

Urban Household Coping Strategies for Food Security in Pateros, Philippines: A Cross-sectional Study

Lauren Rose P. Tamondong, RND, MSPH,¹ Kim Leonard G. dela Luna, RND, MSPH, PhD²
and Francesca Lauren F. Vivas, RND²

¹Nutrition Section, Quezon City Health Department, Quezon City, Philippines

²Department of Nutrition, College of Public Health, University of the Philippines Manila, Manila, Philippines

ABSTRACT

Background. Globally, approximately 9.8% of the population faces varying levels of food insecurity. The existence of food insecurity within households significantly impacts food consumption, leading to difficulty in meeting dietary requirements to maintain optimum health. Moreover, urban areas in particular are vulnerable to the harmful effects of food insecurity; discovering coping strategies towards food security must be done.

Objective. This study aimed to determine the different coping strategies of households in Pateros to achieve food security.

Methods. A cross-sectional study design was used among 690 primary caregivers of households in Pateros. Demographic information, data on their food security status, and coping strategies were all gathered at one point in time. An association between coping strategies and household food security was done by multinomial logistic regression using Stata 16.

Results. The study revealed that 6 out of 10 households in Pateros were food insecure, at varying levels. Specifically, 22% were mildly food insecure, 32% were moderately food insecure, and 7% were experiencing severe food insecurity. Moreover, the most common coping strategies used by food-insecure households were found to be relying on less preferred foods as they are less expensive, as well as purchasing food on credit. Having a household head aged 41–59 years old was associated with a higher risk of mild insecurity (RRR = 1.54, $p = 0.051$). While household income was found to be strongly protective, suggesting that incomes of PhP 25,001–35,000 (RRR = 0.23, $p < 0.001$) and above PhP 35,000 (RRR = 0.11, $p < 0.001$) were significantly associated with decreased risks of mild, moderate, and severe food insecurity.

Conclusion. Collaborative efforts between the local government units and local communities to improve the food environment and tailor effective strategies must be done to sustainably improve the state of food insecurity in the area.

Keywords: coping strategies, food insecurity, urban health



eISSN 2094-9278 (Online)
Published: July 15, 2026
<https://doi.org/10.47895/amp.v60i13.13537>
Copyright: The Author(s) 2026

Corresponding author:
Lauren Rose P. Tamondong, RND, MSPH
Nutrition Section
Quezon City Health Department
Quezon City, Philippines
Email: lptamondong@up.edu.ph

INTRODUCTION

Exposure to food insecurity in the household poses serious health outcomes, such as chronic conditions and nutritional deficiencies.^{1,2} In urban settlements, food security is greatly affected by scarce job availability, reliance on food markets, and giving importance to traditional gender roles.³

Food insecurity experienced in the household significantly affects food intake, which may have an impact on meeting dietary needs and the right nutrients for maintaining health. To cope with food security, there are several strategies that households use to alleviate their concerns in terms of food access. In a study conducted in Capiz, Philippines, households reported that the cash or food items they received from Conditional Cash Transfers were used by households to supplement household expenditures on food and health-related needs. When food shortages occurred, families often coped by reducing the number of meals consumed per day.⁴ Across the country, most beneficiaries claimed that the Pantawid Pamilyang Pilipino Program (4Ps) had a positive impact in terms of their food access and diet diversity. However, larger households with higher dependency ratios have an increased likelihood of being food insecure.⁵

Similar patterns have been observed in other low-resource settings. In rural Bangladesh, where farming is the most common source of livelihood, the most common coping strategies include using their savings and/ or borrowing resources to address difficulties in terms of food access.⁶ In relation, mothers from food-insecure households were found to be at a higher risk of developing depression, whereas fathers prioritized fulfilling their roles as providers over attending to their own well-being.⁷ Although it is often assumed that the children are protected in cases of household food insecurity, it was observed that children actually worry about not having enough to eat and often adapt into an imaginary world as a coping mechanism to manage their distress.⁸

Coping strategies are likewise evident in other countries facing food insecurity. Families experiencing food shortages were coping by decreasing the number of meals or relying on cheaper food items.⁹ Food shortage is more prominent among poorer families, wherein a big part of their income is used on food.¹⁰ In Indonesia, some households are preparing home and backyard gardens, wherein harvests serve as food sources during times of food shortage.¹¹

Recent findings show that rural areas tend to be more vulnerable to experiencing food insecurity compared to urban settings. However, the unique characteristics of urban poor communities, such as reliance on unstable income sources, limited access to affordable food, and higher living cost were more vulnerable to food insecurity than those who live in areas relying entirely on a cash-based economy.¹² Local studies further indicate that low income and reduced purchasing power, occupation related to agriculture and elementary work, and lower educational attainment of the household head were associated with food insecurity.^{13,14} In

Pateros, being an urban area, 40.4% households experience acute food insecurity that co-exists with poverty.¹⁴ Similar to many urban areas, households tend to be highly dependent on cash income and market-purchased food, making them susceptible to price fluctuations and income instability. However, limited local data indicate the factors associated with household food insecurity and their coping mechanisms in the study areas and specific to Pateros.¹⁵ Hence, this study aimed to describe the strategies of households to cope with varying levels of food insecurity, as well as identify its determinants among households, and the association between the food security status and the coping strategies employed by households in Pateros, Philippines.

METHODS

Study Design

This study used a cross-sectional design, wherein all pertinent data were collected at one point in time. However, the collected data can only reflect the association between the exposure variable and outcome variable, which cannot be used to infer causality. The study ran from June 5, 2023 to August 30, 2023, with data collection conducted over a three-week period from June 21 to July 18, 2023.

Study Participants

Household heads aged 20 to 59 years old living in Pateros for at least 1 year were interviewed. In the absence of the household head, the primary caregiver, who was generally responsible for the food preparation, was interviewed. The primary caregiver was considered the most knowledgeable respondent, aside from the household head, with regard to household expenses and other information. Households were identified using the Community-Based Monitoring and Information System (CBMIS) List from the 10 barangays as the sampling frame. The Local Government Unit (LGU), through its Barangay Nutrition Scholars (BNS), assisted with the study by locating the identified households. Households were excluded if (1) the household head or any member tested positive for COVID-19 during the data collection period or (2) any household member was under quarantine. A total of 727 household heads were invited to participate in the study, of which 703 (96.7%) met the eligibility criteria and provided consent. During data processing, 13 responses were excluded due to missing responses on key variables and duplicated entries. The final sample consisted of 690 participants for inclusion in the analysis, and data collection was conducted over a period of three weeks.

Sample Size

The sample size was computed for each objective and each of the variables identified. The largest sample size that was used for the study's sample size calculation was based on the study conducted in Iran using the OpenEpi application with the following parameters: Odds ratio of participation

in government programs among food insecure is 2.21, and prevalence of food insecurity is 64.1%.^{14,16} Power was set at 80%, the level of significance is $\alpha = 0.10$, and the design effect was set at 1.5. Stratified random sampling was applied using proportionate allocation based on the household population of each barangay. The sampling method resulted in the required sample size of 662 households.

Study Setting

The study was conducted in Pateros, a lone municipality in the metropolitan area with a population of 63,840 and a total land area of 10.40 km².¹⁷ The Municipality of Pateros represents 0.48% of the total National Capital Region (NCR) with 10 barangays. In 2018, the poverty incidence in Pateros was 4.0%, and a family of five required approximately PhP 14,102 monthly to meet their basic food and non-food needs.¹⁷ Health issues, such as stunting and underweight, were identified as medium-level concerns in Pateros. According to the 2019 National Nutrition Survey, 40% of households in Pateros experienced acute food insecurity, while 30% experienced chronic food insecurity.¹⁴

Research Instrument and Variables

Food security status was assessed using the Household Food Insecurity Access Scale (HFIAS) questionnaire. It is composed of questions that depict the increasing level of severity of food security, which represents the frequency of occurrence used to determine how often a condition or experience occurred. The tool used a 30-day reference period and determines the severity of household food insecurity by assigning a code to which it falls. The scores were calculated as:

1. **Food Secure** – if [(Q1a = 0 or Q1a = 1) and Q2 = 0 and Q3 = 0 and Q4 = 0 and Q5 = 0 and Q6 = 0 and Q7 = 0 and Q8 = 0 and Q9 = 0].
2. **Mildly Food Insecure** – if [(Q1a = 2 or Q1a = 3 or Q2a = 1 or Q2a = 2 or Q2a = 3 or Q3a = 1 or Q4a = 1) and Q5 = 0 and Q6 = 0 and Q7 = 0 and Q8 = 0 and Q9 = 0].
3. **Moderately Food Insecure** – if [(Q3a = 2 or Q3a = 3 or Q4a = 2 or Q4a = 3 or Q5a = 1 or Q5a = 2 or Q6a = 1 or Q6a = 2) and Q7 = 0 and Q8 = 0 and Q9 = 0].
4. **Severely Food Insecure** – if [Q5a = 3 or Q6a = 3 or Q7a = 1 or Q7a = 2 or Q7a = 3 or Q8a = 1 or Q8a = 2 or Q8a = 3 or Q9a = 1 or Q9a = 2 or Q9a = 3].

The Coping Strategy Index (CSI) was used to measure the coping mechanisms adopted to address food insecurity. It is an indicator, in particular, of the things people do when they cannot access enough food, which is converted into a single index. The tool used was adapted from the 2018 Expanded National Nutrition Survey (ENNS) in the Philippines.

Data Collection Procedure

A letter of Approval from the LGU was secured, and respondents were randomly selected. The adapted HFIAS

questionnaire used in the study was from Tehran, Iran, and was pre-tested in Quezon City, which showed acceptable levels of internal consistency, validity, and reliability. All questionnaires were examined and validated for the accuracy of entries. It was ensured that no missing information was found. After each scheduled collection session, all the obtained data was entered into a formatted data sheet.

Data Analysis

To ensure completeness and consistency, data were reviewed prior to analysis. Participants with incomplete and duplicate responses on key variables were excluded from data analysis. Data was analyzed using descriptive and inferential statistics. Means, frequencies, and proportions were used to describe the profile of households in the study, their household food security, and coping strategies. Estimation of the proportion of food-insecure households and their coping strategies was done. The association between coping strategies and household food security was also determined using multinomial logistic regression and was presented using relative risk ratios and confidence intervals. Confounders found to be significantly associated with household food insecurity were then fitted in a multinomial logistic regression that related a specific exposure of interest with household food insecurity. Proportions and frequencies for each specific coping strategy were reported. STATA v16 was utilized to organize and process all the data entries and summary statistics.

Ethical Considerations

The collected data is protected by the Data Privacy Act of 2012, wherein each respondent was assigned a unique code to avoid using their name and to maintain anonymity while encoding their data. The study protocol was reviewed and approved by the University of the Philippines Manila Research Ethics Board with Code 2023-0044-01.

RESULTS

Sociodemographic Characteristics of Households in Pateros

A total of 690 households in Pateros participated in the study, wherein 65% of the household heads were female, and the majority (46%) were married. In addition, most (67%) were aged 41 to 59 years old, indicating that the study largely represented household heads in their middle adult life stage, and 46% finished only high school or vocational education, with 46% finished their college degree or taken units. Age was categorized as 20 to 40 years old and 41 to 59 years old to reflect young and middle adult life stages. More than half (54%) of the household heads were skilled workers or daily wage earners, while 36% were employees from private companies. In relation to income, more than half had a monthly income between PhP 6,501.00 - 15,000.00 and PhP 15,001.00 - 25,000.00. The income class was based on the Philippine Statistics Authority using the monthly family

income data. In addition, 6 out of 10 (61%) households were living with less than five (5) members and more than half (51%) of the households had children aged 0-10 years old. More than half (52%) of the household were within ≤500 meters from the food market. 19% of households practiced urban farming, 2% were members of 4Ps, and 5% received food assistance from the government. (Table 1)

In terms of food security status, 39% of households in Pateros were found to be food secure. Meanwhile, the remaining 61% of households were experiencing varying levels of food insecurity. It was observed that 22% of households were mildly insecure and 3 out of 10 (32%) were moderately insecure, indicating that they often have to compromise on food quantity and quality due to limited resources. Lastly, 7% of households were suffering from severe insecurity, suggesting that they regularly face significant disruptions in food intake, leading to hunger. (Table 1)

Coping Strategies to Achieve Food Security Employed by Households in Pateros

Families experiencing food insecurity were more likely to rely on cheaper, less preferred foods to get by. This was reported by 90% of severely food-insecure households, 82% of moderately insecure households, 64% mildly insecure households, and even 21% of food-secure households. In relation to buying cheaper food sources, consuming food stocks meant for future use, and purchasing food on credit were prominent practices as the severity of food insecurity increases. Specifically, 20% of mildly insecure households purchased food on credit, and this increases among moderately and severely insecure households (45% and 81%, respectively). Additionally, consumption of stocks held for future use increases from 37% in mildly insecure households to even 54% and 56% in moderate and severely insecure households, respectively. Relying on help from relatives was also seen more commonly among severely insecure households (44%) (Table 2).

It also appeared that some food-insecure households altered family dynamics by sending other family members elsewhere to eat, or in some cases, to beg. These practices were observed in bigger households, which were observed in the 25% of severely insecure households. 23% of severely insecure households ask family members to beg. Rationing strategies were also an evident form of coping strategies for insecure households, wherein 67% of severely insecure households regulated meal compositions and made children's food a priority by reducing adult food intake. Almost half (54%) of moderately insecure and 18% of mildly insecure households reported that they are limiting their portion sizes. Prioritizing the working members was seldomly (12%; 24%; and 52%, respectively) observed among households experiencing mild, moderate, and severe insecurity. Some (13%) of the moderately insecure households even reported that they had reduced their number of meals, and it is much worse among severely insecure households, where 60% of them reported

Table 1. Characteristics of Households in Pateros, NCR, 2024

Socio-demographic Characteristics	n = 690, n (%)
Sex of head of the household	
Male	241 (35)
Female	449 (65)
Age of head of the household (years)	
20-40	225 (33)
41-59	465 (67)
Marital status of household head	
Single	144 (21)
Married	315 (46)
Live in	133 (19)
Have been married	98 (14)
Educational attainment of household head	
Elementary level	57 (8)
High school level/vocational	318 (46)
College level	315 (46)
Household size	
>5	270 (39)
≤5	420 (61)
Household income (PhP)	
<6,500.00	122 (18)
6,501.00 - 15,000.00	271 (39)
15,001.00 - 25,000.00	151 (22)
25,001.00 - 35,000.00	73 (11)
>35,000.00	73 (11)
Occupation of household head	
Skilled worker/daily wage	369 (54)
Government employee	71 (10)
Private company/employee	250 (36)
Number of children aged 0-10	
None	339 (49)
1-5	343 (50)
6-10	8 (1)
Household distance to food markets	
≤500 meters	362 (52)
501 meters to 2 kilometers	290 (42)
>2 kilometers	38 (6)
Practice of urban farming	
Yes	129 (19)
No	561 (81)
Participation of government program (4Ps)	
Yes	15 (2)
No	675 (98)
Participation of government program (Food assistance)	
Yes	32 (5)
No	658 (95)
Food security status	
Secure	269 (39)
Mildly Insecure	153 (22)
Moderately Insecure	220 (32)
Severely Insecure	48 (7)

the same strategy. The findings also reported that 19% of the most insecure households had to skip the entire day without eating.

On the contrary, secure households also practiced several coping strategies to ensure adequate food access. The most common coping strategy reported by food-secure households was relying on cheaper food items (21%), consuming food

Table 2. Coping Strategies Employed by Households when Aggregated According to their Level of Food Security in Pateros

Coping Strategies	Secure (n = 269)	Mild Insecure (n = 153)	Moderate Insecure (n = 220)	Severe Insecure (n = 48)
Dietary change				
Consuming cheaper and less preferred foods	57 (21)	98 (64)	180 (82)	43 (90)
Short-term improvement of household food availability				
Borrowing or relying on relatives	10 (4)	8 (5)	37 (17)	21 (44)
Purchasing on credit	13 (5)	30 (20)	98 (45)	39 (81)
Gathering/ harvesting	4 (1)	7 (5)	36 (16)	15 (31)
Consuming available stocks	53 (20)	57 (37)	119 (54)	27 (56)
Depending on aid	8 (3)	17 (11)	60 (27)	21 (44)
Decrease the number of household members				
Members were sent elsewhere	3 (1)	6 (4)	19 (9)	12 (25)
Send members to beg	1 (0)	0 (0)	11 (5)	11 (23)
Rationing strategies				
Controlling meal portions	17 (6)	27 (18)	118 (54)	32 (67)
Reducing adult food intake	5 (2)	18 (12)	74 (34)	32 (67)
Prioritizing working members	5 (2)	18 (12)	45 (24)	25 (52)
Reducing the frequency of meals	1 (0)	7 (5)	29 (13)	29 (60)
Skipping the whole day without food	0 (0)	2 (3)	5 (2)	9 (19)

stocks in advance (20%), and limiting food portions (6%) (Table 2).

Factors Associated with the Varying Levels of Food Insecurity Among Households in Pateros

Having a household head aged 41–59 years old was associated with a higher risk of mild insecurity (RRR = 1.54, $p = 0.051$). In addition, being married (RRR = 1.87, $p = 0.044$) and having a household income of PhP 15,001–25,000 (RRR = 0.41, $p = 0.017$) were both associated with mild insecurity among households in Pateros. Among moderate food insecure households, head of the household age (RRR = 1.02, $p = 0.038$), being married (RRR = 2.05, $p = 0.004$), and domestic partner households with income PhP 15,001–25,000 (RRR = 0.31, $p < 0.001$) were significantly associated. Higher educational attainment of the household head was seen as a protective factor (RRR = 0.15, $p < 0.001$) (Table 3).

Among severely insecure households, being married (RRR = 3.26, $p = 0.007$) was identified as a significant factor. Similarly, households with an income of PhP 15,001–25,000 had a reduced risk of severe food insecurity (RRR = 0.20, $p = 0.002$). The number of children aged 0–10 years showed a complex pattern where households with 6–10 young children had dramatically higher risks of severe food insecurity (RRR = 3.22–343.22, $p = 0.003$), while smaller numbers (1–5 children) were not statistically significant.

On the other hand, household income was strongly protective, suggesting that incomes of PhP 25,001–35,000 (RRR = 0.23, $p < 0.001$) and above PhP 35,000 (RRR = 0.11, $p < 0.001$) were significantly associated with decreased risks of mild, moderate, and severe food insecurity. Participation in government programs, particularly the 4Ps, was also found to be associated with reduced risks of moderate food insecurity (RRR = 0.20, $p = 0.017$) and severe food insecurity (RRR = 0.20, $p = 0.013$) (Table 3).

Factors Associated with Coping Strategies Among Households in Pateros

Households headed by females were significantly more likely to adopt high coping strategy scores compared to male-headed households (RRR = 2.29, $p < 0.001$), suggesting that female household heads are more responsive to food insecurity or more likely to implement diverse coping mechanisms under stress. Moreover, smaller households were significantly less likely to use medium coping strategies (RRR = 0.59, $p = 0.046$) while larger households may experience more food pressure, prompting greater use of adaptive strategies. In relation, households with 6 to 10 young children were more likely to adopt both medium (RRR = 12.20, $p = 0.003$) and high coping strategies (RRR = 22.59, $p = 0.001$) (Table 4).

Meanwhile, households whose heads attained college-level education were significantly less likely to engage in both medium (RRR = 0.19, $p = 0.002$) and high coping strategies (RRR = 0.08, $p = 0.003$). This relationship suggests that higher educational attainment correlates with better economic opportunities or food security. Employment in the private sector significantly reduced the likelihood of adopting medium (RRR = 0.19, $p < 0.001$) and high coping strategies (RRR = 0.05, $p = 0.004$), suggesting stable employment in private companies likely provides more food security. Households with income levels between PhP 15,001–35,000 were significantly less likely to engage in medium coping strategies compared to those earning <PhP 6,500 (RRR = 0.27, $p = 0.002$ and RRR = 0.12, $p = 0.004$, respectively). This suggests that moderate-income households may have more resources to mitigate food insecurity without resorting to severe coping strategies.

Households located within 500 meters of food markets were significantly more likely to adopt medium (RRR = 2.43, $p = 0.001$) and high (RRR = 3.88, $p = 0.003$) coping strategies. This could reflect increased exposure to food insecurity in

Table 3. Factors Affecting Food Security Status in Pateros, 2023

Variable	Mild Insecure		Moderately Insecure		Severely Insecure	
	RRR (95% CI)	p	RRR (95% CI)	p	RRR (95% CI)	p
Sex of household head						
Male	1.0	-	1.0	-	1.0	-
Female	0.92 (0.61-1.38)	0.675	0.94 (0.65-1.37)	0.758	1.42 (0.72-2.82)	0.313
Age of household head						
	1.02 (1.00-1.03)	0.083	1.02 (1.00-1.03)	0.038*	1.00 (0.96-1.01)	0.384
Age of head of the household (years)						
20-40	1.0	-	1.0	-	1.0	-
41-59	1.54 (1.00-2.37)	0.051	1.33 (0.91-1.94)	1.470	1.06 (0.56-2.02)	0.854
Marital status of household head						
Single	1.0	-	1.0	-	1.0	-
Married	1.35 (0.80-2.26)	0.263	2.05 (1.23-3.35)	0.004*	3.26 (1.37-7.73)	0.007*
Live in	1.87 (1.02-3.45)	0.044*	2.71 (1.53-4.81)	0.001*	1.03 (0)	0.977
Have been married	1.35 (0.70-2.63)	0.370	1.60 (0.85-3.01)	0.142	1.56 (0.49-4.97)	0.448
Educational attainment of household head						
Elementary level	1.0	-	1.0	-	1.0	-
High school level/vocational	0.89 (0.36-2.21)	0.802	0.56 (0.27-1.18)	0.130	0.46 (0.17-1.26)	0.132
College level	0.46 (0.19-1.14)	0.093	0.15 (0.07-0.32)	<0.001*	0.08 (0.03-0.25)	<0.001*
Household size						
>5	1.0	-	1.0	-	1.0	-
≤5	0.93 (0.62-1.39)	0.707	0.93 (0.64-1.34)	0.687	1.39 (0.72-2.68)	0.330
Household income (PhP)						
<6,500.00	1.0	-	1.0	-	1.0	-
6,501.00 - 15,000.00	0.90 (0.46-1.74)	0.749	0.37 (0.21-0.66)	0.001*	0.50 (0.22-1.12)	0.093
15,001.00 - 25,000.00	0.41 (0.20-0.85)	0.017*	0.31 (0.17-0.56)	<0.001*	0.20 (0.07-0.54)	0.002*
25,001.00 - 35,000.00	0.23 (0.10-0.54)	0.001*	0.07 (0.03-0.17)	<0.001*	6.10 (0)	0.981
>35,000.00	0.11 (0.04-0.29)	<0.001*	0.02 (0.01-0.07)	<0.001*	3.63 (0)	0.983
Occupation of household head						
Skilled worker/daily wage	1.0	-	1.0	-	1.0	-
Government employee	0.41 (0.21-0.79)	0.008*	0.33 (0.17-0.62)	0.001*	0.20 (0.06-0.57)	0.010*
Private company/employee	0.28 (0.18-0.44)	<0.001*	0.27 (0.18-0.40)	<0.001*	0.80 (0.03-0.21)	<0.001*
Number of children aged 0-10 years						
None	1.0	-	1.0	-	1.0	-
1-5	0.93 (0.62-1.38)	0.718	1.42 (0.99-2.04)	0.054	2.86 (1.44-5.69)	0.003*
6-10	4.44 (0)	0.984	5.95 (0.65-54.01)	0.113	33.27 (3.22-343.22)	0.003*
Household distance to food markets						
≤500 meters	1.0	-	1.0	-	1.0	-
501 meters to 2 kilometers	1.31 (0.87-1.97)	0.198	1.14 (0.79-1.66)	0.477	1.81 (0.95-3.42)	0.071
>2 kilometers	1.05 (0.43-2.59)	0.911	1.03 (0.47-2.30)	0.934	1.50 (0.40-5.64)	0.549
Practice of urban farming						
Yes	1.0	-	1.0	-	1.0	-
No	0.98 (0.59-1.62)	0.926	0.97 (0.61-1.53)	0.887	1.14 (0.50-2.59)	0.751
Participation of government program (4Ps)						
Yes	1.0	-	1.0	-	1.0	-
No	0.08 (0.01-0.64)	0.017*	0.20 (0.02-1.82)	0.153	0.06 (0.01-0.55)	0.013*
Participation of government program (Food assistance)						
Yes	1.0	-	1.0	-	1.0	-
No	1.07 (0.44-2.59)	0.880	2.11 (0.80-5.52)	0.130	0.89 (0.25-3.18)	0.853

densely populated areas where food access does not always translate to affordability or sufficiency (Table 4).

DISCUSSION

Household Food Security Status in Pateros

Globally, a quarter of the population is currently experiencing insufficient access to nutritious food, and one in

every 10 people is experiencing severe food insecurity.¹⁸ The findings of this present study matched the national and local estimates, revealing that 6 out of 10 households in Pateros were experiencing varying levels of food insecurity. Additionally, in 2019, 40.4% of households in Pateros experienced food insecurity thereby consistent with the current findings.¹⁴

Rapid economic growth has indeed been a key strategy for many countries to address various challenges, such as

Table 4. Factors Affecting Coping Strategy in Pateros, 2023

Variable	Medium Coping Strategy Score		High Coping Strategy Score	
	RRR (95% CI)	p-value	RRR (95% CI)	p-value
Sex of household head				
Male	1.0	-	1.0	-
Female	0.89 (0.53-1.51)	0.676	2.29 (0.85-6.16)	<0.001*
Age of household head	1.00 (0.91-1.01)	0.669	1.02 (0.98-1.05)	0.360
Age of head of the household (years)				
20-40	1.0	-	1.0	-
41-59	1.23 (0.71-2.16)	0.462	1.35 (0.56-3.27)	0.501
Marital status of household head				
Single	1.0	-	1.0	-
Married	1.32 (0.66-2.64)	0.436	8.90 (1.18-67.38)	0.034*
Live in	1.01 (0.43-2.37)	0.983	3.30 (0.34-32.18)	0.304
Have been married	1.45 (0.61-3.42)	0.402	6.31-7.11 (0.69-57.46)	0.102
Educational attainment of household head				
Elementary level	1.0	-	1.0	-
High school level/vocational	1.32 (0.57-3.10)	0.517	0.93 (0.30-2.84)	0.895
College level	0.19 (0.07-0.55)	0.002*	0.08 (0.01-0.42)	0.003*
Household size				
>5	1.0	-	1.0	-
≤5	0.59 (0.36-0.99)	0.046*	0.51 (0.23-1.12)	0.094
Household income (Php)				
6,500.00	1.0	-	1.0	-
6,501.00 - 15,000.00	0.61 (0.34-1.11)	0.104	0.68 (0.29-1.61)	0.381
15,001.00 - 25,000.00	0.27 (0.12-0.60)	0.002*	0.14 (0.03-0.68)	0.015*
25,001.00 - 35,000.00	0.12 (0.03-0.51)	0.004*	4.71 (0)	0.992
>35,000.00	4.56 (0)	0.988	4.39 (0)	0.992
Occupation of household head				
Skilled worker/daily wage	1.0	-	1.0	-
Government employee	0.64 (0.28-1.48)	0.296	0.19 (0.03-1.46)	0.112
Private company/employee	0.19 (0.09-0.41)	<0.001*	0.05 (0.01-0.38)	0.004*
Number of children aged 0-10 years				
None	1.0	-	1.0	-
1-5	1.60 (0.94-2.72)	0.083	1.75 (0.76-4.07)	0.191
6-10	12.20 (2.34-63.62)	0.003*	22.59 (3.35-152.27)	0.001*
Household distance to food markets				
≤500 meters	1.0	-	1.0	-
501 meters to 2 kilometers	2.43 (1.41-4.17)	0.001*	3.88 (1.61-9.39)	0.003*
>2 kilometers	1.70 (0.55-5.20)	0.353	3.01 (0)	0.985
Practice of urban farming				
Yes	1.0	-	1.0	-
No	1.36 (0.67-2.75)	0.389	2.92 (0.68-12.53)	0.149
Participation of government program (4Ps)				
Yes	1.0	-	1.0	-
No	0.66 (0.14-2.99)	0.585	0.51 (0.06-4.09)	0.528
Participation of government program (Food assistance)				
Yes	1.0	-	1.0	-
No	1.07 (0.32-3.61)	0.913	676357.9 (0)	0.985

poverty and food insecurity. As economies grow, household income levels tend to rise, leading to increased purchasing power, which can make up the demand for food products, especially higher-quality or more diverse foods. When demand outpaces supply, prices can increase, leading to food inflation. Food inflation can have a significant impact on people's lives, especially those with lower incomes, as inflation affects the ability to afford basic necessities.¹⁹ According to the Philippine Statistics Authority, national food inflation

levels continued to rise and arrived at 6.3% in July of 2023. Although there has been a decrease in food inflation for consecutive months of the year, there has been an increase in the year-on-year food inflation rate from 5.2 in 2018 to 6.8 in July 2023. This sustained rise in food prices over the past five years suggests that the cost of living, particularly in urban areas such as Metro Manila, may continue to challenge household purchasing power and negatively impact food security.²⁰

This study's findings on food security are an important concern in relation to the implications of food insecurity in the household. Exposure to food insecurity in the household could lead to serious health outcomes, such as chronic conditions and nutritional deficiencies, as food insecurity is not just a matter of insufficient food intake but also encompasses poor dietary diversity and negative impacts on health and well-being. Lack of energy and concentration at school for children, and lower work capacity either at home or at work for adults, were seen to be consequences of the varying levels of food insecurity. Furthermore, compared to those who live in food-secure households, children and adults who live in food-insecure households are more likely to experience negative health outcomes, which can include poor health, delayed development, limitations on bodily and mental functions, lower productivity at work and school, lower earnings as adults, and, in the worst situations, a shorter life span.^{1,2}

As food prices rise, it becomes more challenging for households to afford an adequate and balanced diet, consequently leading to decreased food security, especially for vulnerable populations. Food insecurity directly impacts the well-being and overall quality of life of all household members and is also linked with negative health outcomes across all age groups. In a study conducted in India in 2022, 72.4% of the participants lived in food-insecure households, indicating that a significant proportion of the population lacks consistent access to sufficient and nutritious food. The same study reported alarming rates of child malnutrition, with the prevalence of underweight children among those under five years old is 29.9%, while the proportion of wasting among under-five children is 17.8%, and 27.2% of under-five children are stunted, highlighting the long-lasting impact of food insecurity on their growth and development.²¹ In Pateros, the 2019 ENNS indicated approximately 27.9% of households experienced chronic food insecurity. Additionally, among children under the age of five, two out of ten (20.5%) are stunted, and two out of ten (17.7%) are underweight, indicating medium public health concerns. The findings emphasize the persistent health risk associated with food insecurity, particularly its effect on the growth and development of children.¹⁴

Coping Strategies to Achieve Food Security Employed by Households in Pateros

The findings of this study revealed that a variety of coping strategies, ranging from short-term to long-term measures to cope with limited resources, were employed by the households in response to food insecurity. Among the coping strategies identified, relying on cheaper, less preferred food options was the most common approach used by food-insecure households. As food insecurity increases, households rely more on this coping strategy, with 82% of moderately food-insecure and 90% of severely food-insecure resorting to such foods. These households may opt for cheaper food

items that may not be their preferred choices to meet their dietary needs, and also compromise the nutritional quality of their diet in favor of affordability. Another coping strategy used by food-insecure households is purchasing food on credit. These food-insecure households obtain food on credit from vendors and shops, as they may not have sufficient financial resources that they can immediately tap to buy food. Given their limited purchasing power, these households may sacrifice food quality, leading to poor dietary diversity and potential nutritional deficiencies.¹

The study revealed that coping strategies are utilized to varying degrees based on the severity of food insecurity. Many food-insecure households cope with their situation by consuming stored food in advance. Households use up food reserves, if available, to stretch their food supply. Though it may provide short-term relief, it may eventually deplete household resources needed in the future, creating a cycle of food insecurity. Controlling portion sizes at meal times by reducing the amount of food consumed at each meal is a common practice among food-insecure households. This may reduce uncertainty regarding future food access, but it may affect the health and well-being of the family members, which may result in malnutrition and reduced productivity.²

This present study suggested that there is a higher chance that households rely on cheaper, less preferred foods as the severity of food insecurity increases. This was also seen in the case of purchasing food on credit, indicating a higher level of reliance on credit and poor purchasing power of households in Pateros. The commonly employed coping strategies among food-insecure households were relying on cheaper, less preferred (76%), and consumption of stored food in advance (48%). The coping strategies among NCR households were to cut out all non-essential expenses, obtain food items on credit from local convenience stores (*sari-sari* stores), and control food consumption by members or change the type of food being consumed.

An alarming coping mechanism employed that resulted from the study was the rationing strategies employed by food-insecure households. Some households reported sending their members to beg for food and skipping entire days without eating, which is prevalent among the severely food-insecure households. This strategy not only highlights food deprivation but may also have social and psychological consequences, possibly from feelings of shame and exclusion.²² This result also showed that food insecurity may extend beyond physical health and may affect the social and mental well-being of households.

The study also highlighted that some of the interviewed households were members of the Pantawid Pamilyang Pilipino Program (4Ps). The 4Ps program serves as a poverty alleviation initiative by the Department of Social Welfare and Development that serves as the government's national strategy to alleviate poverty through conditional cash transfer. It was observed in this study that among the recipients of 4Ps, 12 out of the 15 had low coping strategy scores. This indicates

that households engaged in the 4Ps rarely rely on coping mechanisms showing mild to moderate food insecurity. Most of the coping strategies were purchasing food on credit and relying on cheaper, less preferred foods. The strategies highlighted the financial challenges experienced by the 4Ps beneficiaries. The persistence of food insecurity among the beneficiaries suggests external factors, such as rising food prices due to inflation, especially affecting those with limited incomes, even if they are recipients of government programs such as 4Ps. Although food inflation has been the priority of the government, recent disruptions in supply have led to elevated food inflation, contributing to the broader increase in inflation, resulting in price hikes in basic commodities.²³ Socio-economic conditions at the macroscale exacerbate the condition of food insecurity and hunger in the country. Also, the impact of conflicts in developed and developing countries impacts global food security. Disruption of agricultural exports, labor shortages, and affects the supply and demand, leading to increased global food prices.²⁴

Households spend more than half of their monthly income on food. Although there was assistance from the government, it can be safely assumed that the intervention was not enough to break the cycle of poverty due to the increase in food costs and necessary supplies for the family. These coping strategies highlight the challenges faced by food-insecure households in trying to manage their food needs with limited resources.^{25,26}

Limitations of the Study

Differences in the results might be attributed to the limitations of the use of HFIAS to measure food insecurity. This tool was highly prone to respondent bias as it heavily relied on respondents' memories. During the present study, respondents were asked to recall their important activities in the previous weeks in chronological order from weeks 1 to 4. This facilitated the flow of recall and lessened memory lapses on the food security experiences, thus addressing *possible understating of the responses* to protect their social pride and minimize shame. Different quality control procedures were done to control and minimize this bias, such as proper training of researchers and consistent checking. In this study, the adopted HFIAS questionnaire was pretested in Quezon City for the local context of the study area.

CONCLUSIONS

The findings revealed that food insecurity is still a persistent problem in Pateros despite food accessibility and the availability of food markets. Relying on cheaper, less preferred food, as well as purchasing food on credit, emerged as the top coping strategies of food-insecure households. These coping strategies highlight the increased vulnerability of households to food insecurity, driven by rising food costs and limited financial resources.

Recommendations

It is important to focus on strengthening food resilience within communities. Diversifying possible food sources by including traditional foods and locally grown crops can be done, offering affordable and nutritious options. Moreover, LGUs may focus on improving the urban food system to promote self-sufficiency among households.

Acknowledgments

The authors express their gratitude to the Municipal Government of Pateros for their support and cooperation during the data collection phase.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

All authors declared no conflicts of interest.

Funding Source

None.

REFERENCES

- Gundersen C, Ziliak JP. Food insecurity and health outcomes. *Health Affairs (Millwood)*. 2015 Nov;34(11):1830-1839. doi: 10.1377/hlthaff.2015.0645.
- Pourmotabbed A, Moradi S, Babaei A, Ghavami A, Mohammadi H, Jalili C, et al. Food insecurity and mental health: a systematic review and meta-analysis. *Public Health Nutr*. 2020 Jul;23(10):1778-1790. doi: 10.1017/S136898001900435X.
- Roy A, Mazaniello-Chézol M, Rueda-Martinez M, Shafique S, Adams AM. Food systems determinants of nutritional health and wellbeing in urban informal settlements: a scoping review in LMICs. *Soc Sci Med*. 2023 Apr;322:115804. doi: 10.1016/j.socscimed.2023.115804. PMID: 36905724.
- Binas EE Jr. Economic security assessment of Ma-ayon, Capiz, Philippines during COVID-19 pandemic. *Int J Res Appl Sci Biotechnol*. 2020 Nov-Dec;7(6):159-161. doi: 10.31033/ijrasb.7.6.23.
- United Nations Children's Fund. Making the 4Ps inclusive for all children of currently enrolled households. Manila (PH): UNICEF Philippines; 2020.
- Ahmed UI, Ying L, Bashir MK, Abid M, Zulfikar F. Status and determinants of small farming households' food security and role of market access in enhancing food security in rural Pakistan. *PLoS One*. 2017 Oct;12(10):e0185466. doi: 10.1371/journal.pone.0185466.
- Rahi B, Mashharawi FA, Harb H, Khoury-Malhame ME, Mattar L. Food insecurity and coping mechanisms: impact on maternal mental health and child malnutrition. *Nutrients*. 2025 Jan;17(2):330. doi: 10.3390/nu17020330. PMID: 39861459; PMCID: PMC11768350.
- Leung CW, Stewart AL, Portela-Parra ET, Adler NE, Laraia BA, Epel ES. Understanding the psychological distress of food insecurity: a qualitative study of children's experiences and related coping strategies. *J Acad Nutr Diet*. 2020 Mar;120(3):395-403. doi: 10.1016/j.jand.2019.10.012.
- Boonyabancha S, Kerr T, Joshi L, Tacoli C. How the urban poor define and measure food security in Cambodia and Nepal. *Environ Urban*. 2019 Oct;31(2):517-532. doi: 10.1177/0956247819863246.
- Andini M, Dewi O, Marwati A. Urban farming during the pandemic and its effect on everyday life. *Int J Built Environ Sci Res*. 2021; 5(1):51-62. doi: 10.24853/ijbesr.5.1.51-62.

11. Purwanto, Yaumidin U, Yuliana C, Nurjati E, Rahmayanti A, Cahyono B, et al. Urban farming and food security: household's adaptive strategy to COVID-19 crises. *IOP Conf Ser Earth Environ Sci.* 2021;892:012070. doi: 10.1088/1755-1315/892/1/012070.
12. Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, United Nations Children's Fund, World Food Programme, World Health Organization. *The State of Food Security and Nutrition in the World 2020: Transforming food systems for affordable healthy diets.* Rome (IT): FAO; 2020. doi: 10.4060/ca9692en.
13. Bermudez ANC, Juban NR, Tan JZG. Factors associated with household food insecurity in the Santa Rosa sub-watershed area of Laguna Lake watershed, Philippines. *Southeast Asian J Trop Med Public Health.* 2016 Jul;47(4):844-851.
14. Department of Science and Technology-Food and Nutrition Research Institute. *Philippine Nutrition Facts and Figures: 2018 Expanded National Nutrition Survey.* Taguig City (PH): DOST-FNRI; 2019.
15. Angeles-Agdeppa I, Javier CA, Duante CA, Maniego MLV. Impacts of COVID-19 pandemic on household food security and access to social protection programs in the Philippines: findings from a telephone rapid nutrition assessment survey. *Food Nutr Bull.* 2022 Jun;43(2):213-231. doi: 10.1177/03795721221078363. PMID: 35196895; PMCID: PMC8883167.
16. Mokari-Yamchi A, Faramarzi A, Salehi-Sahlabadi A, Barati M, Ghodsi D, Jabbari M, et al. Food security and its association with social support in the rural households: a cross-sectional study. *Prev Nutr Food Sci.* 2020 Jun;25(2):146-152. doi: 10.3746/pnf.2020.25.2.146. PMID: 32676465; PMCID: PMC7333000.
17. Philippine Statistics Authority. *2015 Census of Population: Final Results Pateros.* Quezon City (PH): PSA; 2017 Dec 27.
18. Food and Agriculture Organization, International Fund for Agricultural Development, United Nations Children's Fund, World Food Programme, World Health Organization. *The State of Food Security and Nutrition in the World 2019: Safeguarding against economic slowdowns and downturns.* Rome (IT): FAO; 2019.
19. Walsh JP, Yu J. Inflation and income inequality: is food inflation different? *IMF Work Pap.* 2012 Jun;12(147).
20. National Economic and Development Authority. *Philippine Development Plan 2023-2028.* Manila (PH): NEDA; 2023.
21. Burman J, Paul B, Sembiah S, Parida D, Negi R, Vantepaka S, et al. Association between household food insecurity and nutritional status among children aged <5 years: a community-based study in a slum of Kolkata, Eastern India. *J Fam Med Prim Care.* 2022 Jul;11(7):3885-3890. doi: 10.4103/jfmpc.jfmpc_635_21. PMID: 36387641; PMCID: PMC9648303.
22. Militao EMA, Salvador EM, Silva JP, Uthman OA, Vinberg S, Macassa G. Coping strategies for household food insecurity and perceived health in an urban community in Southern Mozambique: a qualitative study. *Sustainability.* 2022 Jul;14(14):8710. doi: 10.3390/su14148710.
23. Philippine Statistics Authority. *Summary inflation report consumer price index.* Quezon City (PH): Philippine Statistics Authority; 2002. Available from: <https://psa.gov.ph/price-indices/cpi-ir>.
24. Hassen TB, El Bilali H. Impacts of the Russia-Ukraine war on global food security: towards more sustainable and resilient food systems? *Foods.* 2022 Aug;11(15):2301. doi: 10.3390/foods11152301. PMID: 35954068; PMCID: PMC9368568.
25. World Food Programme. *The Philippines: Food Security Monitoring.* Manila (PH): WFP; 2022.
26. Orbeta AC Jr, Melad KAM, Araos NVV. Longer-term effects of the Pantawid Pamilyang Pilipino Program: evidence from a randomized control trial cohort analysis (third wave impact evaluation). *PIDS Discuss Pap Ser.* 2021;(2021-01). Quezon City (PH): Philippine Institute for Development Studies.