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Strengthening the Role of Community Health Workers and Digital Innovation in Stunting Prevention in Nagari Dusun Baru Tapan, Pesisir Selatan Regency, West Sumatra Province

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ABSTRACT

Stunting is still a public health problem in Indonesia, particularly in one with less of nutrition and health knowledge. It results in long-term impacts on learning, cognitive development, productivity, and risk of noncommunicable diseases. The relationship between home visits by community health workers and the concomitant effect of digital innovations to prevent stunting can be seen in this study, where it was conducted in Nagari Dusun Baru Tapan, Pesisir Selatan, West Sumatra. These community services were incorporated into the 2025 Community Service Program of Andalas University which included promo-gizi, local processed food processing training and monitoring of nutritional status in toddlers using Android-based application GiziAnakKu. The program was centered around 1,000 days of life as a crucial window period for child development through nutrition, including the practice of exclusive breastfeeding and complementary feeding and balanced diet behaviors. Results from surveillance showed that most of the toddlers possessed acceptable nutrition (85.3%), however, 14.7% were stunted and 8.8% had an increased risk of overnutrition indicating double burden of malnutrition. Attendees appreciated the training and reinforced the value of sustainable community-based intervention. Through empowerment of community health workers and use of digital technology, the present study adds to definitions for comprehensive stunting prevention that can become best practice in similar areas.

Keywords: stunting, digital innovation, health education, health workers

INTRODUCTION

Stunting as the child growth failure is still a central issue in human development in Indonesia (Kesmas, 2023). Stunting occurs frequently in children who suffer from long-term inadequate intake of nutrients, starting during pregnancy and for the duration of early life. It often develops in the context of maternal and/or childhood malnutrition, and adversely impacts a child's physical and intellectual development (Stunting, 2025). The long-term effects of stunting are sizable, reducing quality of life at the personal level in terms of learning potential and cognitive development, as well as diminished productivity

in future life. In addition, stunted children are at greater risk of non-communicable diseases even as adults. Insight Impaired memory, concentration and problem-solving skills are widespread in stunted children and may impair academic achievement / learning inclination. And stunting can impair brain structure and function permanently so as to lower intelligence levels and work productivity, while increasing vulnerability to degenerative diseases in later life (Andriani et al., 2023; Fitriana et al., 2024; Imeldawati, 2025; Stunting: Ancaman Serius Bagi Masa Depan Pendidikan Anak, 2024; Yadika et al., 2019).

Internationally, stunting is still an important health problem and 162 million under five children suffer from it. If present trends persist, this will fall to 127 million by 2025. The World Health Assembly has set the goal of cutting the number scrunters by that year to 100 million (Department of Nutrition for Health and Development, 2024). Nationally, the prevalence of stunting in Indonesia appears to be decreasing; the 2024 ISPEN reported a decline from 21.5% (2023) to 19.8% (2024) (Kemenkes RI, 2025). While this decline is encouraging, that's a helluva lot of work ahead to make those national objectives.

In West Sumatra, stunting continues; although poverty has been declining over the last 10 years. It is also projected that 128,000 children under the age of five will suffering stunting in 2025 at a prevalence rate of 25.2%, compared to 23.3% in 2021 (Husni, 2025). Sub-district level, there are also worrying trends coming from Pesisir Selatan Regency which demonstrated a prevalence of stunting at 29.8% in 2023 with 2,314 cases. Area modified goal The local government goal is to reduce prevalence to less than 20% using a multi-sectoral approach (Pemkab Pesisir Selatan Tegaskan Intervensi Menyeluruh Untuk Turunkan Angka Stunting, 2025; Stunting Di Pesisir Selatan Meningkat, Capai 2.314 Kasus, 2024).

Successful prevention of stunting will require a strong multi-sectoral effort based on clear role sharing and targeting programs that have the greatest impact on reducing harmful child growth. Assistance has to be more than just support on a material basis, but it also must consist of training and transferring knowledge (Wiwitaningsih & Hartono, 2024). The struggle to overcome stunting in Pesisir Selatan Regency, especially in Nagari Dusun Baru Tapan is very complex and interrelated problem. In reality, there is a suboptimal growth monitoring of children with low attendance in posyandu, a poor data recording and low awareness among parents about the importance of frequent growth measurements. Mothers have insufficient knowledge about IYCF, animal source protein feeding and maternal dietary adequacy; all adding up to the problems faced in the growth of their children.

Poor availability of health information in communities is compounded by low digital literacy and scant use of available local communication channels. Community health workers (kaders), as the first line in preventing stunting, are dealing with constraints related to limited amount, basic education material and technology-based tool is not yet available that would support learning process beyond theoretical lecture on how disease occur. In addition, some of these homes are located in places with poor sanitation and inadequate clean water availability; factors that increase chances of repeated infections that are closely associated with growth failure.

Current sectoral interventions are still not informed by reliable, specific data to identify households at risk, such as those with children in the first 1,000 days of life. Therefore, stunting-prevention interventions have not adequately covered the root causes—behavioural, environmental and capacity related—that are required to bring about permanent change at community level. Furthermore, the continuity of service programs (for example Posyandu programming) is suboptimal and the supplemental feeding for stunted children remains poor. Health cadres have a role in strategy as

frontline actors for the surveillance of nutritional status, instructing parents and referring earlier cases of malnutrition or threats of stunting.

Based on the situation, the program Strengthening Role of Health Cadres and Digital Innovation for Stunting Prevention in Nagari Dusun Baru Tapan Pesisir Selatan District of West Sumatra Province is implemented as a combination between cadre enhancement – digital technology. This approach is in line with the national plan to accelerate stunting reduction, focusing on community level interventions and better monitoring. By joining the students into the student Community Service Program, this program synergizes cadre, Nagari government, health center and community effort. It is hoped not only to decrease the prevalence of stunting in Nagari Dusun Baru Tapan, but also to become a best practice which can be adopted in other areas of Pesisir Selatan Regency.

METHOD

This community empowerment program was implemented in Nagari Dusun Baru Tapan from July to August 2025 which consisted of monitoring, education and training activities for mothers with young children and cadres at Posyandu. Nutritional status surveillance was conducted on total sampling involving all 34 children under five years registered at Posyandu Nangka 4. It involved registering all children attending the Posyandu and making home visits to those who did not. Nutritional status of each child was determined by GiziAnakku, an Android-based digital application system created by the program team. Lectures were used for the health education sessions while demonstrations and practice (with mother's and cadres) for training. The training content targeted stunting prevention and treatment and skills in the preparation of locally available complementary foods. Nutritional status was described on the basis of anthropometric data.

RESULTS AND DISCUSSION

The community service was conducted integrated with the 2025 Community Service Program of Andalas University. The key activities conducted were: (1) counseling to pregnant women, mother with toddler and cadre regarding stunting prevention and treatment; (2) nutritional status monitoring of toddlers using digital innovation that is GiziAnakKu. Stunting is one of the primary challenges for public health development in Indonesia, particularly in areas with limited access to information and balanced nutrition. For this purpose, a team representing the Faculty of Public Health at Andalas University worked with KKN students at Nagari Dusun Baru Tapan, Kecamatan Basa Ampek Balai Tapan. In this work, we aimed to improve the knowledge and expertise in preventing and managing stunting through health education, local food processing training, and the use of digital media based on the Android application named GiziAnakKu.



Figure 1. Digital innovation in the form of the android application GiziAnakKu used for nutritional status measurement

Education emphasized the significance of the First 1,000 Days of Life period (which spans 270 days during pregnancy and extends to the first two years of a child's life). Information on infant and child feeding practices such as Early Initiation of Breastfeeding (EIB), exclusive breastfeeding for six months, age-appropriate complementary feeding, and adherence to the gold standard for infant and child nutrition was delivered. The GiziAnakku application used for nutritional status monitoring and stunting education was also introduced to the community.



Figure 2. Education for cadres, mothers with toddlers, and pregnant women on stunting prevention and management

The counseling sessions were interactive and received positive responses from the community, especially housewives and Posyandu cadres. The participants' excitement highlighted the significant relevance of the content to the community's needs, leading to the conclusion that the mentoring program needs to be maintained. It illustrated how

higher education practitioners can collaborate with students to encourage a collaborative sense of collective awareness of stunting prevention. Altogether, this program validates that stunting prevention interventions must be multifaceted and must work in partnership with families, health cadres, and other sectors. Ongoing education and the use of digital technology are expected to enhance interventions to help improve toddler nutritional status, reaching a healthy and productive Indonesian generation.

Apart from teaching cadres, pregnant women, and mothers with toddlers, the community service team also assisted in the implementation of Posyandu activities in the Nagari Dusun Baru area. The team also worked on a mentorship role but also to monitor the nutritional status of the toddlers at one of the local Posyandus. Nutritional status monitoring was accomplished by anthropometric measurements (weight and height) using WHO growth standards to get an objective and specific picture of toddlers' nutritional status.

The nutritional status monitoring results obtained from Posyandu activities are presented in the following table:

Table 1. Nutritional Status Monitoring Results at One Posyandu in Nagari Dusun Baru Tapan

Indicator	Category	Frequency	Percentage (%)
BMI-for-Age (IMT/U)	Good Nutrition	29	85.3
	Under Nutrition	2	5.9
	At Risk of Overnutrition	3	8.8
Height-for-Age (TB/U)	Normal	29	85.3
	Short/Stunting	5	14.7
Weight-for-Age (BB/U)	Normal Weight	32	94.1
	Underweight	2	5.9
Weight-for-Height (TB/BB)	Good Nutrition (Normal)	31	91.2
	Under Nutrition	3	8.8

Results of the nutritional status measurements indicated that the majority of the children were in adequate nutritional status. According to the BMI-for-age (IMT/U) indicator, 85.3% of the toddlers were classified as having good nutrition, 5.9% experienced undernutrition, and 8.8% were at risk of overnutrition. The height-for-age (TB/U) measurements showed that 85.3% of the toddlers had normal height, while 14.7% were stunted. For the BB/U indicator, the majority (94.1%) of children were normal weight, while 5.9% were underweight. In this category (weight-for-height TB/BB), 91.2% of the toddlers were in good/normal nutrition category, while 8.8% displayed signs of undernutrition.

The results of this study demonstrate that while most of the toddlers showed good nutritional status, chronic nutritional problems remain, including stunting (14.7%) and undernutrition (5.9–8.8%). As early indications of overnutrition occur in 8.8% of toddlers, this indicates that the community is suffering from a double burden of malnutrition. These findings underscore a significant public health concern, as undernutrition and emerging overnutrition have lasting repercussions for growth, cognitive development, and future metabolic health. These observations highlight the importance of integrated and holistic nutrition policies. The prevalence of stunting and undernutrition remains a priority with interventions including targeted nutrition strategies in early nutrition (the first 1,000 days of life), supplementary feeding programs, education of parents, and balanced diet

modification. At the same time, the preventive approach to overnutrition should be enhanced, encouraging the eating of balanced food, limiting the consumption of processed foods, and fostering physical activity early in life. These results are in accordance with reports on the same pattern of double burden malnutrition in Indonesian communities, where persistent gaps in maternal knowledge, irregular growth monitoring, and inconsistent anthropometric data delay the identification of nutritional risk. Thus, the identification of toddlers with suboptimal growth patterns in the current study underlines that Posyandu attendance and data quality continue to be important issues (Febry, 2012; Putri Anggraini Lalu, Sofyawati D. Talibo, 2021).

A likely explanation for the reported nutritional disparities may be explained by structural factors such as food insecurity, limited access to animal-source foods, and inadequate household sanitation. Those contextual factors have been extensively reported as the key factors contributing as factors for both undernutrition and early overweight in these lower resource settings. Looking at the GiziAnakku digital application from both clinical and public health perspectives the benefits of this clinical application are promising. It emerged as an application with the potential to improve anthropometric data accuracy and to assist with early detection of growth deviations, consistent with work from other digital health innovations that have bolstered community-based nutrition surveillance. However, reliable and effective use of the application requires continuous cadre education, supportive supervision, and incorporation into standard health system workflows.

There are limitations of this study as well, including the briefness of the community engagement activities, reliance on cadre-reported measurements, and the low size of the sample, which can influence the generalizability of results. However, the results offer significant guidance for enhancing community-based nutrition programs. Future studies might consider the long-term measurement of such digital monitoring tools, investigate structural adjustments aiming to reduce the barriers to better child nutrition, and the efficacy of a combined approach, that is, digital surveillance, behavior-change communication and food access interventions, at multiple population levels. The present analysis concludes with the premise that, even though most toddlers have adequate nutritional status, the double burden of malnutrition remains and that the interventions need to be integrated, data-based and community-focused. Establishing better cooperation between the community health workers and local health centers, along with regular capacity-building and ongoing community engagement is crucial for sustainable benefits of child nutrition.

CONCLUSION

During the community service activities sponsored by the team of lecturers and KKN students from Andalas University in Nagari Dusun Baru Tapan, integrated education and nutritional status monitoring of toddlers were successfully conducted using a digital application named GiziAnakKu. Education centered on the critical period of the First 1,000 Days of Life to prevent stunting with appropriate breastfeeding and complementary feeding according to standards emphasized. While most toddlers were in good nutritional status, cases of stunting showed up at 14.7% and risk of overnutrition at 8.8%, which is a double burden of malnutrition. Stunting prevention efforts require the need for family-driven, health cadres and cross-sectoral interventions including collaboration, with digital technology for reinforcing intervention. Monitoring data are also essential to develop more targeted and locally relevant nutrition interventions to achieve a healthy, productive Indonesian generation.

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