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Community Service Program Based on Family Empowerment through Increased Knowledge on the Use of Local Food for Stunting Prevention

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Abstract

Stunting is a chronic nutritional problem that remains a public health challenge in Indonesia. Based on the 2023 Indonesian Health Survey, the national prevalence of stunting reached 21.5%, still above the national target of 14%. Preventing stunting requires a comprehensive approach through improving family nutrition literacy and optimizing the use of locally available food. This community service activity aims to analyze the effectiveness of family empowerment-based interventions in increasing knowledge about stunting prevention through education on the use of local Minahasa food. The activity used a quasi-experimental design with a one-group pre-test–post-test approach. A total of 30 participants were purposively selected from the working area of the Ranomuut Community Health Center, Manado City. The intervention included participatory education, demonstrations of local food processing, and assistance for families at risk of stunting. Knowledge was measured using questionnaires before and after the intervention and analyzed using a paired sample t-test. The results show that the mean knowledge score increased significantly from 71.67 ± 5.31 to 85.00 ± 5.72 ($p < 0.001$). The mean difference of 13.33 points with a large effect size (Cohen's d = 1.87) indicates a strong practical impact of the intervention. Participants showed an increased understanding of stunting prevention and the ability to utilize local foods such as corn, sweet potatoes, moringa leaves, gedi leaves, and seafood as sources of nutrition for complementary feeding and toddler food. The conclusion is that empowerment-based interventions through education, demonstrations, and family assistance can increase families' knowledge about stunting prevention through the use of local Minahasa food ingredients. This approach has the potential to be replicated as a contextual and sustainable promotive-preventive strategy in supporting the acceleration of stunting reduction at the community level.

Keywords: Stunting, Family Empowerment, Local Food, Knowledge.

Abstrak

Stunting merupakan masalah gizi kronis yang masih menjadi tantangan kesehatan masyarakat di Indonesia. Berdasarkan Survei Kesehatan Indonesia tahun 2023, prevalensi stunting nasional mencapai 21,5%, yang masih berada di atas target nasional sebesar 14%. Pencegahan stunting memerlukan pendekatan yang komprehensif melalui peningkatan literasi gizi keluarga serta optimalisasi pemanfaatan pangan lokal yang tersedia. Kegiatan pengabdian kepada masyarakat ini bertujuan untuk menganalisis efektivitas intervensi berbasis pemberdayaan keluarga dalam meningkatkan pengetahuan tentang pencegahan stunting melalui edukasi pemanfaatan pangan lokal Minahasa. Kegiatan ini menggunakan desain kuasi-eksperimental dengan pendekatan one-group pre-test–post-test. Sebanyak 30 peserta dipilih secara purposive dari wilayah kerja Puskesmas Ranomuut, Kota Manado. Intervensi meliputi edukasi partisipatif, demonstrasi pengolahan pangan lokal, serta pendampingan keluarga berisiko stunting. Pengetahuan diukur menggunakan kuesioner sebelum dan sesudah intervensi, kemudian dianalisis menggunakan uji paired sample t-test. Hasil menunjukkan bahwa rata-rata skor pengetahuan meningkat secara signifikan dari 71,67 ± 5,31 menjadi 85,00 ± 5,72 ($p < 0,001$). Selisih rata-rata sebesar 13,33 poin dengan effect size yang besar (Cohen's d = 1,87) menunjukkan dampak praktis yang kuat dari intervensi. Peserta menunjukkan peningkatan pemahaman mengenai pencegahan stunting serta kemampuan memanfaatkan pangan lokal seperti jagung, ubi jalar, daun kelor, daun gedi, dan

hasil laut sebagai sumber gizi untuk MP-ASI dan makanan balita. Kesimpulannya, intervensi berbasis pemberdayaan melalui edukasi, demonstrasi, dan pendampingan keluarga dapat meningkatkan pengetahuan keluarga tentang pencegahan stunting melalui pemanfaatan bahan pangan lokal Minahasa. Pendekatan ini berpotensi untuk direplikasi sebagai strategi promotif-preventif yang kontekstual dan berkelanjutan dalam mendukung percepatan penurunan stunting di tingkat masyarakat.

Kata Kunci: Stunting, Pemberdayaan Keluarga, Pangan Lokal, Pengetahuan.

A. INTRODUCTION

Stunting is a condition of growth failure due to chronic malnutrition over a long period of time (Sekretariat Wakil Presiden Republik Indonesia, 2019). This condition mainly occurs during the first 1000 days of life (HPK). Its impact is not only on physical growth but also on cognitive development, learning ability, economic productivity, and increased risk of non-communicable diseases in adulthood (De Onis & Branca, 2016; Soliman et al., 2021). Globally, the WHO reports that in 2022, approximately 149 million children under five (22.3%) will be stunted. This data indicates that stunting remains a serious public health issue (UNICEF/WHO/The World Bank, 2023).

In Indonesia, the prevalence of stunting based on the 2023 Indonesian Health Survey is 21.5%. In North Sulawesi Province, the prevalence of stunting was recorded at 21.3% (Kementerian Kesehatan Republik Indonesia, 2024). Based on the 2025 North Sulawesi Province Stunting Discussion report, the prevalence of stunting in Manado City was recorded at 18.8%, still far from the national target of 14%, so this region still requires more contextual and sustainable interventions (Pemerintah Kota Manado, 2025).

Manado City, as the provincial capital, has urban characteristics with complex social dynamics, including variations in education levels, population mobility, and the continued occurrence of teenage pregnancies, which contribute to the risk of stunting (Badan Pusat Statistik Kota Manado, 2024). Although access to health services is relatively better than in rural areas, literature shows that families' knowledge of nutrition is not commensurate with the availability of health services (Prayitno et al., 2025; Silva et al., 2023; Wahyuni et al., 2023). This confirms that health facility-based interventions need to be strengthened with a family empowerment approach at the household level.

The Ranomuut Community Health Center was chosen as a priority location because its working area still records toddlers with poor nutritional status and at risk of stunting based on the health center's growth and development monitoring data. In addition, although posyandu activities have been running regularly, family involvement in stunting prevention practices and the utilization of local foods has not been optimal. In fact, the utilization of local foods is one of the important determinants in UNICEF's conceptual framework of nutrition, which emphasizes the role of families in feeding practices and food access (UNICEF, 2020). Several studies also show that low parental nutrition literacy and suboptimal utilization of local foods contribute to an increased risk of stunting (Nafisah & Astuti, 2023; Rusliani et al., 2022). Thus, strengthening interventions in Manado City, particularly in the Ranomuut Community Health Center working area, is relevant and strategic as an effort to bridge the gap between national policies and implementation at the community level. A family empowerment-based approach integrated with the utilization of local foods is expected to contribute in a more contextual and sustainable manner to accelerating the reduction of stunting.

Although national policies have emphasized the importance of family assistance, implementation at the community level still tends to be informative in nature. Nutrition education has not been fully integrated with the direct practice of utilizing local food in accordance with local cultural values (Chapman et al., 2024; Siregar et al., 2025; Putra et al., 2025). Therefore, an approach is needed that not only increases knowledge but also demonstrates how to process local foods into children's meals.

This community service program offers innovation through the integration of participatory education, demonstrations of local food-based menu planning, and family assistance in monitoring child growth and development with quantitative effect size evaluation at the community health center level. Theoretically, this program strengthens the implementation of a family-based nutritional determinants framework by placing families as the main agents of change. Practically, this program improves families' knowledge in processing nutritious local foods to prevent stunting in children. In

terms of policy, this activity supports Peraturan Presiden No. 72 of 2021 and contributes to the achievement of SDG 2 (Zero Hunger) and SDG 3 (Good Health and Well-being). Thus, the objective of this activity is to analyze the effectiveness of family empowerment-based interventions in increasing families' knowledge in utilizing local Minahasa food ingredients for stunting prevention.

B. METHODS AND IMPLEMENTATION

This community service activity uses a quasi-experimental design with a one group pre-test–post-test approach. This design is used to assess changes in participants' knowledge before and after the educational intervention. In addition, this activity also evaluates the implementation of family assistance in stunting prevention based on the use of local foods. The approach used is participatory and based on family empowerment, integrating education, demonstration, and assistance for families at risk of stunting.

The activity was carried out from September to October 2025. The preparation stage was carried out at the Nursing Science Study Program, Faculty of Medicine, Sam Ratulangi University. The core activities were carried out in the hall and working area of the Ranomuut Community Health Center, Manado City, North Sulawesi Province. The activity began with coordination with the head of the community health center and the person in charge of the Maternal and Child Health (MCH) program. Next, the team compiled educational materials, leaflets, and evaluation instruments in the form of pre-test and post-test questionnaires.

The population of the activity consisted of pregnant women, families with infants, and families with children aged 0–59 months in the Ranomuut Community Health Center working area. A total of 30 families were selected using purposive sampling based on growth and development monitoring data and recommendations from posyandu cadres. Participant selection took into account the risk of stunting, activity in posyandu activities, and willingness to participate in the entire series of activities. The inclusion criteria included adolescent pregnant women, families with infants or toddlers residing in the working area, willingness to participate in the activities until completion, and ability to fill out the questionnaire. The exclusion criteria were participants who did not complete the pre-test or post-test or withdrew before the activity was completed. In addition, five families with children who were malnourished or at risk of stunting received intensive assistance based on health center data.

The activity was carried out in three stages. The first stage was education and interactive discussion on stunting prevention and the use of local Minahasa foods as alternative sources of nutrition. The methods used included interactive lectures, question and answer sessions, and group discussions. Before the material was presented, participants filled out a pre-test to measure their initial knowledge. After the activity, participants filled out a post-test using a questionnaire consisting of 20 multiple-choice questions.

The second stage was a demonstration of the use of local Minahasa foods. Participants and the team identified local food ingredients available in the surrounding environment, such as sweet potatoes, corn, moringa leaves, gedi leaves, sea fish, shrimp, squid, bananas, and coconuts. The team demonstrated how to process these ingredients into healthy meals for pregnant women, complementary foods, and toddler foods. Participants were actively involved in preparing simple menus based on local foods, including Manado porridge (tinutuan), corn fritters, and grilled fish as examples.

The third stage was family assistance through home visits to five families at risk of stunting. This activity included personalized education tailored to the needs of each family, observation of child feeding practices, monitoring of weight and height, and discussions about obstacles and solutions in meeting the family's nutritional needs. The educational media used were leaflets based on local foods. The assistance aimed to ensure that the knowledge gained could be applied in daily practice.

The evaluation instrument is a questionnaire on knowledge about stunting prevention and the use of local foods. Scores are calculated as percentages and compared between pre-test and post-test values. An increase in scores indicates the effectiveness of the intervention in improving

participants' knowledge. The data from the assistance is analyzed narratively based on changes in feeding practices and family involvement in monitoring child growth and development.

All activities were carried out after obtaining permission from the Manado City Health Office (Number: 400.7/D.02/KES/215/2025). Participants were given an explanation of the purpose of the activity and expressed their consent to participate. The confidentiality of respondent data was maintained and used only for program evaluation purposes.

C. RESULTS AND DISCUSSION

Table 1. Demographic characteristics of participants (n= 30).

Variables	f	%	M (SD)
Age			24.77 (7.575)
Respondent Categories			
Families with pregnant mothers	8	26.7	
Families with infants	8	26.7	
Families with children aged 1-5 years	14	46.6	
Number of Children in the Family			
0	6	20.00	
1	3	10.00	
2	4	13.33	
3	13	43.33	
4	4	13.33	
Head of household education			
Elementary education	1	3.3	
Secondary education	25	83.3	
Higher education	4	13.3	
Family income			
North Sulawesi regional minimum wage (Rp. 3.775.425)	7	23.33	
< North Sulawesi regional minimum wage (Rp. 3.775.425)	23	76.67	

**Note: M = mean; SD = standard deviation; f = frequency*

Table 1 shows that the mean age of participants was 24.77 years (SD = 7.58). Nearly half were families with children aged 1–5 years (46.6%), while 26.7% were families with pregnant mothers and 26.7% had infants. Most families had three children (43.33%). The majority of heads of household had secondary education (83.3%). In addition, most participants (76.67%) reported a family income below the North Sulawesi Minimum Wage, indicating a predominantly low-to-middle socioeconomic background.

Table 2. Comparison of knowledge scores before and after the intervention (n = 30).

Variable	M ± SD	MD	p-value	95% CI of the Difference	Cohen's d
Pre-test	71.67 ± 5.31				
Post-test	85.00 ± 5.72	13.33	<0.001	-15.989 to -10.678	1.87

**Note: MD = Mean Difference*

The results showed a statistically significant increase in participants' knowledge scores after the intervention ($p < 0.001$). The mean score increased from 71.67 ± 5.31 before the intervention to 85.00 ± 5.72 after the intervention, with a mean difference of 13.33 points. The 95% confidence interval did not cross zero, indicating a meaningful difference between pre-test and post-test scores. Furthermore, the effect size was very large (Cohen's d = 1.87), demonstrating that the intervention

had a strong practical impact on improving participants' knowledge of stunting prevention and the utilization of local food resources.

Figure 1. Education on stunting prevention using local Minahasa food ingredients.

Figure 2. Community service team, students, head of community health center, and community health center nurses who will conduct family visits to provide family assistance.

The results of the activity show that education and assistance interventions based on family empowerment significantly increased participants' knowledge about stunting prevention through the use of local food ingredients. There was an increase in the average score from 71.67 ± 5.31 to 85.00 ± 5.72 with an average difference of 13.33 points. Statistical tests showed a significant difference ($p < 0.001$) with a very large effect size (Cohen's $d = 1.87$). This effect size indicates that the intervention was not only statistically significant but also had a strong practical impact on improving family nutrition literacy.

In terms of respondent characteristics, the majority of participants were young, with an average age of 24.77 years. The relatively young age of mothers is often associated with limited experience in parenting and managing family nutrition, thus requiring capacity building through practice-based

education (Prayitno et al., 2025). In addition, most families had three children (43.33%) and the majority had incomes below the North Sulawesi Provincial Minimum Wage (76.67%). This condition indicates the potential for economic limitations that can affect access to nutritious food and household consumption diversity. UNICEF (2020) emphasizes that socioeconomic factors and access to food are fundamental determinants that influence feeding practices and children's nutritional status.

Although most heads of households have a secondary education (83.3%), formal education levels do not always correlate with nutrition literacy and appropriate feeding practices (Nafisah & Astuti, 2023; Rusliani et al., 2022). Therefore, the participatory education approach used in this activity through interactive lectures, discussions, simulations of local food processing, and household assistance is a relevant strategy. This approach is in line with behavior change theory, which emphasizes that increasing knowledge is the initial stage in the process of adopting healthy behaviors (Glanz et al., n.d.). In the context of stunting prevention, maternal nutrition literacy plays an important role in determining feeding practices, food selection, and child growth monitoring (Novitasari et al., 2025; Pipitcahyani et al., 2024; Sinaga, 2020).

The integration of local food utilization is a key strength in this intervention, especially considering that most respondents are in the lower-middle income category. The use of food ingredients such as corn, sweet potatoes, moringa leaves, and seafood not only increases the availability of energy and protein sources but also supports household food security. The concept of local food security emphasizes that optimizing local food ingredients can improve accessibility, cultural acceptance, and the sustainability of nutrition interventions (Andriani et al., 2023; Ngura, 2022; Trisnawati et al., 2023). This approach allows families to apply the knowledge they have gained without relying on expensive food ingredients or commercial products.

Family assistance through home visits also plays an important role in bridging the gap between knowledge and practice. Studies show that education without guidance often does not result in sustainable behavioral change (Chapman et al., 2024; Siregar et al., 2025). This activity, direct observation of feeding practices and personal discussions enable the identification of specific barriers faced by families, especially those with economic limitations and more children. This is in line with findings that intensive mentoring increases family compliance with recommended nutrition practices (Nurpratama et al., 2024; Simbolon et al., 2022).

Overall, these results show that community-based family empowerment strategies are particularly relevant for groups with lower socioeconomic backgrounds and young mothers. Interventions that integrate education, practical demonstrations, and the use of local foods have great potential to strengthen the implementation of policies to accelerate stunting reduction as mandated in presidential regulation No. 72 of 2021 (Pemerintah Pusat Indonesia, 2021).

However, this activity has limitations, namely the absence of a control group and a relatively short monitoring period, making it impossible to assess the long-term impact on children's anthropometric status. Further research with a stronger experimental design and a longer follow-up period is needed to evaluate changes in feeding practices and their direct impact on children's nutritional status.In general, the significant increase in knowledge and the magnitude of the effect size indicate that the family empowerment approach based on the utilization of local foods is a contextual strategy with the potential to be replicated in areas with similar socio-economic characteristics.

CONCLUSION

This community service activity demonstrated that a family empowerment approach effectively improves families' knowledge of stunting prevention through the utilization of local food ingredients. The findings indicate a statistically significant and practically meaningful increase in knowledge following the intervention. The integration of participatory educational strategies with locally available foods that align with the community's social and cultural context successfully strengthened participants' understanding of stunting prevention. Therefore, this intervention model can be recommended as a contextual, feasible, and community-based promotional strategy to support efforts to accelerate stunting reduction at the community level.

However, several limitations should be considered in interpreting these findings. The quasi-experimental one-group pre-test–post-test design without a control group limits the strength of causal inference, as external factors may have influenced the results. The relatively small sample size and the use of purposive sampling restrict the generalizability of the findings to broader populations. In addition, the short monitoring period only assessed knowledge improvement and did not evaluate the sustainability of behavioral changes, feeding practices, or their impact on child anthropometric indicators. The reliance on questionnaire-based cognitive assessments may also introduce social desirability bias. Future studies employing more rigorous experimental designs, larger and more diverse samples, longer follow-up periods, and more comprehensive outcome measurements are recommended to strengthen the evidence of this intervention's effectiveness..

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