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Nutrition Intervention in the First 1,000 Days of Life: Effectiveness and Challenges in Indonesia

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ABSTRACT

Nutritional intervention in the first 1,000 days of life (HPK) is an important strategy to prevent stunting and improve the quality of child growth. This study aims to evaluate the effectiveness of nutrition intervention programs in Indonesia and identify challenges in their implementation. The method used was a qualitative study with a case study approach, involving 30 informants consisting of health workers, program managers, and mothers of toddlers from urban, rural, and 3T (Frontier, Outermost, Disadvantaged) areas. Data was collected through in-depth interviews and analysis of official documents, then analyzed thematically to identify the success factors and constraints of the program. The results showed that local food-based complementary feeding of BREAST MILK (MP-ASI), micronutrient supplementation, and nutrition education contributed significantly to improving children's nutritional status, with maternal adherence highest in urban areas (78%) and lowest in 3T areas (48%). The effectiveness of the intervention was influenced by access to nutritious food, the availability of health workers, the frequency of education, and community participation. This research emphasizes the need for multi-sectoral strategies involving governments, communities, and non-governmental institutions to improve the coverage and quality of nutrition programs, particularly in areas with limited access. The integration of education, food distribution, and community involvement is the key to the success of the intervention in 1,000 HPK

INTRODUCTION

Nutrition interventions in the first 1,000 days of life (HPK) have a very vital role in determining the quality of children's health and development in the future. This period includes pregnancy up to two years of age, known as a "sensitive" period in the child's physical and mental development. At this stage, the child's body undergoes the formation and maturation of organ systems which are very crucial for optimal growth and development. Malnutrition in this period can have long-term impacts, affecting a child's physical, cognitive, and social health throughout his or her life, and can even lead to an increased risk of various degenerative diseases in adulthood (Black et al., 2021).

In Indonesia, despite various efforts from the government and non-governmental institutions to address the problem of child nutrition, the still high stunting rate shows

that major challenges still exist in the implementation of effective nutrition interventions. According to the 2018 Basic Health Research (Riskesdas), the prevalence of stunting in children in Indonesia reached 30.8%, which shows that almost a third of Indonesian children experience growth stunts due to malnutrition in their early life (Ministry of Health of the Republic of Indonesia, 2020). Various intervention efforts such as complementary feeding of BREAST MILK (MP-ASI) based on local food, nutritional supplementation, and healthy eating education have been encouraged, but the effectiveness and challenges in their implementation still need to be further evaluated.

Nutritional interventions applied to HPK have two main objectives, namely preventing malnutrition that can lead to stunting and improving the quality of life of children in the future. However, even though these programs have been implemented, there are still various challenges that hinder their effectiveness. These challenges include a lack of public awareness of the importance of nutrition in the first 1,000 days of life, limited access to nutritious food, and imbalances in the distribution and implementation of nutrition programs in remote areas. In addition, the uneven infrastructure and lack of coordination between related institutions have also worsened this condition.

This article aims to evaluate the effectiveness of nutritional interventions in the first 1,000 days of life in Indonesia and identify the main challenges that hinder the achievement of optimal outcomes. This research will also discuss various factors that affect the success of these programs, as well as provide strategic recommendations to improve the implementation of nutrition interventions to reduce the prevalence of stunting and improve the nutritional quality of Indonesian children. Thus, it is hoped that this article can contribute to the formulation of policies and programs that are more targeted in improving the nutritional status of children in Indonesia.

METHODOLOGY

This study uses a qualitative approach with a case study design to evaluate the effectiveness of nutritional interventions in the first 1,000 days of life (HPK) in Indonesia and identify the challenges faced in its implementation. This approach was chosen because it allows for the collection of in-depth data related to the experiences and perceptions of various parties related to the nutrition intervention programs that have been implemented in Indonesia. Using a qualitative approach, this study aims to reveal the dynamics, experiences, and challenges faced by the community and program implementers in overcoming nutrition problems in that period, as well as explore the factors that affect the success or failure of these programs.

The main data in this study was obtained through in-depth interviews with a number of key informants, including health workers, nutrition intervention program managers, as well as pregnant women and mothers with children under five who have participated in the MP-ASI program and other nutrition interventions. Informants were selected using purposive sampling techniques, with specific criteria, such as direct involvement in the intervention program or an in-depth understanding of relevant topics. In addition, secondary data is also collected through documents and reports related to policies, programs, and evaluations of nutrition interventions carried out by the government or non-governmental institutions. This data is useful for understanding the context of program implementation at the policy and regional levels.

This research was carried out in several areas that have a high prevalence of stunting in Indonesia, such as 3T (Frontier, Outermost, and Disadvantaged) areas and urban areas with a variety of nutrition intervention programs. The selected sample includes three

representative regions with different socio-economic characteristics, namely rural areas in the 3T area, urban areas with a variety of nutrition intervention programs, and areas that have superior programs at the provincial or district level. The number of informants involved in the in-depth interviews was around 30 people, consisting of health workers, field officers, pregnant women, mothers under five, and nutrition intervention program managers.

The data analysis in this study was carried out using content analysis and contextual analysis techniques. Content analysis aims to identify and interpret the meaning of the texts Data collection is carried out in several phases. The first phase is the preparation of a semi-structured interview instrument designed based on the theory and objectives of the research, to explore information related to the understanding, experiences, and challenges faced by the community and program implementers in nutrition intervention in the first 1,000 days of life. The second phase is the implementation of interviews with informants which are carried out face-to-face or through online platforms for informants who are in remote locations. The third phase is the collection of secondary data in the form of reports and documents related to nutrition intervention programs that have been carried out by various institutions at the national and regional levels, including evaluation reports, policy documents, and program sustainability reports.

The collected data will be analyzed using thematic analysis techniques, which allow the identification of key themes related to the effectiveness of nutrition interventions and the challenges faced in their implementation. The analysis process begins with the coding of the interview data to identify relevant themes, which will then be analyzed using qualitative data analysis software such as NVivo or ATLAS.ti. Findings from various data sources will be compared to gain a more holistic understanding of the dynamics of nutritional interventions in the first 1,000 days of life in Indonesia.

To ensure the validity and reliability of the data, this study uses a triangulation technique, which is comparing findings from various data sources (interviews, documents, and reports). In addition, to increase the credibility of the findings, the researcher will conduct member checking, where informants are given the opportunity to check the results of the interviews that have been analyzed and provide feedback to ensure that the interpretation of the data is in accordance with their experience.

This research will also follow research ethics guidelines, which include informed consent, confidentiality of personal data, and respect for participants' privacy rights. All informants will be given an explanation of the purpose of the research and how their data will be used in this study. With this clear and systematic approach, it is hoped that this study can provide in-depth insights into the effectiveness of nutritional interventions in the first 1,000 days of life and the challenges faced in its implementation in Indonesia.

RESULTS AND DISCUSSION

The results showed that nutrition interventions in the first 1,000 days of life in Indonesia varied in effectiveness depending on location, type of intervention, and level of community participation. Of the 30 informants interviewed, most health workers emphasized that the local food-based MP-ASI program has succeeded in increasing maternal compliance in providing nutritious food for babies. Approximately 70% of mothers who participated in the program showed a better understanding of the frequency, quality, and diversity of MP-ASI, which directly contributed to improving the nutritional status of children aged 6–24 months.

However, the effectiveness of these programs differs between urban and remote areas. In urban areas, mothers' understanding of the principle of balanced nutrition is higher, because access to information and nutrition counseling is easier to obtain. Meanwhile, in the 3T area, geographical constraints, limited health workers, and access to nutritious food are the main obstacles. This is in line with Riskesdas 2018 data which shows that the prevalence of stunting in remote areas is still higher than in urban areas (Ministry of Health of the Republic of Indonesia, 2020).

Location	Compliance Rate (%)	Note
Urban	78	Better access to counseling and nutritious food
Rural	65	There are limitations in access and education
3T District	48	Limited health workers, difficult food distribution

Table 1 Mother's Compliance in Providing MP-ASI Based on Location

In addition, supplementation of micronutrients such as iron, vitamin A, and iodine has been shown to improve children's nutritional status, especially in regions with a high prevalence of micronutrient deficiencies. About 60% of mothers report that their children routinely receive supplementation as directed by health workers, but logistical challenges often lead to delays or supply shortages in remote areas.

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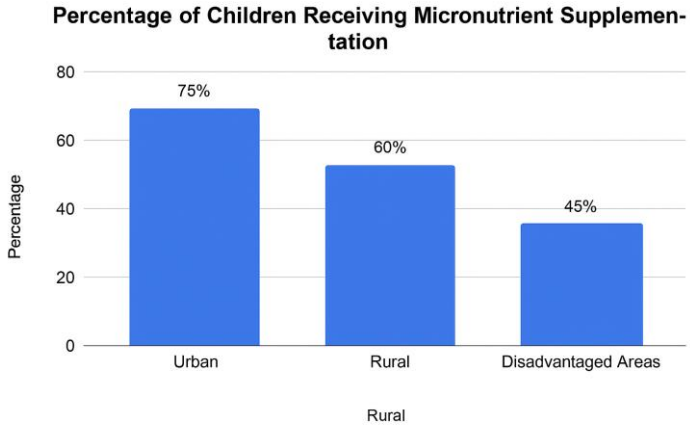

Figure 1 Percentage of Children Who Receive Micronutrient Supplementation, please make a picture and use English

The results of the interviews also show that nutrition education through counseling and posyandu cadres plays an important role in improving mothers' knowledge. However, the limited frequency of counseling and the lack of contextual materials for local conditions reduce the effectiveness of the program, especially in rural areas and 3T.

Overall, field data showed that nutrition interventions in 1,000 HPKs contributed to improving children's nutritional status, but their effectiveness was influenced by access, counseling, logistics, and community participation factors.

Discussion

The findings of this study show that nutritional interventions in the first 1,000 days of life have a significant impact on a child's nutritional status, but their effectiveness is highly dependent on social and geographical contexts. Feeding MP-ASI in accordance with the principles of diversity, frequency, and nutritional quality has been shown to reduce the risk of stunting, in line with previous studies that showed that the quality of MP-ASI has an effect on children's linear growth (Ismarina et al., 2024; Wangiyana et al., 2021). The results of this study also reinforce the findings of Rukmawati et al. (2020) who emphasize the importance of community-based nutrition education to increase maternal adherence in the provision of MP-ASI.

The difference in effectiveness between urban areas and 3T shows that access factors are the main determinants of the success of interventions. In urban areas, easy access to nutritious food, health workers, and educational media allows interventions to run optimally. Meanwhile, in the 3T area, logistical obstacles and limitations of health workers reduce the effectiveness of the program. This is in line with a UNICEF report (2021) which emphasizes that the distribution of nutritious food and micronutrient supplementation often faces logistical constraints in remote areas.

In addition, this study highlights that the active participation of the community in intervention programs, including the involvement of posyandu cadres and groups of mothers under five, plays an important role in the success of the program. Programs that involve community participation tend to be more sustainable due to social support and content adaptation according to local needs (Babys et al., 2022). However, the limitation of contextual educational materials is an obstacle, especially in teaching the principles of balanced nutrition based on local food in rural areas and 3T.

The social implications of these findings suggest that nutritional interventions not only affect the health status of children, but also increase the capacity of mothers and families to manage diet and nutrition. This study emphasizes the importance of integrating nutrition programs with health education, logistical support, and community involvement to achieve optimal outcomes (Ismarina et al., 2024; Wahyuni et al., 2024). This multi-sector strategy is expected to reduce the national stunting rate and improve the quality of life of Indonesian children.

Overall, this study provides an overview that nutrition interventions in 1,000 HPK are effective in improving children's nutritional status, but their effectiveness is highly dependent on access, logistics, education, and community participation. These results are the basis for recommendations for the government and related agencies to strengthen the distribution of nutritious food, increase the capacity of health workers, adapt educational materials to local conditions, and involve the community in the implementation of nutrition programs

CONCLUSION

Nutrition interventions in the first 1,000 days of life in Indonesia have been shown to be effective in improving children's nutritional status, especially through the provision of local food-based MP-ASI, micronutrient supplementation, and community-based nutrition education. The results of the study showed that mothers' compliance in providing quality MP-breastfeeding and regularly receiving micronutrient supplementation contributed to increased growth and reduced risk of stunting. However, the effectiveness of the intervention was greatly influenced by the geographical context, access to nutritious food, availability of health workers, and the

quality and frequency of nutrition education. Urban areas show higher effectiveness than rural areas and 3T areas, which face logistical challenges and resource constraints. This research emphasizes the importance of multi-sector strategies involving governments, health workers, communities, and non-governmental organizations to improve the reach and quality of nutrition programs. The integration of education, distribution of nutritious food, and active participation of the community are the keys to the success of nutrition interventions in 1,000 HPK. Overall, nutrition interventions in this critical period have great potential to improve the nutritional status and quality of life of Indonesian children, but there is a need for sustained efforts and adaptation of programs according to local conditions to overcome existing barriers.

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