

Household and Community-Level Factors Associated with Stunting Among Children Aged 0–59 Months in a Rural Philippine Municipality

John Vincent Paul V. De Villa

Student, AGO Medical and Educational Center Graduate School of Health

Abstract— Childhood stunting remains a major public health concern, particularly in rural communities where household vulnerabilities and community-level inequalities influence child nutrition outcomes. This study aimed to examine the household and community-level factors associated with stunting among children aged 0–59 months in a rural Philippine municipality. A quantitative descriptive-correlational cross-sectional design was employed among 220 caregivers of children aged 0–59 months identified with stunting from 18 barangays in Presentacion, Camarines Sur. Data were collected using a researcher-developed structured questionnaire assessing demographic characteristics, family nutritional and feeding practices, access to child health services, and household sanitation and hygiene practices. Descriptive statistics, Chi-square tests, and Spearman correlation analysis were used to determine patterns and relationships among variables. Results showed that caregivers generally reported favorable nutritional practices, healthcare utilization, and sanitation behaviors. However, significant associations were identified between barangay location and family nutritional practices, employment status and nutritional practices, civil status and access to child health services, barangay location and healthcare access, and barangay location and household sanitation practices. These findings highlight that childhood stunting is influenced not only by household behaviors but also by geographic and socioeconomic conditions affecting families' capacity to provide optimal care. Strengthening integrated, community-based interventions that combine nutrition support, healthcare accessibility, sanitation improvement, and socioeconomic assistance is essential for addressing childhood stunting in rural Philippine settings.

Keywords— childhood stunting; child nutrition; household factors; community health; rural Philippines.

I. INTRODUCTION

Childhood stunting remains one of the most persistent public health challenges worldwide, reflecting chronic undernutrition that affects children's physical growth, cognitive development, and long-term well-being. Stunting is commonly defined as a height-for-age measurement below two standard deviations from the World Health Organization (WHO) Child Growth Standards and represents prolonged exposure to inadequate nutrition, repeated infections, and unfavorable living conditions. The first five years of life, particularly the period from birth to 59 months, represent a critical window when nutritional deficiencies and inadequate care practices may have lasting consequences on child development. Beyond impaired physical growth, children affected by stunting are at increased risk of poor cognitive performance, reduced school achievement, lower

productivity in adulthood, and greater vulnerability to chronic diseases later in life.

Globally, childhood stunting continues to affect millions of children despite decades of nutrition and health interventions. According to the Joint Child Malnutrition Estimates of UNICEF, WHO, and the World Bank, approximately 149 million children under five years of age were affected by stunting worldwide in 2022, representing about 22% of children in this age group. Although global prevalence has gradually declined, stunting remains concentrated among vulnerable populations, particularly those living in rural, geographically isolated, and economically disadvantaged communities. These settings often experience multiple barriers, including limited access to nutritious foods, unstable household income, inadequate healthcare services, and poor sanitation infrastructure, creating conditions that

increase children's vulnerability to chronic malnutrition.

The Philippines continues to experience a substantial burden of childhood stunting despite ongoing national nutrition programs and health initiatives. The 2021 Expanded National Nutrition Survey conducted by the Department of Science and Technology–Food and Nutrition Research Institute (DOST-FNRI) reported that approximately 26.7% of Filipino children aged 0–59 months were stunted. The persistence of high stunting rates reflects the complex interaction between household-level vulnerabilities and broader socioeconomic inequalities. Rural communities are particularly affected because families often face challenges related to poverty, food insecurity, limited livelihood opportunities, and geographic barriers that influence access to health and nutrition services.

In the Bicol Region, childhood malnutrition remains a significant concern, with rural municipalities experiencing challenges related to access, resources, and service delivery. In Camarines Sur, local nutrition monitoring data indicate that stunting remains present among young children, including in the Municipality of Presentacion, where the prevalence rate based on Operation Timbang Plus results remained a public health concern. The municipality consists of 18 barangays, including coastal, mainland, and upland/interior communities, with varying levels of accessibility and available resources. These geographic differences may influence household food availability, healthcare utilization, sanitation conditions, and the capacity of families to provide adequate care for young children.

Childhood stunting is recognized as a multifactorial condition resulting from the interaction of immediate, underlying, and structural determinants. At the household level, nutritional and feeding practices remain central factors associated with child nutrition outcomes. Appropriate breastfeeding practices, timely introduction of complementary foods, dietary diversity, and adequate nutrient intake contribute significantly to preventing growth failure. Susianto et al. (2022) emphasized the protective role of early initiation and exclusive breastfeeding against stunting,

while Basri et al. (2021) demonstrated that inadequate dietary diversity and poor dietary patterns are associated with impaired linear growth among children. Similarly, Dinaol (2022) identified inadequate dietary diversity, limited consumption of animal-source foods, and larger household size as important factors associated with stunting among children under five years old.

Healthcare access represents another important determinant of child growth outcomes. Preventive services such as immunization, growth monitoring, deworming, and regular health center visits contribute to early identification and management of conditions that may affect nutritional status. Previous studies have demonstrated associations between incomplete immunization and increased risk of stunting among children. However, healthcare utilization is not determined solely by caregiver decisions; it is also influenced by accessibility, geographic location, availability of services, and household social support systems.

Environmental conditions, particularly water, sanitation, and hygiene (WASH), also play an important role in childhood nutrition. Poor sanitation conditions increase children's exposure to infections that can interfere with nutrient absorption and contribute to growth faltering. Studies by Gaffan et al. (2023) and Harron et al. (2023) showed that inadequate access to safe water, sanitation facilities, and hygiene practices increases the likelihood of childhood stunting. These findings highlight that improving child nutrition requires interventions that address both dietary factors and environmental conditions surrounding children and their families.

Beyond household practices, increasing evidence emphasizes the importance of social, economic, and geographic factors associated with childhood stunting. The ecological perspective of child development suggests that children's growth outcomes are shaped by multiple interconnected systems, including family environments, community resources, institutional support, and broader socioeconomic conditions. Bronfenbrenner's Ecological Systems Theory explains that child development occurs within

interacting levels of influence, where household behaviors are affected by community structures and larger social systems. In the context of child nutrition, factors such as household income, caregiver education, employment opportunities, and geographic location may influence families' ability to provide adequate nutrition and access essential services.

In the Philippines, socioeconomic disparities continue to contribute to unequal nutrition outcomes among children. Ulep et al. (2021) identified maternal education, household socioeconomic status, prenatal care quality, and child diet as significant contributors to disparities in stunting between poor and non-poor Filipino children. Similarly, Vaivada et al. (2020) emphasized household wealth as a consistent predictor of improved child growth outcomes. These findings suggest that addressing stunting requires strategies that extend beyond nutrition education by addressing poverty, livelihood opportunities, service accessibility, and community-level inequalities.

Although existing studies have extensively examined factors associated with childhood stunting, many investigations have focused primarily on individual household characteristics or national-level patterns. Limited evidence exists regarding how household practices interact with community-level conditions within specific rural municipalities in the Philippines. In particular, the influence of geographic differences among barangays, including coastal, mainland, and upland communities, remains insufficiently explored. Understanding these localized relationships is important because interventions designed at the national level may not fully address the unique barriers experienced by rural families.

In Presentacion, Camarines Sur, where communities differ in geographic accessibility and available resources, examining childhood stunting through a household and community-level perspective provides valuable evidence for developing context-specific interventions. By investigating family nutritional practices, access to child health services, sanitation behaviors, and demographic characteristics, this study contributes localized evidence that may guide rural

nutrition programs and strengthen community-based approaches to preventing childhood stunting.

Therefore, this study aimed to examine the household and community-level factors associated with stunting among children aged 0–59 months in a rural Philippine municipality. Specifically, it assessed household factors related to family nutritional and feeding practices, access to child health services, and sanitation and hygiene practices; determined the demographic and socioeconomic characteristics associated with family nutritional practices; examined the relationship between community and household characteristics and healthcare access and sanitation practices; and identified implications for developing integrated community-based interventions addressing household and structural factors associated with childhood stunting in rural Philippine settings.

II. METHODOLOGY

This study employed a quantitative descriptive-correlational cross-sectional research design to examine household and community-level factors associated with stunting among children aged 0–59 months in a rural Philippine municipality. The design allowed the researchers to describe caregiver characteristics, assess household practices related to nutrition, healthcare access, and sanitation, and determine statistical associations between demographic/community characteristics and child-related care practices. Data were collected at a single point in time among caregivers of children identified as stunted based on available growth monitoring records from local health centers in Presentacion, Camarines Sur. The study was conducted across the municipality's 18 barangays, representing coastal, mainland, and upland/interior communities.

The respondents consisted of 220 parents or primary caregivers of children aged 0–59 months who met the inclusion criteria of being at least 18 years old, residing in Presentacion, Camarines Sur for at least six months, and willing to participate in the study. The sample size was determined using Slovin's formula from a municipal population of 471 identified stunted children, with a 5% margin of error. Data were gathered using a researcher-developed structured

questionnaire consisting of four sections: demographic and socioeconomic characteristics of caregivers and households; family nutritional and feeding practices; access to child health services; and household sanitation and hygiene practices. The instrument was reviewed and validated by a public health nutrition expert, research adviser, and statistician, and was pilot-tested among respondents with similar characteristics outside the study sample.

Data analysis involved descriptive and inferential statistical procedures. Frequency counts and percentage distributions were used to summarize caregiver demographic and socioeconomic characteristics, while mean scores from the four-point Likert scale were used to assess household nutrition, healthcare access, and sanitation practices.

Chi-square tests of independence were employed to determine associations between categorical demographic/community characteristics and household-level practices, while Spearman's correlation was used for relationships involving ordinal variables. Statistical significance was determined at a p-value of ≤ 0.05 . Ethical principles, including informed consent, voluntary participation, confidentiality, anonymity, and compliance with the Data Privacy Act of 2012, were observed throughout the research process.

III. RESULTS

Household-level factors associated with stunting among children aged 0–59 months in terms of family nutritional and feeding practices, access to child health services, and household sanitation and hygiene practices

The findings presented in Table 1 showed that caregivers reported strong adherence to recommended

child nutrition practices, utilization of child health services, and household sanitation and hygiene behaviors.

Among the assessed indicators, access to health services obtained the highest ratings, particularly health center visits (Mean = 3.61), immunization coverage (Mean = 3.60), growth monitoring services (Mean = 3.58), and deworming services (Mean = 3.58).

Family nutritional practices also received favorable ratings, including exclusive breastfeeding (Mean = 3.54) and complementary feeding (Mean = 3.45). Household sanitation and hygiene practices likewise obtained a high rating (Mean = 3.51).

These findings indicate that caregivers generally perceived themselves as practicing behaviors recognized as important in preventing childhood malnutrition.

However, despite the favorable reported household practices, the persistence of stunting among children in the study population suggests that child growth outcomes may not be explained solely by caregiver behaviors.

Stunting is a complex condition resulting from the interaction of immediate, underlying, and structural determinants.

While appropriate feeding practices, healthcare utilization, and sanitation are essential components of child growth promotion, these behaviors are influenced by broader factors such as socioeconomic status, geographic accessibility, food security, and availability of resources.

Table 1. Assessment of Household-Level Factors Associated with Stunting Among Children Aged 0–59 Months (n=220)

Household-Level Factors	Indicators	Mean	Interpretation
Family Nutritional and Feeding Practices	Exclusive breastfeeding practices	3.54	Strongly Agree
	Complementary feeding practices	3.45	Strongly Agree
Access to Child Health Services	Health center visits	3.61	Strongly Agree
	Immunization coverage	3.60	Strongly Agree
	Growth monitoring services	3.58	Strongly Agree

	Deworming services	3.58	Strongly Agree
Household Sanitation and Hygiene Practices	Proper hygiene and sanitation practices	3.51	Strongly Agree

This finding is consistent with the UNICEF conceptual framework on child malnutrition, which emphasizes that inadequate diets and insufficient caregiving practices operate within larger social and environmental conditions affecting child nutrition outcomes. Previous studies cited in the thesis support the importance of breastfeeding, dietary diversity, healthcare utilization, and sanitation in reducing stunting risk. Susianto et al. (2022) highlighted the protective role of early initiation and exclusive breastfeeding, while Basri et al. (2021) and Dinaol (2022) emphasized the contribution of dietary diversity and adequate nutrient intake to improved linear growth outcomes. Likewise, Gaffan et al. (2023) and Harron et al. (2023) demonstrated that inadequate water, sanitation, and hygiene conditions increase the likelihood of childhood stunting.

The results suggest that although strengthening household practices remains important, interventions should move beyond behavior modification alone. The

continued occurrence of stunting despite positive caregiver responses indicates the need to address wider community and structural barriers affecting families' ability to maintain optimal child nutrition.

Association between caregiver demographic and socioeconomic characteristics and family nutritional and feeding practices among households with children aged 0–59 months

The findings in Table 2 revealed that among the demographic and socioeconomic variables examined, only barangay location and employment status were significantly associated with family nutritional practices. Barangay location showed a significant relationship with nutritional practices ($\chi^2 = 76.740$, $p = 0.001$), while employment status was also significantly associated ($\chi^2 = 85.705$, $p = 0.030$). Other characteristics, including caregiver age, sex, civil status, household income, educational attainment, and number of young children, showed no statistically significant relationship with nutritional practices.

Table 2. Association Between Demographic and Socioeconomic Characteristics and Family Nutritional Practices

Demographic/Socioeconomic Variable	Statistical Test	Test Value	p-value	Interpretation
Age	Spearman correlation	$\rho = 0.082$	0.225	Not Significant
Sex	Chi-square	$\chi^2 = 10.963$	0.963	Not Significant
Civil Status	Chi-square	$\chi^2 = 59.718$	0.594	Not Significant
Barangay Location	Chi-square	$\chi^2 = 76.740$	0.001	Significant
Number of Children (0–5 years)	Spearman correlation	$\rho = 0.127$	0.060	Not Significant
Monthly Household Income	Spearman correlation	$\rho = 0.041$	0.545	Not Significant
Educational Attainment	Spearman correlation	$\rho = 0.084$	0.213	Not Significant
Employment Status	Chi-square	$\chi^2 = 85.705$	0.030	Significant

The significant association between barangay location and nutritional practices highlights the influence of community environments on household food behaviors. Families living in coastal, mainland, and upland/interior areas may experience differences in food availability, market accessibility, livelihood opportunities, and transportation conditions. In rural settings, geographic location can influence not only access to nutritious foods but also the ability of

households to sustain recommended feeding practices. This supports the ecological perspective adopted in the study, which recognizes that child health outcomes are shaped by multiple interacting systems beyond the immediate family environment.

Employment status was another significant factor associated with nutritional practices. In this study, the majority of respondents were unemployed (86%), and

most households had a monthly income below ₱10,000. Limited employment opportunities may affect household food security and the capacity to provide diverse and nutrient-rich foods for young children. Although income itself was not statistically associated with nutritional practices, employment may represent a broader indicator of household economic stability and resource availability.

These findings are supported by previous studies included in the thesis. Vaivada et al. (2020) identified household wealth as a consistent driver of improved child growth outcomes, while Bustos et al. (2025) emphasized that children from economically disadvantaged households face increased risks of stunting and food insecurity. Ulep et al. (2021) further demonstrated that socioeconomic disparities significantly contribute to differences in stunting prevalence among Filipino children.

Therefore, improving child nutrition requires interventions that consider the socioeconomic and

geographic realities of families. Nutrition education should be complemented by livelihood support, food security initiatives, and location-specific strategies that address barriers experienced by vulnerable households.

Relationship between community and household characteristics and access to child health services and sanitation practices among families with children aged 0–59 months

The results presented in Table 3 showed that civil/marital status and barangay location were significantly associated with access to child health services.

Barangay location demonstrated a significant relationship with healthcare access ($\chi^2 = 117.484$, $p = 0.001$), while civil/marital status also showed significant association ($\chi^2 = 144.741$, $p = 0.011$). Other demographic factors, including age, sex, income, education, occupation, and number of children, were not significantly related to healthcare access.

Table 3. Association Between Demographic and Community Characteristics and Access to Child Health Services

Demographic/Community Variable	Statistical Test	Test Value	p-value	Interpretation
Age	Spearman correlation	$\rho = 0.112$	0.098	Not Significant
Sex	Chi-square	$\chi^2 = 14.104$	1.000	Not Significant
Civil/Marital Status	Chi-square	$\chi^2 = 144.741$	0.011	Significant
Barangay Location	Chi-square	$\chi^2 = 117.484$	0.001	Significant
Number of Children (0–5 years)	Spearman correlation	$\rho = 0.121$	0.072	Not Significant
Monthly Household Income	Spearman correlation	$\rho = -0.032$	0.641	Not Significant
Educational Attainment	Spearman correlation	$\rho = 0.072$	0.286	Not Significant
Occupation	Spearman correlation	$\rho = 0.112$	0.098	Not Significant

The significant influence of barangay location indicates that geographical conditions remain an important determinant of healthcare accessibility in rural communities. Families living in coastal or geographically distant areas may encounter challenges related to transportation, distance to health facilities, availability of outreach services, and continuity of healthcare contact. This finding reinforces the importance of community-level health systems in ensuring equitable access to preventive child health services.

Civil/marital status was also associated with healthcare access, suggesting that household social support structures may influence health-seeking behaviors. Families with stronger support systems may have greater capacity to attend health center visits, comply with scheduled services, and access available programs. The thesis discussion highlighted that married or partnered caregivers may benefit from shared responsibilities and additional support, which can improve healthcare utilization.

This finding is consistent with Lindström et al. (2024), who reported that social relationships and marital status may influence health outcomes and healthcare behaviors. Similarly, studies included in the thesis emphasized that healthcare utilization is affected not only by individual characteristics but also by social and environmental conditions influencing families' ability to seek care. The results emphasize that improving child health service utilization in rural municipalities requires strengthening community-based healthcare delivery, particularly in geographically disadvantaged areas.

The findings in Table 4 revealed that barangay location and the number of children aged 0–59 months were significantly associated with household sanitation practices.

Barangay location showed a significant relationship ($\chi^2 = 54.995$, $p < 0.001$), while the number of children in the household was also significantly associated with sanitation behaviors ($p = 0.198$, $p = 0.003$). Other demographic characteristics showed no significant relationship.

Table 4. Association Between Demographic and Community Characteristics and Household Sanitation and Hygiene Practices

Demographic/Community Variable	Statistical Test	Test Value	p-value	Interpretation
Age	Spearman correlation	$\rho = 0.052$	0.439	Not Significant
Sex	Chi-square	$\chi^2 = 2.146$	0.543	Not Significant
Civil/Marital Status	Chi-square	$\chi^2 = 6.033$	0.737	Not Significant
Barangay Location	Chi-square	$\chi^2 = 54.995$	<0.001	Significant
Number of Children (0–59 months)	Spearman correlation	$\rho = 0.198$	0.003	Significant
Monthly Household Income	Spearman correlation	$\rho = -0.059$	0.383	Not Significant
Educational Attainment	Spearman correlation	$\rho = -0.031$	0.647	Not Significant
Occupation	Chi-square	$\chi^2 = 4.041$	0.909	Not Significant

The significant relationship between barangay location and sanitation practices demonstrates that hygiene behaviors are influenced not only by household choices but also by environmental conditions. Differences in water availability, waste disposal systems, housing conditions, and community infrastructure may explain variations in sanitation practices among coastal, mainland, and upland communities.

The association between household size and sanitation practices suggests that families with more young children may face greater challenges in maintaining consistent hygiene behaviors. Larger caregiving demands may affect the ability of households to sustain sanitation routines, particularly in resource-limited settings.

These findings support previous evidence from Gaffan et al. (2023) and Harron et al. (2023), which demonstrated that inadequate access to water,

sanitation, and hygiene services increases childhood stunting risk. Schneider (2025) further emphasized that ecological and environmental conditions contribute significantly to child growth outcomes in low- and middle-income countries.

Therefore, sanitation interventions should not focus solely on individual behavior change but should include improvements in community infrastructure, water access, and environmental health systems.

Evidence-based implications for strengthening integrated community-based interventions addressing household and structural factors associated with childhood stunting in rural Philippine settings

The findings summarized in Table 5 indicate that addressing childhood stunting requires a comprehensive, multisectoral approach. Although caregivers demonstrated positive nutritional practices, health service utilization, and sanitation behaviors,

significant relationships with geographic location, employment status, household composition, and social characteristics indicate that structural conditions continue to influence child health outcomes.

The findings support the development of integrated community-based interventions such as the proposed

Barangay Integrated Child Nutrition, Health, and Sanitation Enhancement Program (BICNHSEP). Such interventions should combine nutrition counseling, breastfeeding and complementary feeding support, child health monitoring, immunization promotion, WASH initiatives, and socioeconomic assistance.

Table 5. Evidence-Based Intervention Priorities Based on Identified Household and Community Factors

Identified Factor	Evidence From Findings	Recommended Intervention Direction
Geographic disparities among barangays	Barangay location significantly influenced nutrition practices, healthcare access, and sanitation practices	Develop barangay-specific nutrition, health, and sanitation programs
Employment and socioeconomic vulnerability	Employment status was associated with nutritional practices; majority of households had low income	Strengthen livelihood support and social protection programs
Child health service accessibility	Barangay location and civil status influenced access to child health services	Improve outreach healthcare delivery and strengthen community health services
Sanitation and hygiene conditions	Barangay location and number of young children influenced sanitation practices	Expand WASH interventions and household hygiene promotion
Need for integrated approaches	Stunting persisted despite reported positive household practices	Implement multisectoral programs involving LGUs, health workers, nutrition workers, and community organizations

The evidence suggests that rural municipalities require interventions tailored to specific community contexts rather than uniform approaches. Coastal, upland, and geographically isolated communities may require different strategies based on their unique barriers to food access, healthcare availability, and sanitation resources.

This approach aligns with the ecological systems perspective, which recognizes that child development is shaped by interactions between family, community institutions, and broader socioeconomic systems. Strengthening partnerships among local government units, rural health units, Barangay Nutrition Scholars, and other agencies is essential for creating sustainable solutions to childhood stunting.

IV. CONCLUSION & RECOMMENDATION

This study demonstrated that childhood stunting among children aged 0–59 months in a rural Philippine

municipality is influenced by the interaction of household practices and community-level conditions. Although caregivers reported favorable family nutritional and feeding practices, access to child health services, and household sanitation and hygiene behaviors, these factors alone did not fully explain the persistence of stunting. The findings revealed that geographic and socioeconomic contexts play an important role in shaping child nutrition outcomes, with barangay location significantly associated with family nutritional practices, access to child health services, and sanitation practices. Employment status was also associated with family nutritional practices, while civil status influenced access to child health services and household composition affected sanitation behaviors. These results highlight that childhood stunting should not be viewed solely as a consequence of individual caregiver practices but as a reflection of broader structural conditions, including geographic disparities, livelihood limitations, and

unequal access to essential resources. Addressing stunting therefore requires approaches that integrate household-level interventions with community-based strategies that respond to the social, economic, and environmental realities of rural communities.

Based on the findings, an integrated community-based approach is recommended to address both household and structural determinants associated with childhood stunting in rural Philippine settings. Local government units, through rural health units, Barangay Health Workers, and Barangay Nutrition Scholars, should strengthen existing nutrition and child health programs by providing sustained breastfeeding support, age-appropriate complementary feeding education, growth monitoring, immunization promotion, and regular household visits, particularly among geographically vulnerable communities. Water, sanitation, and hygiene (WASH) initiatives should also be expanded through improved sanitation facilities, hygiene promotion, and community environmental health programs. Beyond nutrition-specific interventions, local stakeholders should implement socioeconomic support mechanisms, including livelihood opportunities, food security programs, and stronger intersectoral collaboration among health, social welfare, agriculture, education, and employment agencies. Future programs should prioritize barangay-specific strategies that recognize differences in geographic accessibility and household vulnerabilities to ensure equitable opportunities for optimal child growth and development.

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