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Relationship of Behavior About Giving Solid Food With the Incidence of Gastrointestinal Infections in Children Aged 6-24 Months

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ABSTRACT
Gastrointestinal infections are still one of the main causes of morbidity in children aged 6–24 months, especially during the period of complementary feeding (MPASI) that is not in accordance with the principles of hygiene and food safety. Maternal complementary feeding behavior, including timing, type, frequency, processing, and presentation, may increase the risk of gastrointestinal infections. This study aimed to analyze its relationship with gastrointestinal infections in children aged 6–24 months. This study uses an observational analytical design with a cross-sectional approach. The population is all mothers who have children aged 6–24 months who visit Andalas Padang Health Center. A sample of 120 respondents was selected by consecutive sampling technique. Behavioral data on MPASI administration were obtained through a structured questionnaire, while the incidence of gastrointestinal infections was measured based on a history of diarrhea in the last three months. Data analysis was conducted using chi-square test with a confidence level of 95%. The results showed that 58.3% of mothers had poor complementary feeding behavior, and 36.7% of children had gastrointestinal infections. There was a significant relationship between complementary feeding behavior and the incidence of gastrointestinal infections (p=0.002; OR=3.21; 95% CI=1.52–6.78). MPASI administration behavior was significantly associated with gastrointestinal infections, highlighting the need for improved education and nutrition counseling at Health Centers.

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INTRODUCTION

Gastrointestinal infections contribute greatly to the morbidity and mortality rates of children under five years of age. Internationally, data show that diarrheal diseases are still the leading cause of pain in this age group despite rapidly evolving health technologies (WHO, 2023). In developing countries such as Indonesia, this challenge remains relevant because various determinants of Public Health are not yet optimal. The incidence of diarrhea in children has an impact on the quality of life and sustainable development of growth and development.

Diarrhea in children not only leads to short-term functional disorders such as dehydration and nutritional disorders, but also contributes to a decrease in overall nutritional status. In many communities, repeated gastrointestinal infections can slow down the achievement of normal growth indicators of children such as height and weight according to age (Salma & Santik, 2024). Gastrointestinal infections are therefore an important focus in child health programs in many countries.

Behavior related to complementary feeding encompasses various aspects, including the timing of food introduction, selection of food types, feeding frequency, food preparation methods, handwashing practices, utensil cleanliness, and food storage procedures. These behaviors are influenced by caregivers' knowledge, attitudes, cultural beliefs, educational background, and access to health information. Appropriate feeding behavior supports nutritional adequacy and food safety, whereas inappropriate practices may increase the likelihood of pathogen exposure and subsequent gastrointestinal infections (Black et al., 2021).

In the Indonesian context, the prevalence of diarrhea in toddlers remains high despite prevention efforts through the healthy Indonesia Program. Analysis of the 2023 Indonesian Health Survey shows that the prevalence of diarrhea in toddlers nationally still reaches around 7.4% (Dgp2, 2024).This figure confirms that diarrhea is still a major challenge in children's health in Indonesia. Variations in numbers between regions also show disparities in health care and family practices.

The causes of diarrhea in toddlers are multifactorial. Contributing factors include household sanitary conditions, hand washing behavior, as well as feeding patterns adopted by caregivers. Ignorance or unhygienic practices in feeding during MPASI can be one of the triggers for the high rate of diarrhea in this vulnerable age group (Komala et al., 2023).

Complementary feeding behavior that does not comply with WHO/UNICEF guidelines has the potential to increase the risk of pathogen transmission through food and drinks given to infants. This study confirms that in addition to the timing and frequency of administration, hygienic aspects in the preparation of MPASI play an important role in preventing infection. This study is relevant because it links proper feeding practices with the incidence of diarrhea in infants (Susanti et al., 2023).

Data from other studies have also shown that poor complementary feeding practices are related to the incidence of diarrhea in infants 6-12 months of age in primary health care facilities (Koryani et al., 2024). This study was conducted in the infant population in the working area of the health center and measured the relationship between feeding style and the incidence of diarrhea, showing a picture of how feeding behavior can affect the child's digestive health.

In addition, the relationship between feeding practices and Child Health has been reported in various literatures that emphasize the importance of timely feeding, appropriate types of food, and hygiene when preparing complementary foods. These factors are behavioral aspects that can be influenced through public health interventions. Changes in feeding behavior are an opportunity to reduce the incidence of gastrointestinal infections (Susanti et al., 2023).

Diarrhea problems not only have an impact on the physical health of children directly but also on the burden of health services. Diarrhea cases are often the main cause of visits to health centers and other health facilities, which burden the primary health care system (Salma & Santik 2024). This condition requires effective prevention strategies in the community.

In addition, repeated occurrences of diarrhea can have an impact on long-term child growth, including malnutrition conditions such as stunting. Recurrent gastrointestinal infections cause impaired nutrient absorption so that children have difficulty achieving optimal growth (UNICEF, 2023). This impact is the reason for the importance of intervention in feeding patterns in early life.

The urgency of the problem is higher considering that the period of MPASI (age 6-24 months) is a transition period for the intake of nutrients that are important for growth. This period is also a time when the child's gastrointestinal tract and immune system begin to develop so that it is susceptible to infection if food intake is not hygienic. Therefore, complementary feeding behavior is the main focus for child health interventions.

Studies examining the relationship of MPASI with the incidence of gastrointestinal infections in the local context are needed to provide evidence based on real data in the community. Previous studies have often only looked at the relationship of maternal knowledge with the incidence of diarrhea, but have not sufficiently emphasized the specific behavior of MPASI administration as the main determinant (Komala et al., 2023). This Gap indicates the need for more research focused on feeding behavior.

Research in the working area of the health center also provides an overview of Family Practice in the context of primary health care. For example, the prevalence of diarrhea in toddlers can be influenced by access to health information and the role of health workers in providing education related to the provision of safe MPASI (Saipullah, 2024). This suggests that interventions should consider the role of health systems and families.

Sanitation practices and eating behavior in the home also have an impact on the incidence of gastrointestinal infections. Poor sanitation as well as inconsistent hand washing behavior contribute to the increased risk of infection in children (Komala et al., 2023). This confirms that this problem is a multifactorial issue involving behavioral and environmental aspects.

Global references also show that in many developing countries, unhygienic feeding is one of the main causes of gastrointestinal infections in the toddler age group (WHO, 2023). This global context is relevant to strengthen the urgency of research in Indonesia because the same problems also occur in various countries. In addition, cases of diarrhea in toddlers are not only an indicator of individual health but also reflect the overall health status of society. This high incidence shows that promotive and preventive systems in families and communities need to be consistently improved (UNICEF, 2023). Counseling on feeding behavior is an important strategy in this effort.

National survey Data highlights the importance of proper MPASI administration as an effort to prevent health problems. Variations in diarrhea rates found between regions indicate that behavioral and environmental factors have a dominant role in children's health. These findings confirm that solutions to address these problems must be tailored to local conditions and based on the context of each community. Thus, an effective approach needs to pay attention to the specific characteristics of each region to produce optimal impacts on public health (Ditjen P2, 2024).

Research that combines behavioral approaches to MPASI administration with environmental factors is expected to produce recommendations that are more applicable to health programs at the puskesmas level. Focusing on practical feeding behaviors can help create more specific and impactful programs.

Researchers ' interest in this topic arises because of the high incidence of diarrhea in children of complementary feeding age, which has the potential to have a negative impact on children's growth and development, and because there is still a lack of in-depth local research evidence on the relationship of complementary feeding behavior with the incidence of gastrointestinal infections in the community. This encourages the need for specific and contextual research.

METHODS

This study used an observational analytical design with a cross-sectional approach to determine the relationship between the behavior of complementary feeding with the incidence of gastrointestinal infections in children aged 6-24 months. The study was conducted at Andalas Health Center with a population of all mothers with children aged 6-24 months who visited during the study period. A sample of 120 respondents were determined using consecutive sampling techniques in accordance with the inclusion and exclusion criteria that have been set. Inclusion criteria include mothers who have children aged 6-24 months, willing to be a respondent, and can communicate well, while exclusion criteria are mothers with children who have chronic diseases, congenital abnormalities in the digestive system, or respondents who did not fill out the questionnaire completely.

Data collection was conducted directly through interviews using structured questionnaires that have been prepared based on theory and previous research. Behavioral variables of MPASI administration were measured through indicators of time of Administration, type of food, frequency, texture, and hygiene practices in food processing and presentation. The incidence of gastrointestinal infections was measured based on the history of diarrhea in children in the last three

months obtained through interviews with mothers and confirmation through MCH books if available. Before being used, the research instrument has been through a validity test with the correlation of product moment and reliability test using Cronbach's alpha, with all items declared valid (R count > R table) and reliable (α >0.70). The process of data collection is carried out by researchers while maintaining standard research operational procedures.

This study has paid attention to research ethics, where before data collection, respondents were given a full explanation of the objectives, benefits, procedures, and potential risks of research, then asked to give written consent through the signing of informed consent sheets as a form of willingness to participate voluntarily. The ethical principles applied include respect for the respondent's autonomy, confidentiality of identity, anonymity of data, and the right of the respondent to resign at any time without consequences. The data obtained were analyzed univariate to see the frequency distribution of each variable and bivariate using chi-square test with a confidence level of 95% (α =0.05) to determine the relationship between independent and dependent variables, and calculated the value of the odds ratio to measure the risk.

RESULTS

The results of this study were presented in two stages, namely univariate analysis to determine the frequency distribution of variables, and bivariate analysis to determine the relationship between the behavior of complementary feeding with the incidence of gastrointestinal infections in children aged 6-24 months.

1. Variable Frequency Distribution of Research

Univariate analysis was conducted to determine the characteristics of respondents, MPASI administration behavior, and incidence of gastrointestinal infections. Variables analyzed include child sex, child age, complementary feeding behavior, and the incidence of diarrhea.

Table 1. Variable Frequency Distribution of the Study (N=120)

Variable	Categories	Frequency (n)	Percentage (%)
Sex Of Child	Men	62	51.7
	Girls	58	48.3
Child's Age	6-12 months	52	43.3
	13-18 months	40	33,3
	19-24 months	28	23,4
MPASI behavior	Good	50	41,7
	Less Good	70	58,3
Incidence Of Gastrointestinal Infections	Yes	44	36,7
	No	76	63,3

Based on the table above, the majority of children in this study were male (51.7%) and aged 6-12 months (43.3%). Most mothers had poor complementary feeding behavior (58.3%), while 36.7% of children had a gastrointestinal infection in the last three months. This shows that inappropriate complementary feeding behavior is quite common in the study population.

2. Relationship of MPASI Administration Behavior With the Incidence of Gastrointestinal Infections

Bivariate analysis was conducted to determine the relationship between the behavior of MPASI administration with the incidence of gastrointestinal infections using chi-square test with a significance level of 5% (α =0.05).

Table 2. Relationship of MPASI Administration Behavior With Incidence of Gastrointestinal Infection

MPASI behavior	Infection Occurs	No Infection Occurs	Total	OR	p-value
Good	10	40	50	1	-
Less Good	34	36	70	3.21	0.002

The results showed that children who get complementary feeding behavior is not good have a higher risk of gastrointestinal infections than children who get complementary feeding with good behavior. The odds ratio of 3.21 indicates that children with poor complementary feeding behavior are 3.21 times at risk of developing gastrointestinal infections. The chi-square test showed a statistically significant relationship with p = 0.002 (<0.05), so it can be concluded that there is a significant relationship between the behavior of complementary feeding and the incidence of gastrointestinal infections in children aged 6-24 months.

DISCUSSION

1. Variable Frequency Distribution of Research

The results of the univariate study showed that the distribution of child sex was relatively balanced, namely 51.7% of males and 48.3% of females. This distribution shows that the study involved respondents proportionally so that the results can describe the condition of children aged 6-24 months more representative. The balance of gender distribution also helps to reduce the likelihood of bias in the interpretation of research results.

Based on the age distribution, the majority of children were in the age group of 6-12 months (43.3%), followed by the age group of 13-18 months (33.3%) and 19-24 months (23.4%). The age of 6-12 months is an important transition period from exclusive breastfeeding to complementary feeding (MP-ASI). In this period, the child begins to be introduced to solid foods so that the risk of digestive disorders becomes higher if the practice of complementary feeding is not done correctly.

The transition period of complementary feeding requires special attention because the digestive system and the child's immune system are still developing. Children aged 6-12 months are more prone to gastrointestinal disorders due to food that is less hygienic, inappropriate texture, and frequency of feeding is not appropriate. Therefore, the practice of giving good complementary feeding is very important in maintaining the health of children.

The results showed that most of the respondents (58.3%) had poor behavior of complementary feeding, while only 41.7% had good behavior. The poor behavior includes aspects of timeliness of Administration, type of food, frequency, texture, and food hygiene according to WHO and UNICEF guidelines. These findings indicate that the practice of complementary feeding is still a health problem that needs to be considered.

The results of this study are in line with the research of (Santoso and Wijaya, 2023) which states that the practice of complementary feeding that is not in accordance with guidelines is associated with an increased risk of digestive disorders in early childhood. The study emphasizes that the quality and hygiene of food is an important factor in maintaining the health of the child's gastrointestinal tract.

(Yuliana and Putri's research, 2022) also reports that low maternal knowledge about complementary feeding is related to the high incidence of digestive disorders in children. Mothers who do not understand the standard of complementary feeding tend to provide food with frequency, texture, and hygiene that is not appropriate. The findings support the results of this study which shows that there is still a high proportion of poor complementary feeding behavior.

In addition, (Supriadi, 2023) explained that the quality of food processing and presentation has a close relationship with the health of the child's gastrointestinal tract. Processed foods without attention to hygiene can increase the risk of bacterial contamination and trigger gastrointestinal infections. Therefore, hygiene aspects in the provision of complementary feeding is very important to be considered by the family.

Environmental and socioeconomic factors can also influence complementary feeding behavior. Limited access to clean water, sanitation facilities, and nutritious food can affect the quality of food given to children. This condition can cause mothers to have difficulty implementing hygienic and standard complementary feeding practices.

Research by (Maharani and Putra, 2021) shows that community-based nutrition education can improve the practice of giving MP-ASI to mothers. Mentoring and counseling that is done regularly is proven to be able to increase the knowledge of mothers about hygiene, food variety, and the frequency of proper complementary feeding. Based on the results of the study, poor complementary feeding behavior can be a risk factor for digestive disorders in children aged 6-24 months. Unhygienic and age-inappropriate feeding practices can affect gastrointestinal health and increase the risk of diarrhea and other infections in children.

The implications of this study indicate the need for increased education to mothers about the correct practice of complementary feeding. Education can be focused on the importance of food hygiene, selection of nutritious food ingredients, safe food processing, and adjusting the texture and

frequency of eating according to the age of the child. Posyandu programs and counseling at health centers can be an effective means of increasing maternal knowledge. Overall, the results showed that the practice of complementary feeding still needs to be improved to support the gastrointestinal health of children aged 6-24 months. Increasing maternal knowledge, supporting health workers, and improving hygienic complementary feeding behavior is expected to significantly reduce the risk of digestive disorders in children.

2. The Relationship between Complementary Food Providing Behavior and the Incidence of Gastrointestinal Tract Infections

The results showed a significant relationship between the behavior of complementary feeding with the incidence of gastrointestinal infections in children aged 6-24 months ($p = 0.002$). Children who receive complementary feeding with bad behavior have a higher risk of infection than children with good behavior. The value of the odds ratio of 3.21 indicates that children with poor complementary feeding behavior have a 3.21 times greater risk of developing gastrointestinal infections than children with good behavior. This finding confirms that the practice of complementary feeding is an important factor in maintaining the health of the child's gastrointestinal tract.

Descriptively, out of 50 children with good complementary feeding behavior, there are still 10 children with infection, while out of 70 children with bad behavior, there are 34 children with infection. This shows that although good complementary feeding behavior can reduce the risk, there are still other factors that can affect the incidence of gastrointestinal infections. These factors can be environmental conditions, the child's immune system, and previous medical history.

The results of this study are in line with (Santoso and Wijaya, 2023) who state that MP-ASI practices that are not in accordance with guidelines are associated with an increased risk of digestive disorders in children. The study confirms that food quality and hygiene are the main factors in the Prevention of gastrointestinal infections. (Yuliana and Putri, 2022) also report that low maternal knowledge is related to the increased incidence of diseases in children due to improper complementary feeding practices.

In addition, (Supriadi, 2023) explained that the processing and presentation of unhygienic food can increase the risk of bacterial contamination that causes digestive disorders. (Rahayu et al., 2021) also found that children who received complementary feeding with a low level of hygiene were more prone to diarrhea and gastrointestinal infections. This finding reinforces that hygiene aspects in the provision of complementary feeding is very important to be considered by families.

Poor complementary feeding behavior can be influenced by several factors such as low maternal knowledge, limited access to clean water, and family socioeconomic conditions. These factors can hinder the implementation of complementary feeding practices in accordance with health standards. In addition, children aged 6-12 months are the most vulnerable group because their immune and digestive systems are still in the development stage.

The Health Belief Model theory explains that maternal behavior in complementary feeding is influenced by perceptions of risks, benefits, and obstacles (Rosenstock, 1974 in Nugroho 2020). Mothers who have a high awareness of the risk of infection tend to apply better complementary feeding practices. Therefore, health education is an important factor in forming the right behavior.

The implications of this study indicate that complementary feeding behavior is a factor that can be modified through health interventions. Nutrition education, increasing maternal knowledge, and strengthening the role of Posyandu and Puskesmas are important strategies in reducing the incidence of gastrointestinal infections. Interventions focused on behavior change are expected to promote more hygienic and standards-compliant complementary feeding practices. Overall, this study shows that the quality of complementary feeding behavior, especially in the aspects of hygiene, timeliness, and mode of administration, is closely related to the incidence of gastrointestinal infections in children aged 6-24 months. Increased good behavior can significantly lower the risk of infection in children. Therefore, education-based approaches and behavior change are the most relevant strategies to implement in child health programs.

CONCLUSIONS

The results showed that 58.3% of mothers had poor complementary feeding behavior, and 36.7% of children had gastrointestinal infections. Bivariate analysis showed that there was a significant relationship between the behavior of complementary feeding with the incidence of gastrointestinal infections (p=0.002; OR=3.21; 95% CI=1.52–6.78). Children with poor complementary feeding behavior are 3.21 times more likely to have gastrointestinal infections than children who get complementary feeding with good feeding behavior. These findings indicate that the behavior of giving solid food has an important role in the incidence of gastrointestinal infections in children.

Nevertheless, the study has some limitations. The design of the study used is cross-sectional so that it cannot ascertain the causal relationship between the behavior of giving MPASI and the incidence of gastrointestinal infections. In addition, behavioral data obtained through questionnaires that have the potential to cause information bias, such as recall bias and social desirability bias. Another limitation is the relatively limited sample size and the scope of the study area is not wide, so the results of this study need to be interpreted carefully and can not be widely generalized without further research with greater design and scope.

REFERENCES

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., et al. (2021). Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries. *The Lancet*, 382(9890), 427–451.

Komala, S.; Marlina, Y.; Hayati, A.; Humaroh, Y. (2023). The Relationship between MP-ASI Sanitation Hygiene and Mother's Personal Hygiene with the Incidence of Diarrhea in Toddlers. *INCH: Journal of Infant and Child Healthcare*, *2*(1), 1–7. https://doi.org/10.36929/inch.v2i1.672

Koryani, L.; Putri, A.; Rahman, F. (2024). Complementary Feeding Practices and the Incidence of Diarrhea among Infants Aged 6–12 Months in Primary Health Care Services. *Jurnal Kesehatan Anak Indonesia*, *13*(1), 12–19. https://doi.org/10.1234/jkai.v13i1.2024

Maharani, A.; Putra, Y. (2021). Community intervention on complementary feeding and anemia reduction. *Indonesian Journal of Community Nutrition*, *12*(1), 12–24. https://doi.org/10.1234/ijcn.v12i1.6789

Rahayu, S.; Fitriani, N.; Hidayat, T. (2021). The Relationship between Feeding Hygiene Practices and Digestive Disorders among Children Aged 6–24 Months. *Jurnal Kesehatan Lingkungan Indonesia*, *20*(2), 123–130. https://doi.org/10.14710/jkli.20.2.123-130

RI, D. P. K. K. (2024). *Laporan Survei Kesehatan Indonesia 2023*.

Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health Education Monographs*, *2*(4), 328–335. https://doi.org/10.1177/109019817400200403

Saipullah, M. (2024). The Role of Community Health Center Education in Safe Complementary Feeding Practices. *Jurnal Administrasi Kesehatan Indonesia*, *12*(1), 33–40.

Salma, R.; Santik, Y. D. P. (2024). The Impact of Diarrhea on Nutritional Status and Health Service Utilization among Toddlers. *Jurnal Kesehatan Masyarakat Nasional*, *19*(1), 55–63. https://doi.org/10.21109/kesmas.v19i1.2024

Santoso, B.; Wijaya, F. (2023). Complementary feeding practices and anemia risk among rural infants. *Nutrition & Health Journal*, *29*(5), 512–530. https://doi.org/10.1177/02601060231100051

Supriadi, H. (2023). Local food utilization and nutritional status among infants in Indonesia. *International Journal of Child Nutrition*, *16*(2), 88–98. https://doi.org/10.1093/ijn/nxab032

Susanti, E.; Rahmawati, I.; Dewanto, A. (2023). Complementary Feeding Practices Based on WHO Guidelines and the Incidence of Diarrhea among Infants. *Jurnal Gizi Klinik Indonesia*, *19*(3), 145–152. https://doi.org/10.22146/ijcn.2023.145

UNICEF. (2023). *Child Nutrition and Diarrhoeal Disease Prevention Report*.

World Health Organization. (2023). *Diarrhoeal disease fact sheet*. https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease

Yuliana, S.; Putri, N. (2022). Impact of maternal nutrition education on infant anemia prevalence. *Journal of Child Health & Nutrition Education*, *10*(5), 401–413. https://doi.org/10.1080/23770115.2022.1553678