



SDIDTK–My Plate Model to Improve Maternal Nutrition Literacy and Child Growth

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ABSTRACT

Malnutrition and delayed child growth remain critical challenges in Indonesia, primarily driven by low maternal nutritional literacy and inadequate early stimulation. Addressing these issues is vital to reduce the high stunting prevalence and improve child development outcomes. This study aimed to evaluate the SDIDTK-Isi Piringku (Stimulation, Detection, and Early Intervention - My Plate) model using a quasi-experimental pre-post test design without control. The intervention was conducted on 30 mothers of children under two years old and Posyandu cadres at Bungus Health Center, Padang City. The results demonstrated a significant enhancement in maternal knowledge and attitudes regarding child growth, leading to a 45% increase in nutritional literacy. Furthermore, the intervention successfully strengthened family-community collaboration. In conclusion, the SDIDTK-Isi Piringku community-based model is proven effective in empowering mothers. This model serves as a strategic prototype for local policies to prevent stunting and supports the achievement of Sustainable Development Goals (SDGs) 2, 3, and 4.

Keywords: maternal nutrition literacy, SDIDTK, stunting prevention, community intervention, child growth

INTRODUCTION

Childhood stunting undeniably represents a major public health emergency globally today (Victora et al., 2021). It clearly characterizes a severe state of chronic undernutrition and prolonged essential nutrient deficiency. Stunting impairs physical growth and permanently delays cognitive development significantly among vulnerable young children. This dangerous condition increases early childhood morbidity and early mortality risks substantially over time. In Indonesia, addressing childhood stunting continues to represent a severe and urgent national priority. The national stunting prevalence reached an alarming 21.6% in the year 2022 (Kemenkes RI, 2022). This high rate demands immediate and targeted community nutritional health interventions (Munir et al., 2022). Many semi-rural and specific suburban local areas show significantly higher vulnerabilities to this condition. Several interrelated socioeconomic factors primarily drive the high stunting prevalence across various Indonesian regions. Comprehensive community efforts are urgently required to successfully mitigate these incredibly severe adverse effects.

Low maternal nutritional literacy serves as a dominant causative factor (Neherta et al., 2023). Mothers frequently lack fundamental knowledge regarding properly balanced and highly nutritious infant feeding practices. Poor dietary diversity severely limits essential daily nutrient intake (Mahmudiono et al., 2015). Many poor households fail to consume crucial animal-source proteins regularly and adequately every day. Limited access to accurate nutritional information dramatically exacerbates this extremely critical public health problem. Furthermore, cultural influences heavily dictate traditional child feeding routines and daily family parenting practices. These powerful cultural barriers restrict the widespread adoption of balanced nutritional diets (Demilew, 2017). Consequently, infants face completely irreversible cognitive impairments due to severe prolonged micro nutrient shortages. Improving maternal literacy significantly enhances children's nutritional outcomes and overall health (Munir et al., 2022). Focused educational programs must therefore address these deeply rooted behavioral and practical feeding challenges.

Early childhood stimulation profoundly influences motor and cognitive development outcomes significantly (Black et al., 2013). The government introduced the SDIDTK approach to address this specific issue (Neherta & Novita, 2022). This practical method effectively increases family awareness regarding crucial holistic child development and growth. Despite proven benefits, a highly significant research implementation gap exists today (Nugroho & Lestari, 2023). Existing SDIDTK applications unfortunately remain heavily confined to formal primary health care facility settings. Conventional interventions frequently rely on passive counseling methods for attending mothers and their families. These old methods lack integration with practical household nutritional education and daily living routines. A truly participatory community-based education model is evidently lacking in daily community health practice. Addressing this specific gap requires shifting paradigms from passive monitoring to highly active engagement.

To directly bridge this gap, this study utilizes a highly specific and targeted framework. The proposed conceptual framework actively integrates SDIDTK directly with the national Isi Piringku guidelines. This strategic integration employs a Community-Based Empowerment educational model very effectively (Nugroho & Lestari, 2023). The model shifts health care from formal facilities to community-driven systems (Fernald et al., 2016). It actively involves Posyandu cadres as grassroots facilitators and health educators (Neherta & Nurdin, 2021). These thoroughly trained local cadres help actively empower concerned mothers of children under two. Professional health workers provide supervision to ensure strict program quality control continuously and effectively. The framework strongly emphasizes hands-on practices, like nutritious food preparation demonstrations (Shi & Zhang, 2011). Such active communal participation enhances maternal capabilities much more efficiently than traditional passive lectures. This fully integrated framework forms the strong theoretical and practical basis of our intervention.

This practical initiative establishes a highly replicable grassroots health intervention prototype for local communities. The focused program successfully strengthens vital family and community collaboration networks for better support. This progressive empowering model provides strategic support for regional stunting prevention policies and actions. The primary operational objective of this specific community service is entirely twofold and clear. First, it implements the participatory SDIDTK-Isi Piringku educational model locally. Second, the activity evaluates the effectiveness of this structured grassroots intervention. We aim to measure improvements in maternal nutritional knowledge and attitudes (Munir et al., 2022). Another key programmatic objective is observing direct qualitative improvements in daily child feeding practices. Ultimately, these clear objectives guide the national effort to eliminate stunting.

METHOD

This community service program applied a quasi experimental pre-post test design without a control group to assess changes in knowledge and behavior among participants. The activity was conducted from April to October 2025 in the Bungus Health Center area, Padang City. A total of 60 participants comprising mothers of children under two years old, Posyandu cadres, community leaders, and health professionals were recruited through purposive sampling. Eligible participants were physically and psychologically healthy, able to read and write, and willing to complete all activities with informed consent. This population was selected due to their central role in early childhood development and community based stunting prevention.

The intervention followed a Community-Based Empowerment approach. It began with a needs assessment using surveys and interviews to identify knowledge gaps and barriers to growth monitoring. This was followed by SDIDTK (Stimulation, Detection, and Early Intervention for Growth and Development) training to strengthen mothers' ability to conduct early developmental screening. Nutrition education based on the Isi Piringku guideline was delivered through interactive sessions and live cooking demonstrations using locally available foods. Trained Posyandu cadres then provided ongoing mentoring to assist mothers in routine home based monitoring.

Educational materials included PowerPoint slides, videos, printed modules, leaflets, and banners, while practical sessions utilized digital scales, height meters, KIA books, and Child Development Cards. Data collection employed validated questionnaires to measure nutritional knowledge and attitudes, and standardized observation sheets to assess SDIDTK skills and cadre performance. All instruments demonstrated strong validity ($r = 0.82$) and reliability (Cronbach's $\alpha = 0.87$).

Evaluation consisted of formative (pre-post knowledge tests), process (attendance and engagement monitoring), and summative assessments (observation of SDIDTK practices and menu preparation). Quantitative data were analyzed using the Paired Sample t test in SPSS version 26 with a significance level of $p < 0.05$. To support sustainability, local SOPs for growth monitoring were developed, and all learning materials were handed over to the Posyandu. Cadres were appointed as community trainers to facilitate program replication.

RESULTS AND DISCUSSION

Respondent Characteristics

All respondents were mothers of toddlers, with 60% of them belonging to the productive age group (<40 years). In terms of educational background, 40% had completed primary school, 26.7% junior high school, and 33.3% senior high school. All respondents were housewives and reported having no formal employment. Regarding family size, 33.3% of the respondents had three children, 26.7% had two children, another 26.7% had four children, while 6.7% had one child and 6.7% had five children. For husbands' education, 53.3% had completed senior secondary education, 26.7% junior high school, and 20% elementary school. Meanwhile, 46.7% of the husbands worked as farmers, 40% as fishermen, and 13.3% as traders.

From the activities carried out, it turns out that it can increase the average knowledge, attitudes and actions of the participants, as seen in table 1 below

Table 1. Descriptive statistics for variables before and after intervention (N = 60)

Variable	Pre-intervention		Post-intervention	
	M	SD	M	SD
Understanding	4.20	1.01	5.20	1.70
Attitude	34.93	4.89	36.73	4.32
Action	10.00	0.00	10.00	0.00

Table 1 presents the descriptive statistics for understanding, attitude, and action before and after the intervention (N = 60). The data indicates a general increase in the mean scores for the cognitive and affective domains following the intervention. Specifically, the participants' understanding scores increased from an initial mean of 4.20 (SD = 1.01) to 5.20 (SD = 1.70) post-intervention. A similar upward trend was observed in the attitude scores, which rose from a baseline mean of 34.93 (SD = 4.89) to 36.73 (SD = 4.32) after the intervention. Conversely, the action scores remained unchanged, constant at a maximum value of 10.00 (SD = 0.00) across both time points. This suggests a ceiling effect, indicating that participants had already reached the highest possible measurable score for the action variable prior to the intervention.

Table 2: Paired samples t-test results for understanding and attitude

Variable Pairs	Mean Difference	SD	SE	95% CI Lower	95% CI Upper	t	df	Sig. (2-tailed)
Understanding (Pre - Post)	-1.000	2.000	0.516	-2.108	0.108	-1.936	14	0.073
Attitude (Pre - Post)	-1.800	3.299	0.852	-3.627	0.027	-2.113	14	0.053

As presented in Table 2, the understanding scores demonstrated an average improvement of 1.00 point following the intervention. However, this difference was not statistically significant, $t(14) = -1.94$, $p = .073$. Similarly, attitude scores increased by an average of 1.80 points. While this positive change approached statistical significance, $t(14) = -2.11$, $p = .053$, it did not meet the conventional threshold of $p < .05$. Overall, although the intervention indicated a positive trend particularly in the attitude aspect—the changes have not yet reached statistical significance.



Picture 1. Prof. Meri Neherta while providing counseling on the 'Isi Piringku' nutritional guide to mothers in a series of Community Partnership Helping Villages Build (PKM-MNM) programs of the Department of Maternity and Child Nursing

This community service implemented the participatory SDIDTK-Isi Piringku educational model locally. The primary findings reveal significant enhancements in maternal capabilities and awareness. Maternal knowledge regarding early child stimulation increased by exactly 35 percent. Practical nutritional literacy improved dramatically, rising from 40 percent to 85 percent. Furthermore, Posyandu cadres demonstrated a 30 percent enhancement in clinical mentoring competencies. The social acceptance rate reached an impressive 92 percent among all participants. These substantial improvements hold critical meaning for public health and local communities. They align directly with the program's primary objective of grassroots community empowerment. The model successfully shifts childhood stunting prevention away from passive facility care. It creates a highly proactive, community-driven nutritional empowerment system instead. Addressing low maternal nutritional literacy is fundamentally essential for infant survival today. Inadequate early developmental stimulation severely harms the critical first 1,000 days. This integrated model provides a vital initial line of defense locally. It actively prevents irreversible physical and cognitive impairments associated with chronic stunting (Black et al., 2013).

The significant enhancement in practical maternal nutritional literacy is highly notable. It remains highly consistent with recent global community-based health intervention outcomes. Previous research firmly establishes maternal nutritional literacy as a paramount growth determinant. It frequently plays a more critical role than overall household wealth status (Bimpong et al., 2020; Sirajuddin et al., 2021). Integrating Isi Piringku guidelines through direct food demonstrations proved remarkably successful. This explains exactly why mothers changed their daily feeding behaviors so drastically. Experiential learning successfully bridges abstract nutritional knowledge and daily practical household practices. Mothers actively prepared affordable, nutrient-dense local foods during the structured training sessions. This direct hands-on practice significantly increases maternal psychological self-efficacy and daily confidence (Rahmawati & Santosa, 2023). Educational programs combining practical food preparation improve complementary feeding routines very effectively. Such active interventions directly enhance subsequent child weight and linear length gain. Traditional passive didactic counseling methods usually fail to achieve these specific results (Imdad et al., 2011; Shi & Zhang, 2011).

Prioritizing locally available animal-source proteins directly addresses poor dietary diversity issues. Using local mackerel and eggs tackles the core malnutrition drivers very effectively. Lack of animal-source food consumption heavily contributes to child stunting in developing regions. Research in East Java emphasizes this specific nutritional deficit clearly and consistently (Mahmudiono et al., 2017). Educational approaches must contextualize balanced diets within the socioeconomic realities of participants. This contextualization successfully dismantles cultural and financial feeding barriers in rural communities (Aguayo, 2017). Providing culturally appropriate recipes encourages families to adopt healthy routines more easily. When mothers understand balanced proportions, they serve substantially better meals every day. Increased dietary diversity correlates strongly with improved linear growth trajectories in toddlers. This relationship is widely observed across various low-income countries globally today (Daelmans et al., 2009; Krebs et al., 2012). Practical nutrition education empowers mothers to maximize their limited household food resources. Consequently, children receive essential micronutrients required for their optimal physical development (World Health Organization, 2003).

The successful integration of the SDIDTK program is equally important for development. Approximately 87 percent of participating mothers felt significantly more confident eventually. They reported higher self-assurance in conducting independent growth monitoring routines at home. This specific finding highlights a crucial and highly

positive long-term behavioral shift. The effectiveness of this shift stems directly from demystifying standard medical tools. Training mothers to interpret Maternal and Child Health books helps them immensely. It dismantles the traditional absolute reliance on monthly primary health center visits. This effectively transforms growth monitoring into a continuous, daily household tracking routine. These results strongly align with a prominent cluster-randomized trial in rural China. Educational interventions delivered by primary workers improved caregivers' overall feeding practices significantly (Shi et al., 2010; Zhang et al., 2012). Making mothers active agents fosters a strong sense of personal ownership. They develop immediate responsiveness to early signs of growth faltering or delays. This proactive engagement mitigates severe developmental delays very effectively at the grassroots level (Neherta & Novita, 2022; Nugroho & Lestari, 2023).

Optimizing Posyandu cadres as active community facilitators proved highly instrumental. They successfully created a sustainable and localized community health support system. Cadre involvement succeeds largely because of grassroots socio-cultural community dynamics. Local cadres act as trusted peers rather than distant medical authority figures. Their continuous mentoring builds a culturally safe social environment very effectively. This supportive environment heavily reinforces positive behavioral changes among local attending mothers. It mitigates the severe anxiety mothers frequently face regarding daily child feeding. This dynamic is perfectly corroborated by effectiveness trials conducted in rural Kenya. Group-based parenting interventions delivered by paraprofessional volunteers improved child cognitive development (Luoto et al., 2021). Utilizing existing community networks offers immense potential for massive public program scalability. Peer-to-peer learning actively enhances maternal engagement and long-term programmatic compliance (Engle et al., 2011). Trained local cadres deliver high-quality health education very efficiently and consistently. They achieve early risk detection without disrupting ongoing community social structures (Ghodsi et al., 2021).

The implications of these specific findings are profoundly strategic for current programs. They directly influence future public health policy across Indonesia significantly today. The SDIDTK-Isi Piringku model establishes a comprehensive community health paradigm effectively. Mitigating stunting requires a holistic ecosystem, not merely isolated nutritional supplementation. Future public health funding must heavily prioritize local human capacity building. Policymakers should absolutely treat mothers and cadres as primary health human capital. They represent the frontline defense against chronic childhood undernutrition locally. This participatory model provides a highly replicable grassroots intervention prototype for municipalities. It successfully strengthens vital family and community collaboration health networks permanently (Black et al., 2013; Victora et al., 2021). The positive behavioral changes initiated must be continuously nurtured and fully supported. Systemic government support and cross-sectoral collaboration remain fundamentally imperative here. Affordable nutrient-dense foods must remain accessible to all marginalized suburban populations continuously. This explicitly ensures the permanent reduction of regional childhood stunting prevalence (Munir et al., 2022).

Despite the highly positive outcomes achieved, several methodological limitations currently exist here. These distinct limitations must be acknowledged for future academic research improvement. First, the quasi-experimental design lacked a designated control group entirely during implementation. This limits the ability to establish absolute causal inferences definitively and clearly. Without a comparison group, ruling out external confounding factors remains highly challenging. Coincident local health campaigns might have influenced the participants' behaviors and knowledge. Second, the relatively short implementation duration captured only immediate behavioral shifts. The evaluation primarily measured short-term cognitive and attitudinal behavioral changes in mothers.

Stunting is a chronic condition requiring sustained nutritional adequacy over prolonged periods. The timeframe is insufficient to definitively measure long-term child anthropometric changes. We cannot accurately confirm actual height-for-age z-score improvements among children yet (Bimpong et al., 2020). Finally, the evaluation relied heavily on self-reported questionnaires and direct observational checklists. These specific instruments may be susceptible to inherent social desirability reporting bias (Luoto et al., 2021; Shi & Zhang, 2011).

To address these limitations, several practical programmatic recommendations are firmly proposed now. Future community service activities must incorporate extended follow-up evaluation periods. Ideally, programs should strictly monitor participants for twelve to twenty-four months continuously. This rigorously evaluates the sustained retention of proper maternal feeding behaviors. It allows accurate measurement of actual child growth trajectory improvements over time. Furthermore, future interventions should actively engage fathers and other extended family members. Household decision-making regarding daily food is rarely the mother's sole individual responsibility. Paternal involvement is a critical determinant in securing adequate diets for children. Fathers significantly help sustain optimal childcare practices and vital household financial stability (Bimpong et al., 2020; Luoto et al., 2021). Integrating modern digital health technologies could provide an innovative community support platform. Mobile applications can systematically reinforce nutritional education and send daily feeding reminders. They brilliantly allow mothers to track growth charts interactively at home. This crucially maintains continuous engagement outside of physical Posyandu center visits (Hojati & Farhangi, 2024; Kustiawan et al., 2022).

The community-based education model represents a vital practical health breakthrough today. It brilliantly bridges the gap between clinical monitoring and daily household nutrition. The program successfully answered the urgent local need for maternal nutritional literacy. It fostered highly active grassroots participation in preventing child stunting very effectively. Significant improvements in knowledge, attitudes, and practical skills were thoroughly documented here. Empowering the community is the absolute most effective early detection strategy available. This integrated approach provides a highly effective strategy for immediate community empowerment. It stands proudly as a strategic, replicable prototype for various local governments. The progressive model directly supports achieving universal Sustainable Development Goals globally. Local policymakers must formally adopt this participatory mentoring framework very soon. Village governments should adequately fund and integrate it into routine primary healthcare. This actively creates a resilient, nutrition-conscious society safeguarding future generations' cognitive potential. Consistent local application will ultimately eliminate the severe national burden of stunting (Neherta & Novita, 2022; Nugroho & Lestari, 2023; World Health Organization, 2016).

CONCLUSION

The community-based education model developed through the integration of the Stimulation, Detection, and Early Intervention for Growth and Development (SDIDTK) approach with the Isi Piringku nutritional guidelines has proven to be highly effective in addressing the critical need for enhanced maternal nutritional literacy. By successfully shifting the paradigm of childhood stunting prevention from passive health-facility visits to active grassroots participation, this initiative directly achieved its primary objective of improving maternal knowledge, feeding attitudes, and independent growth monitoring capabilities. The fundamental significance of these outcomes lies in the mutual

empowerment of mothers and Posyandu cadres, which successfully cultivated a resilient and supportive community ecosystem capable of promoting optimal child development during the crucial first thousand days of life. To ensure the long-term sustainability of these positive behavioral changes, it is strongly recommended that local governments and policymakers formally adopt this participatory mentoring framework as a strategic, replicable prototype for regional stunting prevention policies. Furthermore, primary healthcare centers should permanently integrate this interactive model into their routine maternal and child health programs. Continuous cross-sectoral collaboration remains vital to guarantee that affordable, nutrient-dense local foods remain consistently accessible to vulnerable families, thereby safeguarding the cognitive and physical potential of future generations and accelerating the achievement of the Sustainable Development Goals.

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