

The Impact of Nutrition Education Programs on Parents' Knowledge and Feeding Practices for Young Children

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ABSTRACT

Introduction: Infant and Young Child Feeding (IYCF) is one of the key components during the First 1000 Days of Life, which plays a crucial role in preventing stunting and growth disorders. However, inappropriate IYCF practices are still common due to the lack of parental knowledge and behavior. Nutrition education is an effective strategy for improving understanding and ensuring the correct implementation of IYCF practices.

Objective: This study aimed to analyze the effect of nutrition education on improving mothers' knowledge and behavior regarding IYCF practices.

Methods: This study employed a quasi-experimental design with a one-group pretest-posttest approach. The population consisted of all mothers of toddlers in Candirejo Village, West Ungaran, totaling 39 participants. The sample included 28 mothers with children aged 6–24 months, selected using purposive sampling. The intervention consisted of nutrition education sessions on IYCF through interactive lectures and discussions. Data were collected using knowledge and behavior questionnaires and analyzed using the Wilcoxon Signed Rank Test.

Results: Before the intervention, most mothers had a moderate level of knowledge (64.3%), while 35.7% had a good level of knowledge. After the intervention, all mothers showed good knowledge ($p < 0.001$). In terms of behavior, before the intervention, 64.3% of mothers demonstrated good behavior, and 35.7% were poor behavior, whereas after the intervention, all mothers exhibited good behavior ($p < 0.001$).

Conclusion: Nutrition education significantly improved mothers' knowledge and behavior in IYCF practices. These findings highlight the importance of continuous and community-based nutrition education as a promotive and preventive effort to reduce stunting and improve child nutrition during the First 1000 Days of Life.

Keywords: Nutrition education, feeding practices, parental knowledge, infant nutrition, stunting prevention

INTRODUCTION

The First 1,000 Days of Life (1000 HPK) represents a critical window that determines a child's overall growth and developmental quality. During this period, appropriate *Infant and Young Child Feeding* (IYCF) practices play a vital role in preventing stunting, malnutrition, and developmental disorders (UNICEF, 2023). However, inappropriate IYCF practices remain prevalent in many regions of Indonesia, largely due to parents' limited knowledge and inadequate feeding behaviors (Kementerian Kesehatan RI, 2024). Several studies have demonstrated a strong relationship between maternal knowledge and child-feeding practices. Mothers with higher education levels and good nutritional knowledge are more likely to implement recommended feeding practices, such as exclusive breastfeeding for the first six months and providing adequate and safe complementary feeding (Isfaizah et al., 2024), (Kambale, R. M., Ngaboyeka, G. A., Kasengi, J. B., Niyitegeka, S., Cinkenye, B. R., Baruti, A., Mutuga, K. C., & Van der Linden, 2021). Conversely, mothers with lower educational attainment and limited information often introduce solid foods or formula too early, which increases the risk of infection and undernutrition (Gunawan, H., Fatimah, S., & Kartini, 2022). Nutrition education interventions are recognized as one of the most effective strategies for enhancing knowledge and modifying community health behaviors, including those related to child feeding (Notoatmodjo, 2021). Interactive, participatory, and community-based nutrition education has been shown to significantly improve mothers' knowledge, attitudes, and practices regarding infant feeding (Fitria, A., Rahmadani, E., & Lestari, 2023), (Mardani et al., 2024). This approach aligns with the *Health Belief Model* (HBM) and the *Precede – Proceed Model*, which emphasize the importance of predisposing factors (knowledge and attitudes), enabling factors (resources) and information), and reinforcing factors (family and health worker support) in shaping health behaviors (Glanz, K., Rimer, B. K., & Viswanath, 2015). Given these conditions, there is an urgent need for interventions that focus on improving mothers' knowledge and behavior through structured and integrated nutrition education at the community level, particularly in primary health services such as *Posyandu* (community health post) health posts. Therefore, this study aims to analyze the impact of nutrition education programs on mothers' knowledge and feeding practices for infants and young children in Candirejo Village, West Ungaran, Central Java, Indonesia.

MATERIALS AND METHODS

This study employed a quasi-experimental design with a one-group pretest–posttest approach. The population included 39 mothers of children aged 6–24 months, and 28 met the inclusion criteria. The intervention consisted of interactive nutrition education covering breastfeeding, complementary feeding, and balanced diets. This study was approved by the Ethics Committee of Ngudi Waluyo University (Approval No: 324/KEP/EC/UNW/2025). Data were collected using validated questionnaires assessing knowledge and feeding practices. The validity test of knowledge was conducted using 20 knowledge items and 10 feeding practice items, resulting in a calculated r range of 0.471-0.868, which is greater than 0.444 ($n = 20$), and a Cronbach's Alpha above 0.80, indicating validity and reliability. The data were analyzed using the *Wilcoxon Signed Rank Test*.

RESULTS

This research was conducted in the Working Area of the Village Midwife of Candirejo in July 2025 on 28 mothers. The demographic and nutritional characteristics of respondents are presented in Table 1.

Table 1. Respondents' Characteristics

| Characteristics | frequency (f) | Percentage (%) |
|---------------------------------|---------------|----------------|
| Education | | |
| Elementary School | 2 | 7.1 |
| Junior High School | 4 | 14.3 |
| Senior High School | 14 | 50.0 |
| Higher Education | 8 | 28.6 |
| Occupation | | |
| Housewife | 14 | 50.0 |
| Private Employee | 10 | 35.7 |
| Civil Servant | 1 | 3.6 |
| Laborer | 2 | 7.1 |
| Entrepreneur | 1 | 3.6 |
| Child Nutritional Status | | |
| Normal | 21 | 75.0 |
| Underweight | 7 | 25.0 |
| Exclusive Breastfeeding | | |
| Yes (6 months) | 11 | 39.3 |
| Mixed/Formula Feeding | 17 | 60.7 |

Among the 28 participating mothers, half (50%) had completed senior high school, and the other 50% were housewives. Most children (75%) had a normal nutritional status, while 25% were underweight. Exclusive breastfeeding for 6 months was reported by only 39.3% of respondents, indicating suboptimal infant feeding practices in the community.

Table 2: Pre-Post Intervention Results of Mothers' Knowledge and Feeding Practices on IYCF

| Category | Before | | After | |
|------------------|---------------|----------------|---------------|----------------|
| | frequency (f) | Percentage (%) | frequency (f) | Percentage (%) |
| Knowledge | | | | |
| Good | 10 | 35.7 | 28 | 100 |
| Currently | 18 | 64.3 | 0 | 0 |
| Behavior | | | | |
| Good | 18 | 64.3 | 28 | 100 |
| Not enough | 10 | 35.7 | 0 | 0 |
| Total | 28 | 100 | 28 | 100 |

Before the intervention, most mothers demonstrated moderate knowledge (64.3%) and good behavior (64.3%) regarding IYCF, while 35.7% showed poor feeding practices. After receiving nutrition education, all respondents (100%) achieved good levels of both knowledge and behavior, indicating the effectiveness of the intervention in improving maternal IYCF practices. Similar findings by (Mardani et al., 2024) also reported significant improvements in mothers' knowledge and behavior following nutrition education on complementary feeding.

Table 3. Changes in Mothers' Knowledge and Behavior

| Variable | N | Mean Rank | Sum of Ranks | p-value |
|---------------------------------|----|-----------|--------------|---------|
| Knowledge (Pre vs Post) | 28 | 14.00 | 378.00 | <0.001 |
| Feeding Practices (Pre vs Post) | 28 | 11.50 | 253.00 | <0.001 |

Before the intervention, 64.3% had moderate and 35.7% good knowledge of IYCF. After the intervention, all (100%) achieved good knowledge, and behavior improved similarly, with significant results ($p < 0.001$). These findings confirm that structured nutrition education effectively enhanced both cognitive and behavioral aspects of IYCF among mothers. This improvement aligns with the Health Belief Model and Lawrence Green's PRECEDE-PROCEED framework, indicating that interventions addressing predisposing, enabling, and reinforcing factors lead to sustainable behavior change. Similar results were reported by (Fitria, A., Rahmadani, E., & Lestari, 2023), (Mardani et al., 2024) and (Rahayu, D., Sari, N. P., & Yuliani, 2022), reinforcing the role of education in promoting optimal IYCF practices. Integration of community-based nutrition education into Posyandu programs is recommended to strengthen stunting prevention efforts in Indonesia.

DISCUSSION

Respondents' Characteristics

The average age of participating mothers was 33 years, indicating a productive reproductive age associated with better comprehension and decision-making abilities. Increased age is often accompanied by accumulated knowledge and experience, which can positively influence maternal practices in child feeding (Isfaizah et al., 2024). Half of the mothers (50%) had completed high school, and 28.6% had tertiary education. Educational attainment plays a crucial role in shaping maternal knowledge and feeding behavior. Mothers with higher education tend to demonstrate better understanding and application of proper infant and young child feeding (IYCF) practices, including providing more diverse and nutritionally adequate foods (Isfaizah et al., 2024), (Kambale, R. M., Ngaboyeka, G. A., Kasengi, J. B., Niyitegeka, S., Cinkenye, B. R., Baruti, A., Mutuga, K. C., & Van der Linden, 2021), (Septina, Y., Nurasiah, A., & Rosdiana, 2023). In terms of employment status, 50% were housewives, and 50% were working mothers. Employment can influence feeding practices, as working mothers often face time constraints that may affect breastfeeding duration.

This aligns with findings showing that only 39.3% of infants received exclusive breastfeeding. Conversely, working mothers in some contexts exhibit better adherence to minimum dietary diversity and feeding frequency (Isfaizah et al., 2024), (Ahmed, K. Y., Page, A., Arora, A., & Ogbo, 2020). Most toddlers (75%) had normal nutritional status, though 25% were undernourished, highlighting persistent nutrition challenges. This reflects the continuing need for interventions targeting optimal feeding practices during the First 1,000 Days of Life (Likhar & Patil, 2022). The finding that only 39.3% of mothers practiced exclusive breastfeeding for six months suggests suboptimal IYCF behavior. Early

introduction of complementary foods or formula may displace breast milk and increase infection risk, contributing to the 25% prevalence of malnutrition observed among the children (Isfaizah et al., 2024).

Pre–Post Intervention Results of Mothers’ Knowledge and Feeding Practices on IYCF

Knowledge forms the foundation for behavior (Notoatmodjo, 2021), but changing behavior also requires attitudes, motivation, environmental and socio-cultural factors, and personal experiences (Glanz, K., Rimer, B. K., & Viswanath, 2015). Lawrence Green’s PRECEDE–PROCEED model explains that health behavior is influenced by predisposing factors (such as knowledge and beliefs), enabling factors (like access to facilities and information), and reinforcing factors (such as support from health workers, family, and community) (Notoatmodjo, 2021). Thus, even mothers with good knowledge may not practice optimal feeding if the necessary support systems are lacking.

Studies by (Rahayu, D., Sari, N. P., & Yuliani, 2022) show that mothers know a lot about feeding but don’t always follow WHO advice. (Fitria, A., Rahmadani, E., & Lestari, 2023) also say that just knowing more doesn’t always lead to better habits unless there is ongoing social support and help. In the first 1,000 days of a child’s life, good feeding habits are really important to stop stunting and growth problems. But, the success of nutrition programs depends on mothers’ understanding and being able to practice IYCF rules every day (Kementerian Kesehatan RI, 2024), (UNICEF, 2023).

So, nutrition education needs to be continuous and focus on changing behaviors. Programs that include imparting knowledge, demonstrating how to do things, and providing ongoing support from health workers are more effective than just one-time advice (Likhar & Patil, 2022). Our current program probably works because it uses strategies like giving feedback, asking questions, and follow-up mentoring. These help mothers adopt better feeding habits. Research also shows that combining education with social support and peer help makes changes last longer (Li & Li, 2025).

Finally, using a community-based approach through Posyandu activities, mentoring by cadres, and working with primary health services (Poskesdes) proved to be effective. Structured PMBA programs and trained cadres help improve how mothers feed their children and make nutrition efforts work better (Nur Mufida Wulan Sari et al., 2022).

Changes in Mothers’ Knowledge and Feeding Practices

The results showed a significant difference in mothers’ knowledge before and after nutrition education ($p < 0.001$), where 64.3% of mothers initially had moderate knowledge and 35.7% good knowledge, increasing to 100% in the good category post-intervention. Twenty-seven of 28 mothers showed positive rank improvement, confirming the effectiveness of nutrition education in transferring essential information about IYCF, including early initiation of breastfeeding, exclusive breastfeeding, and appropriate complementary feeding. This aligns with Notoatmodjo’s (2021) theory that education transforms knowledge, attitudes, and practices, and with the Health Belief Model, which posits that understanding the benefits of healthy behavior increases motivation to act (Glanz, K., Rimer, B. K., & Viswanath, 2015).

The findings are consistent with (Fitria, A., Rahmadani, E., & Lestari, 2023), who found significant improvement in knowledge after class-based education ($p < 0.001$), and (Rahayu, D., Sari, N. P., & Yuliani, 2022), who reported an 85% knowledge increase through visual counseling. Similarly, (Likhar & Patil, 2022) in India confirmed that nutrition education for mothers of young children improved feeding knowledge and reduced inappropriate practices. The marked increase to 100% good knowledge likely reflects the relevance of the material, interactive methods such as discussion and Q&A, and the trusted role of health workers as facilitators. Comparable findings by (Prasetyo et al., 2023) and (Nafista et al., 2023) also confirmed that structured education significantly improved

maternal literacy on IYCF, while (Intiyati et al., 2024) demonstrated that the Emotional Demonstration (Emo Demo) method effectively enhanced knowledge ($p = 0.010$). These outcomes underscore that innovative and contextually relevant education programs are highly effective in improving maternal understanding of PMBA (Nur Mufida Wulan Sari et al., 2022), (Kementerian Kesehatan RI, 2024), (UNICEF, 2023).

Behavioral changes mirrored knowledge gains, with significant improvement ($p < 0.001$). Initially, 64.3% of mothers had good feeding practices, which increased to 100% after intervention, with 22 of 28 showing positive behavioral ranks. This confirms that nutrition education not only increased knowledge but also transformed behavior. According to (Notoatmodjo, 2021) Behavior is influenced by knowledge, attitude, and motivation, while Green's PRECEDE-PROCEED model emphasizes predisposing, enabling, and reinforcing factors. Comprehensive education can strengthen these components, making healthy practices easier to apply.

These results are consistent with (Fitria, A., Rahmadani, E., & Lestari, 2023) and (Rahayu, D., Sari, N. P., & Yuliani, 2022), who showed that class-based and demonstration-based education improved complementary feeding practices. International evidence also supports this; (Chanie et al., 2025) found that participatory nutrition education significantly improved maternal and child dietary behavior. Interactive, group-based, and contextual learning approaches are more effective than one-way counseling (UNICEF, 2023).

The 100% behavioral improvement in this study indicates successful transformation from knowledge to practice, reflecting increased self-efficacy and motivation. Education not only enhanced understanding but also built mothers' confidence to implement IYCF correctly, consistent with (Nafista et al., 2023). Practical, skill-oriented methods such as demonstrations and role-playing further strengthened this process, as also proven by (Intiyati et al., 2024). Moreover, nutrition education reduced behavioral disparities between mothers of different education levels (Isfaizah et al., 2024). The findings collectively confirm that structured, interactive, and community-based nutrition education—through Posyandu and cadre-led mentoring—can effectively convert cognitive understanding into sustained behavioral improvement, supporting stunting prevention during the First 1,000 Days of Life.

CONCLUSIONS

Nutrition education significantly improved mothers' knowledge and feeding practices. Structured, community-based nutrition education is an effective approach to enhance maternal competence in IYCF and prevent stunting during the First 1000 Days of Life. Regular implementation of nutrition education in Posyandu and integration with maternal and child health services are recommended. Future studies with larger samples and control groups are needed to strengthen evidence for broader application.

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Availability of Data and Materials

All data generated or analyzed during this study are included in this article and available upon request.

Authors' Contributions

IsF contributed to study conception, data collection, analysis, and manuscript preparation. RAP contributed to handling research permits and collecting data. IS contributed by providing nutrition education and leading discussions, as well as performing data tabulation. The author approved the final version of the manuscript.

Conflict of Interest

The author declares no conflict of interest related to this study.

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