



Analysis of the relationship between food role models and nutritional status of toddlers among working mothers in Yogyakarta

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ABSTRACT

The nutritional status of children under five years old is influenced by their food intake and maternal feeding behavior. Mothers who work longer hours tend to have children with poor nutritional intake. Maternal behavior in providing food role models also significantly affects children's nutritional status. This study aims to determine the relationship of eating role models to the nutritional status of toddlers in working mothers. This research is an analytical observational empirical research with a cross-sectional design. The reachable population is all working mothers who have toddlers in D.I. Yogyakarta. Samples were taken by purposive sampling. The research sample was 211 mother-toddler pairs. Data was collected using self-administered offline and online questionnaires on respondent characteristics (mothers and toddlers) and a questionnaire for food role models, namely Musher-Eizenman's Comprehensive Feeding Practices Questionnaire. The statistical test carried out was the Kruskal-Wallis test. Most mothers are 30 years old and have worked for around 7.3 hours, and the average income received is around 2 million rupiah. Most mothers work as private sector workers, with the majority holding positions as employees. After measuring the nutritional status of toddlers, it was found that most (59%) toddlers had normal nutritional status (n=124), with the second most toddlers having overweight dietary status (36%). The highest average food role model score in the eating model component was 3.97 ± 0.67 . The relationship between the three components of the food role model and nutritional status was analyzed, eating model ($X^2(2) = 2.516$, p-value = 0.2842), food education ($X^2(2) = 0.847$, p-value = 0.6547), and overall ($X^2(2) = 2.165$, p-value = 0.3388). It was found that food role model is not significantly related to nutritional status of toddlers.

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Introduction

The nutritional status of toddlers is one of the key indicators for assessing the health and well-being of children in many countries, as it reflects their nutritional condition. Toddlers, defined as the age group between 0 to 59 months, represents a critical period in a child's growth and development. Optimal nutrition during this stage plays a crucial role in determining a child's quality of life, potential for cognitive and physical development, and in preventing long-term health problems. Understanding the nutritional status of children is very important for every parents because imbalances in nutritional intake can cause significant and potentially irreversible damage [1].



The results of the Indonesian Nutrition Status Survey (SSGI) conducted by the Ministry of Health show that Indonesia is one of the countries with a double burden of nutritional problems that affect the development of toddlers, including stunting, wasting, underweight, and overweight. Stunting in Indonesia, characterized by short stature, is still a concern for the government as its prevalence reached 21.6% in 2022, exceeding the threshold set by the World Health Organization (WHO). Wasting increased from 7.1% to 7.7% in 2022, and the prevalence of underweight reached 17.1% in the same year. Finally, overweight affected 3.5% of toddlers in 2022 [2].

In the province of Yogyakarta (DIY), the percentage of toddlers who were severely underweight (below the red line) increased to 0.8% from 2019 to 2020. The prevalence of stunting also rose to 11% and the prevalence of overnutrition reached 3.14%. The prevalence of undernutrition and malnutrition is 8.3%, which is considered a moderate public health problem in developing countries. Based on data from the DIY Health Office, the prevalence of stunting in DIY in 2020 increased by 11.08% with Gunung Kidul Regency reporting the highest number of cases. The prevalence of stunting was 17.43% in Gunung Kidul Regency, 14.30% in Yogyakarta City, 11.30% in Kulon Progo Regency, 9.70% in Bantul Regency, and the lowest was 7.20% in Sleman Regency [3]. The prevalence of nutritional issues among toddlers is an important aspect of analyzing their nutritional status. The data showed that many toddlers face nutrition-related challenges, including overnutrition and undernutrition. Overnutrition, or even moderate levels, can result from various factors, such as imbalanced food intake. This indicates the need for more in-depth study to understand the factors contributing to nutrition status problems in toddlers.

This research focuses on the impact of working mothers on the nutritional status of children under five. The female labor force participation rate in DIY is 62%, with 65% of these mothers of children under five [4]. Working mothers are faced with an imbalance between workplace and household roles, leading to increased stress levels and dual role conflict [5]. Limited time for interaction with children may lead working mothers to choose fast food, which can result in unhealthy eating patterns in their children [6].

The previous study showed that mothers working longer hours tend to have children with poor nutritional intake due to limited time to prepare healthy meals [7]. Maternal income is important in determining the food quality available to the family. Higher-income allows access to more diverse and nutritious food items. In contrast, low income can limit food choices and often leads to reliance on less healthy but cheaper foods [8]. Maternal behavior in providing food role models also significantly affects children's nutritional status. Research showed that healthy eating role models influence the quality of a child's diet. Eating role models can be assessed based on aspects such as the intake of certain types of food and the frequency with which parents eat healthily and demonstrate the benefits and enjoyment of healthy eating in front of children. Food availability, along with eating role models, consciously or unconsciously shapes children's food consumption knowledge and behavior [9].

The few existing studies have been conducted only in limited area of Yogyakarta and have found a significant relationship between maternal eating role models and the nutritional status of toddlers. This suggests that while the mother's role is crucial in shaping children's eating habits, other factors such as parent-child interactions, the quality of family relationships, and parenting practices that support children's health and nutrition also influence toddlers' nutritional conditions. Therefore, it is important to consider all aspects of care and treatment in efforts to improve children's health and nutrition [10].

From the data above, it is evident that stunting, undernutrition, underweight, and overnutrition remain significant problems for children under five in DIY. One of the direct causes of these nutritional problems is inadequate food intake. Mothers play an important role in shaping toddlers'

diets by providing good food role models. However, working mothers in DIY were also at risk of experiencing anxiety or stress, which can alter parenting patterns. Parenting not only affects how a mother interacts with her child but also influences feeding pattern. Therefore, researchers were interested in examining how the nutritional status of toddlers is influenced by food role models among working mothers in Yogyakarta. The aim of this study is to determine the relationship between food role models and the nutritional status of toddlers with working mothers.

Method

This study is an analytical observational study with a cross-sectional design, aimed at analyzing alternative hypotheses related to child nutrition care factors, including the provision of food role models and their association with the nutritional status of toddlers among working mothers. This study was approved by the Ethics Committee of 'Aisyiyah University Yogyakarta under approval number No.3205/KEP-UNISA/IX/2023.

The target population consisted of all working mothers with children under five years of age in DIY. The sample was selected using purposive sampling, focusing on urban areas with a high concentration of working women across five cities/districts. Sample selection was based on proportions according to data on working women in DIY in 2021, specifically Kulon Progo (12%), Bantul (25%), Gunung Kidul (21%), Sleman (31%), and Yogyakarta City (11%) [4]. The sample size was determined using the formula for testing the two-way hypothesis of one population proportion, with $\alpha = 5\%$, $\beta = 20\%$, the proportion of the population being tested = 11%, and the effect size = 6%. The minimum sample size required was 240 people. The actual number of valid samples obtained was 211 mother-infant pairs, with the following distribution: 65 respondents from Sleman Regency, 26 respondents from Yogyakarta City, 64 respondents from Bantul Regency, 31 respondents from Kulon Progo Regency, and 25 respondents from Gunung Kidul Regency. This can occur because samples do not match the research criteria, so the final sample results are below the minimum number specified. The inclusion criteria for maternal samples were women aged 19-49 years from Integrated Health Service Post (Posyandu), who were employees/workers or have an income. The toddler criteria included age 6-59 months, absence of chronic diseases, and residency in the same household as the mother. As for the exclusion criteria for the sample, namely toddlers who live by their grandmother, the mother's age is under 19 years or more than 49 years, and the child is under six months or over 59 months. Data collection was carried out from August to September 2023.

Respondent characteristics include data on mother's and child's identity, age, type of work, income, place of work, length of employment, education, number of children, child's age, gender, and place of residence. Data on these characteristics were collected using a form. The data collection method involved direct interviews; respondents could also complete the form independently.

In this study, the independent variable was the food role model, which refers to providing role models or examples of eating behavior by mothers to their children. This variable was measured the Musher-Eizenman's Comprehensive Feeding Practices Questionnaire to assess specific parental eating habits [11]. The questionnaire employed a Likert scale ranging from 1 to 6, where 1=never, 2=rarely, 3=sometimes, 4=quite often, 5=often, 6=always [12]. Data collection was carried out utilizing direct interviews. Additionally, respondents were also able to fill out the form independently. Food role modeling consists of the components related to feeding and nutrition education. The results were obtained in the form of scores, representing the sum of the values of each component and the overall value of the food role model.

To assess the validity of each questionnaire instrument, STATA version 16 was used with Multivariate analysis and Cronbach's alpha. Reliability was tested by examining the Cronbach's alpha

value. Pearson and Spearman bivariate tests were employed to determine the relationship between food role models and nutritional status. Each response was assigned a score. A higher food role model score indicates that the mother's eating behavior more effectively serves as a eating role models.

The validity of the questionnaire was assessed by comparing the item-test correlation rrr values with the rrr table for a two-tailed test at a 0.05 significance level. The rrr table value was 0.1663 (df = 97). All item rrr values exceeded this threshold, confirming the validity of the questions. The food role model questionnaire had a test scale value of 0.8460, indicating reliability since it is above 0.6. Descriptive results were reported as proportions and means. Bivariate tests were considered significant if $p < 0.05$ and the 95% confidence interval did not include one.

The dependent variable in this study is toddlers' nutritional status, assessed using z-scores based on body weight relative to height. Nutritional status is measured through anthropometry, which is commonly used for this purpose. This method involves measuring body weight (BW) and height (TB) with tools such as digital scales, dacin, and baby scales for weight, and infanto meters, stadiometers, and wall-mounted height stickers for height. The results categorize weight relative to height into three groups: malnutrition, normal, and overweight. The Kruskal-Wallis test was used to examine the relationship between food role models and toddlers' nutritional status. This test is appropriate because the data are not normally distributed, involve more than two independent sample groups, and the dependent variable is on a numeric or ordinal scale. The normality test confirmed non-normal distribution, multiple groups, and a numeric/ordinal dependent variable, justifying the use of this nonparametric test. The analysis was performed using STATA 2016.

Results and Discussion

3.1. Results

Table 1 describes the characteristics of respondents including the mother's age, length of employment, income, mother's education level, type of work, job position and the toddler gender and age.

Table 1. Mean Value of Respondent Characteristics

Characteristics	Mean
Age mothers (years)	30,7
Length of working mother (hours)	7,3
Income mother (rupiah)	2.032.971
Age toddler (month)	33,8

Table 1 and 2 show that the average age of mothers is around 30 years, the average age of children is about 33 months, mothers have typically worked for 5 years, and their average income is at 2 million rupiah. Most mothers were college graduates, worked as private sector employees, and have two children. Additionally, there were slightly more male toddlers than female toddlers.

Table 2. Percentage Value of Respondent Characteristics

Characteristics	Percentage (%)	
Level of education Mother	Graduated from elementary school/ equivalent	4
	Graduated from junior high school/ equivalent	13
	Graduated from high school/ equivalent	38
	Graduated from College (Diploma, S1, S2, S3)	45
Amount child	1	37.5
	2	45
	3	14
	4	3
	6	0.5

Type of work Mother	Entrepreneur / Entrepreneur	26
	Employees / workers private	37
	Government employees	8
	Laborer	13
	Worker free	8
	Other	8
	Position / title mother in place Work	Owner
	Director (or equivalent)	2
	Head of Division/Section (or equivalent)	3
	Employees in a division or parts (or equivalent)	58
	Other	9
Gender toddler	Man	50.2
	Woman	49.8

Toddler Nutritional Status and Food Role Model

Table 3. Nutritional Status of Toddlers

Nutritional Status of Toddlers	Percentage (%)
Malnutrition	5
Normal	59
Overweight	36

Table 3 shows that the highest frequency of nutritional status was normal for 124 toddlers (59%), while the lowest frequency was undernutrition, affecting 10 toddlers (5%).

Table 4. Food Role Model

Variable	Mean ± SD	Median (Min-Max)
Food Role Model (score)	Eating model	3,97±0,67
	Food education	3,54±0,68
	Overall	3,75±0,58

Table 4 shows the highest mean and median scores among the three components are in the food role model component. A higher score indicates better implementation of working mothers' food role model component, while a lower score reflects less effective application of this component.

Based on Figure 1, the percentage values for food role models are assessed through two main components: food role modeling and food education. Overall, most mothers have above-average scores, as indicated by a higher proportion of positive behaviors.

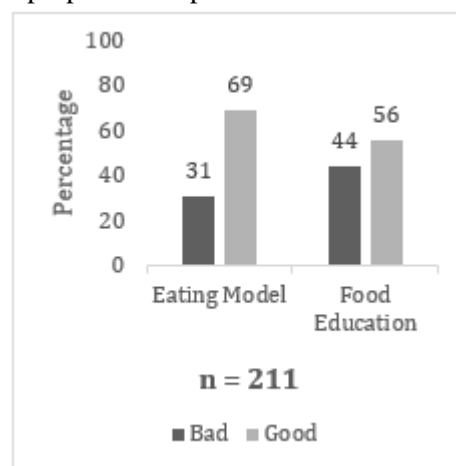


Figure 1. Food Role Model

Table 5. Results of the Kruskal Wallis test on the Relationship Between Food Role Models and The Nutritional Status of Toddlers

Food Role Model	Nutritional Status			P-Value
	<i>Malnutrition</i>	<i>Normal</i>	<i>Overweight</i>	
Eating Model (mean)	4.30	3.96	3.93	0.2842
Food Education (mean)	3.66	3.54	3.51	0.6547
Overall (mean)	3.98	3.75	3.72	0.3388

Table 5 shows that the p-value for the eating model component is 0.2842, which is greater than 0.05, indicating that H₀ is accepted. For the food education component, the p-value is 0.6547, also greater than 0.05, so H₀ is accepted. Overall, the p-value is 0.3388, which is greater than 0.05, indicating that H₀ is accepted.

This study did not find a significant relationship between food role models and the nutritional status of toddlers in working mothers, whether considered by food modeling, food education, or overall. Although it might be expected that maternal food role modeling would influence toddlers' nutritional status, this finding suggests that other factors may have a more dominant impact on children's nutritional condition.

3.2. Discussion

Research showed that the characteristics of working mothers, such as length of employment, income, type of work, and position affect the nutritional status of toddlers [13]. This study found that mothers worked an average of 7 hours per day and earned an average of IDR 2,032,971.00 per month. Longer working hours can impact children's health, as mothers may lack time to prepare healthy meals and monitor their children's nutrition. This could lead to nutritional deficiencies, as well as increased consumption of fast or instant foods. However, higher income may improve access to better healthcare and food. Therefore, balancing work hours with attention to a child's nutritional needs is crucial for maintaining optimal nutritional status [13]. Maternal income significantly affects food quality with higher income providing access to more diverse and nutritious options [14]. Low income restrict food choices, often leading to reliance on less healthy, cheaper options. Research indicated a positive correlation between maternal income and children's nutritional status, with low-income families being more susceptible to malnutrition [15].

Table 2 shows that most mothers are employed as private workers. The type of work and job position are also important, as those in the informal sector or with irregular hours may struggle more to provide nutritious food and maintain consistent eating routines for their children [16]. In contrast, mothers with stable jobs and higher positions often have more flexibility to manage time and resources, helping maintain their children's nutritional intake. Previous study found that mothers with time-flexible jobs were more likely to have children with better nutritional status compared to those with less flexible jobs [15]. Some theories suggest that working mothers balance work and family to ensure their children receive adequate nutrition. According to Role Strain Theory, role conflict between work and family responsibilities can diminish parenting quality, including attention to child nutrition [17].

Table 3 shows that most toddlers (59%) have normal nutritional status, while 36% are overweight. According to the WHO, this level of overweight is considered a significant public health concern [18]. Overweight toddlers can significantly affect themselves, their families, the society. It increases the risk of future health issues such as type 2 diabetes, hypertension, and cardiovascular diseases [19]. For mothers, having an overweight toddler can be a major source of stress. They may feel guilty or responsible, especially if time constraints or lack of knowledge prevent them from

preparing balanced meals. Additionally, the time working mothers spend at work can limit their ability to ensure their children have a healthy diet [20].

Table 4 shows that the average food role model score is below the median. However, Figure 1 indicates that many categories are still rated as good. This study assesses food role modeling through two components: providing examples of healthy eating and offering nutrition education at home. To support toddlers' growth and development, mothers should model healthy eating by offering a variety of nutritious foods. Examples include whole grain porridge with fruit for breakfast, brown rice with grilled fish and vegetables for lunch, and tofu or tempeh with sweet potato and spinach for dinner. Healthy snacks like yogurt, sliced fruit, or whole-grain biscuits are also important. Involving toddlers in cooking and meal choices helps them understand the value of a balanced diet [21]. Parents and communities play a key role in nutrition education for children. It is crucial for parents to introduce their children to protein, whole grains, fruits, and vegetables to establish healthy eating habits. Nutrition education should start early, involving children in selecting and preparing food, and explaining the benefits of nutrition to foster understanding and healthy habits [22].

Working mothers often struggle to model healthy eating and provide nutrition education due to time and energy constraints after work. Balancing work and household duties can lead to reliance on fast or less nutritious foods. However, mothers with strong nutrition knowledge and access to resources, such as education programs and flexible work policies, can still manage to provide healthy meals. Higher incomes also help by allowing the purchase of better-quality food, though time constraints persist [23].

Table 5 shows no relationship between the two variables. This may be due to working mothers having limited time to interact with their children during meals, leading to ineffective modeling and education on healthy eating. Without parental supervision, children may choose their preferred foods and portions, resulting in uncontrolled nutritional status and potential malnutrition or overweight. Previous studies support this, indicating that while working mothers may set dietary examples, other factors like food quantity, quality, and social support also impact children's nutritional status [7].

The statistical analysis results show no relationship between food role models and the nutritional status of children under five, which could be due to several factors. One of the main reasons is the complexity and multi-factoriality of the determinants of nutritional status in children. Although parents are often regarded as the main role models regarding eating habits, other factors can offset their influence. According to previous studies, the relationship of grandmothers or caregivers to the diet and nutritional status of children under five is very significant. Grandmothers or caregivers are often the primary caregivers for children, providing full attention and responsibility in replacing parental duties. Having more time with children means that grandmothers or caregivers play an important role in shaping children's diets and determining their nutritional status [24]. According to other studies, grandmothers or caregivers who model good eating can help improve children's appetite and reduce the incidence of difficult eating. They can also set a good and balanced example when it comes to diet [25].

The lack of a relationship between food role models and the nutritional status of children under five may be due to the complexity of nutritional determinants. While parents are key role models for eating habits, other factors can diminish their influence. Previous studies show that peers, school environments, and media also impact children's food preferences. For example, food advertisements can overshadow parental influence [26]. Additionally, nutrition interventions and educational programs in schools can enhance children's nutritional status, regardless of parental eating habits. These programs often educate children about healthy food choices, independent of home role models [27].

Maternal education significantly affects the nutritional status of children under five. Mothers with higher education levels generally possess better knowledge of nutrition and health, leading to healthier feeding practices. They understand the importance of balanced diets, select nutritious foods, and utilize health resources effectively. Conversely, less educated mothers may have a limited understanding of their children's nutritional needs, which can negatively impact their children's nutritional status. Therefore, enhancing maternal education is crucial for improving children's overall nutrition [28].

Research methods and controlled variables can impact the results. If a study emphasizes parameters like weight or height without considering micronutrient intake or long-term eating habits, the effect of food role modeling might not be clear. Previous research shows that factors such as physical activity, genetics, and overall health also affect nutritional status, making the impact of a single variable like food role modeling less significant [29].

Another relevant theory is the ecological theory of development, which posits that child development is shaped by interactions between various environmental systems, such as family, school, and community. In this framework, food role models are just one of many factors affecting children's eating habits and nutritional status [30]. Previous research supports a multifactorial approach to understanding children's eating habits. It shows that, besides parental food role models, factors like school policies, the availability of healthy food at home, and social support also play crucial roles [31].

Previous studies might show different results due to varying designs or populations. For instance, some research found parental food role models significantly influenced children when access to healthy food was limited. However, in areas with better resources and nutrition education, this influence may be lessened by other dominant factors [32].

The lack of a significant link between food role modeling and the nutritional status of children under five can be due to varying influences, external interventions, the complexity of nutritional factors, and research methods. A comprehensive, multifactorial approach is needed to effectively address and improve toddlers' nutritional status. These findings highlight the importance of considering diverse environmental and social factors in improving child nutrition.

Studies using samples from Integrated Health Service Posts (Posyandu) face significant limitations, impacting result validity and generalizability. A major issue is the sample's bias, as it mainly includes mothers who frequently visit the posyandu, typically those with more time and health awareness. This excludes working mothers, who often lack time for such visits. Previous research indicates that full-time working mothers frequently face time constraints that limit their participation in community health activities like posyandu [33].

Mothers who visit Integrated Health Service Posts (Posyandu) often come from socioeconomic backgrounds with better health awareness and access to services, which may introduce bias. This does not reflect the conditions of mothers from different socioeconomic backgrounds. Previous research shows that access to health services and nutrition information is often influenced by socioeconomic status, affecting children's nutritional status [34]. Relying on posyandu samples may overlook important data variability. For example, full-time working mothers or those living far from posyandu may have different diets and parenting practices. Previous research shows that variations in parents' occupations and socioeconomic backgrounds significantly influence children's eating habits and nutritional status [35].

Mothers who regularly visit posyandu benefit from nutrition education and health interventions, improving their parenting practices and their children's nutritional status. In contrast, those who do not visit posyandu miss these benefits, which could explain the differences in child nutritional status

not captured in this study. Previous research shows that participation in public health programs like posyandu positively impacts children's nutritional status [36].

Methodological limitations may also affect the results of the study. By excluding mothers who do not visit the posyandu, the study may have failed to capture important factors that affect the nutritional status of children from this group. For example, factors such as work pressure, lack of time to prepare healthy meals, and stress faced by full-time working mothers were not taken into account. According to previous research, these factors strongly influence the diet and nutritional status of children of working mothers [37]. In addition, the weakness of this study can also come from working mothers who leave their children with caregivers or grandmothers. Most of the time the child, especially at mealtime, is with the caregiver or grandmother, it can be ascertained that the mother is less able to describe as a food role model. Therefore, in the future, we can reconsider the respondents taken. Although it is more appropriate for mothers to fill in, it should also be noted whether mothers really still have time to be able to interact and eat together with children or mothers have no time at all with children. This can also affect the results of research that are not significantly.

This study has several significant advantages. First, the study utilized a cross-sectional design that allowed for simultaneous data collection from a large sample of 211 mother-infant pairs, thus providing a fairly representative picture of the working mother population in Yogyakarta. Secondly, the purposive sampling method used ensured that the selected sample was relevant and fit the inclusion criteria, enhancing the external validity of the study. Third, the measurement of the nutritional status of toddlers was carried out using anthropometric methods that have been standardized and widely recognized in nutrition research, so that the results obtained can be trusted and have high reliability. Finally, this study also examined mothers' demographic and socio-economic factors, such as age, education, type of employment, and position at work, which provides a deeper understanding of the influence of maternal characteristics on the nutritional status of toddlers.

4. Conclusion

The high nutritional problems of toddlers in Yogyakarta are not significantly related to the food role model of working mothers. This study considers other factors that may prevent the relationship between food role models and the nutritional status of children under five, namely toddlers who are entrusted to caregivers or grandmothers, so that mothers and children have very little time to interact. Therefore, the researcher suggests that further research can reconfirm the respondents who fill in, so that new results are obtained that are more relevant to working mothers who have toddlers.

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Conflict of Interest

The authors declare no conflict of interest.

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