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Relationship between the provision of complementary foods and the nutritional status of infants aged 6-11 months

Yulinda Reza[1]✉, Oon Fatonah[1], Desy Rosita[1]

[1]Department of Midwifery, Politeknik Kesehatan Kementerian Kesehatan Pontianak, Pontianak, West Kalimantan, Indonesia

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Abstract

Malnutrition contributes to morbidity, mortality, disability, and reduced national human resource quality. Adequate nutrition during infancy is essential for optimal growth, with exclusive breastfeeding recommended for the first six months and continued breastfeeding with nutritious complementary foods thereafter. In 2017, exclusive breastfeeding coverage in Mempawah District was only 60.7%, and the Wajok Hulu Community Health Center had the lowest rate at 24.1%, indicating many infants received complementary foods too early. This study aimed to examine the relationship between complementary feeding and the nutritional status of infants aged 6–11 months in Wajok Hulu Village. Using a retrospective case–control design with 64 infants, results showed that most infants had good nutritional status despite receiving inappropriate complementary feeding. The study concluded that there was no significant relationship between complementary feeding practices and nutritional status (p = 0.337), suggesting that other factors may play a greater role in determining infant nutrition.

Corresponding Author:
✉ Yulinda Reza
Department of Midwifery, Politeknik Kesehatan Kementerian Kesehatan Pontianak, Pontianak, West Kalimantan, Indonesia
Email: yulindaareza@gmail.com

INTRODUCTION

Nutrition is a fundamental determinant of human health and development (Wells et al., 2021; Katoch et al., 2022; Tamir et al., 2022; Lim et al., 2023; Townsend et al., 2023). Malnutrition contributes to morbidity, mortality, disability, and a decline in the quality of a nation's human resources, ultimately threatening national resilience and long-term survival (Kementerian Kesehatan Republik Indonesia, 2014). Nutritional status is therefore a key indicator of public health, commonly assessed in infants aged 6–11 months through anthropometric measurements such as weight-for-age, height-for-age, and weight-for-height (Supariasa et al., 2012; Anjos et al., 2021; Gómez-Campos et al., 2021; Kamruzzaman et al., 2021; Cheikh Ismail et al. 2022; Lelijveld et al., 2022). Adequate nutrition during infancy supports optimal organ formation, neurological development, and immune function.

Monitoring data in Mempawah District in 2017 indicate persistent nutritional challenges in infants, including cases of malnutrition, severe malnutrition, stunting, wasting, and overweight (Dinas Kesehatan Kabupaten Mempawah, 2017). High-quality food in appropriate quantities is essential for supporting healthy growth and development in infants and young children (Hasdianah, Siyoto, & Nurwijayanti, 2014). Complementary feeding (MP-ASI) becomes particularly important after six months, when breast milk alone is no longer sufficient to meet nutritional needs.

UNICEF, WHO, and the Ministry of Health emphasize exclusive breastfeeding for the first six months of life, followed by continued breastfeeding alongside safe and nutritious complementary foods until at least two years of age. Despite high breastfeeding initiation rates in Indonesia, only 42% of infants under six months receive exclusive breastfeeding (UNICEF Indonesia, 2016). In Mempawah District, exclusive breastfeeding coverage is 60.7%, but the Wajok Hulu Health Center reports the lowest coverage at 24.1%, suggesting that early introduction of complementary foods remains widespread (Dinas Kesehatan Kabupaten Mempawah, 2017). .

A preliminary study conducted in the Wajok Hulu Health Center area revealed that most mothers introduce complementary foods prematurely. Among ten mothers with infants aged 6–11 months who were interviewed, eight reported providing complementary feeding before the recommended age of six months. These findings suggest gaps in maternal knowledge and practices regarding optimal infant feeding, which may influence nutritional outcomes.

Although many studies have examined complementary feeding and nutritional status, limited research focuses on small rural communities like Wajok Hulu Village, where feeding practices and access to health information may vary significantly from urban settings. This study offers novel insights by specifically analyzing the relationship between complementary feeding practices and nutritional status among infants aged 6–11 months in an area with notably low exclusive breastfeeding rates. Therefore, the objective of this research is to determine the relationship between complementary feeding practices and the nutritional status of infants aged 6–11 months in Wajok Hulu Village, Mempawah District.

METHOD

This study employed a retrospective case–control research design, which evaluates current health outcomes while identifying past exposure to risk factors (Ircham Machfoedz, 2017). The population consisted of 213 mothers with infants aged 6–11 months in Wajok Hulu Village, Mempawah District. Based on sampling theory, 25% of the population was selected, resulting in a sample of 64 respondents, divided into 32 infants in the case group and 32 infants in the control group. Samples were obtained using purposive sampling based on predetermined inclusion and exclusion criteria.

Data were collected through structured interviews with mothers and a review of the Infant Health Record (KIA book) to obtain information on complementary feeding practices and infant nutritional status. Complementary feeding (MP-ASI) was categorized as appropriate or inappropriate according to WHO standards, while nutritional status was assessed using weight-for-age classifications. A structured questionnaire and anthropometric standards served as research instruments. Data were analyzed using the Chi-Square test with a significance level of $p < 0.05$ to determine the relationship between complementary feeding practices and the nutritional status of infants aged 6–11 months.

RESULTS AND DISCUSSION

Table 1. Distribution of Complementary Feeding Practices and Nutritional Status of Infants Aged 6–11 Months in Wajok Hulu Village.

Complementary Feeding (MP-ASI)	Good Nutrition	Poor Nutrition	Total
Inappropriate MP-ASI	28 (87.5%)	4 (12.5%)	32
Appropriate MP-ASI	24 (75%)	8 (25%)	32
Total	52	12	64

Based on Table 1, most infants who received inappropriate complementary feeding still had good nutritional status (87.5%), while only 12.5% experienced poor nutritional status. Similarly, among infants who received appropriate complementary feeding, 75% had good nutritional status and 25% had poor nutritional status.

Table 2. Chi-Square Test Result

Statistical Test	p-Value
p-value (Continuity Correction)	0.337

Table 2 shows that the Chi-Square test yielded a p-value of 0.337, which is greater than the significance level of 0.05. Therefore, statistically, there is no significant relationship between complementary feeding practices and the nutritional status of infants aged 6–11 months in Wajok Hulu Village, Mempawah District. This indicates that factors other than complementary feeding may have a stronger influence on infant nutritional status in this population.

DISCUSSION

Based on the results of data analysis using the Chi-Square test with 64 respondents, the null hypothesis (Ho) was accepted, and the alternative hypothesis (Ha) was rejected. This indicates that there was no significant relationship between complementary feeding practices and the nutritional status of infants aged 6–11 months in Wajok Hulu Village, Wajok Hulu Health Center Work Area, Mempawah District, as shown by a p-value of $0.337 < 0.05$. These findings are consistent with the study by Sakti (2013), which examined the relationship between complementary feeding and the nutritional status of infants aged 6–23 months in the coastal area of Talo Subdistrict, Makassar City, and similarly found no relationship between the first introduction of complementary foods and nutritional status, with a p-value of 0.748. Sakti's study concluded that the timing of initial complementary feeding was not associated with nutritional outcomes among infants aged 6–23 months. Infants aged 6–11 months require complementary foods in addition to breast milk because, at this stage, they have developed chewing reflexes and stronger digestive abilities. However, feeding practices must take into account the accuracy of feeding frequency, type of food, quantity, and preparation method (de Queiroz et al., 2022; Eghtesad et al., 2023; Epp et al., 2023; Esposito et al., 2023).

Inappropriate complementary feeding refers to introducing food before 6 months of age, whereas appropriate complementary feeding refers to the introduction of foods after the infant reaches 6 months. The results of this study showed no significant relationship between the timing of complementary food introduction and nutritional status (based on weight-for-age categories) among infants aged 6–11 months. Notably, a greater proportion of infants with poor nutritional status had actually received complementary foods at the appropriate age, totaling 8 infants (25%). This indicates that even when complementary foods were introduced at the recommended age, other factors may have contributed to undernutrition among these infants.

The findings of this study differ from those of Fitriahadi (2017), who investigated the relationship between complementary feeding and the nutritional status of infants aged 6–11 months in the Beji Sidoarum Godean Sleman area. Fitriahadi's study reported a significant relationship, with a significance value of 0.0000 and a p-value > 0.05, and demonstrated a moderate correlation (contingency coefficient = 0.455), concluding that complementary feeding practices were associated with nutritional status.

Providing foods that are not appropriate for an infant's age can negatively impact nutritional status. Introducing complementary foods too early or too late may interfere with growth and development. Timely introduction of complementary foods is essential for meeting nutritional needs during the transition from exclusive breastfeeding to family foods. Inappropriate complementary feeding can result in nutrient intake that does not meet the infant's requirements and may also lead to digestive problems such as abdominal discomfort, constipation, and allergies.

Nutritional problems are multifactorial, involving food intake, infectious diseases, household food security, child-rearing patterns, parental education, and socioeconomic conditions. Research on nutritional status has consistently shown that food intake is directly linked to nutritional outcomes. Good nutritional status is achieved when the body receives adequate nutrients that are used efficiently to support physical growth, brain development, work capacity, and overall health. Complementary feeding plays an important role in fulfilling these nutritional needs, as breast milk alone can no longer meet the infant's increased energy and nutrient demands beyond 6 months of age. Diluting formula milk can lead to malnutrition due to inadequate nutrient intake. Although complementary foods should ideally be introduced after 6 months of age, real-world practices often differ substantially from theoretical recommendations, contributing to poor nutritional outcomes among infants.

CONCLUSION

Most infants who received inappropriate complementary feeding still demonstrated good nutritional status, while only a small portion experienced poor nutritional status. Overall, the analysis showed no significant relationship between complementary feeding practices and the nutritional status of infants aged 6–11 months in Wajok Hulu Village, Mempawah District.

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