Relationship Between Types Of Complementary Feeding And Protein Consumption Levels With Nutritional Status Of Children 6-24 Months

Ni Luh Putu Putri Bajra Dani[1], I Gusti Agung Ari Widarti [2], I Komang Agusjaya Mataram[3]

[1,2,3] Nutrition and Dietetics Program, Applied Bachelor's Study Program, Health Polytechnic of Denpasar

Abstract

Complementary feeding is one of the factors that influence the nutritional status of toddlers in relation to their nutritional intake. This study aims to determine the relationship between the type of complementary feeding and protein consumption levels with the nutritional status of toddlers aged 6-24 months in Subamia Village, Tabanan. This study used a cross-sectional design with a sample size of 34 people. This study was conducted from October to December 2024. Anthropometric data were obtained by measuring height, and data on the types of complementary feeding and protein intake were obtained through food recall interviews, then analyzed using Spearman and Pearson correlation tests. Based on the results of Spearman's correlation test, there was no significant relationship between the type of complementary feeding and the nutritional status of toddlers. Based on the results of Pearson's correlation test analysis, there was a significant relationship between protein consumption levels and toddler nutritional status. It is hoped that children aged 6-24 months who receive complementary foods in the adequate category, have insufficient protein intake, and still have nutritional problems, their parents will begin to be careful in providing complementary foods and always monitor their children's nutritional status by regularly visiting and consulting with the health workers. Health workers are also expected to play an active role in increasing public knowledge and awareness of the importance of complementary foods and protein intake.

Keywords: complementary feeding, protein, nutritional status

INTRODUCTION

Nutritional status is the condition of an individual's body, which can be assessed based on nutritional intake and utilization of nutrients (Hasanah, 2023). For toddlers, nutritional status evaluation usually involves anthropometric measurements that include age, weight, and height (Septikasari, 2018).

According to data from the 2023 Indonesian Health Survey (SKI), Indonesia has experienced a decline in the prevalence of stunting in toddlers. The 2022 Indonesian Nutritional Status Survey (SSGI) recorded a figure of 21.6%, which then decreased to 15.8% in the 2023 SKI results. Meanwhile, the prevalence of stunting in Bali was 7.2%. One of the districts in Bali, Tabanan Regency, has a stunting rate of 6.3% among toddlers (Kemenkes RI, 2022; Kemenkes RI, 2023).

A child's nutritional status can be determined by two main categories of factors, namely external and internal. External influences on a child's nutrition include breast milk and the introduction of complementary foods. On the other hand, internal factors include the child's age, overall physical condition, and the presence of disease (Paramashanti, 2019). The growth and development of infants and toddlers are largely influenced by the amount of breast milk they receive (Mawarti et al., 2022). Infants aged 0 to 6 months can meet their nutritional needs with breast milk alone, while infants aged 6-24 months have increased nutritional needs and need to be given complementary foods (Hasanah, 2023). Complementary foods (MP-ASI) are foods for children aged 6 to 24 months that serve as a transition from breast milk to family foods, given gradually with attention to portion size, type, form, and frequency of feeding to meet nutritional needs adjusted to the child's ability and age (Lestiarini & Sulistyorini, 2020).

According to the World Health Organization (WHO), inappropriate complementary feeding can lead to obesity, type 2 diabetes, and disabilities in adulthood. Meanwhile, if a child experiences malnutrition, it can result in reduced capacity for activity, and in girls, it can lead to reduced reproductive capacity (WHO, 2023). In addition, malnutrition can also affect morbidity,

Corresponding author: putbadani@gmail.com
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mortality, cognitive development, and infant and child mortality rates among children under five years of age (Hasanah, 2023).

Based on the background described above, the researchers were interested in investigating the relationship between the type of complementary feeding and protein consumption levels with the nutritional status of toddlers aged 6-24 months in Subamia Village, Tabanan.

METHOD

The study used an observational design with a cross-sectional design that took place from October to December 2024. The sample size for this study was 34 people, selected using saturated sampling techniques. Anthropometric data was obtained by measuring height, which was then used to determine the nutritional status of children using z-scores for height-for-age categories.

Data on the type of complementary feeding and protein consumption levels were obtained by interviewing respondents using a food recall form. The determination of the type of complementary feeding collected referred to the criteria for the main food types, which consisted of 4 stars, namely nuts, fruits and vegetables, staple foods, and animal protein. Then, the collected protein consumption level data was converted from household measurements to grams. Next, the weight of the ingredients was converted back into nutrients using Nutrisurvey. The protein consumption level was calculated and compared with the child's nutritional adequacy. Then all data was analyzed descriptively and analyzed using Spearman and Pearson correlation tests.

RESULTS

Respondent Characteristics

There were 34 respondents in this study, with 88.2% being female. Most of them had a high school education (67.6%), and the most common occupation was private employee (41.2%).

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Sample Characteristics

Based on the characteristics of the sample, 52.9% were female and 47.1% were male. Based on the age of the sample, most of the sample were aged 12-24 months, namely 64.7%. It was found that most children did not receive breast milk, namely 52.9%. Based on the history of illness during the last 3 months, it was found that the most common diseases experienced by the sample were cough, cold, and fever, namely 17.6%.

Relationship between Types of Complementary Feeding and Nutritional Status of Children Aged 6-24 Months

Based on the results of the study, it was found that 73.5% of children with normal nutritional status received inappropriate complementary foods. The results also showed that 2.9% of children with nutritional problems according to the height-for-age index, namely stunted children, received inappropriate complementary foods.

Based on the Spearman's rank correlation statistical analysis, the results show that $r = -0.012$; $p = 0.946$ ($p > 0.05$), which means that there is no significant relationship and a very weak negative correlation between the type of complementary feeding and the nutritional status of toddlers aged 6-24 months based on height-for-age. The relationship between the type of complementary feeding and the nutritional status of toddlers can be seen more clearly in Table 1.

Table 1. Nutritional Status Distribution Based on Type of Complementary Feeding

Type of Complementary Feeding	Nutritional Status of Toddlers						p	r
	Stunted		Normal		Total			
	n	%	n	%	n	%		
Suitable	0	0,0	8	23,5	8	23,5		
Unsuitable	1	2,9	25	73,5	26	76,5	0,946	-0,012
Total	1	2,9	33	97,1	34	100,0		

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The Relationship Between Protein Consumption Levels and the Nutritional Status of Children Aged 6-24 Months

Based on the results of the study, it was found that 2.9% of samples with short stature based on PB/U or TB/U had a moderate protein deficiency. The results of the study showed that 70.6% of the 33 samples with normal nutritional status had normal protein intake.

Based on Pearson's correlation statistical analysis, the results show that $r = 0.422$; $p = 0.013$ ($p < 0.05$), which means that there is a significant and moderately positive correlation between protein intake and the nutritional status of toddlers aged 6-24 months based on their height for age. The relationship between protein consumption levels and the nutritional status of toddlers can be seen more clearly in Table 2.

Table 2. Nutritional Status Distribution Based on Protein Consumption Levels

Protein Consumption Levels	Nutritional Status of Toddlers						p	r
	Stunted		Normal		Total			
	n	%	n	%	n	%		
Above Adecuacy	0	0,0	2	5,9	2	5,9		
Normal	0	0,0	24	70,6	24	70,6	0,013	0,422
Deficit	1	2,9	7	20,6	8	23,5		
Total	1	2,9	33	97,1	34	100,0		

DISCUSSION

This study found that there was no relationship between the type of complementary feeding and the nutritional status of children, as indicated by a p-value of 0.946. This condition may have occurred because most respondents did not provide the appropriate type of complementary feeding for children with normal nutritional status. This was evidenced by the research findings that 73.5% of the sample with normal nutritional status received inappropriate complementary feeding.

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This study is in line with research conducted by Waode Hamsilni, et al. in 2020 in the working area of the Nambo Community Health Center in Kendari City, which found that there was no significant relationship between the type of complementary feeding and the nutritional status of toddlers with a p-value of 0.403 (Hamsilni et al., 2020). This indicates that there are still respondents who provide complementary foods with less variety. Children who receive inappropriate types of complementary foods, but whose food consumption meets their nutritional needs, may still have normal nutritional status.

In this study, it was found that samples with normal nutritional status and inappropriate complementary foods were mostly aged 12-24 months (14 children), female (15 children), and had a history of cough, cold, fever, and diarrhea (11 children). In line with Elisabeth's (2021) study on the relationship between a history of infectious diseases and nutritional status in toddlers aged 12-59 months, it was found that 77.9% of children with nutritional problems had experienced infectious diseases. Discomfort when sick can cause a decrease in a child's appetite, resulting in inappropriate food consumption (Cono et al., 2021).

The 4-star complementary food type consisting of 4 components, namely nuts, fruits and vegetables, staple foods, and animal protein, is considered important to meet nutritional needs in helping improve children's nutrition. Although no significant relationship was found in this study, if children with normal nutritional status are always given inappropriate complementary foods, it is possible that they will experience a decline in nutritional status.

Based on the results of protein consumption research, it was found that there is a significant relationship between protein intake and the nutritional status of toddlers, indicated by a p-value of 0.013. This study proves that protein intake has a significant relationship with children's nutritional status. It was found that samples with normal protein intake tended to have normal nutritional status. This study is in line with Tazkiyyah Khanifah, et al. in 2023 at PKU Muhammadiyah Cipondoh Hospital, which found that there is a significant relationship between protein intake and children's nutritional status with a result of p = 0.016 (Susanti et al., 2023). Another study conducted by Choridatul and Veni in 2024 at the Mulyorejo Surabaya Community Health Center

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also proved that there is a significant relationship between protein intake and the nutritional status of toddlers with a value of p = 0.045 (Quddus & Indrawati, 2024). This shows that the better the protein intake received by children, the better their nutritional status.

CONCLUSION(S)

Based on the above discussion, it can be concluded that the type of complementary feeding given to children in the appropriate category is 23.5% and in the inappropriate category is 76.5%. Children with normal protein consumption levels are 70.6%. The results of the analysis found that there is no relationship between the type of complementary feeding and the nutritional status of toddlers, and there is a relationship between protein consumption levels and the nutritional status of toddlers.

Based on the above discussion, it can be recommended that mothers with toddlers aged 6-24 months start to be careful in providing complementary foods by paying attention to the type and amount appropriate for the child's age to avoid the risk of the child experiencing nutritional problems.

Conflict of Interest

This research has received approval from the Denpasar Polytechnic of Health Ethics Committee and a recommendation for implementation from the Tabanan City Government. The research team has no conflicts of interest related to the research objectives.

Acknowledgment

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