PHILIPP AGRIC SCIENTIST
Vol. 107 No. 4, 409-418
December 2024

ISSN 0031-7454
https://doi.org/10.62550/HCD03049024

Comparative Analysis of Household Food and Nutrition Security in Selected Philippine Urban and Rural Households During the COVID-19 Pandemic

Jay-al P. Reyes[1] and Julieta A. Delos Reyes[1,*]

[1] Department of Agricultural and Applied Economics, College of Economics and Management, University of the Philippines Los Baños

Author for correspondence: Email: jadelosreyes@up.edu.ph

Received: August 03, 2024 / Revised: October 15, 2024 / Accepted: October 16, 2024

This study analyzed the food and nutrition security of selected urban and rural households in Pili, Camarines Sur, Philippines during the COVID-19 pandemic. It determined the prevalence of food insecurity among the selected urban and rural households, analyzed the determinants of food insecurity in these households, determined the prevalence of malnutrition, and assessed the relationship between the households' food security and nutrition security. Primary data from a survey of 185 urban and rural households and secondary data from the Electronic Operation Timbang Plus (e-OPT) Tool were used to determine the prevalence of food insecurity using the Food Insecurity Experience Scale (FIES) of the Food and Agriculture Organization (FAO) and nutrition insecurity between urban and rural households, respectively. Results revealed that, during the pandemic, there were more (89.1%) food-insecure households most of which were from urban areas (88.3%). The ordered logistic regression analysis also showed that food insecurity in urban households was determined by the age of the household head, household monthly income, household size, and access to credit, while food insecurity in rural households was determined by education, monthly income, household daily food expenditure, and land ownership. Stunting and wasting among children under the age of five were more evident in urban households; however, rural households had a higher prevalence of stunted and wasted children aged 6 – 12 yr. The Fisher's Exact Test results showed that the food security status and nutrition security level of children aged 0 – 5 yr and school-aged children were unrelated. Targeted courses of action are recommended to address area-specific nutrition problems.

Keywords: COVID-19 pandemic, food security, nutrition security, ordered logistic regression

INTRODUCTION

The Sustainable Development Goal 2 (SDG 2) of the United Nations (UN) that aims to achieve zero hunger by 2030 targets the achievement of food and nutrition security of the global population. Food security, as defined by the 1996 World Food Summit of the Food and Agriculture Organization of the United Nations (FAO), "exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meet their dietary needs and food preferences for an active and healthy life" (FAO 1996). On the other hand, nutrition security, as per FAO (2021), is achieved when individuals "have a nutritionally adequate diet and the food consumed is biologically utilized such that adequate performance is maintained in growth, resisting or recovering from disease, pregnancy, lactation, and physical work". It also requires that people are able to afford quality healthcare services and have access to a clean environment (UN 2013).

The four dimensions of food security are food availability, accessibility, utilization, and stability (FAO 2008). Food availability refers to the presence of adequate amounts of quality food, while food access pertains to access of individuals or households to sufficient resources to purchase appropriate food for a nutritious diet. On the other hand, utilization focuses on how food is utilized to meet the physiological needs of the body, while the stability dimension refers to access to food at all times—a temporal determinant that affects the first three

food security dimensions. This dimension can be influenced by unexpected events such as economic shocks, climatic crises, and sudden outbreaks such as the COVID-19 Pandemic (HLPE 2020).

The COVID-19 Pandemic is a global health crisis that further threatens the food and nutrition security of the world's population, millions of whom were already experiencing hunger and malnutrition even before the outbreak. In the Philippines, as reported by the Australian Center for International Agricultural Research (2020), the pandemic had a significant impact on consumption as a response to changes in employment and income. Palo et al. (2020) said that the limited movement due to quarantine restrictions resulted in the closure of businesses and a reduction in consumer demand and eventual purchases. In agriculture, logistical restrictions disrupted the farm operations and activities that created bottlenecks in the supply chain, especially for production inputs and distribution of agricultural commodities (Palo et al. 2020). All of these have negatively affected the food security and nutrition situation of the country.

The FAO, International Fund for Agricultural Development (IFAD), United Nations Children's Fund (UNICEF), UN World Food Programme (WFP), and World Health Organization (WHO) (2021) report on the state of food security and nutrition in the world indicated that in 2018–2020, the Philippines had the greatest number of people in Southeast Asia who are considered food insecure with 46.1 million moderately or severely food insecure. In terms of nutrition, 0.6 million (5.6%) Filipino children under the age of 5 were wasted, 3 million (28.7%) were stunted, and 0.4 million (4.2%) were overweight. Among the provinces in the country with severe cases of food and nutrition insecurity is Camarines Sur (DOST-FNRI 2019) with 70.3% food insecure households—21.7% of whom were severe cases. Stunting was common among children under the age of 5 and those school-aged with a prevalence rate of around 30%.

As affirmed by the Committee on World Food Security (CFS) (2017), food security is influenced by global and local factors, household heterogeneity, and economic and social behaviors. The attainment of a food and nutrition secure population depends on the interplay of these determinants. Specifically, food security depends on strong links between urban and rural areas (Obayelu 2012). The prevalence of food insecurity among individuals and households in the urban and rural areas varies since various socio-demographic and economic indicators differ between these geographical delineations.

Rural areas are characterized by a limited number of markets and the absence of diverse and nutritious food, leaving the people vulnerable to food and nutrition insecurity (Bashir and Schilizzi 2013). However, studies have shown that household food insecurity is also prevalent among urban households due to increasing population, inaccessibility to social services, high cost of living, and lack of income due to unemployment. The increasing urbanization or shift of population from rural to urban areas has an impact on the quality and diversity of their diet, which affects their food security (Jones 2015). These conditions were exacerbated by the social and economic impacts of the COVID-19 pandemic. While it is a global phenomenon, the Organisation for Economic Co-operation and Development (OECD) (2021) stated that its effects were territorially different. Urban areas were hit by the virus early and since they are densely populated, the disease's rate of spread was relatively faster (OECD 2021). Kang et al. (2021) also argued that urban areas were more affected considering their dependence on employment income to obtain food. On the other hand, rural areas suffered from limited health care services and in these areas where agricultural production is concentrated, the pandemic exerted negative shocks on production, prices, and income (Harris-Fry et al. 2015). With these varying claims on the consequences of the pandemic, a local empirical study becomes imperative—thus, the conduct of this study. This analysis of food and nutrition security in selected urban and rural households during the pandemic will put a local perspective in the identification of crucial social and economic factors that could facilitate the achievement of food and nutrition security in the area.

The general objective of the study was to analyze the food and nutrition security among households during the COVID-19 pandemic in selected rural and urban households in Pili, Camarines Sur, Philippines. Specifically, it determined the prevalence of food insecurity among the selected urban and rural households, analyzed the determinants of food insecurity in these households, determined the prevalence of undernourishment or malnutrition, and assessed the relationship between households' food security and nutrition security during the pandemic.

Conceptual Framework

Fig. 1 illustrates how household food and nutrition security can be determined by the socio-demographic characteristics of urban and rural residents. Food security has four dimensions: availability, accessibility, utilization, and stability. The physical availability of food refers to the supply of food commodities for consumption. The accessibility dimension refers to the economic and physical access to food or the ability to acquire food necessities with little to no limitations. It is the access of individuals or households to adequate resources to obtain appropriate food for a nutritious diet. The utilization dimension focuses on how food is utilized to meet the physiological needs of the body. Stability, on the other hand, refers to the capacity to keep food sufficiently available, adequately accessed, and optimally utilized in a sustained period. It is affected by sudden events such as the COVID-19

pandemic that cause economic crises which also mirrored changes in the other dimensions of food security.

Among the various socio-demographic and economic factors that can affect food and nutrition security of urban and rural households are the household head's age, gender, and education; and the household's size, income, per capita food expenditure, access to credit, and land ownership. The household head's age can be a major determinant as it may positively affect household food insecurity levels, with senior citizens totally banned from going out. Gender can also be a factor mainly due to the ability or inability of the person to prepare various nutritious foods, as women are typically more able to prepare nutritious foods. Household size may directly limit the amount of food available per family member especially if family resources are limited. On the other hand, the possibility of augmenting family resources can increase with increasing level of education resulting in improved employment opportunities which, in turn, translates to more income that can be used to access food. It can also influence the quality of food needed to satisfy the health and nutritional needs of household dependents including adequate healthcare services and effective sanitation measures.

Access to credit and land ownership are also important factors since developing countries have increasing dependence on the availability of land for production and other farm activities. With available land that is supported by credit, farm productivity is more likely to be improved, thereby increasing household income and the likelihood of food and nutrition security. This is tied with household food expenditure, a direct indicator of food security suggesting that a high consumption level positively influences food security.

Food security of households is expected to promote nutrition security which is indicated by anthropometric measures such as stunting, wasting, and Body Mass Index classifications (underweight and overweight).

RESEARCH METHODOLOGY

This study utilized a two-stage sampling procedure to determine the respondents: two barangays each were randomly selected from the rural and urban barangays in Pili, Camarines Sur, Philippines from which sample households were chosen. Cochran's formula was used to determine the sample size for each urban (94) and rural group (91). Data obtained via structured interview schedules were analyzed using descriptive statistics such as frequency counts, percentages, means and modes.

The Food Insecurity Experience Scale (FIES) (FAO 2013) was used in classifying the level of food insecurity of the selected households. The FIES consists of eight items where affirmative responses per item correspond to their level of food insecurity (Table 1). The anthropometric indicators obtained from the e-OPT of urban and rural barangays which determined the prevalence of malnourishment and undernutrition through cases of stunting, wasting, underweight, and overweight/obese for child members of households were used in the analysis of nutrition security. Also, per household, the height and weight of children aged 6 –12 yr were measured for the calculation of their Body Mass Index (BMI).

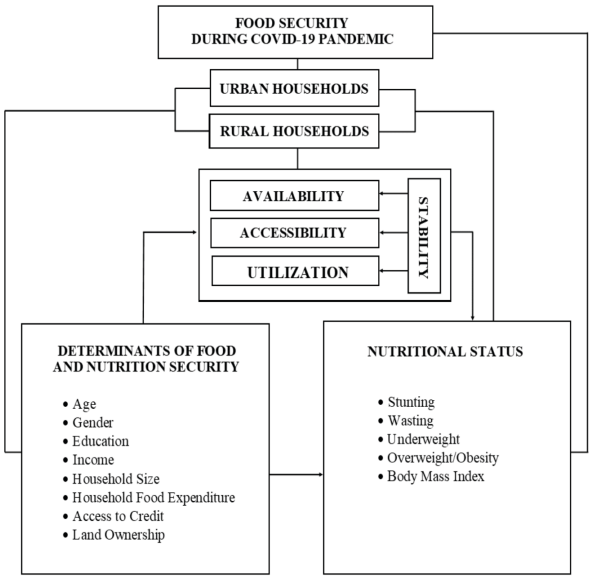

Fig.1. Conceptual framework used in analyzing the food and nutrition security between urban and rural households in Pili, Camarines Sur, Philippines.

Table 1. The eight Food Insecurity Experience Scale (FIES) items by severity of food insecurity.

	Scale Items	Severity of Food Insecurity
1	Worried about running out of food because of lack of money or other resources	Mildly Food Insecure
2	Unable to eat healthy and nutritious food because of lack of money or other resources	Mildly Food Insecure
3	Ate only a few kinds of foods because of lack of money or other resources	Mildly Food Insecure
4	Had to skip a meal because of lack of money or other resources	Moderately Food Insecure
5	Ate less than you thought you should because of lack of money or other resources	Moderately Food Insecure
6	The household ran out of food because of lack of money or other resources	Moderately Food Insecure
7	Hungry but did not eat because of lack of money or other resources	Severely Food Insecure
8	Went without eating for a whole day because of lack of money or other resources	Severely Food Insecure

Source: FAO 2013

An ordered logistic regression analysis was performed to determine the factors affecting the food insecurity of the selected households. The following model used the levels of food insecurity as dependent variables and socio-economic characteristics as explanatory variables:

Finally, Fisher's Exact Test of Independence was used to determine whether there is a significant relationship between the status of food security and the status of nutrition security of the household-respondents.

$$Y = \beta + \beta_1 AGE + \beta_2 SEX + \beta_3 EDUC + \beta_4 INC + \beta_5 HS + \beta_6 L + \beta_7 DFE + \beta_8 ATC + \mu$$

Where: Y = severity of food insecurity status of households (1 = mild; 2 = moderate; 3 = severe; food-secure is the reference level)
B = intercept/constant term
HHT = household type (0 = rural; 1 =urban)
AGE = age of household head (1 = 36 – 45 years old; 0 = otherwise)
SEX = biological sex of the household head (0 = female; 1 = male)
EDUC = educational attainment of the household head (yr)
INC = household monthly income (Php)
HS = household size
L = land ownership (0 = does not own land; 1 = owns land)
DFE = household daily food expenditure (Php)
ATC = household access to credit (0 = no access to credit; 1 = has access to credit)
μ = error term

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Household-Respondents

The rural household heads were relatively older than their urban counterparts. Most of the households in both areas were managed by a woman. The majority (63.8%) of the respondents had 7 – 12 yr of formal schooling; however, in the urban areas, there were more household heads who attended school for more than 13 yr. Also, 57.3% of the respondents had a low-income level that is less than the estimated 2018 poverty threshold of Php10 727 for a family of five. Comparatively, urban households had a higher average monthly income than those in the rural areas. This is consistent with the findings of the Philippine Institute of Development Studies in 2020 that households in rural areas are predominantly poor while most (61.3%) of urban households belong to the middle-income class group (PIDS 2020). However, the latter had multiple sources of income and many (46.2%) of them were engaged in entrepreneurial activities such as farming as income sources.

The average household size for the urban respondents (6) was higher than those in the rural areas (5) and the average was five. Most of the households in urban (72.3%) and rural (75.8%) areas spent Php 100 – 300 on food and many (38.4%) had a lower expenditure during the pandemic due to the decline in their household income. Also, the meat and poultry group had the highest share in food expenditure for urban households while rural households spent mostly on fish and fishery products. The rural households had a higher tendency to borrow from informal credit sources due to difficulty in complying with credit requirements with formal institutions, mobility restrictions, and fear of contracting the virus. Nevertheless, the majority (79.5%) of urban and rural households had access to private and government financial institutions.

Household Food Security Status

Majority (52.4%) of the household-respondents were food secure prior to the health crisis which was higher than the measured food security prevalence reported by DOST-FNRI (2019) for Camarines Sur (30%). Also, there were more food secure households (55.3%) in urban barangays before the pandemic and most of those insecure were only mild cases (35.1%). On the other hand, 50.5% of rural households were food insecure, most of whom were of mild and moderate cases which may have been the result of rural households having low wage levels and few employment opportunities.

The food security level of urban and rural households worsened during the pandemic when there were only a few households (11.9%) considered food secure (Table 2). Comparatively, there were more food insecure households in urban areas (88.3%) than in rural barangays (87.9%). The lack of immediate access to food and financial constraints were mentioned by urban household heads as primary reasons for food insecurity. Unlike the households from rural areas, they were not able to produce their own food through gardening due to the lack of available space. This situation of urban households was also aggravated by mobility restrictions and the pandemic scare.

However, based on the severity of food insecurity, many (44.7%) of food insecure urban households were mild cases compared with the rural households that incurred a high number of moderately (50.5%) and severely (16.5%) food insecure cases (Table 2). The minimal production of vegetables in their backyard was not able to cushion the impacts of the pandemic on their already compromised socio-economic condition, thus increasing the severity of their food insecurity. Reducing the amount of food intake, taking formal credits, and borrowing money from relatives were among the coping mechanisms of the households from urban and rural barangays during the pandemic.

Table 2. Proportion (%) by food security status of 185 households in Pili, Camarines Sur before and during the pandemic (2021).

Food Security Status	Type of Household					
	Urban		Rural		Both	
	Before	During	Before	During	Before	During
Food Secure	**55.3**	**11.7**	**49.5**	**12.1**	**52.4**	**11.9**
Food Insecure	**44.7**	**88.3**	**50.5**	**87.9**	**47.6**	**88.1**
Mild	35.1	44.7	20.9	20.9	28.1	33.0
Moderate	8.5	35.1	25.3	50.5	16.8	42.7
Severe	1.1	8.5	4.4	16.5	2.7	12.4
Total	**100**	**100**	**100**	**100**	**100**	**100**

Determinants of Food Insecurity

For the urban households, the ordered regression model was found statistically significant at 95% confidence level. It was also determined that the age of the household head, household monthly income, household size, and access to credit were the only significant variables affecting the food security level of urban households with 5% probability level (Table 3). Results imply that the severity of household food insecurity will decrease if the age of the household head is between 36–45 yr old. This is supported by the study of Syafiq et al. (2022) that a household managed by a head whose age lies between this range is least likely to become food insecure amid a pandemic since they have better economic opportunities and decision-making capabilities than the younger and older groups.

Results also suggest that the severity of food insecurity tends to increase with a declining household income. This corroborates the findings of Shuvo et al. (2022) and Banna et al. (2022) stating that household income has a positive impact on food security. This is to be expected since higher income means higher purchasing power for the household. Furthermore, the level of food insecurity is higher for households with more household members and the negative coefficient for access to credit implies that households will more likely be food secure if they have access to credit. This is because credit is an alternative financial source for meeting the needs of the household, particularly for food consumption.

On the other hand, the significant variables affecting the food security level of rural households were education, household monthly income, daily food expenditure, and land ownership (Table 4). The model was significant at 95% confidence level. It was further revealed that the attainment of food security is higher if the household head had more years of formal schooling. This is due to the link of education to employment and knowledge to providing the appropriate quantity and quality of food, healthcare, and sanitation for the family. Likewise, the severity of food insecurity for rural households tends to increase with a decrease in household income. The probability of being in a higher order of food insecurity is also expected for rural households with lower daily food expenditure since this results from low income and low amount of food available for consumption. The negative coefficient for land ownership implies that households that do not own land will be in a more severe food insecurity situation. Owning land aids them in ensuring food supply through subsistence production which can secure the food needs of their household. The pseudo R2 obtained in the regression for urban and rural households were similar at 0.39 indicating that the model is an excellent fit since it was higher than 0.2 per McFadden's interpretation of adjusted R2.

Furthermore, the household type was found to be a significant food insecurity determinant; specifically, the likelihood of being in a more severe level of food insecurity is higher if a household is situated in a rural area. This supports the findings of Kundu et al. (2021) that food insecurity was associated with rural residence due to the relatively lower food consumption during the COVID-19 pandemic compared to urban areas. Additionally, they had lower food accessibility as affected by reduction in income due to unemployment. Again, the regression model had an excellent fit as pseudo R2 value surpassed the 0.2 mark.

Household Nutrition Security

Developed and conceptualized in 2010, the Operation Timbang (OPT) Plus of the Department of Health's (DOH) National Nutrition Council (NNC) is an information system that gathers data on food and nutrition insecurity at the barangay level (FAO

Table 3. Results of the ordered logistic regression analysis on factors affecting food insecurity of 94 urban households in Pili, Camarines Sur during the pandemic (2021).

Factor	Urban		Rural	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Age	-0.9963**	0.494	0.609	0.512
Sex	0.041	0.492	-0.564	0.576
Education	0.082	0.097	-0.2409**	0.112
Household Monthly Income	-0.0000***	0	-0.0000**	0
Household Size	0.4335***	0.116	0.243	0.127
Household Daily Food Expenditure	-0.001	0.002	-0.0045***	0.623
Land Ownership	-0.840	0.666	-2.1651***	0.001
Access to Credit	-3.2655***	0.78	0.217	0.636

***significant at 1% level of probability; ** significant at 5% level of probability
Prob > chi^2: 0.000
Pseudo R2: 0.39

Table 4. Results of the ordered logistic regression analysis on factors affecting food insecurity of 185 households in Pili, Camarines Sur during the pandemic (2021).

Factor	Regression Coefficient	Z-Value	Probability Level	Standard Error
Household Type	-1.4836***	-4.28	0	0.347
Age	-0.111	-0.34	0.737	0.329
Sex	-0.413	-1.17	0.241	0.352
Education	-0.095	-1.38	0.166	0.069
Household Monthly Income	-0.0000***	-3.44	0.001	0
Household Size	0.3515***	4.55	0	0.77
Household Daily Food Expenditure	-0.0034***	-3.36	0.001	0.001
Land Ownership	-1.5821***	-3.76	0	0.421
Access to Credit	-1.3734***	-3.39	0.001	0.406

***significant at 1% level of probability; ** significant at 5% level of probability
Prob > chi^2: 0.000
Pseudo R^2: 0.34

and NNC 2017). It tracks the prevalence of malnutrition and identifies underweight, wasted and stunted, and obese children among vulnerable communities. The more updated Electronic Operation Timbang (e-OPT) Plus Tool is an improved system that includes key features for accuracy in the organization and consolidation of data. The 2021 e-OPT records were obtained from the selected urban and rural barangays in Pili, Camarines Sur. Of the 185 households, there were 105 children aged 0 – 5 yr, 59 of whom were from urban households while the remaining 46 reside in rural barangays.

Considering the three nutrition and anthropometric indicators stated in the e-OPT, for the weight-for-age status, 94.3% of the children had normal status with urban households incurring a slight lead. On the other hand, the prevalence of severely underweight and underweight children was low at 1% and 2.9%, respectively. However, the severe cases were accounted for by urban households with 1.7% incidence. These were the children who had low weight relative to their age. Furthermore, for the height-for-age indicator, the prevalence of stunting (short height for age) was 7.6% with 3.8% severe cases. Comparatively, there were more stunted children in urban households (8.5%) than in rural households (5.5%) (Table 5).

Wasting, a weight-for-height indicator, was also recorded for urban households with one moderately wasted child. In general, for the 0 – 5 age group, those from urban households were more nutrition insecure as they recorded more stunted and wasted children during the COVID-19 pandemic. This can be attributed to urban poverty as evidenced by the low-income level of urban households and financial constraints in accessing healthcare and nutrition services during the pandemic. This age group includes children who are still breastfed. This is supported by the study of the United Nations Standing Committee on Nutrition (UNCSN) (2012) which revealed that urban women tend to breastfeed 2 – 3 mo less than women in rural households, contributing to poor nutrition outcomes among younger children. In addition, the lack of planting areas in urban areas inhibited the households from having constant access to fresh and nutritious types of food (e.g., fruits and vegetables) unlike those in rural areas where fruit trees abound, especially during summertime.

Table 5. Nutritional status of children aged 0–5 yr by type from 185 households in Pili, Camarines Sur during the pandemic (2021).

Nutritional Status	Type of Household					
	Urban (n=59)		Rural (n=6)		Both (n=105)	
	Number	Percentage	Number	Percentage	Number	Percent
Weight-for-Age Status						
Severely Underweight	1	1.7	0	0.0	1	1.0
Underweight	1	1.7	2	4.3	3	2.9
Normal	56	94.9	43	93.5	99	94.3
Overweight	1	1.7	1	2.2	2	1.9
Length/Height-for-Age Status						
Severely Stunted	2	3.4	2	4.3	4	3.8
Stunted/Short	3	5.1	1	2.2	4	3.8
Normal	52	88.1	41	89.1	93	88.6
Tall	2	3.4	2	4.3	4	3.8
Weight-for-Length/Heigth Status						
Severely Wasted	0	0.0	0	0.0	0	0.0
Moderately Wasted	1	1.7	0	0.0	1	1.0
Normal	55	93.2	45	97.8	100	95.2
Overweight	2	3.4	1	2.2	3	2.9
Obese	1	1.7	0	0.0	1	1.0
Total	**59**	**100**	**46**	**100**	**105**	**100**

Since the data on the nutrition of barangays' e-OPT only covers children under the age of 5five, the height and weight of children aged 6 – 12 yr were measured through a survey following the standard measurements and computations on the indicators set by the WHO for the age group. From the total of 185 households, the number of children whose age range falls under the 6 – 12 bracket was 141. Of this count, 72 were from urban households while 69 were from rural households. It was found that for the BMI-for-age indicator, 12.8% of the children were wasted, with almost 8% being severe cases. Additionally, the prevalence of wasting was almost equal for the two household types. However, 7.1% of the children aged 6 – 12 were overweight and most of them reside in rural barangays. Majority of the children—84.7% in urban households and 73.9% in rural households—had a normal BMI-for-age status (Table 6).

In terms of stunting, 7.1% were severely stunted with rural households incurring a higher prevalence (10.1%) compared to the households in urban barangays (4.2%). There were also many children (12.1%) who were stunted or short and most of them belonged to households in rural areas. Consequently, the percentage of children whose height-for-age status was normal was higher in urban areas at 81.9% relative to 72.5% of children in rural households. These made the households in rural barangays relatively more nutrition insecure for this age group. Aside from the socio-economic condition of rural households with several households below the poverty line, the inaccessibility to health services due to distance and issues on unaffordability and inconsistent consumption of adequate, diverse, and nutritious types of food were the primary reasons for nutrition insecurity in this area. Also, while there were available nutrition-related local programs, households in rural areas were unable to take advantage of these since they were impeded by the lack of awareness and limited knowledge on the consequences of malnutrition. This is supported by Naghashpour et al. (2020) who found that rural households have a lower level of knowledge on nutrition than those in urban areas.

Table 6. Nutritional status of children aged 6–12 yr, by type, from 185 households in Pili, Camarines Sur in 2021.

Nutritional Status	Type of Household					
	Urban		Rural		Both	
	Number (n=72)	Percentage	Number (n=69)	Percentage	Number (n=141)	Percentage
BMI-for-Age Status						
Severely Wasted	6	8.3	5	7.2	11	7.8
Wasted	3	4.2	4	5.8	7	5.0
Normal	61	84.7	51	73.9	112	79.4
Overweight	2	2.8	8	11.6	10	7.1
Obese	0	0.0	1	1.4	1	0.7
Length/Height-for-Age Status						
Severely Stunted	3	4.2	7	10.1	10	7.1
Stunted/ Short	8	11.1	9	13.0	17	12.1
Normal	59	81.9	50	72.5	109	77.3
Tall	2	2.8	3	4.3	5	3.5
Total	**72**	**100**	**69**	**100**	**141**	**100**

The nutritional status of children and household heads from urban and rural households and their respective food security levels were cross-tabulated with food security. The Fisher's Exact test of independence was employed to examine the significance of the association between the two categorical variables. Results revealed that the nutrition security level of children aged 0 – 5 yr and school-aged children were not significantly related to their food security status as p-values were more than 0.05 (Table 7). These were due to the low cases of malnutrition, particularly for children under 5 years yr old and school-aged children despite the high prevalence of household food insecurity.

Based on the Barangay Nutrition Reports of the selected urban and rural households, the local programs targeted at reducing undernourishment among children continued to be implemented amid the COVID-19 pandemic. Among these were infant and young child feeding, integrated management of acute malnutrition through micronutrient supplementation and nutritional dietary supplementation, and implementation of other nutrition-sensitive programs. The findings were similar to the results of Speirs et al. (2016) which showed that food insecurity is not associated with the BMI of pre-school-aged children and to the observation of Bhattacharya et al. (2004) which stated that food insecurity among children is not associated with nutritional outcomes. This implies that the nutritional status of children is related to various factors (e.g., school feeding programs) other than the household's food security level. Lastly, the immediate effect (< 2 yr) of the COVID-19 pandemic on the food insecurity of the households may not be sufficient to influence the state of their nutrition. As affirmed by Speirs et al. (2016), it may take 3 – 6 yr or more of inconsistent intake of adequate, diverse, and nutritious food to affect the nutritional status of an individual.

Table 7. Results of Fisher's exact test of independence on the relationship between food security level and nutrition security level of 185 households in Pili, Camarines Sur during the pandemic (2021).

Nutrition Indicator	Type of Household		
	Urban	Rural	Both
	Probabilities		
Children (0–5 yr)			
Weight-for-Age Status	0.292	0.526	0.939
Length/Height-for-Age Status	0.429	0.754	0.423
Weight-for-Length/Height Status	0.263	0.174	0.707
Children (6–12 yr)			
BMI-for-Age Status	0.183	0.521	0.662
Length/Height-for-Age Status	0.835	0.788	0.907

CONCLUSION

The emergence of the COVID-19 pandemic has seriously compromised the food and nutrition security situation of urban and rural households. Specifically, with a slight difference, urban households are more food insecure than households in rural areas during the pandemic. However, severe food insecurity was observed to be more prevalent in rural households. In terms of nutrition, rural households were more nutrition insecure as the prevalence of malnutrition was relatively higher in this area. Moreover, the socio-economic factors that affect the level of food and nutrition security were distinct between urban and rural households, and the conditions which exacerbated or facilitated their status of food and nutrition security amid the pandemic were different. Lastly, the nutrition security level of urban and rural households was not significantly related to their food security status. There were differences in the level of food and nutrition security as well as the factors that influenced them among urban and rural households during the COVID-19 pandemic. This implies that in the new normal, interventions to address food and nutrition insecurity must be made specific to the needs of the particular household classification.

RECOMMENDATIONS

Promoting sustainable livelihood and employment programs for food insecure households. The implementation of sustainable livelihood and employment programs will ensure improvement in the household income level of food insecure urban and rural households, thereby increasing financial stability and food accessibility. In rural areas, since most of them are engaged in farming which is concentrated on the production of rice, corn, and sugarcane, crop diversification is recommended through production of high-value vegetable crops such as ampalaya, cassava, and garlic, among others, that are suitable to the farming conditions of the province. This can be done through the provision of seeds and other basic production inputs as well as trainings and seminars on how to cultivate and market these types of crops. Additionally, this can be a source of varieties of food for the households' own consumption. Such efforts may be led by the Municipal Agriculture Office and the eventual increase in the Internal Revenue Allotment of the local government units (LGUs) as stipulated in the Mandanas-Garcia Ruling should provide the appropriate budget for implementation. On the other hand, LGUs can also encourage urban households to pursue low-capital businesses by providing them with one-time financial capital and skills training. Among these micro-enterprises could be food processing, handicraft making, soap production, and other ventures that require soft skills that can be easily learned by members of the household and can be implemented during a pandemic. Assistance in market development should also be provided to ensure that there will be ready markets for the products. Eventually, these should progress into self-help programs that the households can sustain even without aid from the government.

Additionally, in expanding access to employment among urban and rural populations, the local government in the municipality and province can implement varying programs depending on their constituents' needs. One of these could be the assurance that development projects at the local level would only employ local labor. Also, since the availability of jobs is a concern in urban areas, urban dwellers can benefit from the employment facilitation of LGUs through public and private partnerships (those engaged in businesses in the locality) in the provision of local employment opportunities. Since education is an issue in rural areas, skills training can be done as well as provision of one-time employment financial support.

I*mproved and targeted provision of nutrition and healthcare services for low-income households.* This can be implemented through the provision of discounted/subsidized nutrition and healthcare services to the indigent urban and rural population which include occasional health and nutrition assessments, vitamins and supplements, and consistent monitoring of health status, particularly for children and pregnant and lactating women. For those areas with existing programs, enhancements and more targeted intervention implementation should be done for them to be more effective.

For instance, since proximity was a barrier for rural households with travel time and cost concerns, healthcare access can be ensured through the implementation of mobile clinics and telemedicine. Aside from the reduction in costs and advantages in accessibility, it is a safe way to reach rural residents should another disaster of pandemic magnitude arise again. On the other hand, since financial constraints primarily affected the access of urban households to healthcare services, it is necessary to assist them in securing health insurance that will help them cover future health financial needs. The government and private institutions can help facilitate enrollment and other transactions to improve their accessibility to health insurance. Working closely with non-government organizations can also augment the supply of nutrition and healthcare services for targeted vulnerable groups. Arrangements with private companies that are within the vicinity can be initiated so that the provision of subsidized (if not free) group health insurance contracts is included along with the companies' corporate social responsibility. It is also important that group health insurance is facilitated to lower the cost of insurance mainly due to saved transaction costs from dealing with individuals.

Urban gardening. The promotion of urban gardening can be achieved through the use of vacant urban lots or unutilized government properties. In the absence of these, urban households can implement space-saving measures such as vertical gardening and the use of soil-less media. Accordingly, the government and private institutions can train urban residents to implement these strategies through seminars and workshops as well as provision of basic production inputs such as vegetable seeds and other production essentials including gardening pots and tools. Recycling of reusable plastic containers can reduce expenses on pots for urban gardening and reduce the amount of waste. Gardening can also augment household food supply and offer additional income if done on a larger scale. More importantly, it will increase the availability of diverse, fresh, and nutritious kinds of food that can improve food and nutrition security. Should there be excess production, facilitated talipapas (temporary makeshift markets) can be set up within a barangay during weekends for selling and/or exchange with fellow community members.

Nutrition education in rural households. As emphasized by the FAO (2020), the creation of healthy food environments needs to be accompanied by the provision of food and nutrition education and behavior change communication among vulnerable populations. This can be achieved through mass and social media campaigns to promote healthy diets, trainings and seminars that foster infant and young child feeding, and other nutrition literacy initiatives that will tackle

malnutrition effectively and engage the rural communities in efforts to enhance nutrition. Moreover, the inclusion of nutrition education in school programs will increase awareness among school-aged children. This includes school gardening, workshops on proper hygiene and sanitation practices, and programs that will educate children about the consequences of a pandemic and how to adapt to it. Accordingly, there is a need to ensure that rural populations are informed of where the nutrition services are available and how these can help enhance their food and nutrition security.

Promotion of infant feeding and lactation in urban households. Due to the relatively higher incidence of nutrition insecurity in urban households among children under the age of five because of poor infant feeding and lactation practices, it is recommended that the promotion of exclusive breastfeeding for infants younger than 6 mo be heightened and fully implemented. This should be accompanied by programs that ensure the health of lactating mothers. Possible programs may include mass and social media campaigns, seminars and consultations at the barangay level, and house-to-house visitations of barangay and municipal health personnel. Aside from the importance of breastfeeding, proper complementary feeding for older infants should be taught to pregnant and lactating women.

Since this intervention is already being implemented in the country as mandated by the Expanded Breastfeeding Promotion Act of 2009, its stricter implementation by both the local government units and other development institutions is also recommended. Additionally, since the lack of skilled health workers in maternity clinics was also identified as a contributor to the decline in breastfeeding practice as studied by Save the Children Philippines (2019), it is necessary to increase the number of skilled nutrition and health workers. Lastly, the law that prohibits the promotion of milk products as substitutes to breastmilk must be properly enforced.

ACKNOWLEDGMENT

This study was derived from the undergraduate thesis of the senior author for the degree of Bachelor of Science in Agricultural and Applied Economics from the Department of Agricultural and Applied Economics, College of Economics and Management, University of the Philippines Los Baños. The authors would like to acknowledge the financial support from the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) and Bicol Central Academy Libmanan Alumni Association Inc. (BCALAAI). Utmost appreciation is also given to the 185 household-respondents in Pili, Camarines Sur.

REFERENCES CITED

[ACIAR] Australian Centre for International Agricultural Research. 2020. COVID-19 and food systems in the Indo-Pacific: an assessment of vulnerabilities, impacts and opportunities for action. https://www.aciar.gov.au/publication/covid-19-and-food-systems.

BANNA MHA, SAYEED A, KUNDU S, KAGSTROM A, SULTANA MS, BEGUM MR, KHAN MSI. 2022. Factors associated with household food insecurity and dietary diversity among day laborers amid the COVID-19 pandemic in Bangladesh. BMC Nutr. 8:25. doi:10.1186/s40795-022-00517-8.

BASHIR MK, SCHILIZZI S. 2013. Determinants of rural household food security: a comparative analysis of African and Asian studies. J Sci Food Nutr. 93(6):1251–1258. doi:10.1002/jsfa.6038.

BHATTACHARYA J, CURRIE J, HAIDER S. 2004. Poverty, food insecurity, and nutritional outcomes in children and adults. J Health Econ. 23(4):839–862. doi:10.1016/j.jhealeco.2003.12.008.

[CFS] Committee on World Food Security. 2017. Addressing food security and nutrition in the context of changing rural-urban dynamics: experiences and effective policy approaches with draft decisions. Rome (Italy): Food and Agriculture Organization of the United Nations (FAO). https://www.fao.org/3/mu135e/mu135e.pdf.

[DOST-FNRI] Department of Science and Technology - Food and Nutrition Research Institute. Philippine nutrition facts and figures 2018-2019: expanded national nutrition survey (ENNS). https://enutrition.fnri.dost.gov.ph/uploads/2018-2019%20ENNS%20FACTS%20AND%20FIGURES_JULY182023.pdf.

[FAO] Food and Agriculture Organization of the United Nations. 1996. Food security: some macroeconomic dimensions. https://www.fao.org/4/w1358e/w1358e14.htm.

[FAO] Food and Agriculture Organization of the United Nations. 2008. The state of food security in the world. https://www.fao.org/4/i0291e/i0291e00.pdf.

[FAO] Food and Agriculture Organization of the United Nations. 2013. Food insecurity experience scale (FIES). https://www.fao.org/in-action/voices-of-the-hungry/fies/en/.

[FAO] Food and Agriculture Organization of the United Nations. 2020. School-based food and nutrition education – a white paper on the current state, principles, challenges and recommendations for low- and middle-income countries. Rome (Italy): Food and Agriculture Organization of the United Nations. doi:10.4060/cb2064en.

[FAO, IFAD, UNICEF, WFP, WHO] Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, United Nations Children's Fund, UN World Food Programme, World Health Organization. 2021. The state of food security and nutrition in the world 2021: transforming food systems for food security, improved nutrition and affordable healthy diets for all. Rome (Italy): Food and Agriculture Organization of the United Nations. doi:10.4060/cb4474en.

[FAO, NNC] Food and Agriculture Organization of the United Nations, National Nutrition Council of the Department of Health. 2017. User's guide. Electronic operation timbang plus tool: e-OPT tool for use at local level (barangay and municipality/city). https://www.fao.org/3/i6847en/I6847EN.pdf.

HARRIS-FRY H, AZAD K, KUDDUS A, SHAHA S, NAHAR B, HOSSEN M, YOUNES L, COSTELLO A, FOTTRELL E. 2015. Socio-economic determinants of household food security and women's dietary diversity in rural Bangladesh: a cross-sectional study. J Health Popul Nutr. 33(2). doi:10.1186/s41043-015-0022-0.

[HLPE] High Level Panel of Experts on Food Security and Nutrition. 2020. Impacts of COVID-19 on food security and nutrition: developing effective policy responses to address the hunger and malnutrition pandemic. Rome (Italy): Committee on World Food Security. https://openknowledge.fao.org/server/api/core/bitstreams/8abcbe13-833e-4658-a339-4e3be593b66e/content.

JONES AD. 2015. Household food insecurity is associated with heterogeneous patterns of diet quality across urban and rural regions of Malawi. World Med Health Policy. 7(3):234–254. doi:10.1002/wmh3.152.

KANG Y, BAIDYA A, AARON A, WANG J, CHAN C, WETZLER E. 2021. Differences in the early impact of COVID-19 on food security and livelihoods in rural and urban areas in the Asia Pacific Region. Glob Food Secur. 1:100580. doi:10.1016/j.gfs.2021.100580.

KUNDU S, BANNA MHA, SAYEED A, SULTANA MS, BRAZENDALE K, HARRIS J, MANDAL M, JAHAN I, ABID MT, KHAN MSI. 2021. Determinants of household food security and dietary diversity during the COVID-19 pandemic in Bangladesh. Public Health Nutr. 24(5):1079–1087. doi:10.1017/S1368980020005042.

NAGHASHPOUR M, MANSOURI S, VADIZADEH A, CHERAGHIAN B, FALLAHI R, VAZIRI F. 2020. Determinants of nutritional knowledge, attitude, and practice among southwestern Iranian households: a community-based study. Nutr Health. 26(2):93–102. doi:10.1177/0260106020905419.

OBAYELU AE. 2012. Comparative analysis of households' socioeconomic and demographic characteristics and food security status in urban and rural areas of Kwara and Kogi States of north-central Nigeria. Afr J Food Agr Nutr Dev. 12(3):6027–6054. doi:10.18697/ajfand.51.9290.

[OECD] Organisation for Economic Cooperation and Development. 2021. The COVID-19 crisis in urban and rural areas. In: OECD regional outlook 2021: addressing COVID-19 and moving to net zero greenhouse gas emissions. Paris (France): OECD Publishing. doi:10.1787/c734c0fe-en.

PALO ASM, ROSETES MA, CARIÑO DP. 2020. COVID-19 and food systems in the Philippines. In: COVID-19 and food systems in the Indo-Pacific: an assessment of vulnerabilities, impacts and opportunities for action. Australia: Australian Centre for International Agricultural Research. https://www.aciar.gov.au/sites/default/files/2020-11/covid-chapter7.pdf.

[PIDS] Philippine Institute for Development Studies. 2020. 2020 Philippine income classes: who are the real middle class?. https://pids.gov.ph/details/2020-philippine-income-classes-who-are-the-real-middle-class.

REYES JP. 2022. Comparative analysis of household food and nutrition security in selected urban and rural households in the time of Covid-19 pandemic, Pili, Camarines Sur, 2021 [undergraduate thesis]. [Laguna (Philippines)]: University of the Philippines Los Baños.

SAVE THE CHILDREN PHILIPPINES, INC. 2019. Philippine annual report 2019. https://www.savethechildren.org.ph/__resources/webdata/file/downloadables/1216_Save_the_Children_PH_2019_Annual_Report.pdf.

SHUVO SD, HOSSAIN MS, RIAZUDDIN M, MAZUMDAR S, ROY D. 2022. Factors influencing low-income households' food insecurity in Bangladesh during the COVID-19 lockdown. PLoS ONE. 17(5): e0267488. doi:10.1371/journal.pone.0267488.

SPEIRS KE, FIESE BH, STRONG KIDS RESEARCH TEAM. 2016. The relationship between food insecurity and BMI for preschool children. Matern Child Health J. 20(4):925–933. doi:10.1007/s10995-015-1881-0.

SYAFIQ A, FIKAWATI S, GEMILY SC. 2022. Household food security during the COVID-19 pandemic in urban and semi-urban areas in Indonesia. J Health Popul Nutr. 41:4. doi:10.1186/s41043-022-00285-y.

[UN] United Nations. 2013. Ensuring food and nutrition security. In: World economic and social survey 2013. doi:10.18356/0e3c4bbb-en. p. 85–119.

[UNSCN] United Nations Standing Committee on Nutrition. 2012. Nutrition security of urban populations. https://www.unscn.org/files/Statements/August_31-_UNSCN_World_Urban_Forum_6-_Statement_final_3108_finalfinal.pdf.