Health Dynamics
eISSN: 3006-5518
Publisher: Knowledge Dynamics
DOI: https://doi.org/10.33846/hd10904

Original Research

Evaluating the Impact of Nabila Cantika's Innovation on Reducing Stunting in the Kawedanan Community Health Center, Magetan, Indonesia

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Article history
Received: 17 July 2024
Revised: 3 September 2024
Accepted: 16 September 2024
Published Online: 30 September 2024

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How to cite this article: Handayani M, Setiyani A, Sunarto, Wisnu NT. Evaluating the Impact of Nabila Cantika's Innovation on Reducing Stunting in the Kawedanan Community Health Center, Magetan, Indonesia. Health Dynamics, 2024, 1(9), 332-339. https://doi.org/10.33846/hd10904

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ABSTRACT

Background: Nabila Cantika is an innovation to overcome the problem of stunting. This innovation is in the form of toddler class training involving grandmothers. The training was conducted twice, each lasting 120 minutes. The novelty of the study lies in the involvement of grandmothers in the Toddler class. The purpose of the study was to evaluate the effectiveness of the Nabila Cantika innovation in reducing stunting rates. **Methods:** This study was descriptive and was conducted at the Kawedanan Health Center, Magetan, Indonesia, from February to May 2024. The study population consisted of 90 stunted toddlers cared for by their grandmothers. Samples were taken from the entire population that met the inclusion criteria. The independent variable was grandmothers who attended the Toddler class. Data collection used observation sheets and secondary data in the form of reports from nutrition officers. Data analysis was carried out descriptively, and the effectiveness of this innovation was tested using the McNemar test. **Results:** The results showed that the effectiveness of the Nabila Cantika program varied in each village. Before the innovation was implemented, 71 toddlers (78.9%) were classified as short, and 19 toddlers (21.1%) were classified as very short. After the innovation was implemented, out of 71 toddlers who were classified as short, 48 toddlers (67.6%) increased to the normal category, while 23 toddlers (32.4%) were still classified as short. Out of 19 toddlers who were classified as very short, 8 toddlers (42.2%) remained in that category, while 10 toddlers (57.8%) increased to the short category. This program has proven effective in reducing stunting rates with a significance value of 0.000. **Conclusion:** Nabila Cantika's innovation has proven very effective in reducing stunting rates in the Kawedanan Health Center area. This program needs to be continued and monitored until it reaches the target of zero stunting.

Keywords: Innovation; Nabila Cantika; effectiveness; stunting

1. INTRODUCTION

Stunting is a condition where toddlers fail to grow properly due to prolonged malnutrition, particularly during the first 1,000 days of life.(1) At Kawedanan Health Center, the stunting rate has not shown a significant decrease over the years. Children with stunting tend to have lower intelligence levels and higher risks of diseases, which can lead to

reduced productivity in the future. Consequently, stunting hampers economic growth increases poverty, and widens social inequality.[2]

The World Health Organization (WHO) collects data on the number of stunted toddlers, placing Indonesia among the top three Southeast Asian countries with the highest rates. In Indonesia, the average prevalence of stunting in toddlers was 36.4% from 2005 to 2017. However, data from the 2022 Indonesian Toddler Nutrition Status Study (SSGBI) shows that the stunting prevalence has now decreased to 21.6%, a drop of 2.8% from 24.44% in 2021. In East Java, the stunting rate in 2022 was 34.9%, while in Magetan Regency, it was 14.9%. At Kawedanan Health Center, there were 102 stunted toddlers, or 8.9% of the 1,145 toddlers in 2022.[3]

Stunting in toddlers is caused by a lack of awareness or understanding of toddler nutrition, the importance of maintaining a clean environment, and ensuring food hygiene.[4] Stunting can also occur in the womb, highlighting the importance of maternal nutrition during pregnancy. Stunting is usually only identifiable after the child reaches two years of age. Stunting is caused by inadequate nutrition, birth weight, maternal education, family income, parenting, and dietary diversity. Other factors include family size, parental education and employment, maternal nutrition knowledge, family food security, carbohydrate and fat consumption, complementary feeding timing, infection history, protein intake, maternal employment, family nutrition awareness, and immunization completeness.[5]

The impact of stunting can affect brain development, preventing children from reaching their full intellectual potential. This can reduce productivity in adulthood and increase the risk of chronic diseases.[6] In the short term, stunting can lead to growth failure, metabolic issues, suboptimal body size, and cognitive and motor problems. In the long term, stunting can result in decreased intellectual capacity.[7]

Government measures to reduce stunting include exclusive breastfeeding for the first six months, regular child development monitoring at health centers, and providing toddlers with healthy complementary foods rich in animal protein.[8] One innovation from Magetan Regency is "Anting Emas" (Caring for Stunted Toddlers to Create a Quality Magetan Generation), a collaborative initiative involving foster parents. In Kawedanan Health Center, many toddlers live with their grandparents and extended family members, not just their parents. The Nabila Cantika's (Grandmother Care for Preventing Stunting) innovation, started in April 2023, empowers families, especially grandmothers, in efforts to reduce stunting by educating them on proper feeding and childcare. This initiative has been running for almost a year and has reduced the stunting rate from 8.9% to 7.58%, a 1.4% decrease. However, this reduction is still insufficient, and the goal is to eliminate stunting in Kawedanan Health Center.

Research on the use of Nabila Cantika's innovation is important because stunting is a complex health problem, which requires a multidimensional approach to prevent it. Involving grandmothers in this innovation provides a new perspective in empowering families, which until now has often focused only on mothers and children.[9] By examining grandmothers' participation, we can identify potential additional supports they offer, such as traditional knowledge about nutrition and health, as well as their ability to reinforce positive parenting practices. The benefits of this research include developing more holistic and family-based interventions, increasing the effectiveness of stunting reduction programs through increasing the involvement of all family members in child care, and informing more inclusive policies in efforts to combat stunting in Indonesia.

The novelty of using Nabila Cantika's innovation in reducing stunting lies in the intergenerational approach which includes grandmothers in stunting prevention activities. This innovation broadens the scope of roles in the family, which are usually focused on the mother, by utilizing the experience and central role of grandmothers in child care.[10] This approach has not been widely applied in previous health programs, so it could become a new model in efforts to reduce stunting that is more holistic and sustainable.

2. METHODS

2.1 Study Design and Setting

The type of research carried out was descriptive. The research location is in the working area of the Kawedanan Health Center, Magetan, Indonesia. The research period is from February to May 2024. The population is all Stunted Toddlers who are cared for by their grandmothers. The size of the affordable population is 90 toddlers. All reachable populations were used as research samples. The inclusion criteria in

selecting the population were: 1) Toddlers in the stunting category, 2) predominantly cared for by grandmothers, and 3) grandmothers attended Toddler classes for 2 x 120 minutes. The independent variable in this research is stunting toddlers who received Nabila Cantika's innovation. The toddler class is implemented by the Kawedanan Community Health Center innovation program. The stunting indicator is measured from height per age (TB/U).

2.2 Instrument

The instrument used for data collection was an observation sheet. This sheet is used to record the results of the conclusion category for the condition of stunting in children under five, whether it is decreasing, remaining constant, or increasing, which comes from the report of the officer in charge of nutrition at the Public Health Center.

2.3 Data Collection and Resources

Data was collected from reports from the person in charge of Nutrition at the Kawedanan Community Health Center from March 2023 to January 2024. Data collection began with selecting records of Stunted Toddlers who were cared for by their grandmothers and whose grandmothers attended Toddler classes. The next step is to observe the toddler stunting category which is known from the records of the person in charge of nutrition at the public health center. The measurement results of observations of Stunting Toddlers are categorized as decreasing (getting shorter according to age), constant (not getting shorter or longer according to age), and increasing (increasing taller according to age). After the data was collected, it was then analyzed descriptively and presented in the form of images to determine the effectiveness of Nabila Cantika's innovation implemented by the Kawedanan Magetan Indonesia Public Health Center.

2.4 Data Analysis and Ethics

After the data was collected, it was then analyzed descriptively and presented in the form of images to determine the effectiveness of Nabila Cantika's innovation implemented by the Kawedanan Magetan Indonesia Public Health Center. To determine the effectiveness of implementing Nabila Cantika's innovation using the Mc Nemar statistical test with an error rate of less than 0.05. This research has passed the ethical feasibility test from the health research ethics committee of the Health Polytechnic of the Ministry of Health, Surabaya with number EA/2388/KEPK-Poltekkes_Sby/V/2024.

3. RESULTS

3.1 Stunting Incidents Before and After the Implementation of Nabila Cantika's Innovation

The results of the study showed that of the 90 stunted toddlers sampled, 71 toddlers (78.9%) were categorized as short, while 19 other toddlers (21.1%) were categorized as very short (Table 1). After implementing Nabila Cantika's innovation, of the 19 toddlers who were previously very short, 8 toddlers (42.2%) remained in that category, while 10 toddlers (57.8%) successfully switched to the short category. Of the 71 toddlers who were initially categorized as short, 48 toddlers (67.6%) experienced an increase to normal conditions, while 34 toddlers (32.4%) remained in the short category.

Table 1. Changes in the height category of stunting toddlers before and after implementing Nabila Cantika's innovation

No.	Height size of stunting toddlers	Before	After	Information
1	Very Short	19	8	Down to short 11 toddlers (57.8%), still very short 8 toddlers (42.2%)
2	Short	71	23	Increased to normal 48 toddlers (67.6%), remained short 23 toddlers (32.4%)

3.2 Overview of the Height of Stunted Toddlers per Village Following the Implementation of Nabila Cantika's Innovation

The working area of the Kawedanan Community Health Center in Magetan, Indonesia, covers 11 villages with a total of 90 stunted toddlers spread across the villages. Nabila Cantika's innovation, which involves grandmothers as the primary caregivers for their stunted grandchildren, has succeeded in reducing stunting rates in all villages. Genengan and Sugihrejo villages showed very positive results with a significant

decrease in stunting. However, in two other villages, namely Karangrejo and Tulung, there was a decrease in toddler height that was not balanced with increasing age after the implementation of this innovation. Full details can be seen in Table 2.

Table 2. Category of stunting toddler height after Nabila Cantika's innovation in villages in the Kawedanan Health Center Area, Magetan

No.	Village	Height Size of Stunting Toddlers						Total
		Height increases		Fixed height		Height drops		
		N	%	N	%	N	%	
1	Bogem	2	50%	2	50%	0	-	4
2	Genengan	7	87.5%	1	12.5%	0	-	8
3	Jambangan	4	66.7%	2	33.3%	0	-	6
4	Karangrejo	9	64.3%	4	28.6%	1	7.1%	14
5	Kawedanan	6	66.7%	3	33.3%	0	-	9
6	Mojorejo	4	50%	4	50%	0	-	8
7	Ngadirejo	5	41.7%	7	58.2%	0	-	12
8	Rejosari	2	67.7%	1	33.3%	0	-	3
9	Selorejo	6	54.5%	5	45.5%	0	-	11
10	Sugihrejo	5	83.3%	1	16.7%	0	-	6
11	Tulung	5	55.6%	3	33.3%	1	4.1%	9

3.3 The Effectiveness of Nabila Cantika's Innovation in Reducing Stunting Rates

The results of the McNemar test show that the implementation of Nabila Cantika's innovation in overcoming stunting in toddlers is quite effective, with a significance level of p=0.000 (<0.05), as shown in Table 3.

Table 3. Results of the Mc Nemar statistical test

Parameter	Pre & Post
N	90
Chi-Square [b]	46.021
Asymp.Sig	0.000

4. DISCUSSION

4.1 Incidence of Stunting Before and After the Nabila Cantika Innovation

The study results indicated that before the Nabila Cantika innovation, stunting rates were higher in children with short stature compared to those with very short stature. Following the innovation, half of the children reached a normal status, while the other half remained stunted, either with short or very short stature. Two children's status declined to very short, not because their height decreased, but due to their age advancing without a corresponding significant increase in height, causing their standard deviation score to drop.

If a stunted toddler who has received intensive assistance from a grandmother and provided measurable and monitored additional food experiences a decrease in height, several important aspects need to be considered.[11] First, the quality and adequacy of nutritional intake must truly meet the nutritional needs of toddlers, including protein, vitamins, and important minerals. In addition, the health conditions of toddlers, such as chronic infections or impaired nutrient absorption, can affect growth even though additional food has been given.[12] The method and frequency of feeding also play an important role; administration that is not timely or does not meet needs can reduce the effectiveness of the intervention.[13]

Apart from that, psychosocial factors, such as stress in the family environment, can influence the growth of toddlers. Regular monitoring and evaluation are essential to ensure the approach used is effective and appropriate to the individual needs of the toddler. Adherence to the program, including consistency in supplementary feeding and care, is also key to success.[14] Finally, poor environmental and sanitary conditions can cause recurrent infections and other health problems that inhibit growth, despite increased

nutritional intake.[15] Assessing all these factors will help identify the causes of height loss in toddlers even though the intervention seems to be optimal.

Grandmothers' knowledge, attitudes, and commitment to assisting in reducing stunting using Nabila Cantika's innovative approach have a significant impact on the results of the intervention. In-depth knowledge about nutrition and child care by grandmothers can improve the quality of interventions and contribute to improving the nutritional status of toddlers. Studies show that increasing knowledge about nutrition is positively related to improving children's nutritional status.[16] In addition, grandmothers' positive attitudes towards the intervention program can strengthen their involvement and compliance, which has a direct effect on the effectiveness of the program in reducing stunting.[17]

Grandma's commitment to implementing and maintaining nutritional strategies is also very important. High commitment can increase consistency in implementing interventions, which is associated with significant improvements in children's nutritional status.[18] Thus, adequate knowledge, supportive attitudes, and strong commitment from grandmothers are key factors in the success of Nabila Cantika's innovative approach to reducing stunting. Related references show how important these three aspects are in achieving optimal results in stunting reduction programs.

The researchers believe that the reduction in stunting rates following the innovation represents a significant achievement in efforts to improve children's health and well-being. Evaluating the innovation can help understand the factors contributing to its success and identify areas for improvement. The success in reducing stunting post-innovation can inspire larger-scale efforts to address malnutrition and child health issues globally, encouraging further investment in effective programs and innovations.[19]

4.2 Differences in the effectiveness of implementing the Nabila Cantika innovation in each village

Differences in the effectiveness of a grandmother's assistance in raising grandchildren to reduce stunting after attending toddler classes for 2 x 160 minutes can be influenced by various factors related to village demographics, village sociology, grandmother's status, as well as commitment from various parties. These factors interact and contribute to the success or failure of the intervention.

In terms of village demographics, differences in effectiveness can be influenced by factors such as education level, family income, and the prevalence of infectious diseases in the village. Villages with higher education levels and better family incomes tend to have better resources and access to support intervention programs, including access to nutritious food and health facilities.[20] In addition, villages with a low prevalence of infectious diseases will be more likely to enable children under five to get maximum benefits from nutritional interventions.

Village sociological factors, such as social and cultural support, also play an important role. Villages with high levels of social support, where communities are actively involved in health programs, tend to show better outcomes. Cultural factors, including parenting norms and acceptability of health interventions, also influence program effectiveness.[21] Villages that have a tradition of supportive care and are open to innovation tend to be more successful in implementing programs.

Grandmother's status and commitment are crucial factors in the success of mentoring. Grandmothers with adequate knowledge about nutrition, a positive attitude towards the program, and a high commitment to caring for their grandchildren will be more effective in implementing the strategies taught.[22] This commitment includes a willingness to attend classes consistently and apply the knowledge gained in daily practice.

Commitment from health cadres and supervision from village midwives are also very important. Active and committed health workers can provide additional support to grandmothers, ensuring that they understand the material and overcome challenges as they arise. Supervision by village midwives helps in monitoring and evaluating intervention implementation, as well as providing feedback and support needed to improve program effectiveness.[23] These factors, taken together, influence program outcomes and need to be considered in evaluating the success of grandmother assistance in reducing stunting.

4.3 Effectiveness of the Nabila Cantika Innovation on Reducing Stunting Rates

The results of the study showed that Nabila Cantika's innovation has succeeded in increasing the overall height of stunted toddlers, but its effectiveness

varies from village to village. Some villages showed significant increases in toddler height, while other villages did not experience the same changes. This variation reflects that although this innovation approach has great potential, its effectiveness is greatly influenced by local factors specific to each village.

One of the main factors influencing the differences in outcomes was grandmothers' awareness of the importance of the intervention and their independence in applying the knowledge gained from the program.[24] In villages where grandmothers showed a high level of awareness of the benefits of nutrition and health, and had a good level of independence in implementing parenting strategies, the outcomes achieved tended to be more positive. Conversely, in villages with low grandmother awareness and independence, the impact of Nabila Cantika's innovation was not as strong as expected. This highlights the importance of addressing and improving grandmothers' awareness and practical skills in each community.[22,25]

Grandmothers' awareness of the importance of nutrition interventions plays a key role in the success of the program. Grandmothers who have a deep understanding of the benefits of proper nutrition and parenting tend to be more active and committed to implementing the necessary changes. Grandmothers' independence in managing and utilizing existing resources also greatly influences the effectiveness of the program, as they can better adapt and apply their knowledge in their local context.[25,26]

Nabila Cantika's innovations are designed to be easily accepted and implemented by users, allowing for rapid implementation and adaptation in the field. With simple yet effective practical skills, grandmothers can immediately implement interventions without the need for complex training or large additional resources. This supports broad acceptance and more efficient implementation, despite variations in results across villages.

In addition to Nabila Cantika, various other nutritional innovations have also been implemented to overcome stunting. One of them is a community-based supplementary feeding program that utilizes local products and improves nutritious cooking skills among parents.[27] This program aims to maximize the benefits of available local foods and educate parents on how to prepare nutritious food for their children.

Other innovations include the use of digital technologies, such as mobile applications that provide real-time nutritional guidance and child development monitoring.[28] These applications allow parents to track their child's growth and receive nutritional advice tailored to individual needs. This approach offers a flexible and affordable solution to address stunting, especially in areas with limited access to health facilities.

Limitations of this study include several important aspects that need to be considered for accurate interpretation of the results. First, this research was only conducted in one Puskesmas work area, namely Kawedanan, which may not fully represent conditions in other areas. Variations in local factors, such as access to resources, health infrastructure, and demographic characteristics, may influence the effectiveness of interventions and the generalizability of the results of this study to other regions. Therefore, the results of this study should be considered carefully when applied in different contexts.

Second, the focus on mentoring grandmothers in this research has not been fully monitored by village midwives, which has the potential to affect the quality and consistency of program implementation. Lack of thorough supervision can lead to variations in intervention implementation and impact outcomes. In addition, a Toddler class dose of only 2 x 120 minutes may not be enough to provide the in-depth understanding and skills needed for sustainable behavior change. More comprehensive evaluation and increased training duration may be needed to increase intervention effectiveness.

5. CONCLUSION

The application of Nabila Cantika's innovation at the Kawedanan Community Health Center has proven to be effective in overcoming cases of stunting in toddlers, but its effectiveness has only reached around half of the number of toddlers studied. Even though all villages with stunted toddlers and grandmothers who attended toddler classes were involved in the program, the results varied and not all villages experienced an optimal reduction in stunting. These findings indicate that the program has not been fully effective in all villages. Therefore, it is recommended to carry out an in-depth evaluation to identify factors that influence differences in results in each village. Improvements in

training, increased supervision by village midwives, and increasing the duration of toddler classes can increase the effectiveness of the program, so it is hoped that Nabila Cantika's innovation can have a more significant impact in reducing stunting in the future.

Acknowledgement

We are very grateful to the Head of Kawedanan Health Center for allowing us to become experts in the Kawedanan Subdistrict and all informants who contributed to this study.

Funding Information

No funds were received for this study.

Conflict of Interest

The authors declare no conflict of interest.

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