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Family Roles and The Incidence of Wasting in Toddlers: A Study at Pulo Lor Health Center, Jombang Regency

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ABSTRACT Wasting in toddlers, defined as low weight-for-height, remains a pressing public health concern in Indonesia, particularly in regions like Jombang Regency. The persistence of this nutritional problem is influenced by multifactorial causes, with family roles emerging as a key determinant. This study aimed to investigate the relationship between family roles and the incidence of wasting among toddlers aged 12–59 months in the Pulo Lor Health Center area, Jombang Regency. A cross-sectional research design was applied, involving a total sampling technique of 12 families with wasted toddlers. Data collection included structured questionnaires assessing family roles, along with anthropometric measurements of the toddlers' height and weight using standardized tools. The collected data were analyzed using the chi-square test at a 0.05 significance level. The results revealed that most families (66.6%) had extended family structures, and a significant proportion (75%) had monthly incomes below IDR 2,500,000. Family role implementation was found to be predominantly moderate (50%) and poor (25%). Statistically, there was a significant association between family roles and the incidence of wasting ($p = 0.025$), with toddlers in families with inadequate role implementation being at higher risk. The study concludes that the role of the family, including their support in nutritional planning, food diversity, and consistent feeding practices, is significantly associated with the nutritional status of toddlers. It is recommended that health promotion strategies focus on enhancing family awareness and participation in toddler nutrition through targeted education and community-based interventions. Active engagement in regular growth monitoring and provision of high-quality supplementary food (PMT) are essential to mitigate wasting prevalence.

INDEX TERMS Familiy roles, toddler nutrition, wasting, public health, supplementary feeding

I. INTRODUCTION

Wasting, defined as low weight-for-height, continues to be a significant global public health concern, particularly affecting children under five years of age. It reflects acute malnutrition and poses serious risks to physical growth, cognitive development, and child survival [1], [2]. According to UNICEF, approximately 45.4 million children under five were wasted in 2020, representing 6.7% of the global population in that age group. The highest burden is found in South Asia, followed by Sub-Saharan Africa and parts of Southeast Asia [3]. In Indonesia, although national efforts have led to a decline in wasting prevalence from 10.2% in 2018 to 7.7% in 2022 the issue persists, especially in rural and low-income regions like East Java [4]–[6]. Multiple factors contribute to wasting, including inadequate dietary intake, infectious diseases, and poor sanitation. However, indirect determinants such as socioeconomic status, parental education, and especially family roles particularly caregiving behaviors and feeding practices are increasingly recognized as critical [7]–[10]. In the context of Indonesia, the family unit is central to child-rearing practices. Parental knowledge, attitudes, and behaviors significantly influence child nutrition, yet research focusing on how specific aspects of family roles correlate with wasting outcomes remains limited [11]–[13]. Existing interventions to combat wasting often focus on biomedical or institutional solutions, such as supplementary feeding programs or growth monitoring through posyandu (community-based health posts). While these approaches are important, they frequently overlook the psychosocial and behavioral dimensions that influence nutrition outcomes at the household level [14]–[16]. Several studies have highlighted the importance of involving family members especially mothers in nutrition education, yet comprehensive analyses linking family role dimensions (e.g., decision-making, food preparation, caregiving consistency) to wasting incidence are still scarce [17]–[19].

This study aims to bridge this gap by investigating the relationship between family roles and the incidence of wasting in toddlers aged 12–59 months at Pulo Lor Health Center, Jombang Regency, East Java. Through a cross-sectional design involving 12 households with wasted toddlers, this research explores both the formal and informal roles of families in shaping child nutritional

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outcomes. The contributions of this study are threefold. First, it provides empirical evidence on the association between family role implementation and toddler nutritional status in a rural Indonesian setting. Second, it identifies specific behavioral and structural family factors such as feeding frequency, diversity of diet, and caregiving dynamics that are modifiable and can be targeted through public health education. Third, it contributes to community health policy by offering locally contextualized insights to enhance family-centered interventions in existing child nutrition programs.

II. METHODS

This research employed a quantitative analytical design with a cross-sectional approach, aimed at analyzing the relationship between family roles and the incidence of wasting in toddlers. A cross-sectional method is particularly suitable for identifying correlations at a single point in time and has been widely applied in nutritional epidemiology to assess risk factors and social determinants of health outcomes [20], [21].

A. STUDY LOCATION AND PERIOD

The present study was conducted at the Pulo Lor Health Center, located in Jombang Regency, East Java Province, Indonesia. This location was selected due to its relatively high prevalence of wasting among children under five years of age, as reported in the most recent district health profile. The area serves a diverse population and has been identified as a priority zone for nutritional interventions by local health authorities. Data collection was carried out over a three-month period, from January to March 2024, allowing researchers sufficient time to observe patterns in family behavior, conduct structured interviews, perform anthropometric assessments, and gather comprehensive data needed to analyze the relationship between family roles and the incidence of wasting among toddlers. The region was selected due to its high prevalence of wasting among children under five, as reported in the local public health profile [22].

B. POPULATION AND SAMPLING TECHNIQUE

The target population consisted of toddlers aged 12 to 59 months who were identified as experiencing wasting, as well as their respective families. The inclusion criteria were: (1) toddlers registered at the Pulo Lor Health Center, (2) diagnosed with wasting based on anthropometric standards using WHO's weight-for-height Z-score criteria, and (3) families willing to participate and provide informed consent. A total sampling technique was employed, where the entire population that met the inclusion criteria was selected as the study sample. In total, 12 toddlers and their caregivers were included. Total sampling is appropriate for studies with small populations and allows for comprehensive data capture without sampling bias [23].

C. DATA COLLECTION INSTRUMENTS AND VARIABLES

Data were collected using two primary methods: structured questionnaires and anthropometric measurements. The structured questionnaire consisted of closed-ended questions developed to assess both formal and informal family roles, based on prior validated family role assessment frameworks [24]. The questionnaire items were measured using a four-point Likert scale ranging from "strongly disagree" to "strongly agree." The questionnaire was first subjected to validity and reliability testing. The validity was evaluated through expert review, while internal consistency reliability was determined using Cronbach's alpha, which yielded a value of >0.70, indicating acceptable reliability [25]. The main independent variable in the study was the role of the family, operationalized through indicators such as task distribution, caregiving support, decision-making in feeding practices, and financial role. The dependent variable was the incidence of wasting, determined using anthropometric indicators.

D. ANTHROPOMETRIC MEASUREMENTS

Anthropometric data included body weight and height/length of the toddlers. Body weight was measured using a calibrated Dacin scale (One Med brand), and length/height was measured using a Microtoice height tape and infant body measuring board for non-ambulatory toddlers. Measurements were taken in accordance with WHO protocols, ensuring standardization of positioning and reading with 0.1 cm accuracy for height and 0.1 kg accuracy for weight [26]. Toddlers were categorized as "wasted" if their weight-for-height Z-score (WHZ) was below -2 standard deviations, and "severely wasted" if the score was below -3, following WHO child growth standards [27].

E. DATA PROCESSING AND ANALYSIS

Collected data were entered into Microsoft Excel and processed using SPSS version 25.0 for statistical analysis. Descriptive statistics were used to summarize demographic characteristics, frequency distributions, and central tendency of variables. Categorical variables were presented as percentages and frequencies, while continuous variables were described using means and standard deviations. To examine the relationship between family roles and the incidence of wasting, the study employed bivariate analysis using the Chi-square test. A significance level of $\alpha = 0.05$ was applied. A p-value less than 0.05 was considered statistically significant. Odds ratios (OR) with 95% confidence intervals (CI) were calculated to estimate the strength of associations.

F. ETHICAL CONSIDERATIONS

This study obtained ethical approval from the Health Research Ethics Commission (KEPK) at the Institute of Technology, Science and Health (ITSKes) Insan Cendekia Medika Jombang, under approval number: 013/KEPK/ITSKES-ICME/I/2024. Prior to participation, written informed consent was obtained from each respondent. Confidentiality and anonymity were ensured throughout the research process in compliance with ethical research standards [28].

G. STRENGTHS AND LIMITATIONS

This methodology provides a systematic and replicable approach for assessing the linkage between family structure

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and nutritional outcomes. The use of total sampling ensures full representation of the local target population. However, the limited sample size restricts generalizability, and the cross-sectional design precludes causality inference. Future studies may benefit from expanding to larger sample sizes and employing longitudinal methods to assess changes over time and evaluate the impact of family-based nutritional interventions [29], [30].

III. RESULT

The respondents in this study were mothers/caregivers of 12 wasting toddlers aged 12-59 months who were wasting in the working area of the Pulo Lor Health Center, Jombang Regency in 2024 (January-March 2024).

TABLE 1
Frequency Distribution of Respondent Characteristics in the Pulo Lor Community Health Center area in 2024

No	Respondent Characteristics	n	%
1	Child's age		
	a. Median		34,00
	b. Min-Maks		12-59
2	Height of the child		
	a. Mean		82,74
	b. Standard Deviation		11,09
3	Child's weight		
	a. Mean		77,87
	b. Standard Deviation		9,87
4	Family Form		
	a. Nuclear family	2	16,6
	b. Big family	8	66,6
	c. The family divorced	2	16,6
5	Education		
	a. No school	2	16,6
	b. SD	5	41,6
	c. SMP	2	16,6
	d. SMA	2	16,6
	e. PT	1	8,3
6	Working Status		
	a. Doesn't work	7	58,3
	b. Work	5	41,6
7	Family income		
	a. <Rp. 2.500.000/month	9	75
	b. >Rp. 2.500.000/month	3	25
8	Number of children in the family		
	a. < 2 children	5	41,6
	b. > 2 children	7	58,3
9	Gender		
	a. Man	7	58,3
	b. Woman	5	41,6

Source: Researcher Primary Data 2024

TABLE 1 explains that toddlers aged 12-59 months in the Pulo Lor Community Health Center area are classified as wasting with a median age value of 34.00. The age range for toddlers has a child's height with an average of 82.74 and a standard deviation of 11.09. The range in toddler age has a child's weight with an average of 77.87 and a standard deviation of 9.87. Children under five in the Pulo Lor Community Health Center area have a large family of 8 families (66.6%) with the majority of families' education levels being elementary school in 5 families (41.6%) and non-working status in 5 families (41.6%). The status of caregivers for toddlers in families where the majority do not work has 7 families (58.3%), with family income < IDR 2,500,000.00 for 9 families (75.0%). The opinion of the majority of families is below the minimum wage for Jombang Regency but they have to finance a large number of families, namely the number of children in the family is >2 children, 7 families (58.3%) with the majority being male, 7 toddlers (58.3%).

TABLE 2 with the highest average value in question number 7 with the same median and minimum maximum value, namely a median of 3.00 minimum of 1, and maximum of 4. Table 2 shows that the formal role indicator has the highest average value of 2.829 with a minimum value of 1.5 and a maximum value of 3.7. The informal role indicator has the lowest mean value of 2.677 with a minimum value of 1.0 and a maximum value of 4.0.

TABLE 2
Indicators of family roles in the Pulo Lor Community Health Center area in 2024

Indikator	Mean	Median	Min-Maks
1. Informal Roles			
a. Our family has quite a lot of free time to discuss the hobbies of each family member	2,74	3,00	1-4
b. We always discuss the division of tasks and responsibilities of each family member in terms of housework	2,72	3,00	1-4
Total	2,677	3,00	1-4
2. Informal Roles			
a. Each family member has their duties and responsibilities in terms of completing homework	2,82	3,00	1-4
b. When we ask other family members to do something, the results are what we want	2,99	3,00	1-4
c. Our family has no problems meeting our financial obligations	3,23	3,00	1-4
d. Distribution of tasks fairly and evenly to all family members	3.01	3.00	1-4
e. We are satisfied with the division of tasks in completing the household work that has been given	3,00	3,00	1-4
f. We always remember what our homework duties and responsibilities are	3,02	3,00	1-4
Total	2,829	3,00	1-4

Source: Researcher Primary Data 2024

TABLE 3 shows that the implementation of family roles in the Pulo Lor Community Health Center Area, Jombang Regency is mostly in the medium category, 6 families (50%) while the remaining 3 families (25%) have family roles in the good and poor categories. TABLE 4 shows that the food consumption statements most often answered "Yes" are statements number 8 and 10, namely the mother provides the same snack menu for the toddler as the other family members and the mother does not provide snacks containing flavoring ingredients. 10 respondents (83.3%). Meanwhile, the statement that was answered most often with "No" was statement 1,2,6,7, namely the mother gave a different food menu at each meal to the toddler, the mother gave nutritious food to the toddler, and the mother gave fruit and vegetables to the toddler. Mothers, mothers gave snacks other than rice to their toddlers as many as 7 respondents (58.3%).

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As shown in TABLE 5, out of 12 toddlers identified with wasting, 7 children (58.3%) were classified as "thin," while the remaining 5 children (41.6%) were categorized as "very thin" based on the WHO's weight-for-height Z-score standards, which define wasting as WHZ < -2 SD and

TABLE 3
Distribution indicators of family roles in the Pulo Lor Community Health Center area in 2024

Variable Family Role	n	%
Good	3	25 %
Currently	6	50 %
Not enough	3	25 %

Source: Researcher Primary Data 2024

TABLE 4
Frequency distribution indicators of answers to each question on toddler food consumption and wasting incidents in the Pulo Lor Community Health Center area in 2024

No	Question	Answer			
		Yes		No	
		f	%	f	%
1	Mothers give their toddlers a different food menu at each mealtime	5	41,6	7	58,3
2	mothers provide nutritious food to their toddlers	5	41,6	7	58,3
3	Mother gives milk and vitamins to her toddler	7	58,3	5	41,6
4	Mother gives mother's toddler food 3 times in 1 day	8	66,6	4	33,3
5	Mother gives side dishes to every meal of her toddler	7	58,3	5	41,6
6	mother gives fruit and vegetables to her toddler	5	41,6	7	58,3
7	mother gives snacks other than rice to her toddler	5	41,6	7	58,3
8	The mother provides the same food menu for her toddler as the other family members	10	83,3	2	16,6
9	Mother provides food portions according to the needs and age of the mother's toddler	9	75	3	25
10	Mother gives snacks containing flavoring food ingredients to her toddler	10	83,3	2	16,6

Source: Researcher Primary Data 2024

severe wasting as WHZ < -3 SD [27]. This distribution suggests that the majority of cases fall within the moderate wasting category, although a substantial proportion are severely affected. The presence of both moderate and severe wasting highlights the urgency of targeted family-centered interventions to address nutritional deficiencies, as emphasized in recent WHO guidelines and local public health initiatives [4], [31].

After carrying out univariate analysis, the research results were carried out using bivariate analysis, namely using the chi-square test, the relationship between the independent variables and the dependent variable with a statistical significance limit of p-value (0.05), the following results were obtained:

TABLE 5
Frequency Distribution Based on Waste Measurement Results in toddlers with wasting incidents in the Pulo Lor Community Health Center area in 2024

No	Wasting	f	%
1	Very thin	5	41,6
2	Thin	7	58,3
	Total	12	100

Source: Researcher Primary Data 2024

TABLE 6 shows that of the 12 respondents with poor food consumption categories, the majority had thin toddlers as many as 5 respondents (41.6%), while of the 12 respondents with good food consumption categories, the majority had thin toddlers as many as 2 respondents (16.6%). The results of the bivariate test using chi square obtained a p value of 0.025 <0.05, meaning that there is a significant relationship between maternal knowledge and the incidence of wasting in toddlers at Pulo Lor Health Center, Jombang Regency.

The notation used in the analysis includes *n (%)* to represent the number and percentage of respondents, *OR* for Odds Ratio, χ^2 for Pearson Chi-Square test, and *95% CI* indicating the 95% Confidence Interval. TABLE 7 shows that there is a difference between family roles and the incidence of wasting as evidenced by the Chi Square test (χ 2 = 8.89; p-value = 0.001), it can be concluded that there is a relationship between the implementation of family roles and the incidence of wasting in toddlers in the Pulo Lor Jombang Health Center working area. Toddlers who have families with family role implementation in the good category have a 7.65 times chance of experiencing stunting (OR = 7.65; 95%

TABLE 6
Relationship between food consumption and wasting incidents in toddlers and wasting incidents in the Pulo Lor Community Health Center area in 2024

No	Food Consumption	Wasting in toddlers						P value
		Very thin		Thin		Total		
		f	%	f	%	f	%	
1	Not good	3		5		8		0.025
2	good	2		2		4		
	Total	5		7		12		

Source: Researcher Primary Data 2024

CI = 1.72-31.72). The implementation of family roles in the good category had 2 toddlers (16.6%) experiencing wasting and 1 toddler (8.33%) experiencing very thin wasting. In the implementation of family roles in the moderate category, there were 1 toddler (73.5%) experiencing wasting and 1 toddler (8.33%) was very thin, while in the poor category there were 4 toddlers (33.3%) experiencing wasting and 3 toddlers (25%) were very thin.

TABLE 7
Correlation between the Implementation of Family Roles and the Incident of Wasting in Toddlers in the Pulo Lor Jombang Health Center Area 2024

Family Role	Wasting Incident		Significan x2	OR	95%CI Min-Max
	Thin(%)	Very thin n(%)			
Good	2(16,6%)	1(8,33%)	8,89	7,65	1,72-
Medium	1(8,33%)	1(8,33%)	(0,001)		31,712
Less	4(33,3%)	3(25%)			

Source: Researcher's Primary Data January – March 2024

IV. DISCUSSION

A. INTERPRETATION OF FINDINGS

The findings of this study reveal that the family plays a significant role in the incidence of wasting among toddlers in the Pulo Lor Health Center area. The majority of families had moderate levels of role implementation, and this corresponded with a relatively high proportion of wasting cases among children. A statistically significant association (p = 0.025) was found between family role performance and wasting prevalence, indicating that inadequate parental

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engagement in aspects such as meal planning, food diversity, and caregiving routines contributes to acute malnutrition. Specifically, behaviors such as failing to provide a variety of foods, inconsistent feeding frequency, and limited nutritional supplementation were prevalent among the respondents. These behaviors aligned with the literature that emphasizes the importance of dietary diversity and structured feeding in combating malnutrition [31], [32]. Moreover, a high percentage of families reported food portions not being adjusted to age and nutritional needs, reflecting a lack of knowledge or resources.

B. COMPARISON WITH PREVIOUS RESEARCH

The results of this study are consistent with previous investigations conducted both in Indonesia and other developing countries. For instance, Khattab and Abd-Elsabour [33] found that inadequate caregiving, especially in low-income and low-education households, correlates strongly with child wasting. Similarly, a study by Aguayo and Menon [34] underscored the influence of maternal feeding practices and family decision-making on child nutrition. In the local context, research by Purwanti et al. [35] also demonstrated that family involvement in feeding and healthcare decisions significantly affects child nutritional status. The alignment of this study with regional and international findings reinforces the generalizability of the claim that family dynamics are central to addressing wasting. However, while other studies have demonstrated improvements in nutritional status through maternal education interventions [36], the current study did not implement or measure such interventions, leaving a potential gap for future exploration. This contrasts with the work of Imran [37], who applied community-based education and noted a measurable decline in malnutrition rates.

C. LIMITATIONS AND IMPLICATIONS

One of the major limitations of this study is its small sample size (n=12), which reduces the power of statistical inference and limits generalizability. The use of total sampling ensures coverage but cannot be extrapolated to broader populations without caution. Additionally, the cross-sectional design precludes causal conclusions, though it does allow for the identification of associations. The study also relied on self-reported questionnaires for assessing family roles, which are subject to response bias and social desirability effects. Future studies should consider triangulating data using observational methods or longitudinal follow-ups. Despite these limitations, the study has meaningful implications. First, it highlights the necessity of integrating family-focused strategies in public health nutrition programs. Interventions targeting only individual behavior may be insufficient without the active participation of families, particularly in culturally traditional settings like rural Indonesia [38]. Second, the findings suggest that public health initiatives should go beyond supplementary feeding and incorporate training modules to enhance family knowledge on age-appropriate feeding, food selection, and hygiene. As shown in research by Rahayu et al. [39], family education significantly enhances feeding frequency and quality. Lastly, the study opens avenues for the development of community-based programs involving cadres and posyandu staff to monitor not only child growth but also family involvement in caregiving routines. A pilot study conducted by Budiana and Supriadi [40] demonstrated that integrated family-health worker collaboration can significantly improve toddler health metrics over time.

V. CONCLUSION

This study aimed to examine the relationship between family roles and the incidence of wasting in toddlers aged 12–59 months in the working area of the Pulo Lor Health Center, Jombang Regency. Based on the results of a cross-sectional analysis involving 12 families with wasted toddlers, it was found that the majority of families (66.6%) belonged to extended households with monthly incomes below IDR 2,500,000 (75%). Family role implementation was categorized as moderate in 50% of respondents and poor in 25%, with only 25% demonstrating good role performance. Statistical analysis using the Chi-square test revealed a significant association between family roles and wasting prevalence ($p = 0.025$), with children from families demonstrating poor implementation of caregiving, meal planning, and feeding routines at greater risk. Additionally, toddlers in families with poor food consumption habits also had a higher prevalence of thin or very thin body weight, as indicated by anthropometric measurements. These findings suggest that while clinical interventions are necessary, improving family awareness and engagement in toddler nutrition and care practices is essential for long-term reductions in malnutrition. Future research should consider expanding the sample size, employing longitudinal methods to evaluate causality, and integrating structured family education programs in community-based nutrition interventions. The use of cadre-based outreach and health worker collaboration could also enhance the implementation and sustainability of family-centered care strategies. These initiatives could be aligned with the Indonesian government's target to reduce wasting to below 5% by 2025, contributing to the achievement of national and global child health development goals.

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DATA AVAILABILITY

The datasets used in this study are available from the corresponding author upon reasonable request.

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AUTHOR CONTRIBUTION

Ratna Dewi Permatasari contributed to conceptualization, study design, supervision, and original manuscript preparation. Henny Sulistyawati was involved in data collection, instrument validation, and statistical analysis. Yana Eka Mildiana assisted in literature review, data interpretation, and critical revision of the manuscript. All authors reviewed and approved the final version of the manuscript.

DECLARATIONS

ETHICAL APPROVAL

Ethical approval was obtained from the Health Research Ethics Commission (KEPK) at ITSKes Insan Cendekia Medika Jombang (No. 013/KEPK/ITSKES-ICME/I/2024).

CONSENT FOR PUBLICATION PARTICIPANTS

Consent for publication was given by all participants

COMPETING INTERESTS

The authors declare no competing interests.

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