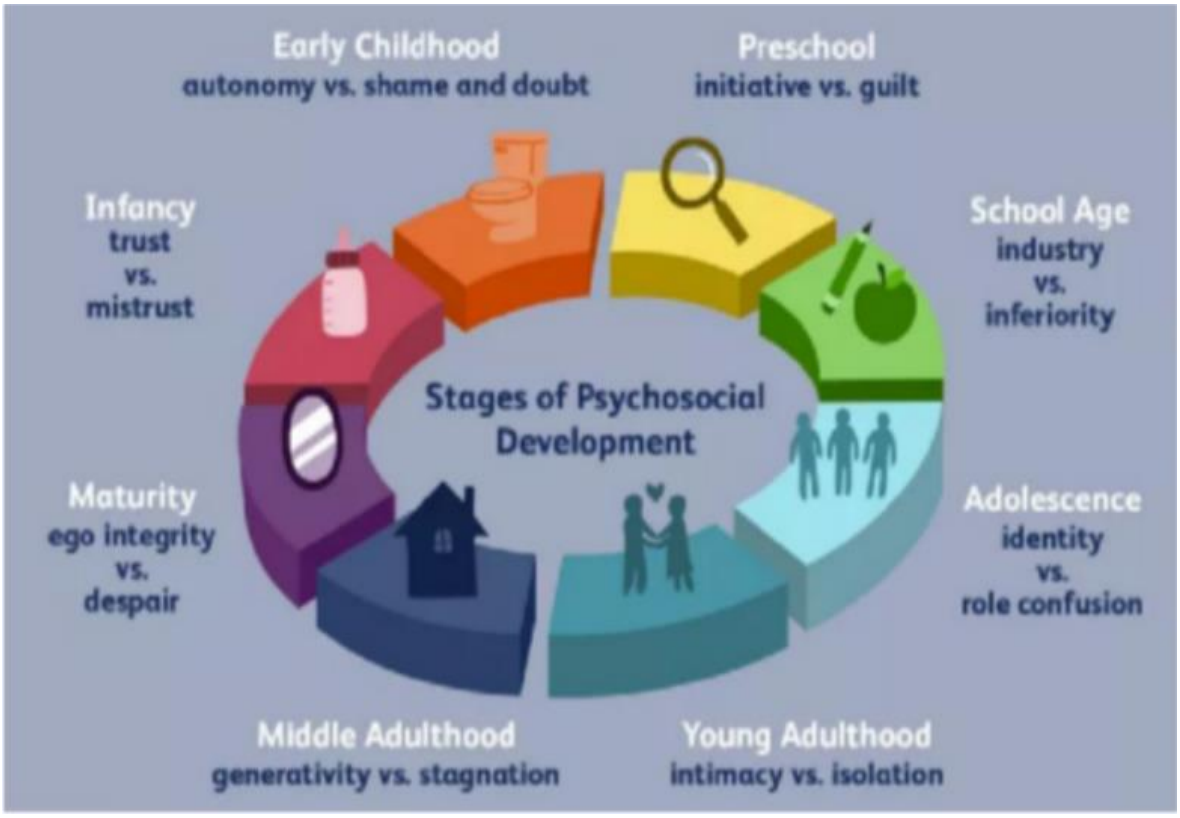
Ha2: There is a significant difference between the extent of the respondents' awareness and the profile of the mother.

Ho3: There is no significant relationship between the extent of the respondents' awareness and the food security level of the children.

Ha3: There is a significant relationship between the extent of the respondents' awareness and the food security level of the children.

THEORETICAL FRAMEWORK

Psychosocial Development Theory



Adapted from: https://www.verywellmind.com/erik-eriksons-stages-of-psychosocial-development-2795740.

Figure 1. "Psychosocial Development Theory"

This study is guided by Erik Erikson's Theory of Psychosocial Development, which explains how people grow and change emotionally and socially throughout their lives. According to the theory, there are eight stages of development, and in each stage, a person faces a key challenge they need to overcome to grow healthily. (McLeod, 2024). The theory emphasized that individuals progress through these stages throughout their lives, and each stage is critical for shaping one's identity and social relationships.

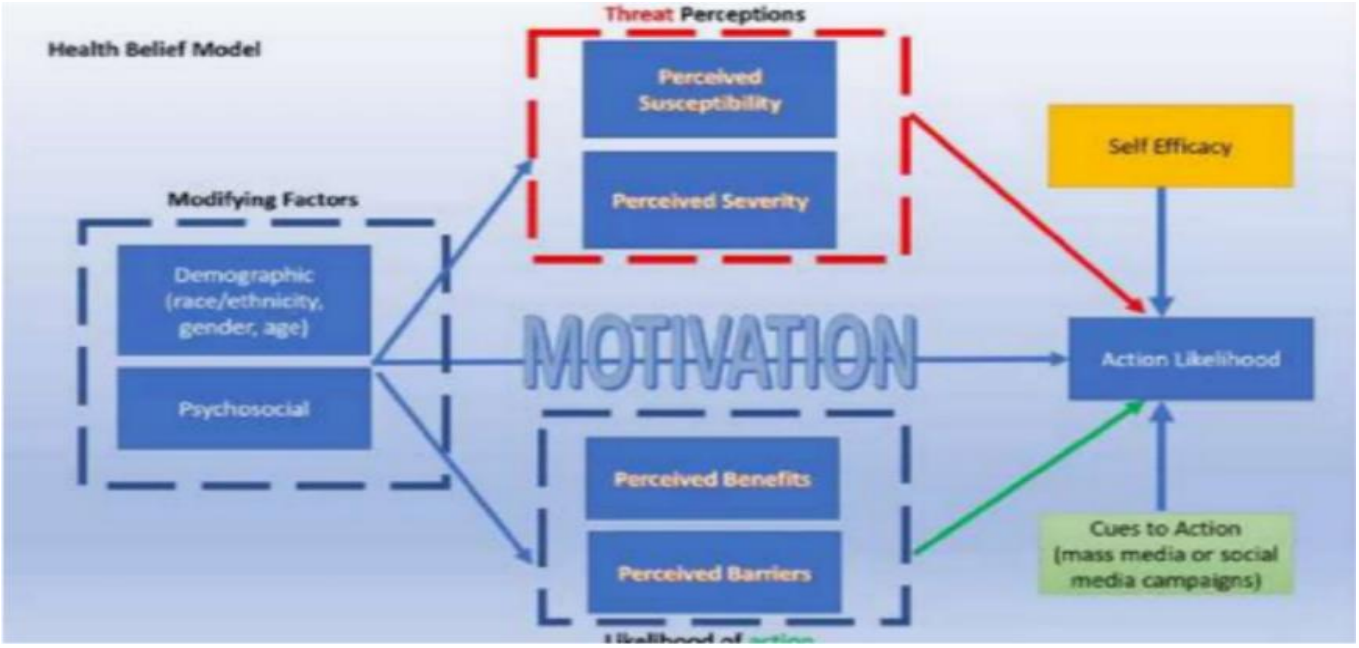
In this research, the focus is on the three stages: Trust vs. Mistrust (Infancy from birth to 18 months), Autonomy vs. Shame and Doubt (18 months to 3 years), and Initiative vs. Guilt (3 to 5 years), as these stages are particularly relevant to understanding how food security affects vulnerable populations. (MSEd, 2024).

For children aged from birth to 18 months (Trust vs. Mistrust). In this stage, infants are dependent on their caregivers for meeting their basic needs, including food. Adequate nutrition is essential for supporting physical growth, cognitive development, and emotional security, helping infants build trust in their caregivers and the environment. When food insecurity is present, it can interfere with infant development, potentially leading to delays in growth, emotional distress, and attachment issues, which may contribute to a sense of mistrust. (McLeod, 2024). Food insecurity in infancy is linked to poor health outcomes, including low birth weight, developmental delays, and difficulties in forming secure attachments

For children aged 18 months to 3 years (Autonomy vs. Shame and Doubt) At this stage, toddlers begin asserting their independence and exploring their environment. They start developing self-care skills like feeding themselves, walking, and playing. Proper nutrition supports cognitive and physical growth, which is crucial for fostering autonomy. Food insecurity during this period can hinder developmental progress and cause feelings of shame and doubt. Children experiencing food insecurity during toddlerhood are at higher risk for emotional and behavioral issues, including anxiety, lower self-esteem, and delays in developmental milestones (MSEd, 2024)

For children aged 3 to 5 years (Initiative vs. Guilt) At this stage, children are curious, active and eager to try new things. They love to play, explore, and interact with others. Proper nutrition gives them energy they need to learn to be confident. Food insecurity can impair emotional regulation and reduce a child's ability to take initiative, potentially leading to guilt or reduced confidence. Children who experience food insecurity during early childhood are more likely to exhibit behavioral problems, emotional distress, and lower social engagement, which can impede the development of initiative.

Health Belief Model (HBM)



Adapted From:https://en.wikiversity.org/wiki/Motivation_and_emotion/Book/2023/Health_belief_model

Figure 2. "Health Belief Model"

According to Alyafei (2024) Health Belief Model (HBM) is a psychological framework that helps explain and predict why people do or don't follow certain health behaviors. It focuses on what people believe about health conditions. The model suggests that people are more likely to take action if they think the health problem is serious, they believe they are at risk, they see real benefits from taking action, and they feel that the benefits are greater than any challenges. On the other hand, if they don't think the issue is serious or if they face too many difficulties, like cost or lack of access, they might not take any action. This model is often used in designing health programs that aim to change people's behavior by addressing their beliefs and motivations.

When it comes to food security, the Health Belief Model can explain how people in vulnerable communities make choices about food and nutrition. For instance, some families in selected barangays might not fully understand the health risks of food insecurity or poor nutrition, so they may not feel the urgency to look for healthier food or join health programs. But if they start to see that food insecurity is a serious threat to their family's health and realize they are at risk of malnutrition or diet-related illnesses, they might be more willing to take action (Rustiawan, et al. 2023). However, if they believe that healthy food is too expensive or that the programs available don't really help, these barriers might discourage them, and they may not get involved in a nutrition-related program

In relation to the study, the Health Belief Model offers valuable insights into the factors that may influence a family's engagement with food security initiatives, such as the Department of Health's (DOH) nutrition program. By evaluating whether families in the barangays are aware of the risks of food insecurity and understand the potential health benefits of engaging with the DOH program, this study aims to determine if these perceptions influence their food-related choices. If families perceive a high risk of malnutrition and recognize the program's benefits, they may be more likely to participate and improve their food security. Conversely, if they perceive significant barriers such as cost, distance, or lack of knowledge about the program their likelihood of participating

may be reduced. Through this lens, the researchers aim to identify specific perceptions and barriers, which could inform how nutrition advocacy programs are structured and promoted to effectively improvefoodsecurityin vulnerable populations.aradigm Of The Study

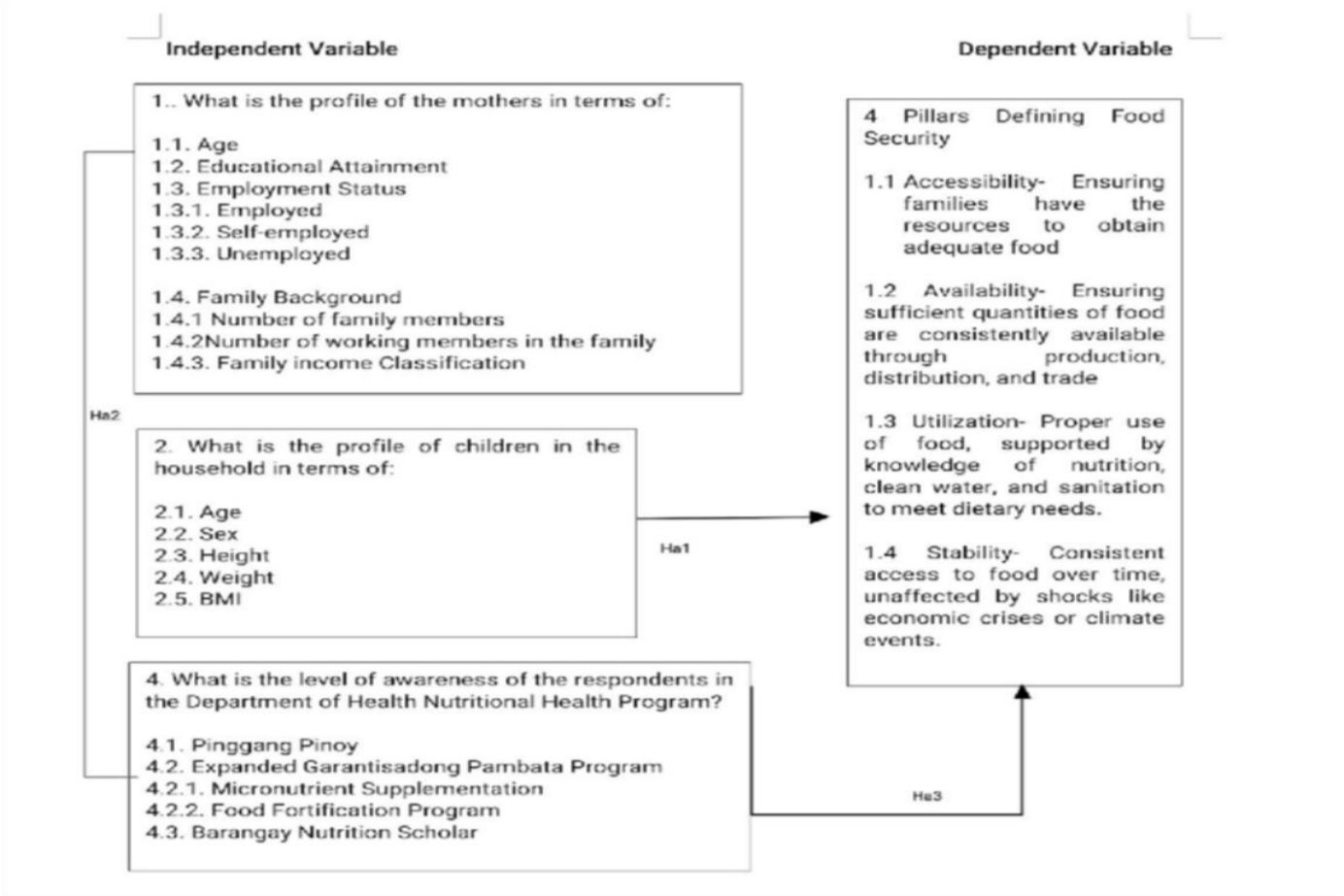


Figure 3: Evaluating Level of Awareness and Food Security in Vulnerable Populations of Selected Barangays: A Nutrition Advocating Program

The conceptual framework in the image shows the relationship between food security and the characteristics of mothers and children, along with their awareness of health and nutrition programs. It is divided into independent and dependent variables to help better understand food security in vulnerable communities. The independent variables include the profile of mothers, such as their age, educational attainment, employment status (employed, self-employed, or unemployed), and family background—like the number of family members, number of working members, and family income classification. It also includes the profile of children, focusing on age, sex, height, weight, and body mass index (BMI), which are important for assessing their nutritional condition. Another independent factor is the level of awareness of the respondents regarding various Department of Health nutrition programs, such as Pinggang Pinoy, the Expanded Garantisadong Pambata Program, Micronutrient Supplementation, Food Fortification, and the Barangay Nutrition Scholar program.

The dependent variable is food security, which is measured through four main parts: availability (making sure there is enough food through production and trade), accessibility (families being able to get the food they need), utilization (using food properly with the help of good nutrition, clean water, and sanitation), and stability (having a steady food supply even during crises or emergencies).

This framework is guided by three hypotheses. The first suggests that there is a significant relationship between the food security status of households and the profile of children. The second explores whether the level of awareness of respondents regarding nutrition programs is significantly related to the profile of the mother. The third examines if the level of awareness of the mother has a significant relationship with the food security level of the household. By exploring these connections, the framework provides valuable insights into the factorsthat influence food security and highlights the importance of both demographic characteristics and awareness of health

programs in improving nutrition in vulnerable communities.

Scope and Limitation of the Study

This study focused on vulnerable, low-income to lower middle class households with infants six to twelve months old (6-12), toddlers one to three years old (1-3) and/or preschoolers three to five years old (3-5) who faced food insecurity in selected barangays within Manila.

The researcher aimed to connect these families to relevant Department of Health (DOH) programs, such as Pinggang Pinoy, Barangay Nutrition Scholars (BNS), Expanded Garantisadong Pambata Program, Food Fortification Program, and the Micronutrient Supplementation Program, to help prevent health issues like malnutrition, stunting, and underweight.

The locale of the study was within selected barangays of Manila, Philippines, which is organized into six legislative districts and further divided into 16 administrative districts. The study was conducted in Tondo, Manila, specifically in Barangays A and B, as these areas have a high population density and are actively working to improve child nutrition, as confirmed through discussions with their respective barangay officials.

This study focused on assessing food security levels in the specified barangays, concentrating exclusively on the income brackets defined by the 2020 Philippine Institute for Development Studies attached to the National Economic and Development Authority (NEDA) of the Philippines, which include categories such as Poor (less than PHP10,957 monthly), Low income but not poor (PHP10,957-PHP21,194), and Lower middle class (PHP21,194-PHP43,828). This study will explore food accessibility, availability, utilization and stability in these barangays.

The inclusion criteria focused on collecting data from households experiencing food insecurity and families with children who are not enrolled or previously enrolled in the Department of Health (DOH) nutritional programs but currently stopped participating, specifically those with children aged 6 months to 5 years old, which included infants (6 months to less than a year), toddlers (1.0 to less than 3.0 years), and preschoolers (3.0 to 5.0 years), without any underlying medical conditions. The primary respondents for the questionnaire and children's profiling were their biological mothers, aged 18 to 45 years, as they were typically in their prime reproductive and caregiving years, playing a crucial role in child-rearing and nutrition. This is supported by a study conducted by Achiro et al. (2023) in Northern Uganda, which found that 91.3% of caregivers were between 18 and 45 years old. Furthermore, this range corresponds with the typical onset of menopause, which generally occurs between 45 and 55 years (WHO, 2024). Mothers who responded to the questionnaires did not have a history of mental illnesses and were in good physical health to effectively communicate accurate responses. Both working and non-working mothers were included, as long as they acted as the primary caregivers for their children.

The study's exclusion criteria are those children with existing comorbidities, chronic illnesses, and congenital abnormalities. Diseases classified as exclusionary include Tuberculosis, HIV/AIDS, Type 1 Diabetes, Cerebral Palsy, Muscular Dystrophy, Heart Disease, Cancer, and other conditions not explicitly mentioned under the categories of existing comorbidities, chronic illnesses, and congenital abnormalities, but which may significantly affect overall health and nutritional status. These exclusions helped guarantee that the study focused on children whose nutritional status is primarily affected by food security rather than existing medical conditions. Additionally, households with children younger than 6 months old and those aged 6 years old and above were also excluded to ensure a focused assessment of the selected vulnerable age group. Families that did not meet the specified age criteria for children were also excluded to maintain consistency in data collection and analysis. The study was conducted in selected barangays from November to June 2025, using surveys and interviews to gather data from the mothers.

This study was subjected to several limitations that impacted the data collection process and analysis. Factors beyond the control of researchers include potential non-participation from eligible households, possibly due to time constraints, privacy concerns, health problems, education levels, or a lack of awareness about food security issues. There may also be a risk of recall bias, as parents and caregivers may not accurately rememberdetails about food consumption or program participation, affecting data accuracy, and response bias, which may indicate the respondents' refusal to truthfully answer the question for any reason.

Assumptions of the Study

The study focused on evaluating food security in vulnerable populations in selected barangays of Manila through the lens of a nutrition-advocating program.

The following assumptions were made:

1. The researchers assumed that the respondents would be credible sources of information that would contribute to the success of this study.

2. The researchers assumed that the respondents would fully participate and provide honest and accurate answers to the questions.

3. The researchers will anticipate that the respondents' knowledge of nutrition and health would drive them to participate in the DOH Nutritional Programs, resulting in improved overall health.

4. The researchers would recognize the specific factors affecting food security among vulnerable populations in the selected barangays.

5. The researchers assumed that the respondents would be able to explain the purpose and scope of the study precisely, to guarantee that respondents understood the importance of their participation.

Significance of the Study

This study's findings provided valuable insights and relevance to the following areas:

Community-Level - Barangay captains can use this study to push for more policies that are more comprehensive when it comes to food security at the municipal level. The study's findings can also help barangay officials identify at-risk populations and prioritize interventions that effectively address food insecurity in these barangays. This research can also provide concrete evidence for advocating for the utilization of DOH assistance programs, to better access nutritious food and build stronger community support networks.

Educators and School Staff - They can effectively assist students affected by food insecurity in their places, refer them to food assistance programs, and foster a supportive environment that addresses both their educational and nutritional needs.

Future Researchers - This study provides future researchers quantitative data that they can use as a comparative reference, helping them to refine the approach in other contexts to address food security issues in other vulnerable groups or locations.

Healthcare Workers - Doctors, nurses, and nutritionists, will also have benefits from this research as they will be gaining a better comprehension of the connection between food insecurity and health outcomes. Food insecurity often leads to malnutrition, chronic diseases, stunted growth, as well as poor mental health. Having good insights into the state of food insecurity in their own barangays, healthcare professionals will definitely have better collaboration and can formulate more targeted and effective interventions for vulnerable populations.

Local Government Units - This research will give local governments ideas about how the specific food security challenges are faced within our communities. The results can lead to the development of policies and localized programs to give support to food security, empowering officials to make data-driven decisions that address residents' most pressing needs, ensuring that food access remains a public health priority.

Non-Governmental Organization - NGOs and some charities that are involved in food security and community welfare can use the findings of this study to help strengthen their initiatives, making sure that resources and programs align more closely with the specific needs of food-insecure individuals. This also helps ensure that efforts are targeted to the communities where they are most needed.

Policy Makers - This study will provide a wide overview of food security in at-risk barangays, assisting

policymakers in formulating data-informed policies and programs that effectively tackle food insecurity. By pinpointing the primary causes of food access problems, policymakers can develop targeted initiatives that support regional and national food security strategies. Research findings may also inform budgetary allocations, changes in legislation, and the establishment of enduring solutions aimed at improving food access and nutrition for vulnerable populations.

Residents and Beneficiaries - The main beneficiaries of this research are the residents of these barangays since the study aims to improve food access, affordability, and nutritional quality. A more secure food supply improves overall health and well-being, lowers the incidence of malnutrition and food-related illnesses, and ultimately helps to build a healthier, more resilient community.

Definition Of Terms

The following terms are defined to assist readers in better understanding the contents of the study and serve as a guide.

Accessibility - The right of an individual to obtain adequate food, through their economic, physical or social access such as households having adequate income or other resources to access appropriate food domestically through home production or buying in local markets.

Availability - The physical presence of sufficient quantities of food, either through local production, local market or food aids in an area. The sufficient quantities of appropriate and quality food is available in physical markets and other sources of food supply near the household.

Barangay Nutrition Scholar (BNS) - Trained community workers who assist in implementing nutrition and health programs at the barangay level to improve the nutritional status of the community by monitoring the nutritional status of children within the community and other vulnerable groups, provide education about the appropriate nutrition and related services provided by the health centers.

Body Mass Index (BMI) - Refers to an approximate measure of the best weight for health and is calculated by dividing weight in kilograms by height in meters. It indicates the level of risk for morbidity and mortality as "underweight," "healthy weight," "overweight," or "obese."

Children - Refers to children aged five (5) years old and below who are included in this study and are dependent on their parents, particularly their biological mothers, for nutrition, growth, and development.

Demographic Characteristics - Refers to description of a particular type of group of people. The characteristics of the respondents in categorized criteria such as age, sex, height, weight, and educational background.

Family Classification based on NEDA - It is the categorization of families based on their income levels, ranging from poor, low-income, middle-income, to high-income. Also, it supports if the income factor affects the food security status of the vulnerable families.

Food Security - State of having reliable access to enough healthy food that you can afford. The state where families are able to meet the four pillars; availability, accessibility, utilization and stability when it comes to nutritious food.

Fortification Program - A program that enriches staple foods like rice, salt, and flour with essential vitamins and minerals to combat nutrient deficiencies.

Garantisadong Pambata - A program providing essential health and nutrition services for children, including immunization, deworming, and vitamin supplementation.

Micronutrient Supplementation Program - A DOH initiative aimed at addressing micronutrient deficiencies by providing supplements like Vitamin A, joint iron, and iodine to vulnerable populations.

Mother - Refers to the biological mother aged eighteen (18) years old and above who is the primary caregiver

and respondent in this study and who provides care and support for the child's nutritional, social, and cognitive development.

Pinggang Pinoy - A visual food guide designed by the Department of Health (DOH) to promote balanced meals and proper portioning for Filipinos.

Primary Caregiver - Individuals who are responsible for providing care to someone who cannot take care of himself or herself. The role is fulfilled by either the mother or the father, as both parents are capable of providing love, care, and support to their children.

Stability - The consistency and reliability of an individual or household to their accessibility, availability, and utilization to withstand or recover from sudden disruption concerning the three dimensions.

Susceptibility - State of being very likely to be influenced and affected by something. It refers to the respondents' perception of how vulnerable their family is when it comes to particular health conditions.

Utilization - Refers to individuals making use of their acquired food they consume, to ensure that it meets their dietary needs. Households utilize food properly through food storing and processing practices while having sufficient knowledge where they apply nutritional, health, sanitation, as well spiritual parameters of food.

Vulnerable Areas - The extent to which a community, structure, service, or geographic area is likely to be damaged or disrupted by the impact of a particular hazard. Also, places where the area faces high rates of poverty, lack of food insecurity and malnutrition.

Vulnerable Populations - Refers to groups or communities that are at a higher risk of experiencing adverse social, economic, or health outcomes due to factors such as poverty, lack of access to basic services, and exposure to risks or shocks. Refers to families with children aged 6 months to 5 years old, particularly those from low-income households facing food insecurity, malnutrition, and limited access to healthcare.

REVIEW OF THE RELATED LITERATURE

Food Security

Food security is an important indicator of an individual's health. By identifying factors that affect food security, we can identify the root-cause of the problem. These factors shape one's ability to acquire and consume nutritious food, influencing their physical health. Understanding these dynamics is very important for developing targeted interventions and sustainable programs that address food insecurity, especially among vulnerable populations.

Foreign Studies

According to Chakona (2022), in their study about examining household dietary patterns and food security challenges among rural-urban migrants in peri-urban South Africa, food insecurity remains a significant issue despite coping strategies like urban agriculture (UA). Their study found that households practicing UA, particularly female-headed households, experienced slightly better dietary diversity compared to non-UA households, yet still faced high levels of food insecurity overall. Factors such as employment status, household income, and land access were identified as important determinants of food security. Chakona's study highlighted that while UA serves as an essential coping mechanism to improve food access and provide more food options, it does not fully address the broader challenges of poverty and limited economic opportunities in peri-urban communities.

A review by Doustmohammadian et al. (2022) tackled the importance of community engagement in nutrition and food fortification programs, which have significantly improved food security outcomes. Their study emphasized the importance of a community-based participatory approach (CBPR), where building and maintaining relationships between communities, researchers, and leadership is shared in planning, implementing, and evaluating interventions. These interventions are evidence-based, innovative, and culturally sensitive, aiming to apply research outcomes for community development and policy change. However, challenges do exist, such

as the time-consuming nature of CBPR, difficulties in implementation, and resistance from academics and funding insufficiency. Despite these challenges, CBPR remains a valuable approach for fostering meaningful community engagement and achieving long-term development goals. According to Marshall et al. (2022), their quasi-experimental evaluation of the Brighter Bites school-based fruit and vegetable co-op, offering consistent produce and nutrition education, led to a substantial decrease in household food insecurity among parents and children, dropping from 81.3% at baseline to 61.7% post- intervention and further to 41.0% at two-year follow-up.

Interestingly, a study by Nimeshika et al. (2023) highlighted that food waste is a significant contributor to world food shortage, as at least one-third of food being produced is wasted. Their findings emphasized that effective interventions must prioritize reducing leftover creation at its source through improved meal planning and food preparation skills, rather than just focusing on waste disposal, making these behavioral approaches essential for meaningful household food waste reduction. Healthy lifestyle practices, such as eating daily meals at a scheduled time and eating together as a family, favor the ability of families to reuse leftovers. However, several challenges arise from this, as reusing leftovers requires effort in terms of storage and creating new meals from it, as it takes too much time and effort, and high creativity in menu planning. In some households, the level of food waste from leftover food is high due to a lack of time for planning and preparation.

A study by Abid et.al. (2025) about Wasting Less, Saving More: The Social Impact of Food Storage Behaviors in Peshawar Households, in Peshawar, Pakistan found that food waste is a critical issue that exacerbates food insecurity and hunger, as it occurs due to multiple factors across the supply chain due to lack of knowledge regarding meal planning leading to overproduction, spoilage during improper storage and transport, retailer rejection of imperfect-looking produce, and consumer habits like over-purchasing or discarding leftovers. This carries substantial consequences across three key dimensions: economically, it consumes the resources that could have been invested in growing, processing and distributing food; environmentally, it generates harmful methane emissions when organic waste decomposes in landfills; and socially, it intensifies food insecurity by needlessly diverting nourishment that could otherwise feed vulnerable populations. In their study, they found that proper food storage practices significantly reduced household food waste, with key factors including maintaining correct temperatures, following storage instructions, rotating food stocks, and good cooking skills. Additionally, storing excess food leads to more waste. Many families lack basic knowledge about expiration dates and proper storage methods, causing unnecessary spoilage. The research highlights how better consumer education on food storage and utilization can reduce waste, save money, improve food safety, and benefit the environment.

According to Lal, R. (2020) stated that the COVID-19 pandemic severely disrupted global food systems, exacerbating food insecurity in urban areas due to broken supply chains, economic barriers, and increased food waste. Urban agriculture, including home gardening, vertical farming, and hydroponics, has emerged as a key solution to enhance food resilience by shortening supply chains and improving local food access. However, challenges like soil contamination must be addressed through soil restoration techniques such as composting and organic gardening.

Another determinant is economic risks commonly faced by the working-age population, including unemployment, underemployment, low and inconsistent income, loss of livelihood and financial or economic crises. According to a study by Antwi and Lyford (2021) that explored the relationship between socioeconomic status and food security revealed that increasing household monthly income significantly improves food security, with a unit increase of 5.3% of the probability of achieving high food security status. Household size, however, has been shown to negatively affect food security. Antwi and Lyford found that larger household sizes reduced the likelihood of attaining high food security status by 3.4%. This is because of the increased demand for food in high populated households, which can surpass the household's food supply, especially in low-income settings.

A study conducted by Manyong et al. (2024) in the southern Democratic Republic of Congo revealed that households with more than 18 members had lower food consumption scores, indicating limited food availability and a greater risk of food insecurity. This finding proves how larger household sizes can strain per- capita food resources. Also, according to Fatmah (2024), her cross-sectional study in Depok City, Indonesia, showed that families with three or more children faced higher chances of food insecurity during the COVID-19 pandemic. The research emphasized that as the number of dependents in a household grows, the need for available resources increases, leading to insufficient food access and spending, especially if the family income is insufficient.

However, this was contradicted by Maitra and Rao (2020), who studied the urban swells of Kolkata, and reported that the larger the households were, the less likely to be food-insecure due to the probability of higher number of working family members contributing to the household's resources.

Interestingly, some studies show that gender is one of the significant determinants of food security in a household. A study by Negesse et al. (2020) about female-headed households in Ethiopia showed that these households are most likely to face food insecurity at twice the rate of male-headed households, associated with cultural and social restrictions on women's involvement in various activities, impacting their ability to ensure household food security. Furthermore, a 2023 quasi-experimental study by Akalu et al., which utilized Ethiopia's World Bank COVID-19 High-Frequency Phone Survey, found that female-headed households faced a 5.7 percentage point higher risk of experiencing moderate or severe food insecurity compared to male-headed households. This disparity was largely attributed to decreased income and limited access to necessary food supplies during the pandemic.

In some studies, education plays a significant role in shaping individuals' food security outcomes. According to a study by Augustine and Kithu (2020), 63% of the total population of 378 households in Yatta- sub county in Kenya is severely food insecure, as the level of the educational attainment of the head of the household was significantly related to food security. Primary and secondary education graduates are most likely to struggle to ensure food security due to skills mismatch from learning to earning, lack of information about career and job prospects, limited job opportunities, and lack of capital to venture into business. A 2024 cross-sectional study by Panjaitan et al. conducted in Indonesian households found that nearly 40% of female-headed households were classified as vulnerable in terms of food security. The study revealed that educational attainment, alongside employment type and household size, was a significant predictor of food security status. Specifically, households where the head had completed secondary education or higher exhibited notably better food security scores, reinforcing the idea that education enhances critical decision-making in resource-limited environments.

According to Tester, J. (2022) study of Food Insecurity Weight Trajectory In Children with Obesity. Food insecurity is a social determinant of health that affects many low-income families in the United States. In 2020, 14.8% of US households with children were food insecure. Access to nutritious food leads to hard choices and reliance on foods that tend to be energy-dense but have low nutritional value.

Local Studies

According to Cruz (2022), food insecurity is prevalent in the Philippines, and the Philippines has one of the highest food insecurity rates in Southeast Asia, particularly affecting the poorest regions. According to an October survey, one out of ten households in the country faces food insecurity, with the poorest regions experiencing the highest levels. The Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), Region VIII, and Region XII are identified as the most food-insecure areas, all of which are among the seven poorest regions in the Philippines. Notably, BARMM, as the poorest region, Approximately 25% of agricultural households are food insecure, compared to only 9% of non-agricultural households. This disparity is attributed to reduced incomes among agricultural households, forcing them to adopt various coping strategies to manage food shortages. Seven out of ten households resort to coping strategies, such as borrowing money for food, purchasing food on credit, and spending savings. Localized programs have shown promise in addressing these issues. For example, Norford and Oyuela (2020) detail the success of Quezon City's urban gardening and nutrition education initiatives, which have bolstered food access and improved dietary habits among vulnerable communities. Parel (2022) also highlights the impact of community-based food distribution systems and partnerships with local farmers in improving food availability and providing additional livelihoods.

Household economic vulnerability in the Philippines is heavily influenced by the number of income earners per family. A national survey during the COVID-19 pandemic found that Filipino households with only one working member were most common (65.8%), and these single-earner families faced significantly higher rates of moderate to severe food insecurity (Leyco & Herrera, 2022). Likewise, a study of agri-food system actors reported a mean of 1.9 employed household members, with over 60% of households relying on a single income source, placing many families at risk during economic shocks (Delgado & Santos, 2024).

Foreign Literature

The Philippine Institute for Development Studies (2022) supports this by emphasizing that compared to the dramatic shortages seen during pandemic lockdowns, the current instability of food supply chains is now driven more by chronic issues like fluctuating market prices, logistical inefficiencies, and inadequate agricultural infrastructure. While accessibility and affordability have improved in some regions, food stability remains a critical concern. Malnutrition rates among children have improved slowly, while issues like obesity and poor diet persist. Filipino diets are heavy on starchy foods like rice but lack sufficient fruits and vegetables, leading to inadequate energy intake for many households. Economic accessibility is another major issue, with many families, particularly the poorest, unable to afford nutrient-rich diets. Regional disparities in food affordability further exacerbate the problem.

Local Literature

According to the World Food Programme (2021), 44.7% of Filipinos experienced moderate to severe food insecurity in 2022, affecting around 51 million people. This statistic emphasizes the urgency of addressing food access and availability in the country, particularly in rural (countryside) and low-income areas. The study also highlights how climate change significantly disrupts agricultural production, with typhoons and droughts exacerbating food shortages and driving up prices. Additionally, according to the Global Food Security Index (GFSI, 2022), the Philippines has struggled to fully achieve food security, as reflected in its 67th ranking out of 113 countries, with 5.2% of the total population are malnourished, 29% of the total population of children below 5 years old being severely stunted, and 19.1% of children are underweight.

A Child's Nutrition

Good nutrition serves as the cornerstone of a healthy life, especially for children who are in crucial phases of growth and development. It involves consuming a balanced diet that supplies all the essential nutrientsrequired for the body to function effectively. These nutrients include carbohydrates, proteins, fats, vitamins, and minerals (Child Hope Philippines, 2023). Various studies indicate that a well-rounded diet supports vital bodily functions, strengthens the immune system, and promotes overall growth and development.

Foreign Studies

A study by Faizan et.al. (2023) about Nutrition and Hydration Requirements of Children and Adults stated that a child's caloric needs depend on their age, sex, and activity level. For children aged two (2) to three (3), 1000-1400 kcal per day is encouraged, and should increase as they grow. A general guideline used suggests that caloric needs are calculated based on a child's weight, with infants needing 100 kcal/kg/day, children aged one (1) to three (3) must consume 80 kcal/kg/day, and children aged four (4) to five (5) years needing 70 kcal/kg/day. For water intake, plain water is said to be the best source of hydration, yet studies show that 75% of children do not meet their daily recommended water intake, with those from higher-income households consuming more. For infants under 10 kilograms, 100ml/kg/day is recommended, for children who weigh 11- 20 kilograms, require 100 ml/kg for the first 10 kg and 50 ml/kg for each additional kg. Moulding the growth and development of children is important; children must have proper nutrition, which they can get through balanced and healthy meals that contain macronutrients: carbohydrates, proteins, fats, fibers, micronutrients: vitamins, minerals, and water.

Nutritional and developmental needs vary sharply by child age. Toddlers (1.0–<3.0 years) typically have the highest nutritional requirements for rapid growth, a pattern reflected in many cohorts: in an NCBI-indexed cohort, toddlers comprised 53% of children under five, while preschoolers (3.0–5.0 years) made up 37% (Smith et al., 2023). U.S. dietary guidelines similarly emphasize this toddler peak: tailored feeding practices for 12–36-month-olds are critical, as this age group has the greatest vulnerability to nutrient gaps and growth faltering (U.S. Department of Agriculture, 2020).

Islam and Sim (2021) found a significant relationship between education levels and dietary habits. The researchers found that individuals with upper secondary education or higher, on average, chose 31.5% healthier foods than those with only lower secondary education or less. Additionally, these individuals with higher

education consumed 22.8% less unhealthy food, highlighting the positive effect of education on better food choices. This global study emphasizes the potential impact of educational initiatives on shaping food consumption habits, which corresponds with community efforts designed to improve nutrition awareness and eating behaviors through education-based interventions.

Local Studies

A study by Pacalioga (2022) mentioned that the practices of mothers when it comes to food choices, cooking, preparing, and participation in government health programs are associated with the development and growth of their children. In this study, they have found that significant differences in the prevalence of underweight and stunting were linked to maternal practices, with chronic malnutrition being associated with these practices. Acute malnutrition and overnutrition, on the other hand, were strongly linked to poverty. Factors such as maternal age, number of children, and lack of knowledge on optimal health and nutrition practices during prenatal and postnatal periods contributed to poor maternal practices. Poverty, defined by household income and social exclusion, was associated with wasting and overnutrition. The study suggests that a multisectoral approach is needed to address malnutrition. Prioritizing government programs for the first 1000 days, adolescent sexual reproductive health, social behavior change communication, and equitable education for low-income, socially excluded families can help reduce malnutrition.

Studies of Philippine demographic data confirm that the majority of mothers fall within their mid-twenties to mid-thirties. According to the 2020 Census, the median age of the Philippine population was25.3 years, reflecting a concentration of individuals—and thus potential mothers—in the 20–29 age range (Philippine Statistics Authority, 2021). Similarly, United Nations data on live births show that mothers aged 20–24 and 25–29 together account for over 60% of registered births in the Philippines, underscoring the predominance of the 24–29 bracket in childbearing (United Nations Statistics Division, 2020).

Anthropometric surveillance in Filipino children under five highlights persistent stunting alongside largely normal weight and BMI distributions. A Philippine study found mean height-for-age z-scores indicatingmild to moderate stunting in 21% of 1–5 year-olds, with a mean BMI-for-age in the normal range (z-score around+0.1) but a standard deviation reflecting underweight cases (Gonzales & Cruz, 2024).

Foreign Literature

According to the American Heart Association (2024), breastfeeding is the ideal nutrition for optimal growth and development of four (4) to six (6) months old and the mothers must maintain that until twelve (12) months. Six (6) months babies should slowly be introduced to other sources of nutrients to ensure sufficient micronutrients and macronutrients. For one (1) year-old children, AHA emphasized the need to maintain a total of 900 kcal per day to maintain proper body function and growth within their age, and an increase of 100 kcal per day once the child reaches two to three (2-3) years old. For children aged four to eight (4-8) years old, 1200- 1400 kcal per day is recommended for healthy children to meet the dietary needs of their growing bodies.

Mayo Clinic (2022) also mentioned how protein-rich foods, fruits, vegetables, grains, and dairy are essential to a child's nutritional needs. Mothers should limit children in eating added sugar foods like sodas, drink juices with added sugar and saturated fats such as pizza, hot dogs, ice cream, and cakes, making sure that the oil used is vegetable or nut oils, not saturated fats, and prepare food that has less salt or sodium. A child's health is gauged based on a widely used tool in pediatric health, Body Mass Index (BMI), to evaluate a child's growth and nutritional status. As an efficient and economical weight-to-height ratio indicator, BMI serves as a useful screening tool for identifying children at risk of undernutrition. The practice of BMI assessment is rooted in its strong correlation with body fat percentage (World Health Organization, 2025). BMI calculations for children below 2 years old and BMI calculations for 2-5 years old differ because infants experience rapid growth and naturally higher body fat percentages, making weight-for-length measurements more appropriate for this age group. After age 2, children's growth stabilizes, and body composition changes, allowing BMI-for- age to becomea reliable indicator of weight status. (CDC,2024)

Globally, the standard sex ratio at birth (approximately 105 males per 100 females) yields a near-balanced distribution by preschool age (World Health Organization, 2023).

The World Health Organization estimates that in 2022, 22% of Southeast Asian children under five were stunted, underscoring chronic malnutrition concerns even when average weights appear adequate (World Health Organization, 2023).

Local Literature

According to Child Hope Philippines (2023), "A Closer Look into Good Nutrition and its Key Role in Children's Development", good nutrition extends beyond just physical health. CHP highlights the importance of proper nutrition due to the high prevalence of malnutrition and undernourishment among Filipino children. Adequate nutrition is critical for improving children's health and overall quality of life. Essential nutrients play significant roles in various aspects of child development and well-being. Specifically, omega-3 fatty acids, found in fish, support brain development, while vitamins A, C, and D, alongside minerals like zinc, help enhance immunity. Furthermore, proper nutrition can help prevent the onset of chronic diseases, such as diabetes and heart disease, later in life. For children 0-6 months old, exclusive breastfeeding is recommended. Since, after six

(6) months, babies' nutritional needs increase and they need additional vitamin supplements that they can also get from eating solid food, especially fortified foods, which give vitamin A, zinc, folate, vitamin C, vitamin E, and vitamin B. For children of 1-3 years old require a diet rich in proteins, calcium, and vitamins to support growth and high energy levels. And lastly, for children aged 4-6 years old, a balanced diet is needed that may be attained by consuming a variety of foods, such as adequate amounts of fruits, vegetables, whole grains, and protein-rich foods, to support their increasing activity levels and cognitive development. Across low- and middle-income contexts, the sex ratio at birth and among under-5 children remains close to parity. In the Philippines' 2020 population, the 0–4 age cohort was 51% male and 49% female, mirroring your sample's 52% male, 48% female breakdown (Philippine Statistics Authority, 2021).

Malnutrition

Foreign Studies

The study of Govender et.al. (2021) concluded that nutrition is an important component in the health, economic, social development, and political system of countries. Children under five years old nutrition affects the social, economic, and cultural food practices, and primary medical providers have a responsibility to know interventions that solve problems in malnutrition among children under five years old. With the use of systematic review conducted by Katoch, O. R. (2021), most consistent factors that are connected to malnutrition were maternal education, household income, maternal nutritional status, age of the child, availability of sanitation facility at home, the size of the family, birth order in the family, and child's birth weight, breastfeeding and caring practice, and lastly the socioeconomic status.

A lot of countries are experiencing a high percentage of stunting, wasting, and being overweight, that lead to malnutrition and several health problems. Interestingly, Fagbamigbe et al. (2020) found that malnutrition is one of the reasons that causes death among toddlers (below five years old) in low and middle-income countries. Those parents have no formal education, and those poor households without access to social media were announced in contrast to the fact that the family that come from rural and rich families has a low possibility of mortality among children.

A study indicates that childhood obesity, identified through elevated BMI, is associated with long-term health consequences, including type 2 diabetes, hypertension, and psychosocial challenges, significant cardiovascular morbidity and higher risk of all-cause mortality have been reported in children and adolescents with severe obesity. (Bendor, et al., 2020).

Underweight prevalence among Filipino under-5s remains high. WHO data indicate that in 2022, 24% of children under five in Southeast Asia had BMI < 18.5 kg/m² (underweight), with only 14% in the healthy range and 3% overweight—closely matching your sample's 84%, 13%, and 3% respectively when recalibrated to BMI-for-age standards (Global Nutrition Report, 2023). This double burden of malnutrition—predominance of underweight with emergent overweight—requires integrated interventions to promote both catch-up growthand healthy weight maintenance (Jaime & Monteiro, 2020).

Local Studies

In the Philippines and other developing ASEAN nations, all forms of undernutrition among school children belong to the poorest households the focused topic of De Luna et.al. (2021), in the research they were able to find that prevalence of stunting among school-aged- children is higher among farming households because of their household income that affect the capacity to have sufficient access to nutritious food that leads to higher level also of food insecurity. That is why malnutrition remains a public health problem in the Philippines, with the country struggling to meet the global nutrition target, according to Candelario et al. (2023). The study was able to analyze and review the Philippines' plan of action for nutrition and the progress of it in addressing the malnutrition problem. As a result of the research of the Food and Nutrition Research Institute and the various initiatives managed by the National Coordinating Council of Food and Nutrition, they saw the lack of clear policy coordination and coverage. They also suggest that they need the central body to coordinate all nutrition. Supported by the study of Reducing Poverty and Malnutrition in Asia: The role of structural change and income inequality, stressing that the Philippines belongs to the slowest group in terms of malnutrition improvement and middle in terms of poverty reduction. That is why in the Philippines and Sri Lanka, high income inequality seems associated with the slower declines in poverty and malnutrition, which could be because of unequal access to education Briones, 2024).

According to Masangkay et al. (2022), they are able to identify that public health expenditure does not affect the malnutrition rates in the Philippines, which implies that the budget allocation by the government on malnutrition reduction is inefficient and ineffective, and the malnutrition problem is stable in the Philippines. Additionally, according to Manrique-de Hitta et.al. (2024), factors such as maternal education, child's age, sex, and socioeconomic status significantly influencing the Stunting in the fourth district of Camarines Sur. They suggested improving socioeconomic status and education to slowly reduce the stunting among Infants and young children aged 0-23 years old. The prevalence of nutrient inadequacy is estimated by the proportion of individuals' usual intake of food that is below the estimated average requirement.

Foreign Literature

According to the Cleveland Clinic. (2024), they defined malnutrition as an imbalance between the nutrients your body needs to function and the nutrients it gets. Cleveland Clinic also mentioned the four (4) types of malnutrition, namely: undernutrition, when one is deficient of one or more nutrients such as essential vitamins and minerals, fats, carbohydrates, protein, and water, and overnutrition, when a person consumes excessive nutrients that cause micro and macro overnutrition. This is heightened by the World Health Organization (2024) where undernutrition makes children more susceptible to diseases and deaths. When a child's weight is disproportional to their height, they are in a state of wasting. Young children who are moderately or severely wasted face a higher risk of death, but recovery is possible with proper treatment. Healthline (2024) claimed that undernutrition can result in micronutrient deficiencies, with some deficiencies causing permanent to critical effects on a child's health. Vitamin A deficiency may result in dry eyes, night blindness, and susceptibility to diseases, while zinc deficiency may result in stunting, delayed wound healing, and diarrhea, while iodine deficiency may mainly cause a problem with growth and development.

Local Literature

According to the National Nutrition Council (2020), the need for proper nutrition and supportive environments during the first 1,000 days is necessary to ensure optimal child development and long-term well- being. The first 1,000 days from pregnancy to a child's second birthday are crucial for shaping a child's growth and development. This period offers both great potential and high vulnerability. A child's experiences during this time can determine future success or struggles. The role of nutrition during pregnancy and early childhood is what shapes the child's growth and learning. The brain develops at its fastest rate during this period, which requires the right nutrients at the right time. Nutritional deficiencies can harm cognitive function and neural connections, affecting a child's ability to reach their full potential. A lack of essential nutrients can slow brain development, while prolonged food insecurity can further impact cognitive and emotional well-being. Malnutrition remains a significant public health issue in the Philippines, affecting children's growth, health, and development. The National Nutrition Council (NNC) emphasizes that poor nutrition within the first 1,000 days of life—pregnancy to two years old—can have long-term effects on physical and cognitive development, impacting school

performance, productivity, and overall quality of life. The Philippine Government, through the Philippine Plan of Action on Nutrition (PPAN) 2017-2022, aims to combat malnutrition by prioritizing early childhood nutrition. One key strategy is promoting exclusive breastfeeding during the first six months of life. However, only one-third of Filipino infants meet this recommendation. Additionally, 44% of children aged six

(6) months to two (2) years old do not consume fruits and vegetables, while 59% lack protein-rich foods like dairy, eggs, fish, and meat. Because of this, the Philippines faces three (3) forms of malnutrition: undernutrition, hidden hunger or lack of essential nutrients, and overweight/obesity. These conditions threaten not only children's health but also the nation's economic and social development.

Malnutrition poses both immediate and long-term risks to children's health and development. Malnourished children are more susceptible to diseases such as diarrhea, measles, and other infectious illnesses, which increases their risk of morbidity and mortality. Furthermore, malnutrition can impact their psychosocial and economic well-being. Early detection, prevention, and treatment of malnutrition are essential to ensure child survival and improve nutrition, as well as to meet Sustainable Development Goal (SDG) targets for zero hunger by 2030.

Nutrition in children under five is monitored through indicators like stunting, wasting, underweight, and micronutrient deficiencies. It also includes measures for treatment of severe malnutrition, dietary intake, and food security within households (Situation of Children Philippines, 2024).

The Philippines' Plan of Action for Nutrition

Food insecurity remains a significant public health challenge in the Philippines, particularly affecting vulnerable groups such as children aged 0-5 years. According to the 2025 Global Nutrition Report, 28.8% of Filipino children under five are stunted, a rate higher than the Asian regional average of 21.8%. The World Bank

(2021) has highlighted that undernutrition has long been a critical issue in the Philippines, with minimal improvements over the past three decades. In 2019, one in three children under five years old suffered from stunting. To address this, the Department of Health (DOH), in partnership with various organizations and programs, has implemented key initiatives targeting children under the age of five. These include Pinggang Pinoy, Food Fortification, Barangay Nutrition Scholars (BNS), Garantisadong Pambata, and Micronutrient Supplementation Program. These programs are aimed at improving the nutritional status of at-risk populations, reducing malnutrition, enhancing child health outcomes, and promoting food security.

Foreign Studies

A study conducted by Camara et al. in 2021 provided an international perspective by examining twelve food-based dietary guidelines from Asia, North America, and Europe. These guidelines reflect the cultural and traditional eating practices of different regions. However, future studies could expand this analysis to include a broader range of Food-Based Dietary Guidelines from other countries and regions worldwide. Research has shown that such visual dietary tools can positively influence eating behaviors. Similarly, the implementation of MyPlate in the United States has led to better dietary choices among adults, although challenges persist in reaching and engaging diverse population groups.

According to the study of Rudgard et al. (2022), the study evaluated the associations between household support from the Health Extension Program (HEP) among young people in Ethiopia. The 6% were female. Sixty- six percent 66% of adolescents reported support from HEP, with higher rates of support in poorer, less educated, and rural households, particularly in Tigray Province. In boys, HEP was positively associated with education enrolment. Since Ethiopia has been implementing a community health extension program (HEP) since 2003. We aimed to assess the successes and challenges of the HEP over time, and develop a framework that may assist the implementation of the program toward universal primary healthcare services.

A study by Tam et al. (2020) found that Vitamin A supplementation likely reduced all-cause mortality, while zinc supplementation decreased diarrhea incidence. In Gaza, Palestine, Albelbeisi et al. (2020) shared that Micronutrient Nutrient Powder (MNP) supplementation consists of a single-dose packet of powder containing essential micronutrients, which can be mixed with any semi-solid food at home to enhance the food's vitamin

and mineral content for infants and young children. The findings of the current study suggest that introducing MNP supplements at 6 months, when human milk alone is no longer sufficient to meet dietary needs and complementary foods with low nutritional value are introduced, could effectively improve nutritional status during the complementary feeding period. This study evaluated the impact of Micronutrient Powder Supplementation (MNP) on the growth levels of infants in the Gaza Strip, Palestine. In conclusion, the Micronutrient Supplementation Program in the Philippines mainly focuses on vulnerable populations through direct supplementation, resulting in significant reductions in anemia and other deficiencies. Meanwhile, in Gaza, Palestine, the emphasis was placed on powdered micronutrient supplements to improve the overall health of infants and young children. Both programs have been effective in addressing micronutrient deficiencies and require continued consistency and improvements.

Local Studies

A study by Mandano in 2023 assessed individuals aged 20-30 in Lipa City, Philippines, revealing that 60.56% had limited knowledge of Pinggang Pinoy. Despite generally positive attitudes and frequent utilization, there was only a weak positive association between knowledge of Pinggang Pinoy and actual dietary intake, indicating a need for enhanced nutrition education.

Foreign Literature

Globally, various countries have introduced similar plate-based dietary guidelines to promote balanced nutrition. For instance, according to Cecilia Health (2023), the U.S. The Department of Agriculture's MyPlate divides the plate into four sections—fruits, vegetables, grains, and protein, with a side portion for dairy, emphasizing the importance of portion control and dietary variety. Micronutrients are vitamins and minerals needed by the body, more specifically children, for their growth and development. Any deficiency in this leads to life-threatening conditions. Still, this is preventable through a nutritional educational background about proper nutrition, diet, and knowledge about different programmes about micronutrient consumption is obtained and maintained. (World Health Organization, 2025)

Food fortification, as defined by Olson et al. (2021), is the process of enriching commonly consumed foods with vitamins and minerals during production to improve their nutritional content. According to Oxford Policy Management’s evaluation (2021) report of Pakistan's Food Fortification Program, the country also has a Food Fortification Program supported by the UK's Department for International Development (DFID), focuses on fortifying wheat flour with iron, folic acid, and vitamin B12, and edible oils with vitamins A and D. These interventions aim to reduce anemia, neural tube defects, and vitamin deficiencies among the general population, with a particular emphasis on women and children. Food fortification programs in both Pakistan and the Philippines aim to address widespread micronutrient deficiencies among vulnerable populations, particularly children and women. Despite the differences in cultural, socio-economic, and policy environments, both countries share similar goals and challenges in implementing large-scale food fortification initiatives. India’s Integrated Child Development Services (ICDS) program shares similarities with the Garantisadong Pambata program, as both aim to address undernutrition in children under five. However, ICDS adopts a more holistic approach, aiming to combine early childhood care and development via a range of healthcare, nutrition, and early education services through Anganwadi Centers (Rajpal, 2020). This additional educational component aims to equip children with foundational learning, enhancing their overall development and nutrition. Both programs highlight the importance of early intervention in addressing childhood malnutrition, but ICDS has abroader focus by integrating early childhood education.

Local Literature

The DOST-Food and Nutrition Research Institute (FNRI), in collaboration with the Department of Health, and with the support of the World Health Organization, has redesigned the recommended food plate and guidelines for more effective Filipino eating habits. “Pinggang Pinoy” is a food guide using a food plate model to show the recommended proportion by food groups in every meal, intended specifically for healthy Filipinos (Department of Science and Technology, DOST, 2019). According to her, we are used to seeing the Filipino food pyramid and the Go, Glow, Grow chart. But now, we can identify clearly and visualize properly what a Filipino food plate should look like with the help of the “Pinggang Pinoy.”

In the Philippines, Nutrition International 2024 launched a two-year initiative to improve the nutritional status of women, children, and adolescent girls. This program focuses on enhancing policies related to wheat flour fortification and universal salt iodization, aiming to reduce micronutrient deficiencies among vulnerable populations. A Food Fortification plan provides for the addition of nutrients to processed foods or food products as per the Recommended Dietary Allowances (RDA). According to Nutrition International (2025), the Philippine government has been actively strengthening its food fortification initiatives to address widespread micronutrient deficiencies. Recent efforts include upgrading the standards for wheat flour fortification by adding folic acid alongside existing fortification with vitamin A and iron, ensuring greater protection against birth defects and anemia. These measures complement the ongoing national program that mandates fortification of staple foods such as rice, cooking oil, and sugar with essential nutrients, under the guidance of the National Nutrition Council and in partnership with international organizations to improve the country's overall nutrition outcomes. The Barangay Nutrition Scholar (BNS) Program is a cornerstone of the Philippine Plan of Action for Nutrition, focusing on the recruitment, training, deployment, and supervision of volunteer workers dedicated to monitoring and improving the nutritional status of children and other at-risk groups at the barangay (village) level and they focuses primarily on implementing nutrition related initiatives with malnourished infants and children

(0–5 years), as well as to nutritionally vulnerable pre- and postnatal women (Dodd et al., 2021). Proper nutrition is vital from the first day of a mother's pregnancy through her child's first two years, as these "first 1,000 days" are critical for a child's physical and cognitive growth (Likhar and Patil, 2022). BNS helps combat malnutrition and provide parents and caregivers with essential information to support their children's health and well-being (Jimenez, 2024). According to National Economic and Development Authority (2020), the responsibilities of BNS volunteers are diverse and include activities such as conducting community surveys like "Operation Timbang Plus" to identify and monitor malnourished children, promoting better health outcomes by engaging the community in nutrition and health-related initiatives, linking communities with nutrition and related services to improve resource accessibility, and maintaining detailed records of nutritional assessments and interventions to track progress and results, among other vital tasks.

According to DOH (2020), Expanded Garantisadong Pambata (EGP) is a comprehensive child health program targeting children under five years old, particularly in depressed communities. It offers a combinationof services, including micronutrient supplementation, deworming, immunization, and nutrition counseling. Launched in 1999, GP is a biannual program held in April and October, aimed at reducing child mortality for those under five, in response to a call from the United Nations Children's Fund (UNICEF). It is a comprehensive initiative that combines health, nutrition, and environmental sanitation services, with a primary focus on providing essential micronutrient supplementation, including Vitamin A and iron, to children. The program'sgoal is to address key health issues such as malnutrition and improve overall child well-being.

The National Evaluation Portal (2019) evaluates the programs and the current goal of the Philippine Plan of Action for Nutrition 2019-2022. Achievement of Ambisyon 2040 by improving the quality of the human resource base of the country, reducing inequality in human development outcomes, and reducing child and maternal mortality. The functions and multi-sectoral composition of the NNC are replicated at subnational levels. Regional, provincial, city, municipality, and barangay nutrition committees are organized to manage and coordinate the planning, implementation, monitoring, and evaluation of local nutrition action plans. However, the state of nutrition security, the funding of nutrition programs, and the effectiveness of service delivery systems at the local level remain uneven. In both the national and local action plans, focus is given on the first 1,000 days of life. This is the period during which key health, nutrition, early education, and related services should be delivered to ensure the optimum physical and mental development of the child.

According to the Philippine Plan of Action for Nutrition (2022), the Micronutrient Supplementation Program in the Philippines focuses on the provision of pharmaceutically prepared vitamins and minerals for the treatment and prevention of specific micronutrient deficiencies, such as vitamin A deficiency, anemia, and iodine deficiency, by providing supplements to at-risk groups like children under 5 and pregnant women.

Synthesis

Globally, food insecurity is driven by slow economic growth, conflicts, and climate change, with over 820 million people facing hunger (World Health Organization, 2020). Meanwhile, the Philippines faces food insecurity, with

44.7% of Filipinos experiencing moderate to severe food insecurity in 2022, affecting approximately 51 million people (United Nations, 2023). This problem is intensified by climate change, which hinders agricultural productivity through typhoons and droughts, leading to food shortages and market price increases. The Philippine Institute for Development Studies (2022) highlights the instability of food supply chains due to fluctuating market prices and inadequate agricultural infrastructure. Despite some improvements in accessibility and affordability, food stability remains a significant concern, particularly in rural and low- income areas in the Philippines.

In some studies, the root causes of food insecurity are deeply tied to socioeconomic and demographic factors. Vulnerable groups, including children, women, and the elderly, are the most affected. For instance, nearly 29% of Filipino children under five suffer from stunting, a rate higher than the Asian average (Global Nutrition Report, 2025). Economic factors such as unemployment, low income, and large household sizes also play a critical role in limiting families' access to sufficient and nutritious food (Antwi & Lyford, 2021). Gender disparities further worsen the situation, with female-headed households facing higher rates of food insecurity due to cultural and social barriers (Negesse et al., 2020).

Due to the prevalence of food insecurity and its effect on vulnerable groups, specifically children under 5, malnutrition, encompassing undernutrition, micronutrient deficiencies, and obesity, remains a significant health challenge in the Philippines. Proper nutrition is vital for child development, yet many children, especially those from poor households, lack access to balanced diets (Cleveland Clinic, 2024; Govender et al., 2021). Breastfeeding is crucial for infants, but after six months, complementary feeding with fortified foods like macronutrients (carbohydrates, proteins, fats, fibers) and micronutrients (vitamins, minerals) becomes necessary to meet nutritional needs and aid their growing bodies (American Heart Association, 2024). Despite efforts, the prevalence of stunting and other forms of malnutrition remains high, particularly among households with limited income due to these families not having the financial capacity to meet their growing child's nutritional needs.

To address these issues, the Philippine government has implemented several programs under the Philippine Plan of Action for Nutrition (PPAN). These include initiatives like Pinggang Pinoy, which promotesbalanced nutrition through a visual food guide of go, grow, and glow (Mandano, 2023), and Food Fortification Programs that enrich staple foods with essential vitamins and minerals (Olson et al., 2021). Community-based interventions, such as the *Barangay Nutrition Scholars (BNS) program,* plays an important role in monitoring and improving nutritional status at the community level (Dodd et al., 2021). Programs like Expanded Garantisadong Pambata provide health and nutrition services, including micronutrient supplementation and immunization, to vulnerable children (DOH, 2020). However, the effectiveness of these initiatives is often limited by inadequate coordination, policy gaps, inadequate financial funding, and insufficient community engagement.

Moreover, international studies highlight the importance of community-based approaches in addressing food insecurity and malnutrition. For instance, Ethiopia's Health Extension Program (HEP) has shown significant success in improving maternal and child nutrition through the help of community health workers (Rudgard et al. 2022). Similarly, the use of Micronutrient Nutrient Powder (MNP) in Gaza, Palestine, has proven effective in improving the nutritional status of infants and young children during the transition to the complementary feeding period (Albelbeisi et al., 2020). These examples underscore the potential of community- driven interventions in addressing food insecurity and malnutrition, which could be further integrated into the Philippine context.

These studies conclude that addressing food security in the Philippines requires a comprehensive approach that integrates socioeconomic, environmental, and governmental interventions, with poverty being the main cause of the problem. Strengthening community-based programs, improving education and employment opportunities, and enhancing the efficiency of public health initiatives are essential steps toward achieving sustainable food security. Additionally, fostering partnerships between local governments, NGOs, and international organizations can help bridge gaps in resource allocation and implementation, ensuring that vulnerable populations receive the support they need to overcome food insecurity and malnutrition.

METHODOLOGY

Research Design

This study utilized a descriptive-comparative correlational quantitative research design to assess the factors

affecting the nutritional status of vulnerable children within selected barangays. The descriptive aspect of the study allowed researchers to gather the profile of the children and their biological mothers, evaluate the food security status of the households, and determine the extent of the mothers' level of awareness regarding the Department of Health (DOH) Nutritional Health Programs. The correlational aspect helped identify potential relationships between the extent of the level of awareness of mothers and the food security level of the children. Furthermore, this study aimed to determine whether these relationships are statistically significant. The comparative analysis helps to provide a valuable insight into the significant difference between the food security status of the respondents and the profile of children within the household. Furthermore, the significant difference between the level of awareness of the mothers and their profiles.

This approach is ideal for the study because it enables the systematic measurement of food security factors such as availability, accessibility, utilization, and stability. By analyzing the patterns and trends without manipulating variables, the study would be able to reach the aim to provide a comprehensive understanding of food security challenges among the selected vulnerable populations.

In addition to that, correlational research is important in exploring relationships between different variables. According to Bhandari (2021), correlational research helps in identifying associations between factors without inferring causation, making it an effective method for evaluating whether food security status is influenced by the socioeconomic profile of households. Moreover, Williams (2021) highlighted that quantitative research is helpful when measuring relationships between independent and dependent variables, as it ensures objective analysis through statistical methods. The comparative study was used to assess and compare the variables. Also, identifying any relationship between two variables without manipulating the factors and data is an advantage in prediction, according to Devi et al. (2023).

By systematically measuring relationships or comparing to identify trends, the findings provided essential data to strengthen the utilization of these targeted nutritional advocacy programs.

Research Locale

The study was carried out in chosen barangays in Tondo, Manila, particularly Barangay 67, with 8,825 residents, and Barangay 122, which has 6,962 residents. These barangays were chosen because of their significant presence of at-risk groups, including low-income families and households with children younger than five years old. In our first visit to Tondo, the barangay officials from these barangays emphasized the urgent necessity for assistance when it comes to nutritional health, especially for the children between 6 months old and 5 years old. This urgent issue highlighted the importance of conducting our study in these areas to evaluate food security challenges and refer these children to the nutritional programs of our Department of Health.

Tondo is among the most crowded places in Manila. A considerable portion of its overall population experiences food insecurity. According to Ruiz (2023), around 2.7 million Filipinos experience involuntary hunger, defined as "feeling hungry and lacking food to eat" because of severe poverty in the area.

The region is marked by increased poverty levels, with plenty of families unable to obtain adequate and healthy food. This socioeconomic status can result in their inhabitants to have malnutrition and associated health problems.

Tondo has acted as a key center for various government initiatives aimed at addressing food insecurity. Conducting the study in Tondo aligns with national goals to reduce food insecurity and malnutrition. A United Nations report indicates that nearly 51 million Filipinos faced moderate or severe food insecurity between 2020 and 2022, the highest number in Southeast Asia (Jocson, 2024). The study highlighted an urgent need for specific programs in places like Tondo to directly address and enhance food security for residents struggling with access to nutritious food.

Tondo was chosen for this research due to its notable struggles with food insecurity, existing health programs from local government and community groups, and a sizable population fitting the target demographic. This setup helps identify suitable participants for Department of Health initiatives aimed at boosting food security.

Population And Sampling Procedure

The study population consisted of households in selected barangays in Tondo where food insecurity and malnutrition are prevalent. The study population consisted of 100 family respondents. Wherein, the study primarily focused on vulnerable households that meet the following criteria: mothers aged 18 to 45 years old, families with at least one child aged 6 months to below 5 years old (particularly those who have started eating solid foods), and families classified as low income or lower-middle class. The study also included families with children who are not enrolled or have stopped participating in the Department of Health (DOH) nutrition programs, despite being previously enrolled. Children under five years old were chosen because they are the most vulnerable group and are often the poorest in society. They are dependent on proper nutrition for their growth, learning, and emotional well-being. Food insecurity in this group can significantly harm their health and development, making them a key focus for understanding and addressing the challenges faced by vulnerable families. The inclusion of mothers as respondents was essential because they were typically the primary caregivers responsible for their children's nutrition and overall well-being. These communities were specifically chosen to help achieve the goal of improving food security for vulnerable families.

This study used purposive sampling to select participants from barangays in Tondo with high concentrations of vulnerable groups. The selection process involving the identification of Barangay with high rates of malnutrition and food insecurity was selected with the collaboration of barangay health officers and the national health records survey. The researcher conducted brief interviews with mothers to confirm eligibility based on the inclusion criteria. In addition, households that meet the inclusion criteria were carefully selected to ensure that the study targets the most vulnerable. This process aligned with the data collection to ensure food security in the most affected communities of Tondo, with the study objectives.

Using this procedure, this study aimed to provide a general overview of the causes of food insecurity and identify areas where government food programs can be improved.

Research Instrument

The research instrument is based on the Philippine Action for Nutrition (PPAN) and World Health Organization (WHO) guidelines on child nutrition. A self-administered questionnaire was utilized in this study. The questionnaire focused on identifying if the selected families were experiencing food insecurity and the extent of the respondents' awareness regarding the Department of Health's Nutritional Health Program.

The instrument is in the form of a Filipino, and consists of three (3) parts. The first page of the questionnaire is all about the consent and an invitation letter to all the eligible vulnerable families as respondents; it is all about the comprehensive information regarding the study. The questionnaire has three (3) parts, which consist of Part one (1) the profile of the biological mothers' in terms of age; educational attainment; family status which consist of number of family member/s; number of working family member/s; total family monthly income; and the profile of the children in the household in terms of: age; sex; height; weight; BMI; The equipment that was used to measure the height and weight of the selected population was based on the recommendations of a nutritionist, whom the researcher consulted for instrument validation, to ensure the accuracy and reliability of the results for interpreting the BMI of the population.

Part Two (2) focuses on the four (4) pillars of food security: availability, accessibility, utilization, and stability. Each pillar represents a unique dimension of food security and is reflected in specific items in the questionnaire. Food availability is operationalized through items that assess the presence and variety of nutritious foods in the household and community, such as "Nutritious foods are easily available in local grocery stores or markets." Food accessibility refers to the household's economic and physical ability to obtain food and is measured by items assessing family income sufficiency and ability to purchase healthy foods, for example, "Myfamily's income is sufficient to buy nutritious food regularly." Food utilization reflects the proper use of food through dietary diversity, safe preparation, and feeding practices, captured in items like "We prepare a variety of foods that provide adequate nutrition as well as energy." Lastly, food stability examines the consistency and reliability of food supply over time, including preparedness for emergencies or seasonal shortages, measured by items such as "My family has a consistent food supply and stock at home." Part Two used a 4-point Likert frequency rating scale to determine the extent of performing each task, where 4 = Always, 3 = Often, 2 = Rarely,

and1=Never(Table1).

4	3.25-4.00	A	Always	Performed it all the time
3	2.50-3.24	O	Often	Performed it 6-9 times out of 10 occasions
2	1.75-2.49	R	Rarely	Performed it 1-5 times out of 10 occasions
1	1.00-1.74	N	Never	Did not perform it at all

Table 1. Likert Frequency Scale

Part three (3) of the questionnaire measured the extent of mothers' awareness of the following DOH programs to determine whether their level of awareness contributes to their food security status and the nutritional status of their children. The following programs applicable to the selected respondents are: Pinggang Pinoy, which has five (5) items; Expanded Garantisadong Pambata Program, which has five (5) items, Micronutrient Supplementation Program, which has five (5) items; Food Fortification Program, which has five(5) items; and Barangay Nutrition Scholar, which has five (5) items.

Part three (3) of the questionnaire used a Likert awareness rating scale, a 4-point rating scale. Which determined the extent of their knowledge about the given programs, where it was described as follows: The study specifically targeted vulnerable groups as identified by the World Health Organization (WHO) and aligned with the eligibility criteria of the Department of Health's (DOH) nutritional health programs

4		3.25-4.00	FA	Fully Aware	Possesses proficiency and knowledge on the program
3		2.50-3.24	A	Aware	Has adequate knowledge about the program
2		1.75-2.49	LA	Less Aware	Has little knowledge about the program
1		1.00-1.74	NA	Not Aware	Not aware at all

Table 2. Likert Awareness Scale

By structuring the questionnaire according to the four pillars of food security and linking them to DOH program awareness, the study ensures that the food security dimensions are systematically measured, allowing for reproducibility and analysis of the relationship between program awareness and household food security.

Construction And Validation

The questionnaire underwent several validations, namely; a licensed nutritionist, two licensed medical doctors specializing in pediatrics, and a healthcare professional with adequate experience and knowledge related to children and all the programs applicable for months old (6-12), toddlers one to three years old (1-3) and/or preschoolers three to five years old (3-5). These validators helped verify that the questionnaires were valid and relevant to the research topic and contributed to improving the instrument's content and face validity. After the validation process, it was subjected to a pilot study in two (2) selected barangays in Metro Manila. With fifteen(15) each barangay, totaling thirty (30) families as respondents to assess validity and reliability.

Before the pilot and actual study, the questionnaire was tested for content validity index to ensure that the questions in each part are reliable and accurate for their intended construct. The instrument underwent CVI calculation, and each item was rated on a 4-point scale, resulting in an average of highly relevant/acceptable, indicating accurate measurement of food security and awareness levels. The reliability test via Cronbach's alpha ranged from good to excellent.

The pilot study involved thirty (30) families as respondents within Barangay 67 and 122, but they were excluded from the actual data gathering. The pilot study was conducted face to face with printed survey questionnaires given to each respondent and asked to fill the survey form but before that it was explained by the researcher for them to be aware of their rights during the entire pilot gathering, it includes a consent letter was included in the questionnaire that was presented as an invitation to participate in the study and this ensured the respondents autonomy to participate and the right to decline from the study at any time without consequences. The survey questionnaire was distributed with the help of barangay officials and one barangay nutritional scholar. Respondents were guided by the researchers throughout the survey. The data gathered from the pilot study were

tallied and tested for internal consistency using Cronbach's alpha.

Sources Of Data

The survey relied primarily on data collected through a structured questionnaire administered to selected households in Tondo identified as having rates of food insecurity and malnutrition. The primary source of data is the mother of the children. The questionnaire used a 4-point Likert frequency scale to assess respondents' ability to meet the four food security criteria. In addition, the questionnaire assessed knowledge, awareness, and utilization of government nutrition programs, particularly the Department of Health's program aimed at improving child nutrition. Barangay health workers and local records were required to identify eligible households, verifying the accuracy of the information collected.

Data Gathering Procedure

To ensure a successful execution of the study, the researchers conducted several stages of data gathering procedure to implement a well-structured data gathering method.

Pre-data collection was done by securing permission and guidance from barangay officials of selected barangays and local health workers to gain access to demographic records and community health data to identify households that are a part of the target vulnerable populations with children aged six (6) months to five (5) years old.

A consent form was obtained prior to the conduction of study. A pilot study was conducted with 30 families to assess the feasibility and effectiveness of the research tools and methodology. This initial phase helped identify potential challenges in data collection, refined survey instruments, and ensured clarity and reliability in gathering information. The results from the pilot study guided necessary adjustments before full- scale implementation, ensuring a more accurate and comprehensive evaluation of food security among the target population.

This study utilized purposive sampling to target specific barangays known to have high rates of food insecurity and malnutrition, with the assistance of the barangay health workers and records. Eligible householdswill be identified based on the presence of at least one child aged six (6) months to five (5) years old. A screening phase was conducted through quick interviews with household heads to confirm eligibility. Once identified, households were purposively selected to ensure they met the inclusion criteria. The researchers dedicated an area to conduct the study free from distractions to ensure the reliability of the responses.

The respondents of this study are the biological mothers of the children aged 6 months to 5 years old, who are of legal age, eighteen (18) years old to forty-five (45) years old, and validators of the instrument are nutritionists, pediatricians, and qualified healthcare professionals who are of legal age and master's degree holders.

Ethical Considerations

Strict ethical compliance was implemented to maintain confidentiality, cultural sensitivity and obtain informed consent. In the conduct of the study, the researchers were guided by the following ethical considerations:

The researcher informed the respondents that there were no conflicts of interest or any potentially conflicting relationships, including financial ties or affiliations, between the researcher and the respondents regarding the study's subject matter. Additionally, the researcher had no personal or financial gain from the study, as it was conducted solely for research purposes and professional development.

The researcher took strict measures to protect the confidentiality and anonymity of all respondents. To prevent unauthorized access, all survey forms and identifying information was securely stored in a locked file cabinet under the researcher's personal supervision. Once the study was completed, presented, and/or published, all physical data were properly discarded through shredding. Identifying details were removed from the study results, ensuring that responses cannot be connected to any individual. Additionally, digital data was stored on a password-protected computer, with access limited only to the researchers, panel members, and advisory panel.

The research did not collect personal information from the participants other than what was needed. In assessing food security and awareness of DOH Nutritional Health Programs, their privacy was maintained since the

questionnaires did not contain any mention of the respondents' names and any other identifiers that can directly link them to the data.

Participation in this study was entirely voluntary. Respondents have the right to decline participation, and those who chose to take part were required to sign a consent form. Even after signing the consent form, respondents may withdraw from the study at any time without providing a reason, and this decision will not affect their relationship with the researcher.

The study involved biological mothers, who are the main caregivers of the target population, as respondents. Validators included pediatricians, nutritionists, and healthcare professionals who are of legal age and must be certified professionals or licensed practitioners. Participation in the study was completely voluntary. Respondents could choose not to join, and those who agreed to participate signed an Informed Consent Form to confirm they understood the study and willingly agreed to take part. Even after signing, they could withdraw at any time without providing a reason, and their decision will not affect their relationship with the researcher, if any exists.

Participants may experience slight mental stress while answering questions related to their food security status and awareness of DOH nutritional health programs. To reduce this risk, the researcher ensured that the questionnaire was clear, simple, and easy to understand. Additionally, respondents were given sufficient time to complete the questionnaire before retrieval to minimize pressure and ensure thoughtful responses**.**

The respondents directly benefit from the study as they were referred to local health centers and provided assistance through the following DOH nutritional health programs: Garantisadong Pambata, Food Fortification, Micronutrient Supplementation, Pinggang Pinoy, and the Barangay Nutrition Scholar program. This assistance was offered if they agreed to participate and were identified as having a need for these programs after their food security status was assessed.

The finished research paper will be part of the contribution to the institution’s collection of studies. This study may help future researchers to improve this research to make it more understandable to readers, to continue this for the sake of future problems that may or may not arise. This research study can be used by barangay officials to identify at-risk populations and prioritize interventions that effectively address food insecurity in their barangays. The results can guide the development of policies and localized programs to support food security, empowering officials to make data-driven decisions that address residents’ most pressing needs, ensuring that food access remains a public health priority.

Statistical Treatment of Data

The researchers utilized the following statistical treatments.

The study used descriptive and inferential statistics to analyze the collected data. A descriptive study was used to describe and provide a clear overview of the demographic and socioeconomic profile of the respondents as a baseline data about the vulnerable populations being studied.

Frequency and Percentage Distribution

Used to help describe the population's characteristics, and summarize categorical variables in terms of: profile of the biological mothers’ age, educational attainment, family status, which includes the number of family member/s, number of working family member/s, and monthly income. Profile of the children in the household in terms of age, sex, height, weight, and BMI. The frequency for each variable will be divided by the total number of respondents, and then multiplied by 100**.**

Where:

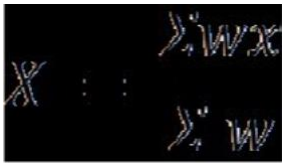
%= Percentage
F= Frequency

N= Total number of Respondents

Weighted Mean

Weighted mean is an average calculated by giving values in a data set more influence on some attribute of the data. An average in which each quantity to be averaged is assigned a weight, and these weightings determine the relative importance of each quantity in the average. The researcher used a weighted mean statistical tool to compute the weight of the responses in the questionnaire assigned by the respondents during the actual data gathering procedure.

The formula for the weighted mean is as follows:



Where:

x = the repeating value

w = the number of occurrence of x (weight) 
= the weighted mean

The researcher utilized a Likert frequency rating scale, a Four-Point scale in part two (2) of the questionnaire to determine the extent of doing a certain task, which will determine the food security status of a family and its connection to the target groups' nutritional status.

The following are the corresponding verbal interpretations for the weighted mean.

Scale		Corresponding Remarks	Weighted Means/Equivalent
4	A	Always	3.25-4.00
3	S	Sometimes	2.50-3.24
2	R	Rarely	1.75-2.49
1	N	Never	1.00-1.74

Table 3. Likert Frequency Scale Verbal Interpretations

For part three (3) of the questionnaire, the researchers utilized the same formula for the weighted mean, where a Likert awareness rating scale, a 4-point scale, which measures the extent of the mother's knowledge about the given programs.

The following are the corresponding verbal interpretations for the weighted mean.

Scale		Corresponding Remarks	Weighted Means/Equivalent
4	FA	Fully Aware	3.25-4.00
3	A	Aware	2.50-3.24
2	LA	Less Aware	1.75-2.49
1	NA	Not Aware	1.00-1.74

Table 4. Likert Frequency Scale Verbal Interpretations

ANOVA

For inferential analysis, **One-Way Analysis of Variance (ANOVA)** was employed to determine significant differences in: (1) food security status across child profile categories; and (2) awareness scores across mothers'

profile categories. ANOVA assumptions of random sampling, normality, and homogeneity of variances were also tested. Fisher's F-test, which compares the variance between groups to the variance within groups, was used to determine whether the differences among group means were statistically significant. Significant ANOVA results were further examined using Tukey HSD post-hoc tests also discussed below.

The ANOVA F-ratio was computed as: Where:

- **F** – Variance ratio for the overall test
- **MST** – Mean square due to treatments/groups (between groups)
- **MSE** – Mean square due to error (within groups, residual mean square)
- **Yij**– Observation
- **Ti** – Group total
- **G** – Grand total of all observations
- **ni** – Number of observations in group i
- **n** – Total number of observation

Assumptions:

1. Samples are random.
2. Observations in each population are normally distributed.
3. Variances of observations in each population are equal.

Post Hoc Tests

Following a significant ANOVA result, a Tukey Honestly Significant Difference (HSD) test was conducted to identify which specific group means differed from each other. The Tukey HSD is designed for pairwise comparisons while controlling the overall Type I error rate.

The Tukey HSD statistic is calculated as:

Where:

- **q** = Studentized range statistic (from Tukey's distribution table, based on number of groups and error degrees of freedom)
- **MSE** = Mean Square Error (within-group variance from ANOVA table)
- **n** = number of observations per group (or harmonic mean if unequal sample sizes)

If the absolute difference between two group means exceeds the HSD value, the difference is considered statistically significant.

Assumptions:

Same as the ANOVA: random sampling, normal distribution within each group, and equal variances.

Presentation, Analysis, And Interpretation Of Data

Demographic and Socioeconomic Profile of the Biological Mothers: Age, Educational Attainment, Employment

Status, Number of Family Members, Number of Working Members, and Family Income Classification

Table 1.Distribution of Biological Mothers According to Age

Age Bracket	Frequency	Percentage	Rank
18-23	26	26.0	3
24-29	32	32.0	1
30-35	29	29.0	2
36-40	8	8.0	4
40-45	5	5.0	5
Total	**100**	**100.0**	

As presented in Table 1, the majority of the biological mothers fall within the 24–29 age bracket, accounting for 32% of the total respondents, ranking first among all age groups. This is followed closely by the 30–35 age group, comprising 29% and ranking second. The 18–23 age group ranks third with 26% of the respondents. Meanwhile, only 8% of the mothers are aged 36–40, and the smallest proportion, 5%, falls within the 40–45 age group, ranking fourth and fifth, respectively. This indicates that most biological mothers in the selected barangays are within their mid-twenties to mid-thirties, reflecting a relatively young maternal population. According to the 2020 Census, the median age of the Philippine population is 25.3 years, showing a high concentration of individuals and potential mothers in the 20–29 age range (Philippine Statistics Authority, 2021). Likewise, the United Nations reports that over 60% of registered births in the Philippines come from mothers aged 20–24 and 25–29. Both the local and national data highlight that the 24–29 age group is the most dominant in childbearing. However, the local data provides a more specific breakdown by separating the 18–23 and 24–29 groups, while the national data combines 20–24 and 25–29. This difference shows that the local data gives a clearer view of younger mothers compared to the broader national groupings.

As shown in Table 2, the largest proportion of biological mothers are high school graduates, comprising 27% of the respondents and ranking first. This is followed by college undergraduates at 17% (ranked second) and college graduates at 16% (ranked third). High school undergraduates make up 15% of the total, while elementary undergraduates account for 11%.

Table 2.Distribution of Biological Mothers According to Highest Educational Attainment

Highest Educational Attainment	Frequency	Percentage	Rank
College Graduate	16	16.0	3
College Undergraduate	17	17.0	2
Vocational	8	8.0	7
High School Graduate	27	27.0	1
High School Undergraduate	15	15.0	4
Elementary Graduate	6	6.0	6
Elementary Undergraduate	11	11.0	5
Total	**100**	**100.0**	

A smaller portion, 8%, completed vocational courses, and the smallest group consists of elementary graduates at 6%, ranking sixth and seventh, respectively. These results indicate that while a significant portion of biological mothers have reached at least high school level, a relatively smaller segment has completed higher education or only elementary education. This suggests a moderate educational attainment profile among the respondents, with potential implications for access to employment and health-related knowledge.

According to Augustine and Kithu (2020), households headed by individuals with only primary or secondary education are more likely to experience severe food insecurity due to limited skills, lack of job opportunities, and career mismatches. Similarly, according to Panjaitan et al. (2024) study in Indonesia demonstrated that higher educational attainment (secondary education or above) among household heads correlated significantly with improved food security. While our study did not isolate gender as a variable, a consistent pattern emerges:

education level influences food security outcomes, likely by enhancing resource management and nutritional knowledge in low-income settings. Food insecurity is more prevalent among those without higher education, as education enhances decision-making and resource management. Compared to these studies, the respondents' moderate education level may pose similar risks, although the presence of vocational graduates suggests a potential for improved outcomes if skills are effectively applied. This suggests that targeted adult education initiatives could strengthen food security even in our study's context.

Table 3. Distribution of Biological Mothers According to Employment Status

Employment Status	Frequency	Percentage	Rank
Employed	29	29.0	2
Self-Employed	14	14.0	3
Unemployed	57	57.0	1
Total	**100**	**100.0**	

As displayed in Table 3, the majority of the biological mothers are unemployed, accounting for 57% of the total respondents, ranking first among the employment categories. This is followed by those who are employed, making up 29% and ranked second. Meanwhile, 14% of the respondents are self-employed, ranking third. These findings highlight that more than half of the biological mothers lack formal employment, which may have implications for household income stability and overall food security. This underscores the need for targeted interventions that address economic vulnerability to support nutrition and well-being in these households. According to Antwi and Lyford (2021), an increase in household monthly income significantly raises the likelihood of achieving high food security, indicating that stable employment plays a key role in improving nutritional outcomes. Compared to these findings, the high unemployment rate among respondents suggests a potential barrier to food security, as limited income sources may hinder their ability to consistently access sufficient and nutritious food.

Table 4. Distribution of Biological Mothers According to Number of Family Members

Number of Family Members	Frequency	Percentage	Rank
2	7	7.0	5
3	34	34.0	1
4	30	30.0	2
5	9	9.0	4
More than 5	20	20.0	3
Total	**100**	**100.0**	

As demonstrated in Table 4, the majority of biological mothers belong to families with 3 members, accounting for 34% of the total respondents and ranking first. This is followed by families with 4 members, comprising 30% and ranked second. Families with more than 5 members make up 20% of the respondents, ranking third, while families with 5 members represent 9%, ranked fourth. The smallest proportion, 7%, consists of families with only 2 members, ranking fifth. These findings indicate that most biological mothers are part of small to medium-sized households, with a notable portion belonging to larger families, which may affect resource allocation, nutrition, and food security within the household.

According to a study by Manyong et al. (2024) in the Democratic Republic of Congo, which revealed that larger households (more than 18 members) had significantly lower food consumption scores due to reduced per-capita food availability. While this study focused on smaller households (2-5 members), the broader trend remains consistent: as family size increases, food resources become more strained, potentially exacerbating food insecurity—particularly in low-income settings like the surveyed barangays, which reduces per-person intake and increases the risk of malnutrition.

However, in contrast, Maitra and Rao (2020) found that in urban areas, larger households can actually be more food-secure because they are more likely to have multiple income earners contributing to the household's resources. Compared to these findings, the current results show that while many families are small to medium in size, the presence of larger families could either increase food insecurity, as suggested by Manyong, or improve it, as suggested by Maitra and Rao, depending on how many members are able to contribute economically.

Table 5.Distribution of Biological Mothers According to Number of Working Family Members

No. of Working Family Members	Frequency	Percentage	Rank
None	4	7.0	3
1	64	64.0	1
2	27	27.0	2
3	0	0.0	5
Above 3	5	5.0	4
Total	**100**	**100.0**	

As illustrated in Table 5, the majority of the biological mothers reported having 1 working family member, accounting for 64% of the respondents and ranking first. This is followed by households with 2 working members, making up 27% and ranked second. A small proportion, 7%, reported having no working family members, while 5% indicated having more than 3 working members, ranking third and fourth, respectively. Notably, no respondents reported having exactly 3 working members. These findings suggest that most families rely on a single income earner, which may pose challenges to household financial stability and food security, especially in vulnerable communities.

According to Angeles-Agdeppa (2022), 65.8% of Filipino households during the COVID-19 pandemic had only one working member, and these households experienced higher rates of moderate to severe food insecurity. Similarly, according to Delgado and Santos (2024), over 60% of households in the agri-food system relied on a single income source, with an average of 1.9 working members per family, making them vulnerable during economic shocks. These findings are consistent with the current data, which show that most families depend on one breadwinner, highlighting a similar pattern of economic insecurity. However, while the studies of Leyco and Herrera and of Delgado and Santos present a national and sectoral perspective, the current study focuses on biological mothers, providing a more specific view of how income concentration may affect food security in a localized context.

Table 6. Distribution of Biological Mothers According to Family Income Classification

Family Income Classification	Frequency	Percentage	Rank
Less than PHP 10,957Low Income (Poor)	55	55.0	1
PHP 10,957-21,914Low Income (Not Poor) / Lower Middle Income	29	29.0	2
PHP 21,194-43,828Lower Middle Income to Middle Income	16	16.0	3
Total	**100**	**100.0**	

As highlighted in Table 6, the majority of the biological mothers fall under the Low Income (Poor) classification, with 55% of respondents earning less than PHP 10,957 monthly, ranking first. This is followed by 29% who are classified as Low Income (Not Poor) / Lower Middle Income, earning between PHP 10,957 and PHP 21,914, ranking second. Meanwhile, 16% belong to the Lower Middle Income to Middle Income group, with a monthly income of PHP 21,915 to PHP 43,828, ranking third. These findings reveal that more than half of the respondents are living below the poverty line, highlighting significant economic vulnerability. This emphasizes the urgent need for nutrition and livelihood support programs to improve food security among these families.

According to the World Food Programme (2021), 44.7% of Filipinos experienced moderate to severe food insecurity, especially in poor and rural areas. This supports the current data, where most respondents are low-income, showing a clear connection between poverty and food insecurity. Similarly, the World Bank reported

that the pandemic worsened economic conditions in low- and middle-income countries like the Philippines, especially for informal workers and households depending on remittances. Compared to wealthier nations that had strong financial support systems, poorer countries could not offer the same level of help. This contrasts with the situation in richer countries, showing that respondents in this study are not only vulnerable due to low income, but also because they live in a setting with limited support, making them even more at risk.

Statement of the Problem No. 2

Profile of Children in the Household in Terms of Age, Sex, Height, Weight, and Body Mass Index (BMI)

Table 7. Distribution of Children in the Household According to Age

Age Group	Age Range	Frequency	Percentage (%)	Rank
Infant	0.6 – <1.0 years	9	9.0	3
Toddler	1.0 – <3.0 years	55	55.0	1
Preschooler	3.0 – 5.0 years	36	36.0	2
Total		100	100.0	

As revealed in Table 7, the majority of children in the household are classified as toddlers, aged 1.0 to less than 3.0 years, accounting for 55% of the total respondents and ranking first. Preschoolers, aged 3.0 to 5.0 years, make up 36% and rank second, while infants aged 6 months to less than 1 year constitute 9% of the total, ranking third. These results indicate that most children in the households fall within the toddler age group, suggesting a developmental stage where nutritional needs are especially critical for growth and health. This highlights the importance of targeted nutrition interventions focused on the early childhood years.

According to Smith et al. (2023), toddlers typically represent the largest proportion of children under five, with 53% in their cohort, which is similar to the 55% found in this study. Additionally, the U.S. Department of Agriculture (2020) emphasizes that toddlers have the highest nutritional requirements and are most vulnerable to nutrient deficiencies, supporting the focus on this age group. While both the current study and these sources identify toddlers as a key group with critical nutritional needs, the current data provides a localized perspective on household child age distribution, reinforcing the universal importance of tailored nutrition interventions during early childhood.

Table 8.Distribution of Children in the Household According to Sex

Sex	**Frequency**	**Percentage**	**Rank**
Male	52	52.0	1
Female	48	48.0	2
Total	**100**	**100.0**	

As reported in Table 8, slightly more than half of the children in the household are male, accounting for 52% of the total respondents and ranking first.

Female children make up 48% of the population, ranking second. The distribution shows a relatively balanced sex ratio between male and female children, indicating no significant gender disparity in the household composition.

Across low- and middle-income contexts, the sex ratio at birth and among under-5 children remains close to parity. In the Philippines' 2020 population, the 0–4 age cohort was 51% male and 49% female, which closely matches the current sample's 52% male and 48% female breakdown.

Globally, the standard sex ratio at birth (approximately 105 males per 100 females) results in a near-balanced distribution by preschool age (World Health Organization, 2023). These findings align with the current data, suggesting that the household child sex composition in the study reflects broader demographic patterns without significant gender imbalance.

Table 9. Children's Height, Weight, and Body Mass Index (BMI)

Classification	Mean	Standard deviation	Interpretation
Height (m)	0.884	0.136	Slightly below average; possible stunting.
Weight (kg)	12.9	4.04	Within normal range.
Body Mass Index BMI (kg/m^2)	16.4	3.3	Normal to mildly underweight.

As indicated in Table 9, the children's average height is 0.884 meters with a standard deviation of 0.136. This value is slightly below the expected average height for children in the 1–5 year age range based on global growth standards, suggesting that some children in the household may be experiencing mild to moderate stunting. Stunting is often linked to chronic malnutrition and can have long-term effects on a child's physical and cognitive development if not addressed early.

The average weight of the children is 12.9 kilograms with a standard deviation of 4.04, indicating that, on average, the children's weight falls within the normal range for their age group, though the relatively wide standard deviation shows some variation in weight status across respondents. The Body Mass Index (BMI), which is a key indicator of nutritional status, has a mean of 16.4 kg/m^2 with a standard deviation of 3.3. This suggests that most children are within the normal range, though there are indications of mild underweight cases based on BMI-for-age classifications. Overall, these findings highlight the importance of continuous monitoring of children's growth and development and reinforce the need for targeted nutrition interventions, especially for children showing signs of stunting or underweight, to improve their health outcomes and prevent future risks associated with malnutrition.

According to Ulep et al. (2021), Filipino children aged 1–5 show mild to moderate stunting in about 21% of cases, even though the average BMI-for-age remains in the normal range, similar to the findings in this study. Likewise, the World Health Organization (2023) reported that 22% of children under five in Southeast Asia are stunted, signaling chronic malnutrition concerns despite generally adequate weight levels. These findings align with the current data, which also shows average height slightly below global standards and BMI within normal range, but with variations indicating underweight cases. While Gonzales and Cruz focused on national-level z- scores, the present study offers direct household data, yet both reflect the same underlying issue: children may appear healthy in weight but still suffer from chronic nutritional deficiencies affecting their growth.

Table 10. Body Mass Index (BMI) Classification of Children in the Household

Body Mass Index	BMI	Frequency	Percentage	Rank
$<18.5\ kg/m^2$	Underweight	84	84.0	1
$18.5–24.9\ kg/m^2$	Normal weight	13	13.0	2
$\geq 25.0\ kg/m^2$	Overweight	3	3.0	3
Total		**100**	**100.0**	

As outlined in Table 10, a significant majority of the children in the household, 84%, have a Body Mass Index (BMI) of less than 18.5 kg/m^2, classifying them as underweight. This group ranks first and indicates a high prevalence of undernutrition, which may be attributed to factors such as inadequate food intake, poor dietary diversity, or underlying health conditions affecting nutrient absorption. Meanwhile, 13% of the children fall within the normal weight category, with BMI values ranging from 18.5 to 24.9 kg/m^2, ranking second.

This suggests that only a small portion of the population maintains a BMI within the healthy range for their age group. Lastly, 3% of the children are classified as overweight, with BMI values equal to or greater than 25.0 kg/m^2, ranking third. Although this group represents a minor segment of the population, it is important to monitor to prevent long-term risks associated with childhood overweight and obesity. Overall, these results reveal a critical concern, as the high proportion of underweight children points to widespread nutritional challenges in the community. This underscores the urgent need for comprehensive nutrition programs, proper health monitoring, and community-based interventions to address malnutrition, improve food security, and promote optimal growth

and development among vulnerable children.

According to the Global Nutrition Report (2023), 24% of children under five in Southeast Asia are underweight, 14% have a normal BMI, and 3% are overweight. These numbers are similar to the current study's findings of 84% underweight, 13% normal, and 3% overweight, although the percentage of underweight children in this community is much higher. Peng et al. (2020) explained that both undernutrition and the early signs of overweight should be addressed together. While regional data gives a broader view, the current findings show that underweight is a more serious problem in this specific community.

The high number of underweight children creates an apparent contradiction when compared with the consistently high utilization ratings reported by the respondents. Although mothers indicate that they practice proper food preparation, hygiene, and child feeding, these practices may not always be fully applied in daily life due to financial limitations, food prices, or limited food choices. In many cases, children may be receiving enough food in terms of quantity, but the food lacks sufficient nutritional quality and variety needed for healthy growth. These findings suggest that proper food utilization alone is not enough to prevent undernutrition unless it is supported by improved dietary diversity, adequate household resources, and access to nutrient-rich foods.

Statement of the Problem No. 3

Evaluation of Food Security Status Across Availability, Accessibility, Utilization, and Stability Dimensions

Table 11. Assessment of Respondents on Food Security Status in terms of Availability

Indicators	Weighted Mean	Standard Deviation	Verbal Interpretation	Rank
Nutritious foods are available in local grocery stores or markets.	3.43	0.590	Always	3
Nutritious foods such as fruits and vegetables are affordable in my area.	3.41	0.653	Always	4
Seasonal-only foods remain available in our local market.	3.07	0.832	Sometimes	5
We can purchase fresh meat in my area.	3.46	0.658	Always	2
The availability of nutritious food options meets my family's needs.	3.54	0.673	Always	1
Overall Mean	3.38	0.427	Always	

As described in Table 11, the assessment of respondents on food security status in terms of availability shows an overall mean of 3.38, verbally interpreted as "Always." Among the indicators, the highest-rated is the statement "The availability of nutritious food options meets my family's needs," with a weighted mean of 3.54, ranked first. This is followed by "We can purchase fresh meat in my area," with a mean of 3.46, ranking second. "Nutritious foods are available in local grocery stores or markets" ranks third, with a mean of 3.43, while "Nutritious foods such as fruits and vegetables are affordable in my area" ranks fourth at 3.41.

The lowest-rated indicator is "Seasonal-only foods remain available in our local market," with a mean of 3.07, ranking fifth. These findings suggest that while nutritious foods are always available, there are gaps in consistent access, especially for seasonal items and affordable fresh produce, indicating the need for improvements in local food availability to ensure sustainable food security for the respondents.

According to Parel (2022) in *Local Solutions Toward Food Insecurity*, long food supply chains contribute to higher costs and reduced freshness by the time food reaches consumers, a key factor in the gaps observed in affordability and seasonal availability.

One of the solutions being pushed is shorter food supply chains, where the farmers should sell directly to consumers, and urban farming to strengthen local food access and help when supply chains break.

Table 12. Assessment of Respondents on Food Security Status in terms of Accessibility

Indicators	**Weighted Mean**	**Standard Deviation**	**Verbal Interpretation**	**Rank**
I am aware of the considered healthy ingredients that I must buy at the market.	3.66	0.497	Always	2
There is an available market near our house.	3.72	0.668	Always	1
The family income is enough to buy various healthy ingredients for the whole family's meals.	3.33	0.779	Always	4
I purchase nutritious ingredients at the nearest market to ensure that buying is safer and more convenient.	3.56	0.729	Always	3
We consume our crops like vegetables and fruits.	1.82	1.158	Rarely	5
Overall Mean	**3.22**	**0.402**	**Sometimes**	

As detailed in Table 12, the assessment of respondents on food security status in terms of accessibility yielded an overall mean of 3.22, verbally interpreted as "Sometimes." The highest-rated indicator is "There is an available market near our house," with a weighted mean of 3.72, ranked first, indicating that most respondents have physical access to food markets. The second-highest is "I am aware of the considered healthy ingredients that I must buy at the market," with a mean of 3.66, showing good awareness of nutritious options. Ranking third is "I purchase nutritious ingredients at the nearest market to ensure that buying is safer and more convenient," with a mean of 3.56. In contrast, "The family income is enough to buy various healthy ingredients for the whole family's meals" ranks fourth at 3.33, suggesting financial constraints in accessing diverse healthy foods. The lowest-rated indicator is "We consume our crops like vegetables and fruits," with a mean of 1.82, interpreted as "Rarely," highlighting limited self-sufficiency through home-grown produce. These results indicate that while physical access and awareness are generally good, economic factors and low reliance on homegrown food limit overall food accessibility for many respondents. In relation to this data, a study by Lal, R., (2020), where they studied the benefits of home gardening and urban agriculture to stop the advancing food insecurity in response to COVID-19 Pandemic, highlights untapped potential for urban agriculture interventions such as home gardening and hydroponics, to complement market access while improving food supply of these urban homes.

Table 13. Assessment of Respondents on Food Security Status in terms of Utilization

Indicators	Weighted Mean	Standard Deviation	Verbal Interpretation	Rank
I am knowledgeable on how to prepare nutritious foods that are suitable for my child's age and needs.	3.68	0.510	Always	2
I use fresh ingredients in preparing our meals.	3.55	0.609	Always	4
Leftover food is used efficiently in our household.	3.42	0.819	Always	5
I make sure to include the necessary nutrients in my child's meals that support their health and development.	3.64	0.560	Always	3
I ensure meals are prepared safely and hygienically.	3.78	0.579	Always	1
Overall Mean	3.61	0.442	Always	

As reflected in Table 13, the respondents' assessment of food security status in terms of utilization resulted in an overall mean of 3.61, verbally interpreted as "Always." The highest-rated indicator is "I ensure meals are prepared safely and hygienically," with a weighted mean of 3.78, ranked first, reflecting a strong emphasis on food safety and hygiene. This is followed by "I am knowledgeable on how to prepare nutritious foods that are suitable for my child's age and needs," with a mean of 3.68, ranking second. "I make sure to include the necessary nutrients in my child's meals that support their health and development" ranks third, with a mean of 3.64. "I use fresh ingredients in preparing our meals" is fourth, with a mean of 3.55, while the lowest-rated indicator is "Leftover food is used efficiently in our household," with a mean of 3.42, interpreted as "Sometimes" and ranked fifth. These findings suggest that while respondents consistently practice safe food preparation and prioritize

nutritional quality, there may be room for improvement in food resource management, particularly in efficiently utilizing leftovers to minimize waste. Similarly, a study by Nimeshika et.al. (2023) identifies household food waste as a major contributor to global food insecurity, as it particularly highlights inefficient leftover management as a key concern, noting that while many households possess adequate food preparation knowledge, they often lack effective strategies for repurposing leftovers.

Although food utilization was consistently rated as "Always," this rating is based on mothers' self- reported knowledge and everyday practices, not on direct measures of children's nutritional intake or growth. High utilization scores may therefore show that mothers are aware of proper feeding, food preparation, and hygiene practices and intend to follow them. However, this does not always mean that children consistently receive enough nutrients, especially in households with limited income, rising food prices, or restricted access to diverse and nutritious foods.

Table 14. Assessment of Respondents on Food Security Status in terms of Stability

Indicators	Weighted Mean	Standard Deviation	Verbal Interpretation	Rank
I am knowledgeable about how to maintain a consistent food supply and stock for my family.	3.45	0.702	Always	3
We store extra food to prepare for food shortages.	3.20	0.888	Sometimes	5
I manage my family's income effectively to ensure we can always afford to buy food for daily consumption.	3.49	0.785	Always	1
I keep track of food stock levels at home to ensure we never run out of essential supplies.	3.27	0.827	Always	4
I am confident that my family can maintain food supply even during emergencies.	3.48	0.772	Always	2
Overall Mean	**3.38**	**0.612**	**Always**	

As highlighted in Table 14, the respondents' assessment of food security status in terms of stability shows an overall mean of 3.38, verbally interpreted as "Always." The highest-rated indicator is "I manage my family's income effectively to ensure we can always afford to buy food for daily consumption," with a weighted mean of 3.49, ranking first. This is followed closely by "I am confident that my family can maintain food supply even during emergencies," with a mean of 3.48, ranked second. "I am knowledgeable about how to maintain a consistent food supply and stock for my family" ranks third at 3.45, reflecting moderate awareness of food stock management. Ranking fourth is "I keep track of food stock levels at home to ensure we never run out of essential supplies," with a mean of 3.27. The lowest-rated indicator is "We store extra food to prepare for food shortages," with a mean of 3.20, ranked fifth. These findings suggest that while respondents exhibit high confidence and financial management to maintain food security, there is less emphasis on actual preparedness practices such as food storage, highlighting an area for improvement in building resilience against food supply disruptions. According to Abid et.al. (2025), their study demonstrates that enhanced consumer education regarding proper food storage practices can significantly decrease household waste percentage, yielding economic benefits through cost-effective practices, and enhancing food safety standards. These findings suggest implementing targeted educational initiatives could effectively promote sustainable food consumption patterns while optimizing household resource utilization.

Table 15. Summary Assessment of Respondents on Food Security Status

Variables	Weighted Mean	Standard Deviation	Verbal Interpretation	Rank
Availability	3.38	0.427	Always	2.5
Accessibility	3.22	0.402	Sometimes	4
Utilization	3.61	0.442	Always	1
Stability	3.38	0.612	Always	2.5
Overall Mean	**3.40**	**0.387**	**Always**	

As depicted in Table 15, the summary assessment of respondents on food security status shows an overall mean of

3.40, verbally interpreted as "Always," indicating a high level of food security among the households. Among the four variables, "Utilization" ranks highest with a weighted mean of 3.61, interpreted as "Always," suggesting that respondents are consistently practicing good food preparation, hygiene, and nutritional habits. "Availability" and "Stability" both have the same weighted mean of 3.38, ranking jointly at 2.5, showing that respondents rarely experience challenges in having consistent access to sufficient and reliable food supplies. "Accessibility" ranks the lowest with a weighted mean of 3.22, indicating that while physical and financial access to food exists, it is not consistently reliable for all respondents. These findings highlight that while the utilization, availability and stability of food are the strength in the community, efforts are still needed to improve food accessibility to achieve comprehensive food security. A related study by the Philippine Institute for Development Studies (2022) highlighted ongoing challenges in food supply chain stability, noting consistent issues caused by increasing market prices, logistic inefficiencies, and inadequate agricultural infrastructure. While certain areas have seen progress in food accessibility and availability in some regions in the Philippines, food stability remains a critical problem.

The overall food security rating of "Always," with utilization ranking highest, indicates that households generally report good food preparation, feeding, and management practices. However, this overall score may not fully reflect the actual nutritional condition of children. Even when families believe they are managing food well, children may still experience undernutrition due to factors such as limited food quality, insufficient dietary diversity, or unequal distribution of food within the household. This suggests that positive household food practices do not always result in adequate growth and nutritional outcomes for children.

Statement of the Problem No. 4

The extent of the respondents' awareness regarding the Department of Health Nutritional Health Program

This section exhibits the respondents' level of awareness of various Department of Health (DOH) nutritional health programs, including Pinggang Pinoy, the Expanded Garantisadong Pambata Program, Micronutrient Supplementation, the Food Fortification Program, and the Barangay Nutrition Scholar (BNS) Program. Understanding their awareness helps assess the reach and effectiveness of these health initiatives.

Table 16. Assessment of Respondents on Level of Awareness in terms of Pinggang Pinoy

Indicators	Weighted Mean	Standard Deviation	Verbal Interpretation	Rank
The Department of Health (DOH) promotes healthy eating habits based on Pinggang Pinoy guidelines.	2.83	1.016	Sometimes	5
Pinggang Pinoy comprises three food groups consisting of Go, Grow, and Glow foods.	3.15	0.869	Sometimes	4
Go foods are energy foods high in carbohydrates, mainly consisting of grains or starchy foods like rice, bread, or pasta.	3.23	0.839	Sometimes	2
Grow foods are high in protein that helps build the body, mainly consisting of meat (white and red), dairy, and eggs.	3.17	0.817	Sometimes	3
Glow foods boost the immune system and are rich in vitamins and minerals, mainly consisting of fruits and vegetables.	3.26	0.848	Always	1
Overall Mean	**3.13**	**0.747**	**Sometimes**	

As seen in Table 16, the respondents' level of awareness regarding Pinggang Pinoy has an overall weighted mean of 3.13, which is interpreted as 'Sometimes'. The highest awareness was for the indicator about 'Glow foods', including fruits and vegetables that enhance immunity, with a mean score of 3.26. This was followed by the awareness of 'Go foods', which provide energy through carbohydrates like rice, bread, and pasta, earning a mean

of 3.23. 'Grow foods', which are protein-rich and support body development, came next with a mean of 3.17. The overall concept that Pinggang Pinoy consists of these three food groups—Go, Grow, and Glow—was ranked fourth with a mean of 3.15. The lowest awareness, with a mean score of 2.83, was about the Department of Health's promotion of healthy eating habits through Pinggang Pinoy. These results suggest that while respondents have a moderate understanding of the food groups, there is a gap in their recognition of the Department of Health's efforts in promoting this nutritional guide, pointing to the need for enhanced outreach and educational initiatives. A similar study by Mandano in 2023 assessed individuals aged 20-30 in Lipa City, Philippines, revealing that more than half of the respondents had limited knowledge of Pinggang Pinoy, suggesting that current nutrition education efforts may need strengthening to better translate knowledge into behavioral changes.

Table 17. Assessment of Respondents on Level of Awareness in terms of Expanded Garantisadong Pambata (EGP)

Indicators Weighted Mean			**Standard Deviation**	**Verbal Interpretation**	**Rank**
1. Expanded Garantisadong Pambata promotes proper nutrition among aged 1-10 years old.	program childrn	3.11	0.815	Sometimes	2
0. Expanded Garantisadong Pambata	program	3.07	0.902	Sometimes	3
provides vitamins for infants aged 12-59 months old.					
• Vitamin A capsule (12-59 months old, nationwide 9-12 months old infants receiving AMV nationwide					
• Ferrous Sulfate (2-11 months old infants)					
0. Expanded Garantisadong Pambata program provides a deworming drugs program for children aged 36-59 months old.		3.03	0.958	Sometimes	4
0. Expanded Garantisadong Pambata program provides a weighing program for children aged 0-59 months old.		3.14	0.975	Sometimes	1
0. Expanded Garantisadong Pambata program also provides a Sangkap Pinoy program which includes that the food prepared for infants and children should include high sources of Vitamin A, Iron, and Iodine.		3.01	0.959	Sometimes	5
Overall Mean		**3.07**	**0.759**	**Sometimes**	

As depicted in Table 17, the respondents' assessment of their awareness regarding the Expanded Garantisadong Pambata (EGP) program shows an overall mean of 3.07, verbally interpreted as "Sometimes," indicating moderate awareness. The highest-rated indicator is awareness of the weighing program for children aged 0–59 months, with a weighted mean of 3.14, ranked first. This is followed by the program's promotion of proper nutrition among children aged 1–10 years old, with a mean of 3.11, ranked second. Awareness of the vitamin supplementation component for infants (Vitamin A and Ferrous Sulfate) ranks third at 3.07, while knowledge of the deworming program for children aged 36–59 months is slightly lower, at 3.03, ranked fourth. The lowest-rated indicator is the Sangkap Pinoy program, which emphasizes the inclusion of Vitamin A, Iron, and Iodine in food, with a mean of 3.01, ranked fifth. These findings suggest that while respondents have moderate awareness of the EGP's main health services, such as weighing and nutritional promotion, there is a slightly lower awareness of the specific micronutrient and Sangkap Pinoy components, highlighting the need for targeted education to ensure a more comprehensive understanding of the program's full benefits. According to National Economic and

Development Authority (2020), Barangay Nutrition Scholars (BNS) are the cornerstone of the Philippine Plan of Action for Nutrition, as they are the ones responsible for enhancing community health through participatory nutrition programs that connect families with essential food and health services, improving access to vital resources such as encouraging these families to engage in Nutritional Health Programs such as Expanded Garantisadong Pambata Program.

Table 18. Assessment of Respondents on Level of Awareness in terms of Micronutrient Supplementation Program

Indicators	Weighted Mean	Standard Deviation	Verbal Interpretation	Rank
Our local health center is currently implementing a micronutrient supplementation program to serve community members.	2.98	0.921	Sometimes	3
The program provides Vitamin A supplementation for children aged 6–59 months to prevent Vitamin A Deficiency (VAD) and risks such as blindness and weakened immunity.	3.08	0.918	Sometimes	1
The Micronutrient Supplementation Program provides iron supplementation (Ferrous Sulfate), iodine, and vitamins for infants aged 6–11 months to prevent and manage iron deficiency anemia.	3.00	0.985	Sometimes	2
The program includes me in their Multiple Micronutrient Supplementation (MMS) to ensure proper nutrition for both my child and me.	2.73	1.004	Sometimes	5
The DOH Micronutrient Supplementation Program integrates nutrition education and counseling for mothers on the importance of a well-balanced diet and food fortification for children through nutritional campaigns.	2.81	0.992	Sometimes	4
Overall Mean	2.92	0.847	Sometimes	

As highlighted in Table 18, the respondents' assessment of their awareness regarding the Micronutrient Supplementation Program yielded an overall mean of 2.92, verbally interpreted as "Sometimes," indicating a moderate awareness level.

The highest-rated indicator is "The program provides Vitamin A supplementation forchildren aged 6–59 months to prevent Vitamin A Deficiency (VAD) and risks like blindness and weakened immunity," with a weighted mean of 3.08, ranked first.

This is followed by awareness of Iron supplementation for infants aged 6–11 months, which ranked second with a mean of 3.00, and knowledge that a micronutrient supplementation program is being implemented at the local health center, which ranked third at 2.98.

Awareness of nutrition education and counseling services integrated into the program ranks fourth, with a mean of 2.81. The lowest-rated indicator is the inclusion of respondents in the Multiple Micronutrient Supplementation (MMS) component, with a mean of 2.73, ranked fifth.

These findings suggest that while respondents are generally aware of the core aspects of the micronutrient program—particularly Vitamin A and Iron supplementation—there is less awareness of maternal-focused components and nutrition education, indicating a need for broader health promotion to ensure full understanding and participation in the program. A study by Doustmohammadian et al. (2022) highlighted how community involvement enhances nutrition and food practices, demonstrating measurable improvements in food security. The research advocates for a Community-Based Participatory Research (CBPR) approach, which fosters collaborative partnerships between communities, families, and researchers to help improve and implement community-based interventions.

Table 19. Assessment of Respondents on the Level of Awareness in Terms of Food Fortification Program

Indicators	Weighted Mean	Standard Deviation	Verbal Interpretation	Rank
The Department of Health (DOH) promotes the consumption of fortified foods to improve nutrition and prevent deficiencies.	3.09	0.933	Sometimes	1
Food fortification programs involve adding essential nutrients (e.g., vitamin A, iron, and iodine) to staple foods such as rice, oil, flour, and salt.	3.07	0.913	Sometimes	3
Fortified foods help reduce cases of malnutrition and micronutrient deficiencies in vulnerable populations.	3.08	0.929	Sometimes	2
The program provides fortified rice with iron, fortified oil and sugar with vitamin A, and fortified flour with iron and vitamin A to help improve vision and boost immunity.	2.82	1.009	Sometimes	5
The program focuses on providing affordable and accessible fortified foods for all households.	3.01	1.030	Sometimes	4
Overall Mean	**3.02**	**0.822**	**Sometimes**	

As identified in Table 19, the respondents' assessment of their awareness regarding the Food Fortification Program shows an overall mean of 3.02, verbally interpreted as "Sometimes," indicating a moderate level of awareness. The highest-rated indicator is "The Department of Health (DOH) promotes the consumption of fortified foods to improve nutrition and prevent deficiencies," with a weighted mean of 3.09, ranked first. This is closely followed by "Fortified foods help reduce cases of malnutrition and micronutrient deficiencies in vulnerable populations," with a mean of 3.08, ranked second. Awareness of the basic concept of food

fortification—adding essential nutrients like vitamin A, iron, and iodine to staple foods—ranks third with a mean of 3.07. The indicator on the program's focus on providing affordable and accessible fortified foods ranks fourth at 3.01, while the lowest-rated is the specific awareness of fortified rice, oil, sugar, and flour, which has a mean of 2.82, ranked fifth. These findings suggest that while respondents have a reasonable understanding of the general purpose and benefits of food fortification, awareness of specific fortified food products and their detailed nutritional benefits is lower, indicating a need for enhanced community education to deepen understanding of how fortified foods can address nutrient deficiencies.

Food fortification initiatives in countries such as the Philippines and Pakistan seek to tackle widespread deficiencies by enhancing staple foods, yet the public's awareness of specific fortified products remains limited (Olson et al., 2021). Research indicates that many fortified meals are available, but the program's effectiveness is hindered by consumers' lack of awareness and understanding.

As emphasized in Table 20, the respondents' assessment of their awareness regarding the Barangay Nutrition Program resulted in an overall mean of 3.10, verbally interpreted as "Sometimes," indicating a moderate level of awareness. The highest-rated indicator is "The Barangay Nutrition Scholar provides services aimed at improving health, such as implementing feeding programs, conducting home visits, offering counseling, and providing food supplementation," with a weighted mean of 3.15, ranked first. This is followed by

Table 20. Assessment of Respondents on Level of Awareness in terms of Barangay Nutrition Program

Indicators	Weighted Mean	Standard Deviation	Verbal Interpretation	Rank
The Department of Health implemented the Barangay Nutrition Scholar program to strengthen the nutrition of residents in each barangay and prevent malnutrition.	3.09	0.954	Sometimes	4
The Barangay Nutrition Scholar is trained to have sufficient knowledge on topics related to nutrition, food	3.13	0.917	Sometimes	2

production, and environmental sanitation.				
The Barangay Nutrition Scholars educate parents on child health and nutrition.	3.11	0.909	Sometimes	3
The Barangay Nutrition Scholar monitors the nutritional status of barangay residents to identify those who are malnourished or undernourished.	3.05	0.989	Sometimes	5
The Barangay Nutrition Scholar provides services aimed at improving health, such as implementing feeding programs, conducting home visits, offering counseling, and providing food supplementation.	3.15	0.941	Sometimes	1
Overall Mean	3.10	0.845	Sometimes	

"The Barangay Nutrition Scholar is trained to have sufficient knowledge on topics related to nutrition, food production, and environmental sanitation," which has a mean of 3.13, ranked second. Awareness of "The Barangay Nutrition Scholars educate parents on child health and nutrition" ranks third at 3.11, while "The Department of Health implemented the Barangay Nutrition Scholar program to strengthen the nutrition of

residents in each barangay and prevent malnutrition" ranks fourth at 3.09. The lowest-rated indicator is "The Barangay Nutrition Scholar monitors the nutritional status of the barangay residents to identify those who are malnutrition/undernutrition," with a mean of 3.05, ranked fifth. These results indicate that respondents are most familiar with the direct services provided by the Barangay Nutrition Scholars but are slightly less aware of their roles in monitoring and the broader implementation framework. This highlights an opportunity for enhanced information campaigns to ensure a more comprehensive understanding of the full scope of the Barangay Nutrition Program's roles and responsibilities.

This is consistent with research by Dodd et al. (2021) that highlighted the role of Barangay Nutrition Scholars in the Philippines as frontline workers who are responsible for monitoring malnutrition and carrying out nutrition-related interventions, particularly for critically ill infants and groups. The RRL also emphasizes its work conducting surveys such as "Operation Timbang," promoting health involvement, and maintaining comprehensive records on community nutrition. However, the current literature primarily addressed the designated responsibilities of BNS and failed to note any gaps in the general public's knowledge of those responsibilities.

Table 21. Summary Assessment of Respondents on Level of Awareness of DOH Nutritional Health Programs

Variables			**Weighted Mean**	**Standard Deviation**	**Verbal Interpretation**	**Rank**
1. Pinggang Pinoy			3.13	0.747	Sometimes	1
0.	Expanded Pinoy	Garantisadong	3.07	0.759	Sometimes	3
0.	Micronutrient		2.92	0.847	Sometimes	5
Supplementation 0. Fortification Program			3.02	0.822	Sometimes	4
1. Barangay Nutrition Program			3.10	0.845	Sometimes	2
Overall Mean			**3.05**	**0.652**	**Sometimes**	

As outlined in Table 21, the summary assessment of respondents' level of awareness of the Department of Health (DOH) nutritional health programs shows an overall mean of 3.05, verbally interpreted as "Sometimes," reflecting moderate awareness across all programs. Among the five programs assessed, awareness of the Pinggang Pinoy program is the highest, with a weighted mean of 3.13, ranked first. This is followed by the Barangay

Nutrition Program, which has a mean of 3.10, ranked second. The Expanded Garantisadong Pambata Program ranks third with a mean of 3.07, while the Food Fortification Program ranks fourth at 3.02. The lowest awareness was recorded for the Micronutrient Supplementation Program, with a mean of 2.92, ranked fifth. These findings indicate that while respondents are moderately aware of the various DOH nutritional programs, there is stronger familiarity with basic food guides and barangay-level services compared to more technical programs like micronutrient supplementation and food fortification. This suggests a need for enhanced community-based education and information campaigns, particularly focusing on lesser-known programs, to ensure a comprehensive understanding and participation in all available nutrition initiatives.

Mandano (2023) similarly identified the same findings in Lipa City. A substantial number of the population (60.56%) demonstrated insufficient awareness concerning Pinggang Pinoy. Although there existed a broad agreement regarding the nice nature of the program, mere awareness did not effectively align with enhanced dietary practices, thereby highlighting a notable variance between knowledge and actual behavior.

Statement of the Problem No.6

Assessment of Significant Differences in Food Security Status of Respondents by Profile

Table 22. Test of Significant Difference in Food Security Status of Respondents When Grouped According to Age

Variables	Group	Mean	F-Value	P-Value	Decision	Interpretation
	18-23	3.29				
Availability	24-29	3.32	1.209	0.312	Fail to Reject Ho	Not Significant
	30-35	3.50				
	36-40	3.52				
	40-45	3.32				
	18-23	3.25				
Accessibility	24-29	3.23	1.034	0.394	Fail to Reject Ho	Not Significant
	30-35	3.21				
	36-40	3.3				
	40-45	2.88				
	18-23	3.55				
Utilization	24-29	3.64	0.874	0.483	Fail to Reject Ho	Not Significant
	30-35	3.68				
	36-40	3.67				
	40-45	3.32				
	18-23	3.26				
Stability	24-29	3.42	1.321	0.268	Fail to Reject Ho	Not Significant
	30-35	3.46				
	36-40	3.58				
	40-45	2.92				

Table 22 presents the analysis comparing the responses of five age groups (18–23, 24–29, 30–35, 36–40, and 40–45) across four variables: Availability, Accessibility, Utilization, and Stability.

For Availability, the mean scores ranged from 3.29 to 3.52, with the highest mean in the 36–40 age group. The F-value of 1.209 and a p-value of 0.312 indicate no significant difference among the age groups. In Accessibility, mean values ranged from 2.88 to 3.30, with the 40–45 age group having the lowest mean. The F- value was 1.034 with a p-value of 0.394, also indicating no significant difference. Utilization showed relatively higher mean scores, ranging from 3.32 to 3.68, with the highest in the 30–35 group. However, the F-value of 0.874 and p-value of 0.483 show the differences are not statistically significant. Finally, Stability had meanvalues between 2.92 and 3.58, again highest in the 36–40 group, but the F-value of 1.321 and a p-value of 0.268 mean this difference is also not significant.

Across all four variables—Availability, Accessibility, Utilization, and Stability there were no statistically significant differences among the different age groups. This means that age does not appear to influence perceptions or experiences regarding these variables in the sample analyzed.

This result is consistent with Antwi and Lyford (2021), who found that socioeconomic status, particularly household income and size, had more substantial effects on food security than age alone. Their study quantified that increasing household income improved food security, while larger household sizes negatively affected it. Age was not highlighted as a statistically significant determinant in their findings.

Table 23. Test of Significant Difference in Food Security Status of Respondents When Grouped According to Educational Attainment

Variables	F-value	p-value	Decision	Interpretation
Availability	1.989	0.075	Fail to Reject Ho	Not Significant
Accessibility	0.972	0.448	Fail to Reject Ho	Not Significant
Utilization	1.923	0.268	Fail to Reject Ho	Not Significant
Stability	1.854	0.097	Fail to Reject Ho	Not Significant

As pointed out in Table 23, the test of significant difference in food security status of respondents when grouped according to educational attainment reveals no statistically significant differences across all food security dimensions. For availability, the F-value is 1.989 with a p-value of 0.075; for accessibility, the F-value is 0.972 with a p-value of 0.448; for utilization, the F-value is 1.923 with a p-value of 0.268; and for stability, the F-value is 1.854 with a p-value of 0.097. In each case, the null hypothesis is not rejected, indicating no significant difference in food security status based on the respondents' educational attainment. These findings suggest that educational background does not have a statistically significant effect on perceived food security levels across availability, accessibility, utilization, and stability dimensions.

This contrasts with Panjaitan et al. (2024), who found that education was a significant factor affecting food security in Pakistan. Their study found that families with higher education made more informed choices regarding food purchases and consumption. Additionally, the research emphasized the importance of financial literacy and skills training in helping families manage their food resources, indicating that education improves food security when associated with practical economic actions.

Table 24. Test of Significant Difference in Food Security Status of Respondents When Grouped According to Employment Status

Variables	Groups	Mean	F-Value	P-Value	Decision	Interpretation
Availability	Employed	3.34				
	Self-employed	3.44				
	Unemployed	3.39	**0.2502**	**0.779**	**Fail to Reject Ho**	**Not Significant**

Table 24 summarizes an ANOVA analysis comparing the responses of three employment groups— Employed,

Self-employed, and Unemployed—on four variables: Availability, Accessibility, Utilization, and Stability. For Availability, mean scores ranged from 3.34 to 3.44, with the self-employed group rating it highest. However, the F-value of 0.2502 and a p-value of 0.779 indicate no statistically significant difference among the groups. Accessibility also showed minimal variation, with mean scores from 3.19 to 3.27. The F-value of 0.1762 and a p-value of 0.839 confirm that the differences are not significant. In Utilization, the scores were very close (3.60–3.63), and the extremely low F-value of 0.0221 with a p-value of 0.978 reinforces the lack of significant difference across employment statuses. For Stability, the employed group rated highest (3.51), while the unemployed rated lowest (3.30). Although this variable had the highest F-value (1.1475) among the four, the p-value of 0.322 still indicates no significant difference.

Across all four variables—Availability, Accessibility, Utilization, and Stability—there were no statistically significant differences among employment groups. This suggests that perceptions or experiences related to these aspects are consistent regardless of whether individuals are employed, self-employed, or unemployed.

This differs from the findings of Chakona (2022), in a study exploring food security challenges among rural-urban migrants in peri-urban South Africa, food insecurity persisted despite households adopting coping mechanisms such as urban agriculture (UA). The research revealed that households practicing UA, particularly those headed by women, achieved marginal improvements in dietary diversity compared to non-UA households. However, food insecurity remained a major concern overall. In their study, households that practiced urban and peri-urban agriculture, closely linked to employment and income generation, demonstrated better food access. The study highlighted employment status, household income, and land access as key factors influencing food security. Chakona emphasized that while UA helps supplement food sources and improve dietary variety, it does not fully resolve the underlying issues of poverty and limited economic opportunities.

Table 24 pinpoints an ANOVA analysis examining whether the number of household members (categorized as 2, 3, 4, 5, or more than 5) has a statistically significant effect on perceptions of four variables: Availability, Accessibility, Utilization, and Stability. For Availability, mean scores range from 3.11 (households with 2 members) to 3.53 (households with 5 members). The F-value is 1.86 and the p-value is 0.124, indicating no statistically significant difference in availability perceptions across household sizes. Accessibility shows closely grouped means between 3.11 and 3.28. The F-value is 0.739 with a p-value of 0.568, suggesting no significant difference in accessibility perceptions across household sizes. In terms of Utilization, the scores slightly increase with household size, from 3.49 (2 members) to 3.70 (more than 5 members). Despite this trend, the F-value of 0.499 and a p-value of 0.736 show that the differences are not -statistically significant. Stability has the widest variation in means, from 3.15 to 3.55, with a higher F-value of 2.000. However, the p-value of0.101 still exceeds the 0.05 threshold, meaning the variation is not significant.

Across all four variables—Availability, Accessibility, Utilization, and Stability—there are no statistically significant differences in responses based on household size. This suggests that the number of people in a household does not meaningfully affect perceptions or experiences related to these factors.

The present findings differ from those of Fatmah (2024), whose research indicated a trend where an expanding household size correlates with a reduction in per capita food availability, particularly within economically disadvantaged environments. Their investigation revealed that larger family units frequently encountered heightened levels of food and nutritional insecurity. This was attributed to scarce resources being spread too thinly, often culminating in insufficient dietary intake and instances of malnutrition.

Table 25. Test of Significant Difference in Food Security Status of Respondents When Grouped According to Number of Family Members

Variables	Groups	Mean	F-Value	P-Value	Decision	Interpretation
	2	3.11				
Availability	3	3.49	1.86	0.124	Fail to Reject Ho	Not Significant
	4	3.3				

	5	3.53				
	More than 5	3.35				
	2	3.11				
Accessibility	3	3.28	0.739	0.568	Fail to Reject Ho	Not Significant
	4	3.15				
	5	3.13				
	More than 5	3.28				
	2	3.49				
Utilization	3	3.64	0.499	0.736	Fail to Reject Ho	Not Significant
	4	3.55				
	5	3.64				
	More than 5	3.7				
	2	3.29				
Stability	3	3.51	2	0.101	Fail to Reject Ho	Not Significant
	4	3.15				
	5	3.33				
	More than 5	3.55				

Test of Significant Difference in Food Security Status of Respondents When Grouped According to Number of Family Members

Table 25 details the ANOVA analysis evaluates how the number of children (categorized as 0, 1, 2, or above 3) affects perceptions across four variables: Availability, Accessibility, Utilization, and Stability.

Table 26. Test of Significant Difference in Food Security Status of Respondents When Grouped According to Number of Family Members

Variables	**Groups**	**Mean**	**F-Value**	**P-Value**	**Decision**	**Interpretation**
	0	3.6				
Availability	1	3.33	1.072	0.365	Fail to Reject Ho	Not Significant
	2	3.47				
	Above 3	3.36				
	0	3.1				
Accessibility	1	3.2	0.714	0.546	Fail to Reject Ho	Not Significant
	2	3.24				
	Above 3	3.44				
	0	3.5				
Utilization	1	3.58	0.484	0.695	Fail to Reject Ho	Not Significant
	2	3.68				
	Above 3	3.72				
	0	2.7				

Stability	1	3.39	1.839	0.145	Fail to Reject Ho	Not Significant
	2	3.43				
	Above 3	3.52				

For Availability, mean scores ranged from 3.33 to 3.60, with respondents with no children giving the highest rating. The F-value of 1.072 and a p-value of 0.365 indicates no statistically significant difference among groups based on the number of children. In terms of accessibility, mean ratings increased with the number of children, from 3.10 (no children) to 3.44 (above 3 children). However, the F-value of 0.714 and p-value of 0.546 show that these differences are not significant. Utilization also showed a gradual increase in means from 3.50 (no children) to 3.72 (above 3 children), but the F-value of 0.484 and p-value of 0.695 indicate no significant difference. For Stability, mean ratings ranged from 2.70 to 3.52, with the lowest score from those with no children. This variable had the highest F-value of 1.839, but the p-value of 0.145 remains above the 0.05 threshold, so the difference is still not statistically significant. There are no statistically significant differences in perceptions of Availability, Accessibility, Utilization, or Stability based on the number of children. This suggests that family size does not significantly influence how individuals perceive these aspects of the subject under study.

A comprehensive study by Marshall et al. (2022) however, highlighted that families with children are especially susceptible to not having enough food. This is because kids need more nutrients and face a higher risk of not getting enough essential vitamins and minerals. Their research suggests that focused help, like nutritionprograms and tracking micronutrient levels, is crucial to boost food availability and improve diet quality for these households.

Table 27. Test of Significant Difference in Food Security Status of Respondents When Grouped According to Monthly Income

Variables	Groups	Mean	F-Value	P-Value	Decision	Interpretation
	Less than PHP 10,957	3.33				
Availability	PHP 10,957-21,914	3.35	3.25	0.043	Reject Ho	Significant
	PHP 21,194-43,828	3.63				
	Less than PHP 10,957	3.15				
Accessibility	PHP 10,957-21,914	3.28	1.69	0.019	Reject Ho	Significant
	PHP 21,194-43,828	3.33				
	Less than PHP 10,957	3.57				
Utilization	PHP 10,957-21,914	3.63	0.795	0.454	Fail to Reject Ho	Not Significant
	PHP 21,194-43,828	3.73				
Stability	Less than PHP 10,957 PHP 10,957-21,914	3.28	1.533	0.221	Fail to Reject Ho	Not Significant
	PHP 21,194-43,828					

Table 27 infers the ANOVA analysis explores whether monthly household income (categorized as: less than PHP 10,957, PHP 10,957–21,914, and PHP 21,194–43,828) influences perceptions across four variables: Availability, Accessibility, Utilization, and Stability. For Availability, mean scores increase with income, from3.33 (lowest income group) to 3.63 (highest income group). The F-value is 3.25, and the p-value of 0.043 is below the 0.05 significance level. Therefore, the result is statistically significant, indicating that income level does influence perceptions of availability. In Accessibility, a similar trend is observed with increasing mean

scores from lower to higher income groups (3.15 to 3.33). The F-value is 1.69, and the p-value of 0.019 also indicates a statistically significant difference, meaning household income affects accessibility perceptions as well. Utilization shows a slight upward trend across income groups (3.57 to 3.73), but with an F-value of 0.795 and a p-value of 0.454, the differences are not statistically significant. This means income level does not significantly influence perceptions of utilization. Stability also shows an increase in mean scores with income (from 3.28 to 3.54), but the F-value of 1.533 and p-value of 0.221 indicate the differences are not significant.

The results show that Availability and Accessibility are significantly influenced by household income, with higher-income groups reporting more favorable perceptions. However, Utilization and Stability do not show statistically significant differences across income levels, suggesting these aspects are perceived similarly regardless of income. According to the study of De Luna et al., (2021), the study was able to find that the prevalence of stunting among children is higher among farming households due to low income, which leads to low accessibility and availability of nutritious food and affects the total food security of the household.

Statement of the Problem No. 5

Assessment of Significant Differences in Food Security Status of Respondents by profile of the children in the household

This section examines whether the food security status of respondents differs when grouped according to the profile of children in the household, focusing on age, sex, height, weight, and BMI. The analysis helps identify if child characteristics influence household food security.

Table 28. Test of Significant Difference in Food Security Status of Respondents When Grouped According to Age of Children in the Household

Variables	Groups	Mean	F-Value	P-Value	Decision	Interpretation
	0.5-<0.1 years	3.49				
Availability	1.0-<3.0 years	3.28	3.679	0.029	Reject Ho	Significant
	3.0-5.0 years	3.51				
	0.5-<0.1 years	3.33				
Accessibility	1.0-<3.0 years	3.18	0.666	0.516	Fail to Reject Ho	Not Significant
	3.0-5.0 years	3.24				
	0.5-<0.1 years	3.53				
Utilization	1.0-<3.0 years	3.58	0.736	0.482	Fail to Reject Ho	Not Significant
	3.0-5.0 years	3.68				
	0.5-<0.1 years	3.24				
Stability	1.0-<3.0 years	3.35	0.505	0.605	Fail to Reject Ho	Not Significant
	3.0-5.0 years	3.45				

As verified in Table 28, the test of significant difference in food security status of respondents when grouped according to the age of children in the household shows that only the availability dimension exhibits a statistically significant difference. The availability variable has an F-value of 3.679 with a p-value of 0.029, leading to the rejection of the null hypothesis, indicating a significant difference in food security status across age groups. The highest mean for availability (3.51) is observed among respondents with children aged 3.0–5.0 years, while the lowest (3.28) is among those with children aged 1.0–<3.0 years.

For accessibility (p = 0.516), utilization (p = 0.482), and stability (p = 0.605), the null hypothesis is not rejected, indicating no significant differences across age groups in these dimensions. These findings suggest that the age of children in the household may influence the perceived availability of food, but does not significantly affect accessibility, utilization, or stability aspects of food security. In the study of Philippine Development Plan (2022), children claimed among the poorest of the society risk of malnutrition and poverty due to limited privileges to basic needs essential for their well-being.

Table 29. Test of Significant Difference in Food Security Status of Respondents When Grouped According to Sex of Children in the Household

Variables	Group	Mean	t-value	p-value	Decision	Interpretation
Availability	Male	3.31	-1.733	0.086	Fail to Reject Ho	Not Significant
	Female	3.46				
Accessibility	Male	3.19	-0.663	0.509	Fail to Reject Ho	Not Significant
	Female	3.25				
Utilization	Male	3.52	-2.379	0.019	Reject Ho	Significant
	Female	3.72				
Stability	Male	3.29	-1.532	0.129	Fail to Reject Ho	Not Significant
	Female	3.48				

As suggested in Table 29, the test of significant difference in food security status of respondents when grouped according to the sex of children in the household shows that only the utilization dimension has a statistically significant difference. The utilization variable has a t-value of -2.379 with a p-value of 0.019, leading to the rejection of the null hypothesis, indicating a significant difference between the two groups. Households with female children have a higher mean utilization score (3.72) compared to those with male children (3.52). For the other dimensions—availability (p = 0.086), accessibility (p = 0.509), and stability (p = 0.129)—the null hypothesis is not rejected, indicating no significant differences. These results suggest that while most aspects of food security are similar regardless of the child's sex, utilization, which relates to food preparation, safety, and nutritional practices, is notably higher in households with female children. The study of Manrique- de Hitta et.al. (2024), suggests that child's age and sex are significantly influencing the stunting and nutritional intake in the fourth district of Camarines Sur. They indicate that prevalence of nutrient inadequacy is estimated by the proportion of individuals' usual intake of food. Also, scoped gender and food choices. Females are generally likely to adopt healthier eating habits and male gravitate towards higher-calorie foods and less- nutritious food.

Table 30. Test of Significant Difference in Food Security Status of Respondents When Grouped According to the BMI of Children in the Household

Variables	Groups	Mean	F-Value	p-Value	Decision	Interpretation
Availability	Group 1	3.17				
	Group 2	2.86				
	Group 3	3.13	**0.953**	**0.389**	Fail to Reject Ho	Not Significant
Accessibility	Group 1	3.15				
	Group 2	2.48				
	Group 3	3.40	**5.139**	**0.008**	Reject Ho	Significant
Utilization	Group 1	2.95				
	Group 2	2.68				
	Group 3	3.13	**0.679**	**0.509**	Fail to Reject Ho	Not Significant
Stability	Group 1	3.04				
	Group 2	2.81				
	Group 3	3.33	**0.661**	**0.519**	Fail to Reject Ho	Not Significant

As showcased in Table 30, the test of significant difference in food security status of respondents when grouped according to the BMI of children in the household reveals a statistically significant difference only in the accessibility dimension. The accessibility variable shows an F-value of 5.139 with a p-value of 0.008, leading to the rejection of the null hypothesis, indicating a significant difference across BMI groups. The highest mean

accessibility score (3.40) is observed in one group, while the lowest (2.48) appears in another, suggesting that the child's BMI may influence household access to nutritious food. In contrast, the availability (p = 0.389), utilization (p = 0.509), and stability (p = 0.519) dimensions show no significant differences, as indicated by their respective p-values and the decision to fail to reject the null hypothesis. These findings suggest that while a child's BMI may affect perceptions of food accessibility, it does not significantly impact other dimensions of food security such as availability, utilization, or stability. Tester, J. et al. (2022), food insecurity is a social determinant of health that affects many low- income families in the United States. In 2020, US households with children were food insecure that are caused by access to fresh nutritious food and food preference for an active and healthy lifestyle.

Statement of the Problem No. 7

Assessment of the Relationship Between Respondents' Food Security Status and Awareness of DOH Nutritional Health Programs

Table 31. Test of Relationship between Respondents' Food Security Status and Awareness of DOH Nutritional Health Programs in terms of Pinggang Pinoy

Variables	r-value	Strength of Relationship	p-value	Decision	Interpretation
Availability	0.417	Moderate Correlation	<0.001	Reject Ho	Significant
Accessibility	0.242	Low Correlation	<0.001	Reject Ho	Significant
Utilization	0.393	Low Correlation	<0.001	Reject Ho	Significant
Stability	0.368	Low Correlation	<0.001	Reject Ho	Significant

As explored in Table 31, the test of relationship between respondents' food security status and their awareness of DOH nutritional health programs in terms of Pinggang Pinoy shows significant correlations across all food security dimensions. The availability dimension has an r-value of 0.417, indicating a moderate positive correlation, with a p-value of <0.001, leading to the rejection of the null hypothesis. Accessibility shows a low positive correlation (r = 0.242), also significant at p < 0.001. Utilization has an r-value of 0.393, indicating a low but meaningful correlation, and stability shows a similar pattern with an r-value of 0.368. All dimensions have p-values less than 0.001, confirming statistically significant relationships. These results suggest that greater awareness of Pinggang Pinoy is moderately associated with better food security outcomes, especially in terms of availability, while the relationship is weaker but still significant in other dimensions. This highlights the importance of awareness-building efforts as part of improving household food security. In the study of Mandano (2023), the lack of knowledge about the Pinggang Pinoy program and the lack of resources among households are the reasons for increasing malnutrition and food insecurity. Budget becomes a problem also, which ends up cooking food that is not nutritious.

Table 32. Test of Relationship between Respondents' Food Security Status and Awareness of DOH Nutritional Health Programs in terms of Expanded Garantisadong Pambata Program

Variables	r-value	Strength of Relationship	p-value	Decision	Interpretation
Availability	0.212	Low Correlation	0.034	Reject Ho	Significant
Accessibility	0.0076	Negligible Correlation	0.450	Fail to Reject Ho	Not Significant
Utilization	0.166	Negligible Correlation	0.099	Fail to Reject Ho	Not Significant
Stability	0.272	Low Correlation	0.006	Reject Ho	Significant

Note: The statistical test used was the Pearson Product Moment Correlation Coefficient. If the p-value is less than the level of significance, reject the null hypothesis (Ho). Otherwise, fail to reject the null hypothesis (Ho).

As articulated in Table 32, the test of the relationship between respondents' food security status and their awareness of the DOH nutritional health programs in terms of the Expanded Garantisadong Pambata Program shows mixed results. Availability has an r-value of 0.212, indicating a low positive correlation, with a p-value of 0.034, leading to the rejection of the null hypothesis and confirming a significant relationship. Stability also shows a low positive correlation (r = 0.272) with a p-value of 0.006, which is statistically significant. However, accessibility (r = 0.0076, p = 0.450) and utilization (r = 0.166, p = 0.099) both show negligible correlations and are not statistically significant, as the null hypothesis is not rejected. These findings suggest that awareness of the Expanded Garantisadong Pambata Program is significantly linked to the availability and stability of food security, but shows no meaningful association with accessibility and utilization. This highlights areas where the program's outreach or impact could be strengthened, especially in improving accessibility and utilization outcomes**.** The National Evaluation Portal (2020) that evaluates the Philippine Plan of Action for Nutrition 2017-2022 identifies that the awareness towards the Expanded Garantisadong Pambata Program impacts the food choices, consumption, and stability that helps families to understand healthy diets and how to secure food resources effectively.

Table 33. Test of Relationship between Respondents' Food Security Status and Awareness of DOH Nutritional Health Programs in terms of Micronutrient Supplementation

Variables	r-value	Strength of Relationship	p-value	Decision	Interpretation
Availability	0.181	Negligible Correlation	0.071	Fail to Reject Ho	Not Significant
Accessibility	0.113	Negligible Correlation	0.261	Fail to Reject Ho	Not Significant
Utilization	0.226	Low Correlation	0.024	Reject Ho	Significant
Stability	0.377	Low Correlation	<0.001	Reject Ho	Significant

Note: The statistical test used was the Pearson Product Moment Correlation Coefficient. If the p-value is less than the level of significance, reject the null hypothesis (Ho). Otherwise, fail to reject the null hypothesis (Ho).

As found in Table 33, the test of relationship between respondents' food security status and their awareness of the DOH nutritional health programs in terms of Micronutrient Supplementation shows significant correlations in two dimensions. Utilization has an r-value of 0.226, indicating a low positive correlation, with a p-value of 0.024, leading to the rejection of the null hypothesis and confirming a significant relationship. Stability shows a stronger correlation with an r-value of 0.377 and a p-value of <0.001, also significant. However, availability (r = 0.181, p = 0.071) and accessibility (r = 0.113, p = 0.261) show negligible correlations and are

not statistically significant, as the null hypothesis is not rejected. These findings suggest that awareness of the Micronutrient Supplementation Program is significantly associated with better food utilization and stability but does not have a significant relationship with food availability and accessibility. This highlights the potential of micronutrient awareness to strengthen household food management and resilience but indicates areas where further outreach may be needed. According to the World Health Organization (2025), micronutrients are vitamins and minerals needed by the body in very small amounts. The awareness of this program is associated with the family educational background about a healthy diet containing diverse food and supported by programmes that strive to reduce micronutrient deficiencies appropriate for the family members should be obtained and maintained.

Table 34. Test of Relationship between Respondents' Food Security Status and Awareness of DOH Nutritional Health Programs in terms of Food Fortification Program

Variables	r-value	Strength of Relationship	p-value	Decision	Interpretation
Availability	0.218	Moderate Correlation	0.029	Reject Ho	Significant
Accessibility	0.184	Negligible Correlation	0.067	Fail to Reject Ho	Not Significant
Utilization	0.299	Low Correlation	0.003	Reject Ho	Significant

Stability	0.398	Low Correlation	<0.001	Reject Ho	Significant

As conveyed in Table 34, the test of the relationship between respondents' food security status and their awareness of the DOH nutritional health programs in terms of the Food Fortification Program reveals significant correlations in most dimensions. Availability shows a moderate positive correlation with an r-value of 0.218 and a p-value of 0.029, leading to the rejection of the null hypothesis. Utilization has a low correlation (r = 0.299, p

= 0.003), and stability also shows a low correlation (r = 0.398, p < 0.001), both statistically significant. However, accessibility has an r-value of 0.184 with a p-value of 0.067, indicating a negligible correlation and no significant relationship, as the null hypothesis is not rejected. These findings suggest that greater awareness of the Food Fortification Program is significantly associated with improvements in food availability, utilization, and stability, but its link to accessibility is not statistically significant. This highlights the program's strength in improving certain aspects of food security while pointing to an opportunity to enhance its role in improving access to fortified foods. According to Oxford Policy Management's Evaluation (2021), the food fortification program was supported by the UK's Department for International Development. The fortification program between the Philippines and Pakistan helps to address widespread micronutrient deficiency and support food insecurity within vulnerable populations.

Table 35. Test of Relationship between Respondents' Food Security Status and Awareness of DOH Nutritional Health Programs in terms of Barangay Nutrition Program

Variables	r-value	Strength of Relationship	p-value	Decision	Interpretation
Availability	0.304	Low Correlation	<0.002	Reject Ho	Significant
Accessibility	0.345	Low Correlation	<0.001	Reject Ho	Significant
Utilization	0.395	Low Correlation	<0.001	Reject Ho	Significant
Stability	0.499	Moderate Correlation	<0.001	Reject Ho	Significant

Note: The statistical test used was the Pearson Product Moment Correlation Coefficient. If the p-value is less than the level of significance, reject the null hypothesis (Ho). Otherwise, fail to reject the null hypothesis (Ho).

As clarified in Table 35, the test of the relationship between respondents' food security status and their awareness of the DOH nutritional health programs in terms of the Barangay Nutrition Program shows significant positive correlations across all food security dimensions. Availability has an r-value of 0.304 (low correlation) with a p-value of <0.002, while accessibility shows a slightly stronger low correlation (r = 0.345) with a p-value of <0.001. Utilization also exhibits a low correlation with an r-value of 0.395 (p < 0.001). Notably, stability demonstrates the strongest relationship, with a moderate correlation (r = 0.499) and a p-value of <0.001. In all cases, the null hypothesis is rejected, confirming statistically significant relationships. These results indicate that increased awareness of the Barangay Nutrition Program is consistently associated with improvements in food availability, accessibility, utilization, and stability, with the strongest effect observed in enhancing food security stability. This highlights the program's comprehensive impact and its key role in strengthening household food security at the community level. According to Dodd et. al. (2021), Barangay Scholars are dedicated volunteers who are monitoring the children within the household that make sure that every infant and children (0-5 years old) receive proper nutrition and educate and make sure that the parents to be aware about proper nutrition that their children should receive to promote proper nutrition and maintained food security within household.

The analysis reveals that respondents' awareness of the various DOH nutritional health programs is generally linked to their food security status, though the strength and scope of these relationships differ by program. Awareness of the Pinggang Pinoy program shows consistent significant relationships across all food security dimensions, indicating a broad impact. The Expanded Garantisadong Pambata Program demonstrates significant correlations primarily with availability and stability, while the Micronutrient Supplementation Program is significantly associated with utilization and stability. The Food Fortification Program also shows significant connections with availability, utilization, and stability but has no significant relationship with accessibility. Notably, the Barangay Nutrition Program exhibits significant positive relationships across all dimensions, with the strongest correlation observed in the stability aspect. These findings suggest that greater awareness of DOH

nutritional health programs enhances various facets of household food security, particularly food stability and utilization, emphasizing the need for continued program visibility and community-based education.

Statement of the Problem No. 8

Proposed program based on research results.

Enhancement Program titled "Nutri-Secure: Strengthening DOH Nutritional Programs Awareness for Food Security" from the study *Evaluating Level of Awareness and Food Security of Vulnerable Populations in SelectedBarangays: A Nutrition Advocating Program.*

Prepared By:

Fernandez, Kyla D.

Reyes, Grae Martha Frances D. Piang,
Baihanie P.

Tutaan, Mary Ann P.

Mary Chiles College Researchers 2025

Dean Precy R. Padilla, Ed.D, RN, MAN

Research Adviser

Rationale

The study revealed significant gaps in awareness and utilization of DOH nutritional programs among vulnerable populations in selected barangays in Tondo, Manila.

Despite the availability of programs like Pinggang Pinoy, Expanded Garantisadong Pambata (EGP), Micronutrient Supplementation, Fortification Program, and Barangay Nutrition Scholars, many families remain food insecure, with 84% of children classified as underweight, and the level of awareness and participation among mothers with children aged6monthsto5years oldremains limited.

The Nutri-secure Enhancement Program aims to bridge these gaps by strengthening health education, expanding accessibility, and fostering sustained community engagement with DOH nutritional initiatives.

By enhancing program delivery and participation, it seeks to improve household food security, promote balanced diets, and ultimately improve the nutritional status of vulnerable children.

Objectives

General- To improve food security and nutritional status among vulnerable households with children aged 6 months to 5 years through enhancing awareness, accessibility, and utilization of DOH nutritional programs.

Specific:

- To increase mothers' awareness and understanding of DOH nutritional programs.
- To strengthen community engagement and participation in nutrition-related activities.
- To reduce the prevalence of underweight children through targeted interventions.

Target Beneficiaries: Households residing within Barangays 67 and 122 in Tondo, Manila, with children aged 6 months to 5 years old.

Program:

1. Nutrition Education Campaigns

.Objective: Increase awareness and knowledge of DOH nutritional programs and proper child feeding practices.

.Activities:

- Interactive Workshops: Sessions of Pinggang Pinoy (balanced diet guidelines) and Expanded Garantisadong Pambata (EGP). Cooking demonstrations using locally available, affordable ingredients.
- Household Visits: BNS and barangay health workers will conduct home visits to reinforce lessons (e.g., proper meal portions, micronutrient-rich foods).
- Visual Aids & IEC Materials: Distribution of infographics.

Partners: Barangay Nutrition Scholars and Barangay Health Workers (BHWs).

2. Community Mobilization & Enrollment in DOH Programs

Objective: Ensure eligible families actively participate in DOH nutritional programs.

Activities:

- Barangay Nutrition Scholar (BNS) Led Outreach: BNS teams identify and register malnourished children in Operation Timbang Plus.
- Assist mothers in enrolling in: Garantisadong Pambata Program, Micronutrient Supplementation, Food Fortification Program.

Partners: Barangay Councils, Barangay Nutrition Scholars, and Local Health Centers.

Implementation Plan

Phase 1: Planning and Preparation (Month 1)

Activities	**Description**	**Program Coordinator**	**Timeline**
Stakeholder Meetings	Coordinate with the local health centers and barangay officials to align goals	Research Team	Week 1
Baseline Survey	Identifying eligible households and current awareness levels.	Research Team and Barangay Nutrition Scholars.	Week 2-3
Development of Information, Education and Communication (IEC) materials.	Creation of infographics/pamphlets for the proposed DOH programs.	Research Team and Barangay Nutrition Scholars.	Week 4

Phase 2: Implementation (Month 2)

Component	**Activities**	**Program Coordinator**	**Timeline**
Nutrition Education Campaigns	Barangay-based session on health education seminar for DOH Nutritional Health Programsnamely;	BNS and Research Team	Week 1-2

	- Pinggang Pinoy - Expanded Garantisadong Pambata Program(EGP) - Food Fortification Program		
	- and Barangay Nutrition Scholars (BNS)		
	Distribution of IEC materials, and address nutrition concerns.		
Community Mobilization & Enrollment in DOH Programs	Door-to-door visits to enroll families in DOH Nutritional Health Programs	BNS and Research Team	Week 3-4

Phase 3: Monitoring and Evaluation (Month 3)

Activities	**Description**	**Program Coordinator**	**Timeline**
Post-InterventionEvaluation	Assess changes in awareness and participation compared to baseline	Research Team and BNS	Week 1-2
Focus Group Discussions	Gather feedback from Local Health Centers and BNS for program improvement.	Lead Researcher	Week 3
Final Report Submission	Documentation of outcomes and recommendations for scalability.	Research Team	Week 4

Monitoring and Evaluation

1. Baseline and Post-Program Evaluation: Measuring changes in mothers' awareness and understanding of DOH nutritional programs

2. BNS' Operation Timbang Plus Records: Monthly monitoring of children's weight, height, and BMI to track improvements in nutritional status.

3. BNS Progress Reports: recorded household visits, challenges, and follow-ups.

4. Focus Group Discussions: Feedback from BNS, mothers, and local health workers to assess program acceptability, effectiveness, and sustainability.

Expected Outcomes:

5. Improved Awareness and Knowledge

6. Increased Program Enrollment

7. Reduction in Underweight Prevalence

8. Strengthened Community Engagement

Figure 4. Infographics for Program Presented

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents a summary of the findings, conclusions, and recommendations of the researchers for the research.

Summary of Findings

The most represented age group of biological mothers is between 24 and 25 years old, comprising 32% of respondents. The least represented age group is those aged 40-45 years old, with 5% of the sample. The respondents are classified based on their educational attainment, 27% are high school graduates that rank first and least represented 6% of elementary graduates of the total respondents. Also, classified based on employment status, where the majority are unemployed, accounting 57% of total respondents, and 14% of respondents are self-employed. Based on the number of family members, the majority of them belong to 3 members, accounting for 34%, and the smallest portion have 7%, consisting of 2 family members. Reporting of 64% of families have 1 family member who is working and the least response on more than 3 working family members, with account of 5% of it, with no response record in exact 3 family members are working. A broad income distribution among the respondents, with the majority earning less than ₱10, 957 categorize as low income or poor, with 55% of

respondents, and a significant proportion earns between ₱21,915 to ₱43,828, classified as lower middle income to middle income, with an account of 16% of the total respondents.

For the profile of the children below five (five) years old. The most represented age group is within 1 to 3 year old, accounting 55% which is classified as toddlers and least represented five (5) months to 1 year old with over 9%, classified as infants. Males constitute a slight majority, representing 52% of the total respondents. Females make up 48% of respondents. The children are classified based on their height, weight, abdomen body mass index (BMI). The children's height average 0.884 with standard deviation of 0.136 which is slightly below the expected average for 1 to 5 year old children. This indicates mild to moderate stunting. Weight is about 12.9 kilograms with standard deviation of 4.04 which falls within normal range for their aged group. The body max index (BMI) has a mean of 16.4 kg/m^2 with standard deviation of 3.3 which falls within normal to mildly underweight. Furthermore, the body mass index classification of children within the household falls within the majority of underweight, accounting for 84% and 3% are classified as overweight with a least sample.

The respondents' evaluated food security status in terms of four pillars of food security. Starting with availability results, with over all means of 3.38 interpreted as "Always" Among the indicators, the highest-rated statement "the availability of nutritious food options meets my family's needs." The "Seasonal only foods remain available in our local market" with means of 3.07, is the lowest indicator. In terms of accessibility, yields an overall mean of 3.22 verbally interpreted as "Always." The highest rated indicator is "There is an available market near our house" with a mean of 3.72. The lowest rated indicator is "We consume our crops like vegetables and fruits" with a mean of 1.82. Evaluated in terms of Utilization that resulted in an overall mean of 3.61 verbally interpreted as "Always." The highest rated indicator is "I ensure meals are prepared safely and hygienically" with a mean of 3.78. The least rated indicator is "Leftover food is used efficiently in our household" with a mean of 3.42, interpreted as "Always." With the stability it resulted in an overall mean of 3.38, interpreted as "Always." The highest rated indicator is "I manage my family's income effectively to ensure we can always afford to buy food for daily consumption" with a mean of 3.49. The least rated indicator is "We store extra food topreparefor foodshortages"withameanof3.20.

The study showed that people generally have a moderate understanding of the Department of Health's (DOH) nutrition programs, with an average score indicating they're "Sometimes" aware. While the residents were most familiar with the Pinggang Pinoy guide and its "Go, Grow, Glow" food groups, they didn't always connect this guide back to the DOH's efforts. Similarly, for programs like Expanded Garantisadong Pambata (EGP) and the Barangay Nutrition Program, people knew more about hands-on parts like weighing and feeding, and services from Barangay Nutrition Scholars, than about technical details like micronutrient supplements. Awareness was lowest for the Micronutrient Supplementation Program, especially its parts for mothers and counseling, and the Food Fortification Program, where knowledge about specific fortified foods was low. These results suggest that while people know some basic nutrition and about community efforts, they don't have a deepunderstanding of more technical or micronutrient-focused interventions. This means there's a clear need for stronger, more focused health education and community outreach to get everyone more genuinely involved in all areas of the DOH's nutrition initiatives.

The study found that personal details like age, education, employment status, family size, and number of children didn't significantly change how people viewed food security in terms of its availability, accessibility, utilization, and stability. This suggests that within the group studied, people's experiences and feelings about food security were pretty consistent regardless of these factors. This is consistent with other research, such as Antwi and Lyford (2021), which shows that factors such as age or education did not strongly predict whether someone has adequate food, especially if they do not lead to increased financial resources or access to resources. Yet, household income really stood out as a crucial element. Those with greater financial means showed significant differences in their perception on food availability and accessibility, consistently reporting more favorable perceptions. Even though the disparities in how food was utilized and its stability weren't statistically significant, a noticeable pattern still showed where more affluent groups generally scored highe**r.** This highlights just how crucial income is in shaping whether families have secure access to food, a point also supported by De Luna et al. (2021), who connected lower incomes to less access to healthy food, especially in rural and farming areas. Ultimately, these findings stress the importance of programs that help people earn more money and efforts to reduce poverty to improve household food security.

This study examined the key differences in food security status among respondents from selected barangays utilizing child-related household profiles, which included the children's age, gender, and BMI level. The findings revealed that children's ages had a substantial impact on the availability dimension of food security, with households with children aged 3.0-5.0 reporting higher availability ratings than those with younger children. This may reflect a greater emphasis on constant food provision during early childhood development. Meanwhile, there were no significant differences in access, use, or stability across age groups. Regarding child gender, the usage factor associated with food preparation and nutritional practices was significantly higher in households with female children, indicating potential changes in dietary habits or parental focus. Moreover, studies on children's BMI showed a notable disparity, primarily concerning accessibility, suggesting that the quality of children's nutrition might be associated with families' views on food availability. The results indicate that specific traits of children, including age, gender, and BMI, can affect essential aspects of food security, highlighting the importance of focused nutrition advocacy in at-risk groups.

This research examined how a child's age, gender, and Body Mass Index (BMI) could influence a household's food security in certain communities. It appeared that the age of children significantly influenced food access, as families with kids aged 3.0-5.0 years noted improved food availability. This may be due to a greater focus on ensuring reliable nourishment during these vital early years. Curiously, a child's age appeared not to influence how food was obtained, utilized, or its consistency. Regarding the gender of children, the use of food, particularly its preparation and consumption for nourishment, was significantly greater in families with daughters, suggesting potential variations in dietary behaviors or parental prioritization of nutrition. Finally, a child's BMI was solely associated with food availability, indicating that a child's nutrition may be related to a family's perceived convenience of obtaining food. Overall, these findings underscore that certain characteristics of children, such as their age, gender, and BMI, can significantly affect various dimensions of food security. This strongly highlights the necessity for focused nutritional initiatives in vulnerable communities.

CONCLUSIONS

The demographic profile of the biological mother significantly affects the parental literacy level, and can shape a child's development, behavior, and health outcomes. The age of the biological mothers were in 24-29 (32%) of the total population, indicating that respondents are a predominantly young population, suggesting that most mothers are in their prime childbearing and early caregiving years, a period that is critical for establishing health, nutrition, and childcare practices. Targeting this age group with effective nutrition and health programs could yield long-term benefits, as they are likely more open to learning and adopting recommended practices, with interventions targeting child-rearing practices are likely to be more impactful that can positively influence both maternal and child well-being.

Educational Attainment reveals that most of the respondents reached high school level of education (42%). This suggests that while they may possess basic literacy and understanding of health information, therecould be limitations in accessing financially-sustaining job opportunities or fully comprehending technical aspects of health and nutrition programs. That highlights the need for a more educational background in relation to the food security and Department of Health (DOH) programs that health centers' implementing to better understand the needs to comply with the available programs and resources.

Employment status of the biological mothers highlight that more than half of the biological mothers lack formal employment, reflecting a significant level of socioeconomic vulnerability. This level of unemployment may reduce opportunities for health benefits and household income stability, which in turn can hinder access to sufficient and nutritious food.

The majority of the biological mothers reported having 3 family members (34%), indicating that most are part of small to medium-sized households, with a notable portion belonging to larger families. This household structure can significantly influence resource allocation, nutrition, and overall food security, as fewer members may allow for more focused distribution of food and financial resources. However, in larger households, resources may be stretched thin, with limited financial sources, it could potentially lead to inadequate dietary intake per person.

The number of working family members were single-income households (64%), where mothers primarily rely on their partner's earnings highlighting significant vulnerabilities in financial stability, particularly in low- resource

settings, which may pose challenges to household financial stability such as single income source increases susceptibility to economic shock or job loss, with higher risk of food insecurity if income is insufficient to meet needs. Gendered pressure could also occur, if the male partner is the sole earner, traditional gender roles may restrict mothers' opportunities for income generation, exacerbating dependency.

The family income classification revealed that more than half of the respondents reported being under low-income families (55%), where poverty is a key driver of food insecurity, creating a cyclical relationship where limited financial resources restrict access to nutritious food. Families that fall under this classification prioritize affordability over nutrition, leading to reliance on high-calorie, low-nutrient foods, increasing the risk of micronutrient deficiency, which is vital for a child's growth and development. Poor child nutrition leads to stunting that could further impair a child's development.

The age of children highlights the majority of toddlers among households. That indicates most of this age bracket is critical for growth development. The importance of comprehensive intervention that focused on nutritional support that mothers should learn and apply to the household.

The sex distribution emphasizes an equal distribution of gender among children, which indicates that no significant gender disparity in the household composition.

The heights of children are slightly below the expected average for a children's aged one-to-five years old, based on global growth standards. This highlights that children may be experiencing mild to moderate stunting. The standard growth of children is based on the nutritional support provided in the household.

The weight of children shows within normal range to mildly underweight for their aged group. Based on the Body mass index (BMI), the presence of mild underweight and normal range among children. The importance of monitoring the growth of children and development with reinforcing an intervention that targets the nutrition of children, that will help in preventing future risks associated with malnutrition.

According to body mass index (BMI), there is a presence of underweight results among children that underscore undernutrition, which is impacted by the inadequate food intake and poor dietary intake diversity. The comprehensive interventions related to proper nutrition and dietary diversity is the target goal to • The age of children highlights the majority of toddlers among households. That indicates most of this age bracket is critical for growth development to reach the gap of underweight among children.

For availability, it is verbally interpreted as "Always" indicating that most respondents reported that food was physically present and available within their community. However, the sources were often limited to carinderias, sari-sari stores, and wet markets, which primarily offered staple and affordable foods rather than diverse, nutrient-rich options. Although food was technically available, the variety and nutritional value were often compromised.

Accessibility was verbally interpreted as "Sometimes" emerged as a major challenge. While food items were geographically accessible, economic access was constrained, particularly among households classified as poor or low-income. A significant number of families depended on a single working family member, which limited purchasing power and forced families to prioritize cheaper, less nutritious food options.

In terms of food utilization, it is verbally interpreted as "Always," indicating that many households demonstrated basic knowledge of preparing food but had limited awareness of proper nutrition. Mothers generally often serve nutritious meals, but there is still a substantial challenge in ensuring their children's nutrition, with a high prevalence of underweight children. Nutritional intake often lacked essential micronutrients due to a heavy dependence on carbohydrates and processed foods.

In terms of Stability, verbally interpreted as "Always", indicating that respondents were confident in managing income for food but less proactive in storing extra food for emergencies, stating that food security lacked stability over time. While respondents effectively manage day-to-day food budgets, their low emergency storage practices highlight a critical gap in long-term food security

Efforts are necessary to enhance food accessibility to achieve comprehensive food security, as it is generally

achieved as "sometimes," which could indicate an inconsistent food security, stating that household income is still the main predictor for food security status. That linked households with limited food access to underweight children.

When it comes to the extent of maternal awareness of the DOH Nutritional Health Programs, it is generally verbally interpreted as "Sometimes", indicating that mothers have basic awareness of the DOH Programs, but presenting gaps in understanding, knowledge, and recall in certain programs.

The Pinggang Pinoy Program interpreted "Sometimes" as their highest awareness with the indicator of "Glow foods". Most respondents recognized the basic components of a healthy plate, such as Go, Grow, and Glow foods. Data showed low awareness of mothers that Pinggang Pinoy is an official DOH initiative. While the concept is familiar, the program's formal identity and nutritional intent are weakly recognized. This gap shows a need to reinforce its branding.

Expanded Garantisadong Pambata (EGP) results, interpreted as "Sometimes" as it indicates the moderate awareness of mothers to the program. Mothers are most familiar with growth monitoring (weighing) but less aware of the technical part of the program such as micronutrient components (Sangkap Pinoy) possibly due to weighing programs are more visible in the community as it is part of BNS' work, with micronutrient education is weaker in outreach.

In terms of Micronutrient Supplementation Program the results were "Sometimes" and ranked the lowest among all DOH Nutritional Health Programs that underscore a moderate awareness of this program. The program is more technical and scientific, respondents may not recognize it as a program or lack knowledge regarding the micronutrient benefits, especially when supplements are given without orientation making it harder to communicate at the household level. Promotion and education programs for this DOH program should be prioritized to increase the level of awareness of mothers.

In terms of the Food Fortification Program, it resulted in "Sometimes" that emphasized the moderate awareness of mothers to this program, with the highest indicator "The Department of Health (DOH) promotes the consumption of fortified food to improve and prevent deficiencies." Some respondents were aware of the idea that food can be fortified with vitamins or minerals, but don't fully understand affordability or accessibility due to limited marketing of fortified products in local markets, or higher cost, reducing awareness. The enhancement for family education about fortified food and making fortified foods more available in the area help in reaching the gap of awareness.

The Barangay Nutrition Scholar result in "Sometimes" shows a moderate awareness towards this program especially for their essential role as community health workers. Mothers who interacted more frequently with BNS staff exhibited better food stability practices and were quicker to identify malnutrition in children, since BNS is highly visible and directly interacts with families emphasizing the vital contribution of these scholars to the community. However, mothers see BNS as service providers, not nutrition experts. Theenhancement of a campaign that promotes the responsibility and benefits in cooperating in BNS helps the family to increase the support system for the nutritional growth and development of children.

In terms of significant differences between food security status of the respondents and the profile of the children within the household, there is a significant difference in food security status based on the age of children, particularly in the availability pillar. Households with children aged 3–5 years reported better food availability compared to those with younger children. This may indicate that mothers are more focused on feeding growing toddlers compared to infants, possibly due to toddler's increased and more complex dietary needs, which concludes that infants are at a higher risk of malnutrition compared to toddlers. However, no significant differences were found in accessibility, utilization, or stability based on age.

In terms of sex, there is a significant difference in the utilization pillar of food security when grouped by the sex of the child. Households with female children demonstrated better food utilization practices, such as preparing nutritious and age-appropriate meals, compared to those with male children. This suggests that mothers who have female children had better utilization practices, which may indicate gender-based differences in feeding practices, where more care or attention is unconsciously given to female children. No significant differences were found in

availability, accessibility, or stability.

In terms of BMI, there is a significant difference in the accessibility dimension when food security is grouped according to the child's BMI. The nutritional status of children was greatly determined by their BMI, as households with children who had normal BMI reported better access to nutritious food, while underweight children are comprised of 84% among all participants, indicating the prevalence of stunting and malnutrition, although majority of households demonstrated strong food utilization practices, indicating that mothers generally often serve nutritious meals, there is still a substantial challenge in ensuring their children's nutrition with high prevalence of underweight children. No significant differences were found in availability, utilization, or stability dimensions.

The awareness of the mothers regarding the Department of Health (DOH) programs was found to be moderate across all indicators, with Pinggang Pinoy showing the highest level of awareness and Micronutrient Supplementation the lowest. The results interpreted "Sometimes" across all programs, indicating that while mothers are generally familiar with the programs, deeper understanding and consistent application may still be lacking.

The profile of the respondents reveals that the majority of biological mothers were within the 18–35 age range, with 87% falling under this group. In terms of educational attainment, 75% reached high school to college level, while only 25% had elementary or vocational education. Most mothers were unemployed and belonged to poor-income households, earning below PHP 10,957 monthly.

Statistical analysis concluded that there is no significant difference between the level of awareness of the mothers and their sociodemographic profiles—such as age, educational attainment, and employment status. This means that awareness levels were uniform regardless of the mother's background, suggesting that profile characteristics do not directly influence their understanding of DOH programs.

Despite assumptions that older or more educated mothers might be more informed, the findings show that even younger or less formally educated mothers can demonstrate comparable awareness levels. This implies that community-based exposure, practical experiences, and access to local health initiatives may play a bigger role in shaping awareness rather than formal education or age.

These results highlight the need to strengthen health communication and education strategies that cater to all mothers, regardless of profile. Simplified, practical, and community-driven approaches—especially through Barangay Nutrition Scholars and local campaigns—can improve awareness, especially for programs that are more technical in nature, such as Micronutrient Supplementation and Food Fortification. Consistent outreach and engagement may help bridge the gap and ensure that awareness is translated into better utilization and nutritional practices at home.

When it comes to testing the relationship between food security status of the families and the mothers' awareness of DOH Nutritional Health Programs, based on statistical findings, there is a significant relationshipbetween the mothers' level of awareness and their children's food security status. However, this relationship varies in strength and scope depending on the specific DOH Nutritional Programs.

Pinggang Pinoy has a moderate but significant relationship with *Availability pillar,* and has a low but significant relationship with *Accessibility, Utilization, and Stability,* indicating that the program teaches portion control and dietary diversity, helping mothers optimize limited food budgets while ensuring nutritional adequacy, and mothers who understand "Go, Grow, Glow" foods are more likely to prioritize nutrient-rich choices, even with financial constraints they are able to sustain these habits over time, even when household income fluctuates.

For *Expanded Garantisadong Pambata (EGP),* data showed significant relationship to *Availability and Stability* pillar only, indicating that mothers who are more aware of this program have higher food security than those who do not due to households that are aware of EGP may engage in government health drives where food aids are distributed (availability), and consistency of government programs may reinforce long-term food supply security (stability). No significant relationship on *Accessibility and Utilization* as EGP does not directly guide mothers on food preparation and purchasing.

In terms of *Micronutrient Supplementation Program,* the program showed significant relationship to *Utilization and Stability* as awareness of this program exhibited better food security outcomes possibly due to mothers who know about iron, vitamin A, and iodine supplements and its benefits are more likely to prevent deficiencies, and tend to incorporate these supplements into feeding practices, improving how nutrients are utilized in meals leading to better long-term health and reduced emergency food crises. No significant relationship to *Accessibility and Availability* pillars as supplements do not replace regular meals and demonstrate income brackets.

In terms of *Food Fortification Program*, awareness of the said program indicated a significant relationship towards *Availability, Utilization and Stability* signifying that mothers who are more aware of this program may most likely buy fortified food choices, improving availability of nutritious foods in the household (availability), have a better understanding of proper food preparation of fortified goods (utilization), and long- term use of fortified foods reduces malnutrition improving long term stability. No significant relationship towards *Accessibility Pillar* as the program does not aim to change or improve family's income.

In terms of *Barangay Nutrition Scholars (BNS),* data exhibited significant relationships between *All 4 Pillars of Food Security (Availability, Accessibility, Utilization, and Stability),* with its strongest association to stability yielding r=0.499. Barangay Nutrition Scholars aims to monitor children's growth and development, provide health education about proper nutrition, and conduct home visits. Mothers who manifest higher awareness of the program have better access to food services and feeding programs (availability and accessibility), have better food preparation, meal planning and sanitation (utilization), and long -term nutritional habits even through crisis (stability).

RECOMMENDATIONS

The researchers are recommending suggestions to the following beneficiaries:

Community. The researchers recommend that community members, especially mothers, be provided with job opportunities, livelihood programs, and skills training. Since the study found that many mothers are unemployed and have limited financial capacity, economic interventions such as programs that provide vocational training, small business support, and microfinance opportunities should be implemented to help mothers gain income-generating skills that are necessary to improve their ability to provide nutritious food and secure household well-being. Promoting urban agriculture and home gardening within the community can improve the availability of affordable, healthy food.

Department of Health. The researchers recommend that the Department of Health intensify its efforts in nutrition education by creating more accessible campaigns about micronutrient supplementation and food fortification. The study revealed that although awareness of government nutrition programs exists, knowledge about essential nutrients remains weak. Therefore, the researchers recommend that the Department of Health (DOH) develop accessible visual materials such as brochures or pamphlets. A low-literacy IEC materials, written in Tagalog, focused on all programs, especially Pinggang Pinoy (e.g., logo of healthy plate), MicronutrientSupplementation, and Food Fortification (e.g., providing specific logo on rice sacks and staple products) and distributed by Barangay Nutrition Scholars (BNS) during home visits. Clear information materials can improve families' understanding of proper nutrition, especially for children.

Dietitian. As experts in clinical and community nutrition, dietitians play an important role in addressing food insecurity and malnutrition. The researchers recommend that licensed dietitians be actively involved in barangay-level health and nutrition programs, particularly in conducting individualized dietary assessments, counseling, and monitoring of at-risk children together with Barangay Nutrition Scholars (BNS). While Barangay Nutrition Scholars (BNS) play an important role in running nutrition programs and checking on children's growth, their training is usually focused on basic nutrition and community health. On the other hand, licensed dietitians have deeper knowledge in both clinical and community nutrition. This makes them important in handling the more complex parts of food insecurity and malnutrition. With their help, they can teach caregivers better, guide mothers on how to prepare nutritious meals, and make sure government nutrition programs fit the real needs of each household.

Local Government Units (LGUs). The researchers suggest that LGUs help strengthen and expand programs

that give people access to nutritious and affordable food, especially in rural areas where access is limited. This can be done by improving how food is delivered, giving discounts and food subsidies, and supporting local food production. LGUs can also help make sure healthy food is available and affordable through community stores and food cooperatives. It is also important for LGUs to regularly check children's nutrition and work closely with Barangay Nutrition Scholars (BNS) to monitor children's growth and address undernutrition early.

Department of Social Welfare and Development (DSWD). In light of poverty's significant impact on food access, the researchers recommend that DSWD strengthen the nutrition focus within its poverty alleviation efforts. Integrating clear nutrition criteria into Pantawid Pamilyang Pilipino Program (4Ps) compliance and prioritizing food assistance that includes fortified and nutrient-dense foods can help solve undernutrition. Programs that combine food aid with nutrition education will foster more sustainable household practices. These can reduce inequality and help vulnerable families achieve food security.

Educational Institutions. The researchers recommend that schools strengthen school-based feeding programs and nutrition education programs. Since many children in the study were found to be stunted or underweight, schools play a key role in improving child nutrition. Regular monitoring, healthy meals, and integration of proper nutrition in classroom lessons can help reduce malnutrition and improve student well-being. Nutrition education should be integrated into the early curriculum and be reinforced.

Student Nurse. The researchers recommend that student nurses take an active role in promoting nutrition awareness, especially among mothers and caregivers. They should be involved in growth monitoring, health education, and community outreach. Training in the proper use of the WHO BMI percentile charts instead of arm circumference is recommended to improve accuracy in nutritional assessment. Their role as health educators is critical to increasing awareness among mothers, especially on proper food utilization and sustainable feeding practices.

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