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THE RELATIONSHIP BETWEEN RESPONSIVE FEEDING PRACTICES, MOTHER'S SELF-EFFICACY, FOOD DIVERSITY, AND SOCIOECONOMIC STATUS WITH TODDLER NUTRITIONAL STATUS

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Abstract

Background: Nutritional issues among toddlers, such as stunting, wasting, and underweight, remain significant health challenges in Indonesia, including in East Jakarta. Several factors influence the nutritional status of toddlers, including responsive feeding practices, maternal self-efficacy, dietary diversity, and socioeconomic factors. This study aims to analyze the relationship between responsive feeding practices, maternal self-efficacy, dietary diversity, and socioeconomic factors with the nutritional status of toddlers in the Duren Sawit Public Health Center, East Jakarta. **Methods:** This study employed a quantitative approach with a cross-sectional design. Data collection included direct interviews, height/length measurements using a microtoise/infantometer, weight measurements using a digital scale, and a 24-hour dietary recall. Questionnaires were used to assess the independent variables. Data were analyzed using the Chi-Square and Fisher's Exact Test. **Results:** The findings indicate that responsive feeding practices, maternal self-efficacy, and dietary diversity significantly influence stunting status (*pvalue* < 0.05). However, socioeconomic factors (maternal education and household income) did not show a significant relationship on stunting. Furthermore, responsive feeding practices, maternal self-efficacy, dietary diversity, socioeconomic factors (maternal education), and socioeconomic factors (household income) were found to have a significant impact on the wasting status of toddlers. **Conclusion:** These findings emphasize the importance of interventions based on responsive feeding and enhancing maternal self-efficacy in improving toddler nutritional status. Therefore, educational programs and initiatives focusing on healthy feeding practices and increasing access to nutritious foods are essential to reduce malnutrition rates among toddlers.

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Keyword: Responsive Feeding Practices, Maternal Self-Efficacy, Dietary Diversity, Stunting, Wasting.

Introduction

Child health and nutrition, especially malnutrition, is a major concern in Indonesia. Malnutrition among toddlers is typically classified into three categories: wasting (low weight-for-height), stunting (low height-for-age), and underweight (low weight-for-age).[1] According to the 2021 UNICEF-WHO-World Bank Joint Child Malnutrition Estimates, 148.2 million children under five worldwide are stunted, 38.9 million are overweight, and 45.4 million are wasted, with 13.6 million of them severely wasted.[2] In 2022, Indonesia ranked 27th out of 154 countries and 5th in Asia for stunting, with a national rate of 21.6%. Not only in rural area with limited accessibility, around capital city, for instance In East Jakarta, which consists of 10 sub-districts and 65 urban villages, the prevalence of stunting in 2021 was recorded at 13.4%. Meanwhile, wasting increased from 7.1% in 2021 to 7.7% in 2022, with Riau Province showing the highest rate at 8.3%.[1]

Stunting results from chronic undernutrition, particularly during the first 1,000 days of life, and is influenced by direct factors (poor nutrition and disease), indirect factors (parenting, food security, health services, environment), and underlying socioeconomic conditions.

Malnutrition in early childhood has far-reaching consequences, including cognitive delays, poor psychomotor development, increased susceptibility to illness, and long-term reductions in human capital. Research shows that stunting can lead to a 7% decrease in cognitive performance, with affected children often scoring lower on non-verbal IQ tests.[3]

Wasting increases the risk of severe infections, developmental delays, and even mortality, while underweight children face similar health risks.[4] Studies have highlighted the importance of responsive feeding practices, where caregivers recognize and respond to their child's hunger and fullness cues. This approach not only improves nutrient intake but also strengthens emotional bonding[5]. Mother's self-efficacy, drawn from Bandura's social cognitive theory, plays a crucial role in this process. Mothers with high self-efficacy tend to implement healthy feeding routines, serve a diverse range of nutritious foods, and maintain structured mealtimes. Their confidence in caregiving significantly influences their children's nutritional outcomes.

Dietary diversity is another key component of toddler nutrition. Measured by the Dietary Diversity Score (DDS) recommended by the FAO, it reflects the variety of food groups consumed and serves as an important indicator of diet quality and nutrient adequacy.[6] Household income has a direct impact on dietary patterns, influencing both food availability and consumption habits. Families with higher incomes are more likely to afford diverse, nutrient-rich foods, while lower-income families may struggle to meet basic nutritional needs.[7]

Methods

This quantitative study used a cross-sectional design and was conducted at Duren Sawit Community Health Center, East Jakarta, from September 19th to 25th, 2024. The study population included approximately 9,200 toddlers, with a target sample of 323 mothers from three posyandu. A total of 100 mothers were selected using a combination of Multistage

Random Sampling and Purposive Sampling, following a method similar to the Basic Health Research Survey (Riskesdas). The dependent variable was the nutritional status of toddlers (stunting and wasting), while independent variables included responsive feeding, maternal self-efficacy, dietary diversity, and socioeconomic factors. Data collection involved direct interviews for demographic information, anthropometric measurements using microtoise or infantometer boards and digital scales, and a 24-hour dietary recall through observation. Questionnaires were used to assess all independent variables.

Data analysis in this study was conducted using SPSS 26 with univariate and bivariate approaches. Bivariate analysis used Chi-Square test to examine relationships between categorical variables, specifically in 2x2 tables. The Chi-Square test was applied if expected cell counts met the assumption of no more than 20% of cells having expected values <5. If assumptions were violated, cell merging was done or the Fisher Exact test was used as an alternative.

Results

The eligible research sample was 100 mothers of toddlers with children aged 6-59 months at the Posyandu, Duren Sawit District.

Table 1. Characteristics of Mothers

Varable	N	(%)
Age (Years)		
17-25	7	7
26-35	74	74
36-55	19	19

Varable	N	(%)
Occupation		
Not working	78	78
Working	22	22
Total	100	100

Table 1 shows the characteristics of respondents based on age and mother's occupation. The age group of mothers with the highest number is 26-35 years old, as many as 74 people (74%). In the mother's occupation variable, the highest number was in the 'not working' category (78%).

Table 2. Characteristics of Toodlers

Variable	N	(%)
Age (Month)		
6-12	23	23
13-24	15	15
25-36	23	23
37-48	28	28
49-60	11	11
Gender		
Male	57	57
Female	43	43
Indicators of nutritional status		
Z-Score TB/U		
Severently stunted (< -3 SD)	7	7
Stunted: (-3 SD sd <-2 SD)	5	5
Normal:(-2 SD sd +3 SD)	84	84
HIgh: > +3SD	4	4
Z-score BB/TB		
Severently wasted <-3 SD	6	6
Wasted 3 SD sd < -2 SD	9	9
Normal -2 SD sd +1 SD	70	70
At risk of overnutrition > + 1 SD sd + 2 SD	10	10
Overweight > +2 SD sd + 3 SD	4	4
Obesity > +3 SD	1	1
Total	**100**	**100**

On Table 2, based on the TB/U (height-for-age) index, most are in the normal category, but 12% of the children are in the stunting category. Based on the BB/TB (weight-for-height) index, 15% of toddlers experience wasting. The gender distribution of children is almost evenly distributed.

Table 3. Other Variable Frequency Distributions

Variable	N	(%)
Responsive Feeding		
Bad	36	36
Medium	23	23
Good	41	41
Mother Self Efficacy		
Bad	54	54
Medium	16	16
Good	30	30
Dietary Diversity		
Less Varied	48	48
Varied	52	52
Education Level		
Completed Primary School	4	4
Completed Junior High School	16	16
Completed senior high school	55	55
College	25	25
Income / Revenue		
<1jt	4	4
1jt-2.5jt	15	15
2.6jt-4.5jt	35	35
4.6jt-5.5jt	31	31
>5.6jt	15	15
Total	**100**	**100**

The distribution results in Table 3 show that the majority of mothers had good responsive feeding practices (41%), although there were still 36% with poor practices. Mothers' confidence in feeding was predominantly low (54%), which may affect their

nutritional parenting. In terms of food diversity, 52% of mothers had provided varied foods, but there were still 48% who lacked variety.

Table 4. Relationship between Responsive Feeding Practices and Nutritional Status of Toddlers (Stunted)

Responsive Feeding	Stunted		Not Stunted		P value	OR
	(n)	(%)	(n)	(%)		
Bad	10	10%	26	26%		
Good	2	2%	62	62%	0.0001*	11.923
Amount	12	12%	88	88%		

Table 4 indicates a significant relationship between responsive feeding practices and the incidence of stunting in toddlers.

Table 5. Relationship between Responsive Feeding Practices and Toddler Nutrition Status (Wasted)

Responsive Feeding	Wasted		Not Wasted		P value	OR
	(n)	(%)	(n)	(%)		
Bad	11	11%	25	25%		
Good	4	4%	60	60%	0.001*	6.600
Amount	15	15%	85	85%		

From table 5, we know that there is a relationship between responsive feeding practices and the nutritional status of toddlers (BB / TB).

Table 6. The Relationship between Mother's Self-Efficacy and Toddler Nutrition Status (Stunted)

Self Efficacy	Stunted		Not Stunted		P value	OR
	(n)	(%)	(n)	(%)		
Bad	10	10%	44	44%		
Good	2	2%	44	44%	0.03*	5.00
Total	12	12%	88	88%		

Table 7. The Relationship between Mother's Self-Efficacy and Toddler Nutrition Status (Wasted)

Self Efficacy	Wasted		Not Wasted		P value	OR
	(n)	(%)	(n)	(%)		
Bad	13	13%	41	41%		
Good	2	2%	44	44%	0.006	6.976
Total	15	15%	85	85%		

Table 8. *The* Relationship between Dietary Diversity and Toodler Nutrition Status (Stunted)

Dietary Diversity	Stunted		Not Stunted		P value	OR
	(n)	(%)	(n)	(%)		
Less Variated (<5)	9	9%	39	39%		
Varried (≥5)	3	3%	49	49%	0.046	3.769
Total	12	12%	88	88%		

Table 9. The Relationship between *D*ietary *D*iversity and *Toodler Nutrition S*tatus (*Wasted*)

Dietary Diversity	Wasted		Not Wasted		P value	OR
	(n)	(%)	(n)	(%)		
Less Variated (<5)	14	14%	34	34%		
Varried (≥5)	1	1%	51	51%	0.0001	21.00
Total	15	15%	85	85%		

Similar significance results also found in the mother's self-efficacy with toddler's nutritional status as shown in table 6 and 7. Table 8 and 9 indicated there is also significance relationship between the dietary diversity with the nutritional status. We also assessed underlying factors and its relationship with the stunting and wasting status. We did not find any significant results on stuting status, but we found significant relationship only in both mother's education level and family income with wasting status (pvalue = 0.036 ; 0.028).

DISCUSSION

It can be seen from table 4, there is a relationship between responsive feeding practices and nutritional status of toddlers (TB/U or PB/U). Studies confirmed that feeding practices are the key indicator of stunting among toddlers. WHO has established eight indicators to assess optimal nutrient intake in young children. Research consistently shows that poor responsive feeding significantly increases the risk of stunting. For instance, a study in Semarang City found that toddlers with non-optimal responsive feeding were 6.496 times more likely to be stunted compared to those with good practices.[8] Similarly, a study in the Jatinangor Health Center area reported a significant relationship between maternal feeding behavior and stunting in children aged 12–23 months.[9] These findings highlight the critical role of responsive feeding in preventing stunting during early childhood. By recognizing hunger and fullness cues and providing positive mealtime interactions, caregivers help ensure adequate intake of essential nutrients like protein, iron, and zinc—critical for growth. Without these practices, children are at risk of nutrient deficiencies that impair linear growth and increase stunting risk. Thus, responsive feeding promotes both nutritional adequacy and optimal growth, helping to prevent stunting.

We also found, from table 5, a relationship between responsive feeding practices and the wasting status of toddler. This finding is in line with the research of Devi at Garuda Health Centre also showed that children with unresponsive feeding practices were more prone to wasting compared to children with better feeding practices.[10] Wasting is a condition of acute malnutrition characterised by body weight that is significantly lower than height. The main causes of wasting are imbalances in energy intake and increased metabolic demand due to

infectious diseases or inadequate diet.[4] Over time, this may lead to wasting, especially during critical growth periods when the risk of muscle and fat loss is higher.[5] Engle et al found that poor feeding practices are associated with inadequate diets and increased growth disorders, including wasting.[11] Unresponsive feeding weakens children's immunity. When children get illness, it increase energy needs and reduce appetite, creating a cycle that worsens wasting.[2]

This study also found a significant relationship between maternal self-confidence with both stunting and wasting status of toddlers. In this context, mothers with high self-efficacy are more likely to take effective preventive measures to reduce the risk of stunting and wasting in their children. Previous study found that mothers with low self-efficacy had an 8.3 times greater risk of having stunted toddlers compared to those with high self-efficacy.[12] Researchers emphasized that mothers with strong support networks are more successful in applying healthy feeding practices even when their self-efficacy is not optimal.[13]

Dietary diversity is vital in preventing stunting in children under five. A varied diet ensures adequate intake of both macro- and micronutrients essential for healthy growth.[4] Low dietary diversity can lead to nutrient imbalances, especially when diets are heavy in carbohydrates and lack protein or key micronutrients. One study found that while all families consumed carbs, only 75% included animal proteins, indicating limited access to high-quality protein sources. Promoting dietary diversity with both animal and plant sources is key to preventing stunting[14].Researchers stated that limited food variety increases the risk of malnutrition, worsens children's conditions, and contributes to wasting.[15] This study is in accordance with previous findings and theory that enhancing dietary diversity may prevent malnutrition among toddler.

This study suggest that the mother's education level does not always reflect the mother's knowledge about their children's nutrition. A scoping review by Wahyuni et al highlight the importance of mother's knowledge related to health and nutrition to stunting status.[16] Rahman et al found no association between mothers' education level and mothers' knowledge with stunting.[17] Mothers with high education can still experience obstacles in providing nutritious food and accessing health services if the family's economic conditions are limited.[18] This study also found that maternal education level was more influential to wasting than with stunting in children under-five. Mothers with lower levels of education are less likely to recognize the importance of providing nutritionally adequate food or to respond promptly to their children's health issues, increasing the risk of wasting.[13,19] Stunting has a weaker association with maternal education due to its complex and long-term nature, which is influenced by broader structural issues such as poverty, food insecurity, poor sanitation, and limited access to healthcare.[19–21] Therefore, while addressing stunting requires long-term, systemic solutions, maternal education remains a critical factor in enhancing dietary quality and directly reducing the incidence of wasting. Similar results were shown on family income. There is a tendency that both mother's educational and family income status affect to wasting more than stunting status. This is a positive affirmation that with proper knowledge of balanced feeding, stunting can still be avoided despite financial constraints.[19] In contrast, Sari et al, found a significant relationship between family income and stunting, with low-income families more at risk of malnutrition due to limited access to nutritious food and health resources.[22] While the study by Nielsen et al. found that children from low-income families were more prone to wasting.[23] Economic constraints limit access to healthcare and nutritious

food, increasing the risk of wasting—especially when triggered by infections. This aligns with findings that low-income families struggle to manage illness-related impacts on children's nutrition.

CONCLUSION

This study concluded that responsive feeding practices, mothers' confidence on feeding their children, as well as food diversity in children's intake have a significant association with the incidence of both stunting and wasting. In addition, in socioeconomic factors, we found that the maternal education and family income was not related with stunting but wasting. Children from families with income below the minimum wage had a 4 times higher risk of wasting than children from families with higher income.

Findings of this study are expected to inform decision-making for interested parties through the establishment of mandatory government programs that focus not only on preventing stunting, but also wasting, as untreated wasting can increase the risk of stunting in the future. The results of responsive feeding practices and maternal confidence have a strong association with the nutritional status of under-fives, so nutrition education on good complementary feeding practices need to be carried out.

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