

Mother's Nutritional Knowledge, Posyandu Participation, and Nutritional Status of Children Under Two Years in Tenggarong District, Indonesia

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Abstract: Most nutrition education in Indonesia operates on the promise that nutritional knowledge can have an impact on children's nutritional status. In addition, the participation of mothers in Posyandu (integrated service post) can improve the basic health effort of mothers and children. This study aims to evaluate the association between mothers' nutritional knowledge, posyandu participation, and the nutritional status of children. This study was a cross-sectional study with purposive sampling which takes in the working area of Rapak Mahang Health Centre, Tenggarong district, nutritional status of 103 children aged six to 23 months was measured. Moreover, mothers' nutritional knowledge and mothers' participation in *Posyandu* were assessed using an interviewer-administered questionnaire. Data were analyzed using Rank Spearman Correlation and Chi-Square. Amount of 48% of mothers have good knowledge regarding balanced nutrition fulfillment, while only 19.4% of mothers are inactive in taking their children to the Integrated Services Posts (Posyandu). Data analysis showed no significant association was found between mothers' knowledge of balanced nutrition fulfillment and nutrition status ($p=0.590$) and a significant association for mother's participation in Posyandu ($p=0.0001$). There is an association between mothers' participation in Posyandu and the nutritional status of children aged 6-23 months in the working area of Rapak Mahang Community Health Center. It is recommended that Rapak Mahang Health Center improve nutritional education programs and promote mothers to Posyandu with a digital system and local wisdom in Tenggarong.

1 INTRODUCTION

A significant public health issue is child undernutrition. In 2020, it was anticipated that 149 million children under the age of 5 were stunted (too short for their age), 45 million were wasting (too thin for their height), and 38.9 million were overweight (United Nations Children's Fund (UNICEF), World Health Organization., & Bank., 2021). In Indonesia, the stunting rate was 21.6% in children under five years old, while the prevalence rates of wasting, underweight, and overweight were 7.7%, 17.1%, and 3.5%, respectively (Indonesia, 2022). In addition, the prevalence of malnutrition in Kutai Kartanegara was higher than in Indonesia. In Kutai Kartanegara, the prevalence of stunting, wasting, underweight, and overweight was 27.1%, 9.4%, 25.1%, and 4.1%, respectively (RI, 2021).

Malnutrition is caused by various factors, including economic vulnerability, maternal

education, and regular growth monitoring. A systematic review study of 37 studies in India, Ethiopia, Bangladesh, Ghana, Nepal, Benin, Netherlands, Columbia, Pakistan, Malaysia, Africa, Egypt, Ecuadorian, and Indonesia found that maternal education was one of the most consistent factors associated with child malnutrition (Katoch, 2022). A previous study in Indonesia also found that the prevalence of underweight and stunting among children under five years old in rural areas was influenced by maternal knowledge of nutrition and health issues as well as growth monitoring programs (Sahangamu, Purnomosari, & Dillon, 2017). Indonesia has *Posyandu* (Integrated Service Post) that provides basic health services such as mother and child health, nutrition, immunization, disease control (diarrhea prevention), and family planning (Health, 2006). Monitoring the nutritional status of children under five was the main reason mothers attended *Posyandu* in Indonesia (Nazri et al., 2016). Moreover, improved health services and providing mothers and

caregivers with nutrition and health information will have a significant impact on young children's nutritional status, especially in rural areas where accessibility is a major challenge. Besides, similar studies have not been undertaken in children under five years in Kutai Kartanegara. Therefore, this study aimed to examine the association between mothers' nutritional knowledge, posyandu participation, and the nutritional status of children in Kutai Kartanegara.

2 MATERIAL AND METHODS

2.1 Study Population

This cross-sectional study collected data from 103 mothers who have children aged 6 to 23 months at the Rapak Mahang Health Center, Kutai Kartanegara, in July 2022. The study population was mothers who had children aged 6 to 23 months (399 participants). Purposive sampling was used to select the sample, including mothers with children aged 6-23 months residing in the service area of Health Centre Rapak Mahang, Tenggarong, Kutai Kartanegara. Eligibility criteria encompassed willingness to participate and possession of a maternal and child health book. Exclusion criteria involved mothers or children with illnesses.

2.2 Demographic Measurement

Sex, age, maternal education, and maternal employment data were collected using the standardized questionnaire. Maternal education was categorized into four levels: lower education, secondary education, higher secondary education, or university education. Maternal employment was classified as housewife, civil servant, or entrepreneur. Children's age was categorized into 6-8 months, 9-11 months, and 12-23 months, defined as the dietary pattern.

2.3 Mother's Knowledge, Mother's Participation, and Nutritional Status of Under-Five Children

Mother's knowledge was defined as understanding the principles of balanced nutrition and insight into providing appropriate food for children based on their age, including the type of food, quantity, and meal schedule. The questionnaire for assessing maternal knowledge consisted of 20 questions related to toddler feeding. Each question was scored with 5

points for 'True' and 0 points for 'Wrong.' Mother's knowledge was categorized as follows: \geq average and below average.

Mother's participation involved mothers bringing their children under five to Posyandu for monthly weighing. Questionnaires and data were employed to assess maternal activity. A mother was categorized active if her child under five is weighted at Posyandu a minimum of 8 times per year.

The nutritional status of children under five was assessed through anthropometric measurements, including weight/height, and recorded in the maternal and child books. The criteria for nutritional status followed the World Health Organization guidelines and categorized as malnutrition (severely wasted, wasted, overweight, and obesity) and good nutritional status (-2 sd to +2sd IMT/U).

2.4 Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics version 23 (IBM, New York, USA), and the significance level was established at a two-sided p-value of less than 0.05. Data were displayed as percentages and number of samples.

The correlation between maternal knowledge, maternal participation, and the nutritional status of children under the age of five was examined through the Chi-Square test.

3 RESULTS

3.1 General Characteristics of the Subjects

The baseline characteristics of 103 participants are summarized in Table 1. Most participants were aged between 20 and 35 years (73%), had attained higher education (80%), were housewives (87%), had children aged 12 to 23 months (42%) and of those children, the majority were boys (52%). No significant difference between general characteristics and the nutritional status of children, except the children's gender. Boys were higher in malnutrition status.

Table 1: General characteristics (n=103).

Characteristics	Nutritional Status		p-value
	Good	Malnutrition	
Maternal age			0.534
20-35 years	58	17	
>35 years	20	8	
Maternal education			0.767
University	8	2	
Higher education	62	20	
Secondary education	6	3	
Low education	2	0	
Maternal employment			0.600
Civil servant	5	0	
Entrepreneur	4	1	
Housewife	67	23	
Others	2	1	
Age of children			0.553
6-8 months	17	8	
9-11 months	28	7	
12-23 months	33	10	
Sex of children			0.018
Boys	35	18	
Girls	43	7	

*chi-square test

3.2 Mother's Knowledge and Nutritional Status

The majority of participants (60.2%) possessed sufficient knowledge of balanced nutrition (60.2%). However, no correlation was found between mothers' nutrition knowledge and their children's nutritional status (p value=0.982) as indicated in Table 2. It was observed that mothers with a good or medium understanding of balanced nutrition generally had a higher proportion of children with better nutritional statuses.

3.3 Mother's Participation, and Nutritional Status

A significant association was discovered between mothers' participation in Posyandu and nutritional status (as shown in Table 2). The majority of active participants exhibited favorable nutritional status for their children.

Table 2: Mother's knowledge, mother's participation, and nutritional status of children (6-23 months)

Variable	Nutritional Status		p-value
	Good	Malnutrition	
Mother's knowledge			0.982
≥average	47	15	
<average	31	10	

Mother's participation

<0.0001

Active	71	12
Non-active	7	13

*Chi-square analysis

4 DISCUSSION

The proportion of baby girls with a good nutritional status was higher compared to baby boys. This trend is consistent with a systematic review study that highlighted the association between the sex of children and malnutrition (Katoch, 2022). A similar finding was also discovered in Ethiopia (Yirga, Mwambi, Ayele, & Melesse, 2019). This difference may be attributed to various biological factors. Baby girls might follow distinct growth patterns and possess distinct nutrient requirements when compared to baby boys. Biological variances in metabolism, hormonal influences, and nutrient utilization could contribute to the observed variation in nutritional status.

Furthermore, cultural practices and gender norms might account for disparities in the care and feeding of baby girls and boys. For example, a prior study conducted in Indonesia indicated that gender-related and socio-economic status-related effects of ethnicity on dietary diversity were present (Kunto & Bras, 2019). These factors collectively shape the nutritional outcomes of infants.

No significant association was identified between mothers' knowledge and the nutritional status of children in the working area of Rapak Mahang Community Health Center. Similar findings were also found in Ghana (Forh, Apprey, & Frimpomaa Agyapong, 2022). This absence of a significant association can be attributed to various factors. Nutritional status is influenced by a wide range of factors, including dietary habits (Khadija et al., 2022), access to healthcare, socioeconomic status, and overall living conditions (Ernawati, Syauqy, Arifin, Soekatri, & Sandjaja, 2021; Eshete, Abebe, Loha, Gebru, & Tesheme, 2017; Katoch, 2022; Maulina, Qomaruddin, Kurniawan, Fernandes, & Astuti, 2022; Yirga et al., 2019). While mothers' knowledge about nutrition is indeed important, it might not directly translate into improved nutritional outcomes for children (Khadija et al., 2022). Challenges in converting knowledge into practical dietary choices or caregiving practices could weaken the observed association. Furthermore, cultural beliefs, practices, and societal norms related to child nutrition might interact with mothers' knowledge in intricate ways,

potentially influencing the observed association (Kunto & Bras, 2019). Additionally, the small sample size could potentially reduce the statistical power necessary to detect a significant association that might indeed exist in the broader population.

A significant association was observed for mothers' participation in Posyandu. A similar finding was reported in the Cianjur District, West Java, where a study indicated that the more frequent the visits to Posyandus, the better the nutritional statuses would be (Anwar, Khomsan, Sukandar, Riyadi, & Mudjajanto, 2010). The primary reason participants attend Posyandu is to monitor the nutritional status of children under five. As a result, enhancing the quality of Posyandu services and providing qualified resources are essential to promote mothers' participation (Nazri et al., 2016). Therefore, effective coordination between relevant agencies is necessary to address multiple factors influencing the nutritional status of children. The coordination is crucial to achieve the reduction and prevention of child malnutrition effectively (Sufri et al., 2023).

5 CONCLUSIONS

No significant association was found between mothers' knowledge and the nutritional status of children (6-23 months), whereas a significant association was found for mothers' participation in Posyandu in the working area of Rapak Mahang Community Health Center, Kutai Kartanegara. Future studies should consider a larger sample size, conduct longitudinal analyses, and explore other factors that influence the nutrition of children.

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