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Effect of Comprehensive Complementary Feeding Intervention on Maternal Self-Efficacy in Feeding Infants Aged 6–12 Months

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ABSTRACT

Introduction: Stunting remains a chronic nutritional problem in Indonesia, including in Southeast Sulawesi and Kendari City, particularly in coastal areas such as Kendari, Abeli, and West Kendari Districts. One of the main causes of stunting is inappropriate provision of complementary foods in terms of timing, quality, and quantity. Many mothers provide Complementary Foods for Breast Milk too early, lack variety, and rely on instant foods. Low maternal self-efficacy also influences Complementary Foods for Breast Milk provision practices. This study aims to Effect of Comprehensive Complementary Feeding Intervention on Maternal Self-Efficacy in Feeding Infants Aged 6–12 Months.

Method: The study used a quasi-experimental design with a pre-test, post-test, and control group design. It was conducted in May–June 2025 in the Abeli, Mata, and Benu-Benu Community Health Centers. The sample consisted of 67 infants aged 6–12 months selected using stratified random sampling. Data were collected through questionnaires, interviews (with 2x24-hour recall), and weight measurements.

Result: The data were not normally distributed (Kolmogorov Smirnov test), but there was a significant effect of comprehensive complementary feeding intervention on self-efficacy ($p < \text{value} = 0.000$).

Conclusion: Mothers of toddlers are expected to increase their self-confidence and provide a variety of foods daily. Community health centers need to provide comprehensive, practical complementary feeding education and training, and future researchers are encouraged to examine other factors, such as psychosocial and environmental aspects.

Introduction

Toddlerhood is a peak period for a child's growth and development. However, without adequate nutrition, this period can be crucial.^[1]

Toddlers need sufficient macronutrient and micronutrient intake to support their physical, psychomotor, mental, and social development.^[2] Therefore, the quality of food consumed by

toddlers is a determining factor in their nutritional status.^[3]

The current trending problem of toddler nutrition is stunting, with the prevalence of stunting in the world according to the World Health Organization (WHO) in 2020 being 22% of toddlers, then in 2021 it was 22.1% and in 2022 it was 22.3%.^[4] Meanwhile, in Indonesia, based on the results of the 2019 Indonesian Toddler Nutrition Status Study, the prevalence of stunting was 27.7%. The 2021 Indonesian Nutrition Status Survey showed a 24.4% increase, a 21.6% increase in 2022, and a 21.5% increase in the 2023 Indonesian Health Survey.^[5] Despite the decline, this figure still falls short of the government's target of 14% stunting reduction.^[6]

The prevalence of stunting in Southeast Sulawesi is among the 10 highest, namely fifth in 2020 at 31.4%, in 2021 at 30.2%, in 2022 Southeast Sulawesi was ranked ninth with a stunting prevalence of 27.7% and in 2023 at 20.6% and severe stunting at 9.4%.⁷ Based on these data, it can be seen that the prevalence of stunting has not yet reached the 2024 medium-term development plan target of 14%. Therefore, it is necessary to accelerate stunting reduction.^[7] The prevalence of stunting in Kendari City was 24%, then decreased to 19.5% in 2022 and increased again to 25.7% in 2023.^[8]

Stunting is generally high in coastal areas due to the lack of understanding of the nutritional benefits of animal-based foods obtained from coastal sources. Based on preliminary data collection, it was found that the Abeli, Mata, and Benu-Benu Community Health Centers in Kendari City are located in the coastal area of Kendari City, and there has been an increase in stunting cases in these three health centers. Therefore, this study focused on the work areas of the Abeli, Mata, and Benu-Benu Community Health Centers in Kendari City.

Stunting severely impairs cognitive abilities in early childhood, hindering children's ability to think and understand their environment. These cognitive deficits can lead to poor academic performance later in life.^[9] The risk of stunting in infants and children can begin as early as six months of age if they are only given breast milk without sufficient complementary foods.^[10] Inappropriate provision of complementary foods, especially in developing countries, can reduce the

intake of quality nutrition, especially protein, which contributes to stunting in toddlers.^[11]

A study published in 10 journals found a correlation between early complementary feeding and stunting in toddlers.^[12] This association was linked to maternal self-efficacy. Self-efficacy is a person's belief in their ability to take actions that produce desired outcomes.^[13] A person can respond in a certain way to receive reinforcement for their actions if their self-efficacy is high. Conversely, if their self-efficacy is too low, they may not be able to react.^[14] Therefore, the mother's self-efficacy plays a very important role in providing complementary feeding.

According to Ayelign & Zerfu studies show that toddlers who consume a diverse diet, including meat (meat, fish, poultry, organ meats), vegetables, carbohydrates, fruits, and milk, have a lower risk of stunting compared to those who do not.^[15] Similarly, toddlers fed carotene rich vegetables such as pumpkin, carrots, mango, papaya, and other beta-carotene-rich fruits reduce the risk of stunting. A study in the Maldives found that toddlers who consume a limited variety of foods significantly reduce their nutritional intake.^[16]

The risk of stunting in toddlers can be reduced by providing a varied diet that includes at least four food groups daily. Understanding diet is essential to raising public awareness of proper nutrition through diet education.^[17] Increased consumption of high-energy but low-nutrient foods is a major cause of stunting in children born to overweight mothers, which leads to weight gain in adults and stunting in toddlers.^[18]

Comprehensive complementary feeding can improve toddler nutritional intake, thereby preventing stunting. Research by Sumarti et al. showed that there is a relationship between macronutrient intake (carbohydrate, protein, and fat) and the incidence of stunting in toddlers in the coastal areas of Kendari City.^[19] Similarly, previous research which found that insufficient protein and fat intake can cause stunting in toddlers.^[20]

Based on these problems, the researcher is interested in conducting research with the title "The Effect of Comprehensive Complementary Feeding Provision Practice Interventions on the Efficacy Cells of Toddler Mothers".

Method

The study used a quasi-experimental design with a pre-test post-test control group, conducted in May–June 2025 in the working areas of the Abeli, Mata, and Benu-Benua Community Health Centers. The population in this study was all 201 infants aged 6–12 months. The sample size was obtained using the Slovin formula, the sample consisted of 67 infants aged 6–12 months, selected by stratified random sampling. Data were collected through questionnaires, interviews (2x24 hour recall), and weight measurements.

The researchers conducted a comprehensive complementary feeding practice for two weeks, with two demonstrations on how to properly prepare complementary feeding for babies aged 6-12 months. The complementary feeding menu consisted of three menus, each appropriate for the baby's age: a complementary feeding menu for 6-8 months, and a complementary feeding menu for 9-10 months and 11-12 months.

To determine the effect of comprehensive complementary feeding practices on self-efficacy, dietary diversity, nutrient intake (protein, fat, and carbohydrates), and growth, data normality was first tested using the Kolmogorov-Smirnov test. If the data were normally distributed, a paired t-test

was performed. If the data were not normally distributed, the alternative test, the Wilcoxon signed-rank test, was performed.

Result

Table 1 the results showed that of the 67 case samples, the average pre-intervention score was 84.3 and post-intervention score was 93.25, an increase of 8.96. Similarly, in the control group, the average pre-intervention score was 102.73 and post-intervention score was 108.34, an increase of 5.4.

Table 2 it is known that after conducting a normality test using Kolmogorov Smirnov on all the variables studied, a p value $< \alpha$ (0.05) was obtained so that the data was not normally distributed, therefore a Wilcoxon Sign Rank Test was carried out.

Table 3 shows that the results of the Wilcoxon Sign Rank Test obtained a p value of 0.000 $< \alpha$ (0.05), so H_a is accepted and H_0 is rejected, so it is concluded that there is an influence of the intervention of comprehensive complementary feeding practices on the self-efficacy of toddler mothers.

Table 1.
Distribution of Self-Efficacy Scores in Mothers of Toddlers

Self-Efficacy	n	Mean	Min	Max	St-Dev
Case Group					
Before Intervention (Pre Test)	67	84.3	77	89	2.98
After Intervention (Post Test)	67	93.25	89	96	1.45
Difference	67	8.96	3	17	3.13
Control Group					
Initial score (Pre Test)	67	102.73	78	113	8.69
Final score (Post Test)	67	108.34	91	118	7.35
Difference	67	5.4	-3	14	4.08

Table 2.
Results of Normality Test on Research Variables

Self-Efficacy	p-value	Conclusion
Pre-Test	0,000	Abnormal
Post Test	0,000	
Difference (Before and After)	0.002	

Table 3.
The influence of interventions on comprehensive complementary feeding practices on the self-efficacy of mothers of toddlers

Self-Efficacy	n	Median	p-value
Before the practice of providing comprehensive complementary feeding (Pre Test)	134	87	0,000
After the practice of providing comprehensive complementary feeding (Post Test)	134	95	

Discussion

Comprehensive complementary feeding can contribute to increased maternal self-efficacy. Self-efficacy is a person's belief in their ability to achieve desired goals, in this case, providing appropriate complementary feeding for their baby.^[21] Providing appropriate complementary feeding, in accordance with sound principles, can increase a mother's confidence in caring for her child, including in meeting nutritional needs.

Several points related to the relationship between providing comprehensive complementary feeding and self-efficacy; (1) providing complementary foods when the baby is 6 months old, in accordance with WHO recommendations, can increase the mother's confidence that she is able to meet the baby's increasing nutritional needs; (2) providing adequate complementary feeding, complementary feeding must meet the baby's energy, protein, and micronutrient needs. This includes attention to quantity, frequency, texture, and variety of foods; (3) providing safe complementary foods, complementary feeding must be prepared and given in a hygienic manner to prevent infections and other health problems; (4) implementation of responsive feeding, responding to a baby's hunger and fullness signals and involving the baby in the mealtime can increase a mother's self-efficacy in recognizing her child's needs and establishing healthy eating patterns. By providing comprehensive complementary foods, mothers not only meet their baby's nutritional needs but also build confidence and belief in their ability to be good caregivers. This can positively impact the mother's physical and mental health and the baby's overall development.

Based on the tabulation of the distribution of Self-Efficacy scores from 67 case samples, the average score before the intervention was 84.3 and

after the intervention was 93.25. There was an increase in the score of 8.96. Similarly, in the control group, the average score before the intervention was 102.73 and after the intervention was 108.34, an increase in the score of 5.4. Overall, the increase in self-efficacy scores indicates that mothers of toddlers who previously felt doubtful became more confident and actively involved in the practice of providing quality complementary feeding. This finding supports Bandura's theory which states that self-efficacy can be increased through direct learning, successful experiences, and adequate social support.

Based on the statistical analysis using the Wilcoxon Signed Rank Test, a p-value of 0.000 was obtained ($p < 0.05$). This result indicates a significant difference between maternal self-efficacy before and after the comprehensive complementary feeding intervention, meaning the intervention significantly increased the self-efficacy of mothers of toddlers.

This increase indicates that the intervention provided was significantly able to strengthen mothers' self-confidence in their ability to provide complementary feeding in accordance with nutritional principles and child development.

Self-efficacy in the context of complementary feeding, also known as complementary feeding self-efficacy, is a mother's belief in her ability to select, prepare, and provide nutritious, safe, and age-appropriate foods for her child.^[22] This belief plays a crucial role in complementary feeding practices, as mothers with high self-efficacy tend to be more consistent in implementing appropriate practices and are better able to overcome various obstacles, such as limited knowledge, financial constraints, or challenges with their child's eating behavior.^[23]

This research is in line with research by Jannah which found that health education about

locally sourced complementary foods had an impact on mothers' knowledge and self-efficacy.^[24] This finding aligns with Bandura's theory of self-efficacy, which states that direct experience and practical skills can increase an individual's confidence in their ability to perform a task.^[25] Through a comprehensive intervention that included education, hands-on practice, demonstrations of appropriate complementary foods for breast milk provision, and mentoring, mothers of toddlers gained experience that strengthened their understanding and confidence in providing appropriate complementary foods.^[26]

In this study, the researchers assumed that comprehensive complementary feeding practices would improve maternal self-efficacy. This assumption is based on the understanding that mothers, as primary caregivers, play a central role in determining the quality and diversity of food consumed by their children, particularly during the complementary feeding period. The comprehensive complementary feeding practices included nutrition education, demonstrations of preparing balanced complementary feeding menus, training in selecting local food ingredients, and familiarization with serving foods from various food groups. The researchers believe that these interventions will increase maternal knowledge, skills, and awareness, which in turn will lead to an increase in the variety of foods provided to toddlers.

The increase in self-efficacy scores of mothers of toddlers found after the complementary feeding intervention, particularly in the complementary feeding aspect, indicates that the intervention had a positive impact on mothers' confidence in carrying out their important role in feeding their children.^[27] This improvement indicates that mothers felt more capable, confident, and prepared to provide appropriate food in terms of type, quantity, frequency, and presentation.

Complementary feeding self-efficacy refers to a mother's confidence in her ability to provide adequate and high-quality complementary feeding. This includes decision-making regarding the timing of feeding, the selection of nutritious ingredients, age-appropriate serving methods, and the ability to face challenges in feeding her child. Mothers with high self-efficacy tend to be more active, persistent, and consistent in implementing

recommended complementary feeding practices than mothers with low self-efficacy.

The interventions in this study included nutrition education, practical skills training, and facilitation of group discussions.^[28] These three components were designed to build mastery experiences, provide examples through the experiences of others (vicarious experiences), and provide encouragement and social support.^[29] These three aspects are key factors contributing to the formation and enhancement of self-efficacy. In this case, the active involvement of mothers in complementary feeding practices and discussions with other participants enabled the simultaneous enhancement of cognitive, affective, and psychomotor capacities.^[30]

Furthermore, the success of this intervention was also supported by an approach focused on empowering mothers. The education and practice provided not only increased knowledge but also shaped positive attitudes and encouraged sustainable behavior change. Mothers became more aware of the importance of dietary diversity, adequate nutrition, and eating patterns appropriate to their child's developmental stage.

By increasing complementary feeding self-efficacy, mothers are expected to be able to carry out complementary feeding practices more independently and effectively, so that they can contribute to improving the nutritional status and optimal growth of children aged 6–12 months.

This assumption also refers to health behavior theory and social learning theory, which explain that behavioral changes (in this case, child feeding patterns) are influenced by educational interventions and direct practice. When mothers gain practical experience, such as preparing menus from various food sources (carbohydrates, animal and plant proteins, vegetables, and fruits), their chances of adopting more varied eating habits at home increase. Furthermore, in the context of local culture and economic constraints, researchers also assume that education based on local and affordable food sources will be more easily accepted and implemented by mothers. Therefore, this intervention is designed not only theoretically, but also applicably and in accordance with field conditions.

Conclusion

Increase self-efficacy in providing complementary foods. Mothers are expected to have confidence and self-belief that they are able to provide healthy, nutritious complementary foods that meet their children's needs.

Implementing a regular Integrated Nutrition Education Program by holding regular classes for mothers of toddlers or comprehensive complementary feeding training, which includes not only theory but also hands-on practice in providing complementary feeding. This activity aims to increase mothers' self-efficacy, namely their confidence in providing complementary feeding correctly and consistently.

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