

RESEARCH STUDY

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Differences in Food Coping Strategy between Rural and Urban Households toward Stunting Incidents

Perbedaan Food Coping Strategy antara Rumah Tangga di Perdesaan dan Perkotaan terhadap Kejadian Stunting

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ABSTRACT

Background: Stunting is one of the growth and development disorders of children as a consequence of a chronic nutrition deficiency and repeated infection, reflected by the height below the standard.**Objectives:** This research aims to recognize the differences in food coping strategies between rural and urban households toward stunting incidents.**Methods:** Cross-sectional design with 300 children in Paser Regency (rural) and Balikpapan City (urban). Assessment of daily nutrition intake of the children using multiple-passed 1 x 24-hour recall to the mother. The household dietary diversity was assessed using the Household Dietary Diversity Score (HDDS). In each household, Anthropometry was measured on the children (weight and height) and mother (weight, height, the middle of the upper arm, waist, and hips).**Results:** The survey showed that the wife was more dominant in determining the food menu, cost of food, and the processing of nutritious food. Food coping strategies in rural households are to consume less favorable food cheaper, collect wild plants, hunt or harvest early, and ask for food or help from colleagues or siblings; meanwhile, food coping strategies in urban households are to consume less favorable food and cheaper. Food security in urban households was 75.3%, and in rural households was 59.3%. The average infant's body length in rural and urban households was 49.22 cm, and the proportion of short infants was 7.33% in urban households and 14.67% in rural households.**Conclusions:** The food coping strategy performed in rural households was deeper than in urban households.

INTRODUCTION

A growth and development disorder in children caused by chronic nutrition deficiency and repeated infection, indicated by the infant's length or height below standard, is called stunting¹. Other sources explain that it is considered stunting based on length/height, according to the age, which is below -2 standard deviation (SD) of the World Health Organization (WHO) growth curve because of irreversible conditions, for instance, insufficient nutrition intake and repeated or chronic infection occur in the First 1000 Days of Life (HPK)². The effects of stunting are growth failure (low birth weight, small, short, and thin) and detention of cognitive and motoric development³. Furthermore, the metabolic disorders during adulthood included non-communicable disease risk (diabetes, obesity, stroke, heart disease)⁴.

According to Survey Status Gizi Indonesia (SSGI) data in 2021, stunting prevalence in Indonesia is 24,4%. Meanwhile, stunting prevalence in East Kalimantan is 22.8%⁵. Compared to the WHO standard (below 20%),

the prevalence in Indonesia, especially in East Kalimantan, is considered high⁶.

Several factors may lead to stunting. Nutrition intake is vital in children's development and growth⁷. A deficiency of nutrition intake leads to malnutrition, an imbalance of nutrition input and output of the body, which may cause unresolved nutrition problems, such as stunting⁸. The problem of individual nutrition deficiency can be solved through food security⁹. Nowadays, the food security concept does not only mainly focus on the macro level (national/regional) to ensure adequate food supply. However, it also provides which area is included in the food security category to ensure food security at the household level even¹⁰.

A food coping strategy is a measure by the family member to fulfill food consumption during declining access to food¹¹. It is a common strategy underprivileged families perform to solve the food uncertainty matter¹². Food coping strategies are commonly based on the assets and skills of the family member¹³. The implication of the

strategy frequently relies on the capital owned by the family, including assets and skills. Several common household strategies include looking for a side hustle to improve income and change the consumption pattern. Food coping strategies are differentiated based on food and non-food coping strategies. Food coping strategies based on food, such as affording cheaper food, and non-food coping strategies, such as looking for additional income or offloading assets¹⁴.

Families with a food shortage apply several possible strategies to fulfill the need for food, for instance, increasing the income through side jobs, changing the food consumption pattern, and increasing access to food¹². The profundity of the action in food coping strategy reflects how often a family suffers a food shortage¹⁴. Therefore, the food coping strategy performed by the households shows an indicator of stunting incidents in the households. Therefore, this research aims to understand how food coping strategies differ in rural and urban households toward stunting incidents.

METHODS

Design, Location, and Time

The research was conducted using a cross-sectional design. The research aims to recognize the differences between rural (Paser Regency) and urban (Balikpapan City) household food coping strategies for stunting incidents. The research was conducted between May - September 2022.

Sampling

Clustered sampling was used to select the sample. Each place was chosen based on the prevalence in the region. The subject was the household in every subdistrict, following the cluster based on each integrated healthcare center. The sample size was based on the assumption that $\alpha=5\%$ ($Z\alpha=1,96$), test power= 90% ($Z\beta=1,28$). Badan Ketahanan Pangan reported that the percentage of food security in rural areas (Paser Regency) was about 72.25%, while in urban (Balikpapan City), approximately 88.74% in Indeks Ketahanan Pangan 2019¹⁵. The example of the calculation is as follows:

$$n = \frac{(z_{1-\alpha/2}\sqrt{2P(1-P)} + z_{1-\beta}\sqrt{P_1(1-P_1) + P_2(1-P_2)})^2}{(P_1 - P_2)^2}$$

$$n = \frac{[1,96\sqrt{0,222(0,889)} + 1,28\sqrt{0,171(0,829)} + 0,051(0,949)]^2}{(0,171 - 0,051)^2}$$

$$n = \frac{[1,96\sqrt{0,222(0,889)} + 1,28\sqrt{0,142} + 0,048]^2}{(0,171 - 0,051)^2}$$

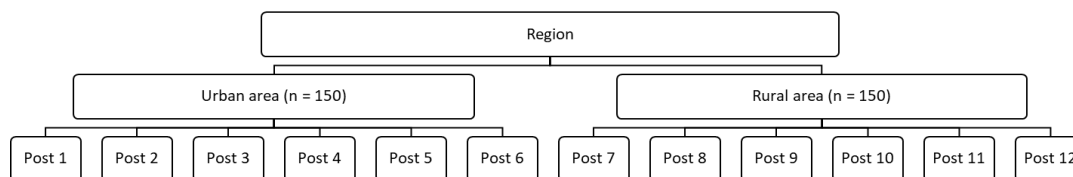
$$n = \frac{[1,96(0,44) + 1,28(0,436)]^2}{(0,12)^2}$$

$$n = \frac{(0,87 + 0,558)^2}{0,014}$$

$$n = 141,6$$

Anticipate any drop-out subject from the research, nine households were added to the amount of sample in each group. Picture 1. shows the number of

subjects in 150 households, the sampling process, and the recapitulation (Table 1.) as follows:



Picture 1. Sampling Procedure of Respondents in Rural (Regency Paser) and Urban (City Balikpapan)

Table 1. Recapitulation of Respondents in Rural (Paser Regency) and Urban (Balikpapan City)

Area	Number of Household
Rural (Paser Regency)	150
Urban (Balikpapan City)	150
Total	300

Data Collection Technique

The research collected primer data obtained from interviews using questionnaires and Anthropometry. Anthropometry measurement was conducted to obtain the nutritional status of the mother and the children in the household. The children were measured based on weight and height, while the mother was measured based on weight, height, the middle part of the upper arm, waist, and hips. The weights of the mother and the children were measured using a digital weighing scale. The length of the children below two years old was measured using a longboard, while the height of the children between 24 and 59 months old and the mother was measured using a stadiometer with an accuracy of 0.1 cm. Measurement was conducted twice for each correspondent, and the average was taken from those two measurements. All the measurement equipment was checked and calibrated periodically.

The questionnaire collected the sociodemographic data of the household, percentage of family expenditure, knowledge level of family nutrition, decision making, the average nutrition intake and sufficiency, dietary diversity, food coping strategy, and nutritional status of the infant. Daily nutrition intake was measured using multiple-passed 1 x 24-hour recall to the mother. The dietary diversity of the household was measured using the Household Dietary Diversity Score (HDDS). HDDS consists of 12 nutritional groups: cereal and tubers, meat and fish, offals, eggs, milk and its derivatives, nuts, vegetables, vitamin A fruits, dark green vegetables, and others. The consumption of those 12 dietary groups can then be classified into three categories: low if the consumption is below five types of foodstuffs, moderate if the consumption involves 5 to 6 types of foods, and high if the consumption involves seven or more types of foodstuffs. HDDS is measured based on the food consumed by each family member. Respondents are responsible for preparing the food the day before, while the target is the household (all the people living in the household sharing the food).

Five standard coping strategies and their severity load: (1) Consume less favorable food or expensive food; (2) Ask for food or help from colleagues or siblings; (3) Limit the portion during meal time; (4) Limit the adult food intake for the younger member and (5) Reduce the meal frequency per day. The research was avowed ethically proper by Komisi Etik Penelitian yang Melibatkan Subyek Manusia Institut Pertanian Bogor with the Number 680/IT3.KEPMSM-IPB/SK/2022.

Data Analysis

The children's consumption data was inputted into Nutrisurvey (www.nutrisurvey.de) to obtain the children's daily nutrition intake (energy, protein, fat, vitamins, and minerals). Afterward, the data was compared to the Indonesian Dietary Recommendation (AKG) according to Kemenkes Nomor 28 Tahun 2019 that the carbohydrate requirement should fulfill 60-65% of total daily energy, protein about 10-15% of total daily energy, fat about 20-25% of total daily energy. In contrast, vitamin and mineral requirements are adapted to macro nutrition requirements¹⁶.

The children's weight and height/length data were analyzed using the WHO Anthro Analyzer, an online device developed by WHO and UNICEF to analyze anthropometry survey data comprehensively. The children's weight and height/length were analyzed using WHO Anthro Daata body height z score per age, body weight z score per age, and body weight z score obtained from the software. The mother's body Mass Index (IMT) was calculated by dividing the body weight in kilograms by body height in square meters.

Data were presented in Table, Graphic, and Picture. Data were presented on average and SD for continuous variables and categorical data proportions. Independent T-Test and Chi-Square test were used to analyze the differences between urban and rural households. All statistical analysis was performed using SPSS 22.0 for Windows. A P-value below 0.05 was significant.

RESULTS AND DISCUSSION

Household Sociodemographic Characteristics

The data on household characteristics is crucial initial information for analyzing the nutritional problems presented in Table 2. In the household characteristics data, there is essential information regarding the age of the respondents, total family members, ethnicity, education level, and the occupations of the interviewed respondents. The age of respondents is necessary as initial data to determine the average age of the interviewed respondents, which will be correlated with other data such as employment status based on age.

Based on the data analysis conducted on the respondents in Paser and Balikpapan, it is found that there is no significant difference in the ages of fathers between the two regions. The average age of fathers in Paser is 35 years, with a standard deviation of 8.01, while the average age of fathers in Balikpapan is 35.5 years, with a standard deviation of 8.37. The average age of fathers in both areas is 35 years, with a standard deviation of 2.06. Similarly, the results for the average age of mothers in both areas show a close similarity. The average age of mothers in Paser is 31.5 years with a standard deviation of 7.54, which is not significantly different from that of mothers in Balikpapan, which is 31.9 years with a standard deviation of 6.46. In comparison, the average age of mothers in both areas is 31.7 years, with a standard deviation of 2.06.

The following socio characteristic is the average number of household members. The data analysis conducted on 150 households in each region reveals no significant difference in the average number of family members between Paser and Balikpapan. The average number of family members in Paser is five; the same goes for Balikpapan. The average number of family members in both areas is 5, with a standard deviation 1.27.

The respondents' households in both regions are divided into various ethnic groups, broadly categorized into eight ethnic groups: Javanese, Paser, Banjar, Bugis, Makassar, Padang, Toraja, and others. This classification is based on the predominant ethnic groups in both areas. In Paser, five ethnic groups dominate, with the largest being the Paser ethnic group, accounting for 49.33%,

followed by Javanese at 21.33%, Bugis at 16%, Banjar at 6%, Makassar at 1%, and others at 6.67%. In contrast, Balikpapan has a more diverse ethnic composition, with seven dominant ethnic groups. Javanese is the most prevalent ethnic group in Balikpapan, constituting 50%,

followed by Bugis at 14%, Banjar at 7.33%, Toraja at 3.33%, and Padang and Paser each having an equal percentage of 0.67%, and the remaining 22% belong to other ethnic groups (Table 2).

Table 2. Sociodemographic Characteristics of the Household in Rural and Urban

Sociodemographic Characteristic	Paser (Rural) n=150	Balikpapan (Urban) n=150
Age (year), mean ± SD		
Father	35.04 ± 8.01	35.55 ± 8.37
Mother	31.58 ± 7.54	31.92 ± 6.46
Number of household members (person), mean ± SD	5 ± 1.24	5 ± 1.31
Ethnicity, n (%)		
Java	32 (21.33%)	75 (50%)
Paser	74 (49.33%)	1 (0.67%)
Banjar	9 (6%)	11 (7.33%)
Bugis	24 (16%)	21 (14%)
Makassar	1 (0.67%)	3 (2%)
Padang	0 (0%)	1 (0.67%)
Toraja	0 (0%)	5 (3.33%)
Others	10 (6.67%)	33 (22%)
Education of father, n (%)		
Did not go to school	1 (0.67%)	0 (0.00%)
Did not finish elementary school	2 (1.33%)	1 (0.67%)
Graduated from elementary school	27 (18.00%)	10 (6.67%)
Graduated from junior high school	30 (20.00%)	18 (12%)
Graduated from senior high school	64 (42.67%)	94 (62.67%)
Graduated from vocational school	15 (10.00%)	14 (9.34%)
Graduated from higher education	11 (7.33%)	13 (8.67%)
Education of mother, n (%)		
Did not go to school	0 (0.00%)	0 (0.00%)
Did not finish elementary school	2 (1.33%)	0 (0.00%)
Graduated from elementary school	28 (18.67%)	16 (10.67%)
Graduated from junior high school	32 (21.33%)	19 (12.67%)
Graduated from senior high school	60 (40.00%)	95 (63.33%)
Graduated from vocational school	18 (12.00%)	14 (9.33%)
Graduated from higher education	10 (6.67%)	6 (4.00%)
Employment status of family members ≥15 years of age, n (%)		
Employed	241(63.42%)	242 (62.53%)
Employed but temporarily laid off	0 (0.00%)	1 (0.25%)
Unemployed, just recently laid off	0 (0.00%)	1 (0.25%)
Unemployed	139 (36.57%)	143 (36.95%)
Occupation of father, n (%)		
Unemployed	1 (0.67%)	3 (2.00%)
School	0 (0.00%)	0 (0.00%)
Civil servant	19 (12.67%)	11 (7.33%)
Private sector employee	18 (12.00%)	63 (42.00%)
Entrepreneur	26 (17.33%)	35 (23.33%)
Farmer	66 (44.00%)	6 (4.00%)
Fisher	0 (0.00%)	0 (0.00%)
Laborer/driver/household helper	20 (13.33%)	32 (21.33%)
Others	0 (0.00%)	0 (0.00%)
Occupation of mother, n (%)		
Unemployed	81 (54.00%)	93 (62.00%)
School	0 (0.00%)	0 (0.00%)
Civil servant	9 (6.00%)	8 (5.33%)
Private sector employee	10 (6.67%)	10 (6.67%)

Moreover, information on the educational level of fathers and mothers in the two data collection areas will be presented. In Balikpapan, the percentage of fathers with high school (SLTA/MA) education is the highest, at 62.67%, followed by those with junior high school (SLTP/MTS) education at 12%. Those with D1/D2/D3 education were 9.34%, university graduates were 8.67%, elementary school (SD) graduates were 6.67%, and the remaining 0.67% did not complete elementary school. In Paser, fathers' educational level differs significantly from Balikpapan, although high school graduates (SLTA/MA) also dominate in Paser with a percentage of 42.67%. Following this, junior high school graduates (SLTP/MTS) constitute 20%, elementary school (SD/MI) graduates make up 18%, D1/D2/D3 graduates account for 10%, university graduates for 7.33%, those who did not complete elementary school for 1.33%, and the remaining 0.67% did not attend school.

The mothers' educational level in Balikpapan is quite good, as none are reported as not attending or completing elementary school. The education level of mothers in Balikpapan is dominated by high school graduates (SLTA/MA), followed by junior high school graduates (SLTP/MTS) and elementary school graduates (SD/MI) with percentages of 63.33%, 12.67%, and 10.67%, respectively. The remaining percentages are for D1/D2/D3 graduates and university graduates (PT) at 9.33% and 4%, respectively. In Paser, mothers' educational level is not significantly different from Balikpapan, although there is a small percentage (1.33%) of mothers who did not complete elementary school (SD/MI). Similar to Balikpapan, the educational level of mothers in Paser is dominated by high school graduates (SLTA/MA), followed by junior high school graduates (SLTP/MTS) and elementary school graduates (SD/MI) with percentages of 40%, 21.33%, and 18.67%, respectively. Mothers with D1/D2/D3 and university (PT)

education in Paser are slightly more than in Balikpapan, at 12% and 6.67%, respectively.

In Balikpapan, the most dominant occupation among fathers is private sector employees (42%), while for mothers, 62% are housewives who do not work. Conversely, in Paser, the most dominant occupation for fathers is farming/agricultural labor, accounting for 44%. Palm oil plantations surround Paser, so a significant portion of the local population is engaged in farming or palm oil plantation labor. Like Balikpapan, almost half of the surveyed mothers are housewives who do not work (54%). Based on the employment status according to age, there are 242 family members aged above 15 who are employed in Balikpapan, accounting for 62.53%, which is only one digit different from Paser, where there are 241 family members employed, constituting 63.42%. In Paser, no family member above 15 years old has experienced layoffs or is currently on leave, unlike in Balikpapan, respondents who have experienced layoffs and are on leave; however, the numbers are minor—one respondent for each category. Several studies suggest a relationship between income and good nutritional conditions, living conditions, and others. Additionally, higher education tends to correlate with awareness and knowledge about health¹⁷.

Family Expenditure Percentages

The percentage of family expenditures can be observed in Table 3, where the proportion of non-food expenditures is higher than food expenditures in rural and urban areas. This study indicates that a decrease in non-food expenditures may occur due to a decrease in income, leading families to restrain spending on non-food items, prioritizing fulfilling food needs. The high household expenditures on non-food items are attributed to the funds used for routine monthly expenses, such as paying for children's school fees, household assistants, security guards, and drivers.

Table 3. The Proportion of Expenditure, Nutritional Knowledge Categories, Dietary Diversity, and Food Insecurity Experience Household in Rural and Urban

Criteria	Paser (Rural)	Balikpapan (Urban)
The proportion of expenditure (%)		
Food	49.72	45.2
Non-Food	50.27	54.79
Nutritional knowledge categories (%)		
Poor (<60)	14.66	9.33
Moderate (60-80)	59.33	58.67
Good (>80)	26	32
Dietary diversity (%)		
Low dietary diversity (≤5 food groups)	1.33	0.67
Medium dietary diversity (6-7 food groups)	4.67	6
High dietary diversity (>7 food groups)	94	93.37
Food insecurity experience (%)		
Food secure (score 0)	59.3	75.3
Mildly food insecure (score 1-3)	28.67	15.3
Moderately food insecure (score 4-6)	10.67	6.7
Severely food insecure (score 7-8)	1.3	2.7

Dietary Diversity

The percentage of dietary diversity consumed by households in Paser and Balikpapan can be seen in Table 3. The diversity of food consumed is divided into three categories: low diversity (≤ 5 types of food), moderate (6-7 types of food), and high (> 7 types of food). The total number of respondents consuming low diversity of food (≤ 5 types of food) in Paser is two respondents or 1.33%. In Balikpapan, one respondent was 0.67%, with three respondents or 1%. Moreover, the number of respondents with moderate food diversity (6-7 types of food) in Paser is seven respondents or 4.67%, while in Balikpapan, it is nine respondents or 6%, with a total of 16 respondents or 5.33%. Furthermore, the category of high food diversity (> 7 types of food) in Paser is 141 respondents or 94%. There are 140 respondents in Balikpapan, or 93.37%, with 281 respondents, or 93.67%, out of 300 respondents sampled. The variety of foods consumed in households in Balikpapan and Paser allows the necessary nutritional intake for the body to be obtained from various sources. A study mentioned that diverse food consumption is crucial for toddlers and family members, enabling optimal growth and supporting energy intake for daily activities¹⁸. Balanced and adequate nutritional fulfillment is crucial in preventing stunting in households¹⁹.

Food Insecurity Experience

The research results indicate that 1.3% of families in Paser experience food insecurity, while in Balikpapan, it is 2.7% (Table 3). The proportion of families experiencing food security is higher in Balikpapan, with a percentage of 75.3%, whereas in Paser, it is 59.3%. Factors influencing food security or insecurity include socio-economic status, education level in the household, food availability, and food consumption¹⁹. Food-tolerant families can meet the availability, affordability, and utilization of food consumption within the household. A study shows a close relationship between household food insecurity levels and the occurrence of stunting⁹.

Parental Nutrition Knowledge

Parental nutrition knowledge is categorized into good, moderate, and poor (Table 3). Maternal nutrition knowledge within the family influences the level of

nutritional intake in the household, which can impact the emergence of diseases resulting from insufficient nutritional intake²¹. According to a study, mothers with poor knowledge of nutrition have a four times higher risk of having stunted children²². Maternal nutrition knowledge does not automatically translate into improving the nutritional status of the family or raising nutritional awareness in the community, meaning that it is not just about having nutritional knowledge; it is also about understanding nutrition itself and being willing to implement the knowledge in providing nutritious food for the household²³. The difference between the two data collection locations, rural and urban areas, is minor. However, in the urban area of Balikpapan, there is a slightly higher percentage of mothers with good nutrition knowledge compared to the rural area in Paser. The percentage of mothers with good nutrition knowledge in Balikpapan is 32%, while in Paser, it is 26%. According to research, in seven provinces and ten rural districts, about 3150 pregnant or lactating mothers with children under two years old are unaware of what stunting is²⁴.

Decision-Making in the Family

The decision-making process within the family related to daily food menus, the quantity of food, expenditure allocation, food portions, selection of nutritious foods, cooking methods, and meal frequency, including whether the food will be cooked at home or purchased, can be observed in Table 5. In family decision-making, wives are more dominant in making decisions. In Paser and Balikpapan, wives are more dominant, with percentages exceeding 50% for all categories. This includes decisions regarding daily food menus and quantities, determining the amount of family income allocated for meals, the type of nutritious food, how it is prepared, the frequency of consumption, and whether to cook at home or buy ready-made food. Decision-making done jointly has a percentage below 20% for all categories in both Paser and Balikpapan. The significant percentage in decision-making lies in the fact that wives are typically responsible for preparing meals, choosing food ingredients, and determining the menu for family members. Meanwhile, as heads of the family, husbands are often outside the home, working and earning a living for the family¹⁸.

Table 5. Distribution of Respondents based on Food Consumption Decision-Making Indicators in Rural and Urban

Decision-making indicators	Paser (Rural) n = 150	Balikpapan (Urban) n = 150
Determine daily food menu, n (%)		
Husband dominant	2 (1.33%)	1 (0.67%)
Husband only		
Wife dominant	72 (48%)	79 (52.67%)
Wife only	51 (34%)	57 (38%)
Fully shared	25 (16.67%)	13 (8.67%)
Determine the amount of food, n (%)		
Husband dominant	1 (0.67%)	
Husband only		
Wife dominant	75 (50%)	80 (53.33%)
Wife only	51 (34%)	59 (39.33%)
Fully shared	23 (15.33%)	11 (7.33%)

Decision-making indicators	Paser (Rural) n = 150	Balikpapan (Urban) n = 150
Determine the amount of Expenditure for daily meals, n (%)		
Husband dominant	3 (2%)	1 (0.67%)
Husband only	1 (0.67)	
Wife dominant	73 (48.67%)	75 (50%)
Wife only	48 (32%)	51 (34%)
Fully shared	25 (16.67%)	23 (15.33%)
Determine the proportion of food expenditure from household income, n (%)		
Husband dominant		1 (0.67%)
Husband only		
Wife dominant	76 (50.67%)	74 (49.33%)
Wife only	49 (32.67%)	48 (32%)
Fully shared	25 (16.67%)	27 (18%)
Determine a nutrition-balanced food menu, n (%)		
Husband dominant		
Husband only		
Wife dominant	78 (50.67%)	79 (52.67%)
Wife only	50 (50%)	55 (36.67%)
Fully shared	22 (14.67%)	16 (10.67%)
Determine the method of food processing, n (%)		
Husband dominant		
Husband only		
Wife dominant	75 (50%)	76 (50.67%)
Wife only	50 (33.33%)	51 (34%)
Fully shared	25 (16.67%)	23 (15.33%)
Determine eating frequency, n (%)		
Husband dominant		
Husband only		
Wife dominant	78 (52%)	81 (54%)
Wife only	50 (33.33%)	58 (38.67%)
Fully shared	22 (14.67%)	11 (7.33%)
Determine cooking or buying outside, n (%)		
Husband dominant	1 (0.67)	
Husband only		
Wife dominant	76 (50.67%)	74 (49.33%)
Wife only	48 (32%)	46 (30.67%)
Fully shared	25 (16.67%)	30 (20%)

Average Intake and Adequacy Levels of Energy and Nutrients

The food intake in relation to families' average nutritional adequacy levels, considering energy, carbohydrates, protein, fat, calcium, iron, zinc, vitamin A, and vitamin C in Paser and Balikpapan can be observed in Table 6. The energy intake (kcal) in Paser and Balikpapan is not significantly different, with an energy intake score in Paser of 1080.87 ± 581.73 kcal, while in Balikpapan, it

is 1097.73 ± 985.73 kcal. For carbohydrate, protein, fat, calcium, iron, zinc, vitamin A, and vitamin C intake, there is also not much difference between Paser and Balikpapan. The intake and adequacy of energy and nutrients depend on the household's ability to access and utilize them as the daily intake for the household. Food is a basic necessity, fulfilling energy and nutrient needs for daily activities.

Table 6. Average of Energy and Nutrient Intake in Rural and Urban

Nutrients, mean ± SD	Paser (Rural) n= 150	Balikpapan (Urban) n= 150
Energy (kcal)	1080.87 ± 581.73	1097.73 ± 985.73
Carbohydrate (g)	133.13 ± 79.23	132.75 ± 119.24
Protein (g)	38.14 ± 25.37	39.35 ± 44.14
Fat (g)	43.71 ± 29.90	45.22 ± 43.66
Calcium (mg)	594.06 ± 480.25	700.39 ± 1404.49
Iron (mg)	5.36 ± 5.18	6.58 ± 14.86

Nutrients, mean ± SD	Paser (Rural) n= 150	Balikpapan (Urban) n= 150
Zinc (mg)	4.38 ± 3.26	4.62 ± 6.65
Vitamin A (RE)	670.84 ± 607.86	737.72 ± 1028.18
Vitamin C (mg)	42.94 ± 55.06	43.26 ± 72.94

The average energy adequacy in Paser is evident in the nutritional adequacy levels of fat, zinc, and vitamin A, with percentages of 76.67%, 54%, and 64%, respectively. In Balikpapan, the average nutritional adequacy levels are observed in protein adequacy with a percentage of 79.33%, zinc 52.67%, and vitamin A 62% (Table 7). The different levels of energy and nutrient adequacy in rural and urban areas can be attributed to (1) the availability of diverse food ingredients, (2) the ability

to access food ingredients, and (3) the ability to utilize these food ingredients¹⁵. Differences in education level, types of household occupations, and awareness of household nutritional intake also contribute to these variations¹⁸. Research conducted on elementary school children in Salatiga shows that energy level and nutrient adequacy depend on preferences in choosing foods high in fat and protein compared to foods containing high complex carbohydrates or vegetables and fruits²⁵.

Table 7. Average of Energy and Nutrient Adequacy in Rural and Urban

Nutrients, %	Paser (Rural) n = 150	Balikpapan (Urban) n = 150
Energy (kcal)		
Sufficient	34.67	38.67
Defficient	65.33	61.33
Carbohydrate (g)		
Sufficient	25.33	26.67
Defficient	74.67	73.33
Protein (g)		
Sufficient	42.67	79.33
Defficient	57.33	20.64
Lipid (g)		
Sufficient	76.67	44.67
Defficient	23.33	55.33
Calsium		
Sufficient	40	46
Defficient	60	54
Iron		
Sufficient	22	22.67
Defficient	78	77.33
Zink		
Sufficient	54	52.67
Defficient	46	47.23
Vitamin A		
Sufficient	64	62
Defficient	36	38
Vitamin C		
Sufficient	34.67	36.67
Defficient	65.43	63.23

One of the factors directly influencing the nutritional status of children is the intake of nutrients. Nutrient intake is assessed to determine the quantity and quality of nutritional intake in toddlers. Adequate nutritional intake will support the optimal growth and development of children. Based on the data in Tables 6 and 7, it is evident that the average levels of energy and nutritional adequacy in toddlers in rural and urban areas are less than 100%. Insufficient energy levels and nutritional adequacy, falling below 100%, contribute to the high prevalence of chronic nutritional issues in children. This situation aligns with research indicating that the adequacy of protein intake affects growth rate

and bone formation because protein is essential for growth¹². Additionally, protein has functions that cannot be replaced by other nutrients, i.e., building and maintaining cells and body tissues²⁶. Therefore, a low level of protein adequacy in food intake can impact growth and potentially lead to stunting if not addressed²⁷.

Food Coping Strategy

Table 10 shows that families consuming less preferred and cheaper food in Balikpapan amount to 20 households (HH); in Paser, it is 38 HH. Families borrowing food or receiving assistance from friends or relatives in

rural areas or Paser are also higher compared to urban areas or Balikpapan. Similarly, families in rural areas have a higher incidence of borrowing food than those in urban areas. Gathering wild plants, hunting, or harvesting early in Paser is done by 39 HH, while in Balikpapan, there are also 5 HH. Families in Paser also consume stored seed

stocks for planting in the next season, amounting to 13 HH. Asking household members to find food elsewhere is reported by 5 HH in Paser, while in Balikpapan, it is reported by 3 HH. Begging for food within the household also occurs, but only in 1 HH each in Balikpapan and Paser.

Table 10. Coping Strategy Mechanism of Food Provision Household in the Past Week in Rural and Urban

K= Coping strategy in the last 7 days, Rata-Rata ± SD	Paser (Rural) n=150	Day : Mean ± SD	Balikpapan (Urban) n=150	Day : Mean ± SD
1. Relying on less preferred and less expensive food	No=112 Ya=38	0.81 ± 1.7	No=130 Ya=20	0.37 ± 1.22
2. Borrow food, or rely on help from a friend or relative	No=132 Ya=18	0.27 ± 0.9	No=140 Ya=10	0.16 ± 0.71
3. Purchase food on credit	No=141 Ya=9	0.08 ± 0.39	No=144 Ya=6	0.06 ± 0.37
4. Gather wild food, hunt, or harvest immature crops	No=111 Ya=39	0.99 ± 1.99	No=145 Ya=5	0.07 ± 0.40
5. Consume seed stock held for next season	No=137 Ya=13	0.23 ± 0.94	No=148 Ya=2	0.01 ± 0.12
6. Send household members to eat elsewhere	No=145 Ya=5	0.11 ± 0.68	No=147 Ya=3	0.03 ± 0.27
7. Send household members to beg	No=149 Ya=1	0.03 ± 0.33	No=149 Ya=1	0.01 ± 0.08
8. Limit portion size at mealtimes	No=140 Ya=10	0.21 ± 0.97	No=142 Ya=8	0.19 ± 0.97
9. Restrict consumption by adults in order for small children to eat	No=142 Ya=8	0.22 ± 1.05	No=144 Ya=6	0.11 ± 0.69
10. Feed working members of HH at the expense of non-working members	No=149 Ya=1	0.03 ± 0.33	No=148 Ya=2	0.02 ± 0.18
11. Reduce the number of meals eaten in a day	No=144 Ya=6	0.11 ± 0.57	No=142 Ya=8	0.15 ± 0.74
12. Skip entire days without eating	No=149 Ya=1	0.03 ± 0.33	No=150	0

Limiting food portions during mealtimes in Balikpapan is practiced by eight families, while in Paser, ten families. Restricting the consumption of adults so that small children can have more food is also practiced by adults in Balikpapan, amounting to 6 families, and in Paser, eight families. Feeding working household members at the expense of those who are not working is also reported by one family in Paser and two families in Balikpapan. Reducing the frequency of meals per day is also observed in this study, with eight families in Balikpapan and six families in Paser. One family in Paser reported having members who do not eat at all, while there were no reports of this in Balikpapan.

Infant Nutritional Status

Infant nutritional status is assessed based on weight-for-age (W/A), with deficient weight in Paser at 2%, while in Balikpapan, it is 5.33% (Table 11). Low-weight infants in Balikpapan account for 17.33%, compared to 2.67% in Paser. Infants with average weight are higher in Balikpapan (77.33%) than in Paser (48%). Meanwhile, the percentage of infants who are overweight is much higher in rural areas (Paser), reaching 47.33%, while in urban areas (Balikpapan), it is 0%

Table 11. Distribution of the Children by Nutritional Status in Rural and Urban

Criteria	Area	
	Paser (%)	Balikpapan (%)
W/A		
Severe underweight (Z score < -3)	2	5.33
Underweight (-3 ≤ Z score < -2)	2.67	17.33
Normal (-2 ≤ Z score ≤ -1)	48	77.33
Risk of being overweight (Z score > 1)	47.33	
H/A		
Severe stunting (Z score < -3)	8	6.67
Stunting (-3 ≤ Z score < -2)	14.67	7.33
Normal (-2 ≤ Z score ≤ 3)	77.33	86

Criteria	Area	
	Paser (%)	Balikpapan (%)
Height (Z score > 3)		
W/H		
Severe wasting (Z score < -3)	4.67	3.33
Wasting (-3 ≤ Z score ≤ -2)	2	1.33
Normal (-2 ≤ Z score ≤ -1)	46.67	45.33
Risk of overweight (1 < Z score ≤ 2)	24	24
Overweight (2 < Z score ≤ 3)	14	19.33
Obese (Z score > 3)	8.67	6.67

Table 11 shows that infant nutritional status is assessed based on height-for-age (HA/Z), with very short height in Paser at 8%, while in Balikpapan, it is 6.67%. Short-height infants in Balikpapan account for 7.33%, compared to 14.67% in Paser. Infants with standard height are higher in Balikpapan (86%) than in Paser (77.33%). There are no infants in both research areas categorized as tall.

Infant nutritional status is assessed based on weight-for-height (W/H), with malnutrition in Paser at 4.67%, while in Balikpapan, it is 3.33%. Undernutrition in Balikpapan is 1.33%, and in Paser, it is 2.0%. Good nutrition is higher in Balikpapan (45.33%) compared to Paser (46.67%), while the risk of overnutrition in both research areas is the same at 24%, with overnutrition in Balikpapan at 19.33% and in Paser at 14%. Obesity in rural areas (Paser) is higher at 8.67%, while in urban areas (Balikpapan), it is 6.67%.

The nutritional status of toddlers in Balikpapan is better than that of toddlers in Paser, as seen from their weight, height, and overall nutritional condition. The differences in nutritional status can stem from maternal knowledge, supported by mothers who prepare meals and choose ingredients²⁸. Additionally, the selection of food coping strategies in households in Paser shows a higher prevalence compared to Balikpapan. It suggests that households in Paser are more likely to experience food shortages. The condition of stunting or poor nutritional status in toddlers is influenced by nutritional intake and sufficiency^{29,19}, maternal nutritional knowledge³⁰, decision-making within the household²⁷, and food coping strategies as efforts to meet the family's food needs¹¹.

Correlation

The analysis using the paired-sample t-test method between each independent variable and the dependent variable (95% CI or alpha 0.05) reveals significant differences between the urban (Balikpapan) and rural (Paser) areas. Significant differences were observed in the father's occupation, decision-making 1 (determining the menu), decision-making 2 (determining the amount of food), and food security variables between urban and rural areas, as shown in Table 12. It indicates that decision-making regarding menu selection, determining the quantity of food, and deciding on the amount of food expenditure are significantly different ($p < 0.05$) between rural and urban areas. There was no difference in nutritional status between rural and urban areas in this study. However, food security in rural and urban areas differs significantly. Based on the results of a study, toddlers in rural areas exhibit a higher incidence of stunting than in urban areas³⁰. When correlated with the results of independent variables, the factors influencing stunting in rural and urban areas are decision-making in menu and food quantity determination, as well as the level of food security in those areas⁸. Menu, food quantity, and food security are closely related to stunting. Areas with good food security tend to have lower stunting cases than areas with poor food security¹². Areas with the highest stunting prevalence are still dominated by Indonesia's outermost provinces, such as East Nusa Tenggara, West Sulawesi, Papua, Aceh, and West Nusa Tenggara, which have low food security scores¹⁵.

Table 12. Correlation of Independent Variables with Dependent Variables in Rural and Urban

No	Variable	p-value	Kesimpulan
1.	Mothers' nutritional knowledge	0.102	Not Significance
2.	Energy adequacy	0.474	Not Significance
3.	Protein adequacy	0.579	Not Significance
4.	Decision-making on the food menu	0.037	Significance
5.	Decision-making on food amount	0.029	Significance
6.	Decision-making on food expense	0.754	Not Significance
7.	Food security	0.002	Significance

CONCLUSIONS

The results of this study indicate that wives are more dominant in decision-making within households, both in rural and urban areas. Urban families exhibit higher food security, resulting in fewer food coping strategies than rural families. The adequacy of protein is better in urban areas than in rural areas. The proportion

of infants experiencing stunting is higher in rural areas compared to urban areas.

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REFERENCES

1. De Onis, M. WHO Child Growth Standards based on length/height, weight and age. *Acta Paediatr. Int. J. Paediatr.* **95**, 76–85 (2006).
2. Utami Widhianti, M. et al. Faktor Berkaitan dengan Stunting dan Wasting pada Pasien Onkologi Anak Factors Associated with Stunting and Wasting in the Pediatric Oncology Patients. *Amerta Nutr.* **6**, 133–139 (2022).
3. Julianti, E. & Elni. Determinants of Stunting in Children Aged 12-59 Months. *Nurse Media J. Nurs.* **10**, 36–45 (2020).
4. Sugiyanto, J., Raharjo, S. S., Lanti, Y. & Dewi, R. The Effects of Exclusive Breastfeeding and Contextual Factor of Village on Stunting in Bontang, East Kalimantan, Indonesia. *J. Epidemiology Public Heal.* **4**, 222–233 (2019).
5. Kementerian Kesehatan Republik Indonesia. *Buku Saku: Hasil Studi Status Gizi Indonesia (SSGI) Tingkat Nasional, Provinsi, dan Kabupaten/Kota tahun 2021.* (2021).
6. Indriyani, R., Novika, Y., Lupiana, M. & Wahyuni, E. S. Kajian Camilan Tortilla Chips dari Formulasi Tepung Jagung dan Tempe untuk Pencegahan Stunting Study of Tortilla Chips Snack from Corn Flour and Tempeh Formulation for Stunting Prevention. *Amerta Nutr.* **7**, 358–364 (2023).
7. Jumilia, J., Cleodora, C. & Widyastuti, M. Analysis of the Impact of Stunting on Psychosocial Development in Pre-School Children in the Working Area Seberang Padang Community Health Center. *J. Keperawatan Komprehensif* **9**, 298–310 (2023).
8. Nadhiroh, S. R., Riyanto, E. D., Jannah, Z. & Salsabil, I. S. POTENSI BALITA RISIKO STUNTING DAN HUBUNGANNYA DENGAN KELUARGA PRA-SEJAHTERA DI JAWA TIMUR : ANALISIS DATA PK-21. *Media Gizi Indones.* 112–119 (2022) doi:10/20473/mgi.v17i1SP.112-119.
9. Islamiah, W. E. et al. HUBUNGAN KETAHANAN PANGAN DENGAN KEJADIAN. *Media Gizi Indones.* 83–89 (2022).
10. Chaireni, R., Agustanto, D., Wahyu, R. A. & Nainggolan, P. Ketahanan Pangan Berkelanjutan. *J. Kependud. dan Pembang. Lingkung.* **1**, 70–79 (2020).
11. Putri, B. D. et al. Food Coping Strategies dan Aplikasi Pemantau Status Gizi Sebagai Upaya Preventif Stunting. *J. Abdimas Kesehat.* **4**, 479–487 (2022).
12. Asesefa Kisi, M., Tamiru, D., Teshome, M. S., Tamiru, M. & Feyissa, G. T. Household food insecurity and coping strategies among pensioners in Jimma Town, South West Ethiopia. *BMC Public Health* **18**, 1–8 (2018).
13. Militao, E. M. A. et al. Coping Strategies for Household Food Insecurity, and Perceived Health in an Urban Community in Southern Mozambique: A Qualitative Study. *Sustain.* **14**, 1–16 (2022).
14. Bedeke, S. B. Food insecurity and coping strategies : a perspective from Kersa. *Food Sci. Qual. Manag.* **5**, 19–27 (2021).
15. Badan Ketahanan Pangan. Indeks Ketahanan Pangan Indonesia 2019 (Food Security Index of Indonesia 2019). *Food Secur. Bur. Repub. Indones.* **14** (2019).
16. Kementerian Kesehatan Republik Indonesia. Peraturan Menteri Kesehatan Republik Indonesia. in (2019).
17. Wang, J. & Geng, L. Effects of socioeconomic status on physical and psychological health: Lifestyle as a mediator. *Int. J. Environ. Res. Public Health* **16**, (2019).
18. Adelina, F. A., Widajanti, L. & Nugraheni, S. A. Hubungan Pengetahuan Gizi Ibu, Tingkat Konsumsi Gizi, Status Ketahanan Pangan Keluarga Dengan Balita Stunting (Studi Pada Balita Usia 24-59 Bulan Di Wilayah Kerja Puskesmas Duren Kabupaten Semarang). *J. Kesehat. Masy.* **6**, 361–369 (2018).
19. Arlius, A., Sudargo, T. & Subejo, S. Hubungan Ketahanan Pangan Keluarga Dengan Status Gizi Balita (Studi Di Desa Palasari Dan Puskesmas Kecamatan Legok, Kabupaten Tangerang). *J. Ketahanan Nas.* **23**, 359 (2017).
20. Rokhmah, D., Farianingsih, Ma'rufi, I. & Khoiron. Study of Nutrition Food Access to Family With Stunting Toddlers in Stunting Countermeasures System in Lumajang Indonesia. *Amerta Nutr.* **6**, 32–37 (2022).
21. Prasetyo, A., Davidson, S. M., Pratiwi, T., Sanubari, E. & Davidson, S. M. Hubungan Keragaman Pangan Individu dan Status Gizi Anak 2-5 Tahun di Desa Batur, Kecamatan Getasan, Kabupaten Semarang Correlation between Individual Dietary Diversity and Children 2-5 Years Old Nutrition Status in Batur Village, Getasan Regency. *Amerta Nutr.* **7**, 343–349 (2023).
22. Mutiarasari, D. et al. A Determinant Analysis of Stunting Prevalence on Under 5-Year-Old Children to Establish Stunting Management Policy. *Open Access Maced. J. Med. Sci.* **9**, 79–84 (2021).
23. Burhani, P. A., Oenzil, F. & Revilla, G. Hubungan Tingkat Pengetahuan Ibu dan Tingkat Ekonomi Keluarga Nelayan dengan Status Gizi Balita di Kelurahan Air Tawar Barat Kota Padang. *J. Kesehat. Andalas* **5**, 515–521 (2016).
24. Mauludyani, A. V. R. & Khomsan, A. Maternal Nutritional Knowledge as a Determinant of Stunting in West Java: Rural-Urban Disparities. *Amerta Nutr.* **6**, 8–12 (2022).

25. Pangestu, F. D., Agustina, V. & Agung Nugroho, K. P. Pola Asuh, Status Gizi, Asupan Zat Gizi dan Hubungannya Dengan Kejadian Kelebihan Berat Badan pada Anak SD Kristen Satya Wacana Salatiga. *Amerta Nutr.* **6**, 235–244 (2022).
26. Yustisia, Y., Anmaru, R. & Laksono, B. The Influencing Factor Analysis of Stunting Incidence in Children Aged 24-59 Months At Kedung Jati Village. *Public Heal. Perspect. J.* **4**, 116–121 (2019).
27. Siregar, N., Ratnawati, R. & Amini, R. Nutritional status and toddler development : a relationship study. *J. Kesehat. Ibu dan Anak* **14**, 57–62 (2021).
28. Nissa, S.Gz.,M.Biomed, C., Mustafidah, I. & Sukma, G. I. Pengetahuan Ibu Tentang Gizi Dan Pola Konsumsi Protein Berbasis Pangan Lokal Pada Anak Baduta Stunting. *Amerta Nutr.* **6**, 38–43 (2022).
29. Khomsan, A. & Sukandar, D. Pengembangan Indeks Ketahanan Pangan Rumah Tangga dan Kaitannya dengan Tingkat Kecukupan Zat Gizi dan Status Gizi Anak Balita Development of Household Food Security Index and Its Association with Levels Adequacy of Nutrient and Nutritional Status of Under. *Amerta Nutr.* 201–211 (2019) doi:10.2473/amnt.v3i4.2019.
30. Sugianti, E., Putri, B. D., Hidayanti, H. & Buanasita, A. Prevalensi Ketahanan Pangan dan Hubungannya dengan Kejadian Stunting pada Rumah Tangga di Daerah Rawan Pangan. in *Proceedings series on physical dan formal sciences* vol. 5 (2021).