Open Access

Journal of Scientific Insights
E-ISSN: 3062-8571
DOI: https://doi.org/10.69930/jsi.v2i3.363
Research Article

ScienceTech. Group

Vol. 2 (3), 2025
Page: 167-180

Maternal Nutritional Empowerment Through "Isi Piringku" Education: Longitudinal Analysis of Stunting Prevention and Life-Cycle Nutritiona Outcomes (2018-2022 Cohort Study)

Abdul Basit *, **Deasy Arisanty** **

Doctoral Programme in Development Studies, Lambung Mangkurat University, Banjarmasin, South Kalimantan, Indonesia
*Email (corresponding author): basit.promkes@gmail.com
**Email (corresponding author): deasyarisanty@ulm.ac.id.

Abstract. *This study aimed to develop and evaluate an empowerment model for pregnant women using "Isi Piringku" ("My Plate") nutrition education to prevent stunting and improve nutritional outcomes. A longitudinal study involving 2,053 pregnant women in South Kalimantan demonstrated that the "Isi Piringku" intervention positively improved maternal nutritional status and reduced childhood stunting prevalence. Key findings included: 99.27% of participants completed ≥4 antenatal care (ANC) visits, 99.22% delivered at healthcare facilities, and 88.11% adhered to iron-folic acid supplementation. Exclusive breastfeeding at six months was reported in 75.06% of cases. Stunting prevalence in Banjarmasin remained below national targets (8.44% in 2019; 9.55% in 2022). The "Isi Piringku" model proved effective for stunting prevention, offering a framework for designing nutritional interventions and raising awareness among pregnant women and communities. Further research is needed to assess the model's applicability across diverse regions and cultural contexts. These findings may inform stunting prevention programs in other areas.*

Keywords: *Empowerment of pregnant women, Isi Piringku education, stunting prevention, nutritional status, life cycle*

1. Introduction

Stunting represents a critical global public health challenge, with profound implications for children's physical and cognitive development. Globally, an estimated 149.2 million children under five were stunted in 2020, with Asia and sub-Saharan Africa bearing the highest burden (World Health Organization [WHO], 2021). Indonesia faces persistent challenges, as evidenced by a 21.6% national stunting prevalence in 2022, surpassing the WHO's 20% threshold (Ministry of Health of the Republic of Indonesia, 2023). Regional disparities are pronounced: South Kalimantan reported stunting rates of 24.6% (2022) and 24.7% (2023), exceeding national averages (Ministry of Health of the Republic of Indonesia, 2023). These figures underscore the urgent need for targeted interventions, particularly those empowering pregnant women as central actors in stunting prevention.

South Kalimantan exhibits stunting rates surpassing national figures, with regional surveys documenting a prevalence of 24.6% (SSGI, 2022) and 24.7% (SKI, 2023) (Ministry of Health of the Republic of Indonesia, 2020, 2023). This persistent disparity underscores the necessity for multi-sectoral interventions, prioritizing maternal empowerment as central stakeholders in stunting mitigation. Comprehensive investigations are imperative to elucidate region-specific determinants and formulate contextually tailored strategies.

Available online: 14 May 2025

Stunting serves as a biomarker of both child undernutrition and suboptimal maternal health trajectories during the perinatal and postnatal periods. Evidence corroborates that maternal undernutrition prior to and during gestation is a significant predictor of childhood stunting (Black et al., 2013). Preventive measures must commence pre-conception and extend through the first 1,000 days of life—a critical window for mitigating irreversible developmental deficits. Stunting arises from interconnected biological, socioeconomic, and behavioral determinants, with insufficient maternal and infant nutritional intake constituting a principal etiological factor (Black et al., 2013). Targeted maternal empowerment initiatives, particularly those enhancing nutritional literacy, demonstrate efficacy in improving fetal growth, infant health, and early childhood development (Lassi et al., 2016; Victora et al., 2021).

Pregnant women constitute a pivotal demographic in stunting prevention, as maternal nutritional inadequacies during gestation are linked to intrauterine growth restriction, low birth weight (LBW), and heightened neonatal stunting risk (Black et al., 2013). Prenatal nutritional interventions yield intergenerational benefits, influencing long-term health trajectories and human capital development (Ruel & Alderman, 2013). Optimal maternal nutrition underpins fetal development, with deficiencies exacerbating LBW incidence—a key precursor to stunting (Black et al., 2013; Victora et al., 2021). Empowering pregnant women through nutrition literacy initiatives fosters immediate improvements in maternal-infant health and disrupts intergenerational cycles of malnutrition. The Indonesian Ministry of Health's "Isi Piringku" ("My Plate") program, introduced in 2020, supersedes the obsolete "Four Healthy Five Perfect" framework, advocating balanced dietary proportions: 35% carbohydrates, 15% animal/plant proteins, 30% vegetables, and 20% fruits (Ministry of Health, Republic of Indonesia, 2020). This visual guide, coupled with community-led education, psychosocial support, and monitoring by posyandu cadres (health volunteers), promotes sustainable dietary behavior and nutritional awareness (B. Sutrisna et al., 2021). Evidence indicates that such interventions enhance birth outcomes and maternal knowledge, particularly when delivered via structured prenatal classes and individualized counseling (Heryani et al., 2023; Lassi et al., 2016).

Enhancing maternal nutrition during pregnancy extends beyond fetal health, improving breast milk quality, complementary feeding practices, and household dietary patterns (Victora et al., 2021). Strategic investments in maternal education thus represent a critical avenue for mitigating the intergenerational transmission of stunting.

This longitudinal study (2018–2025) employs a mixed-methods approach—anthropometric assessments, structured interviews, and programmatic monitoring—to evaluate the impact of "Isi Piringku" education on stunting prevalence and maternal-child health among 2,053 pregnant women in South Kalimantan. By integrating community-based strategies, the research aims to develop a scalable empowerment model to improve family nutrition and prevent stunting within a life-cycle framework. Anticipated outcomes include actionable insights for national policy and adaptable interventions for high-prevalence regions.

The study underscores the viability of "Isi Piringku" as a tool for systemic change, advocating its integration into public health strategies to address stunting in resource-limited settings. Findings are expected to inform replicable, evidence-based models, aligning with global efforts to eradicate malnutrition through culturally resonant, multi-sectoral approaches.

This study contributes to the advancement of the United Nations Sustainable Development Goals (SDGs), particularly Goal 2 (Zero Hunger) and Goal 3 (Good Health and Well-being), by investigating the impact of nutrition-oriented educational interventions targeted at pregnant women (United Nations, 2024). Specifically, the research addresses the prevention of stunting and supports long-term improvements in maternal and child nutrition within a life-cycle approach. The primary aim of this study is to develop and evaluate an empowerment model based on the "Isi Piringku" nutrition education program as a strategy for stunting prevention and sustainable enhancement of nutritional outcomes. The specific objectives are threefold: (1) to document the baseline implementation of the "Isi Piringku" education initiative and the level of compliance with nine established stunting prevention success indicators among 2,053 pregnant women registered on 18 October 2018; (2) to analyze key maternal and child health parameters, including postnatal child nutritional status, during the 2019 follow-up phase; and (3) to assess the nutritional status of the children born to this cohort who had reached preschool age during the subsequent follow-up conducted in 2022 in Banjarmasin.

2. Methods

This study adopted a quantitative cohort (longitudinal) design to investigate the association between pregnancy- and birth-related factors and child nutritional status, particularly in the context of the implementation of the "Isi Piringku" nutrition education program and a formal commitment declaration involving 2,053 pregnant women.

The cohort consisted of 2,053 participants drawn from 13 districts and municipalities in South Kalimantan, recruited during a regional event held on 18 October 2018. A postnatal follow-up was conducted in 2019 to assess maternal and child health and nutritional outcomes. Descriptive statistical methods were employed to evaluate performance across nine key indicators, namely: (1) Completion of at least four antenatal care (ANC) visits during pregnancy; (2) Consumption of iron and folic acid (IFA) supplements and adherence to a balanced diet in line with the "Isi Piringku" guidelines; (3) Childbirth in a healthcare facility; (4) Early initiation of breastfeeding (EIB) and exclusive breastfeeding for the first six months; (5) Provision of appropriate complementary feeding (MP-ASI) based on the child's developmental stage; (6) Routine monitoring of growth and development at community health posts (posyandu); (7) Completion of the basic immunisation schedule; (8) Continuation of breastfeeding until the child reaches two years of age; (9) Practice of clean and healthy living behaviours (PHBS).

Data collected in 2018 documented the initial implementation of the "Isi Piringku" educational intervention alongside the declaration of the nine stunting prevention indicators. In 2019, follow-up data were gathered to evaluate maternal and child nutritional and health outcomes. A subsequent follow-up was conducted in 2022, focusing on the original cohort in Banjarmasin to assess the health and nutritional status of their now preschool-aged children. Descriptive statistical analysis was employed to examine the impact of the interventions on maternal and child health and nutrition across the life course. The analysis included a review of respondent characteristics and the distribution of the nine stunting prevention indicators. The findings are presented in terms of frequencies, percentages, and mean values.

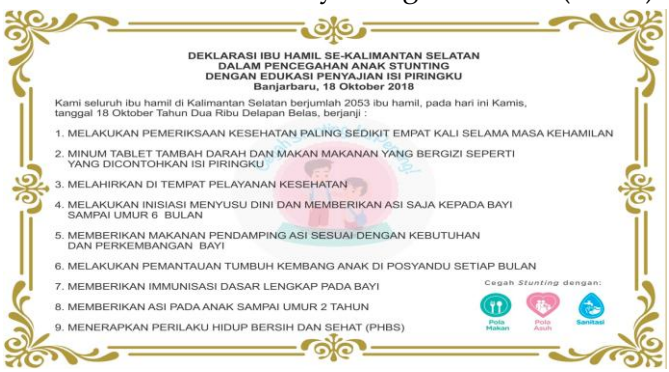
3. Results and Discussion

3.1. Implementation of "Isi Piringku" Nutrition Education

On 18 October 2018, a multisectoral collaboration between the South Kalimantan Provincial Health Office, Department of Marine and Fisheries, and Family Welfare Empowerment Movement Team (TP PKK) launched a large-scale nutrition education intervention targeting 2,053 pregnant women. This program, conducted at the South Kalimantan Provincial Government Secretariat complex in Banjarbaru, achieved national recognition through certification by the Indonesian World Records Museum (MURI) for its unprecedented scale.

The initiative, formally titled "Nutrition Education through Isi Piringku for Pregnant Women," coincided with the 38th World Food Day commemoration. Its primary objective was to enhance nutritional awareness during the critical first 1,000 days of life (HPK) through structured counseling on the "Isi Piringku" balanced diet framework. The intervention emphasized practical application of dietary guidelines to prevent stunting and improve maternal-child health outcomes.

The intervention culminated in a formal "**Stunting Prevention Declaration**" ceremony, during which all 2,053 participating pregnant women collectively committed to adopting nine evidence-based practices for stunting risk reduction. This significant public health initiative received high-level endorsement from multiple stakeholders, including the Indonesian Minister of Health, representatives from the Presidential Staff Office, the Governor of South Kalimantan Province, and the Chairperson of South Kalimantan's Family Welfare Empowerment Movement (TP PKK). The declaration represented a strategic multisectoral effort to address stunting prevention through standardized behavioral commitments, ranging from antenatal care compliance to optimal infant feeding practices, demonstrating an innovative approach to community-based nutritional intervention. The declaration encompassed the following key behavioral indicators: (1) Completion of ≥4 antenatal care (ANC) visits during gestation; (2) Adherence to iron-folic acid (IFA) supplementation protocols and compliance with "Isi Piringku" dietary guidelines; (3) Utilization of accredited health facilities for delivery; (4) Implementation of early initiation of breastfeeding (EIB) followed by six months of exclusive breastfeeding; (5) Provision of developmentally appropriate complementary foods (MP-ASI); (6) Regular growth monitoring through monthly visits to integrated health posts (posyandu); (7) Completion of all scheduled childhood immunizations; (8) Sustained breastfeeding practices until 24 months postpartum; (9) Consistent application of clean and healthy living behaviors (PHBS).


DEKLARASI IBU HAMIL SE-KALIMANTAN SELATAN
DALAM PENCEGAHAN ANAK STUNTING
DENGAN EDUKASI PENYAJIAN ISI PIRINGKU
Banjarbaru, 18 Oktober 2018

Kami seluruh ibu hamil di Kalimantan Selatan berjumlah 2053 ibu hamil, pada hari ini Kamis, tanggal 18 Oktober Tahun Dua Ribu Delapan Belas, berjanji :

1. MELAKUKAN PEMERIKSAAN KESEHATAN PALING SEDIKIT EMPAT KALI SELAMA MASA KEHAMILAN
2. MINUM TABLET TAMBAH DARAH DAN MAKAN MAKANAN YANG BERGIZI SEPERTI YANG DICONTOHKAN ISI PIRINGKU
3. MELAHIRKAN DI TEMPAT PELAYANAN KESEHATAN
4. MELAKUKAN INISIASI MENYUSU DINI DAN MEMBERIKAN ASI SAJA KEPADA BAYI SAMPAI UMUR 6 BULAN
5. MEMBERIKAN MAKANAN PENDAMPING ASI SESUAI DENGAN KEBUTUHAN DAN PERKEMBANGAN BAYI
6. MELAKUKAN PEMANTAUAN TUMBUH KEMBANG ANAK DI POSYANDU SETIAP BULAN
7. MEMBERIKAN IMMUNISASI DASAR LENGKAP PADA BAYI
8. MEMBERIKAN ASI PADA ANAK SAMPAI UMUR 2 TAHUN
9. MENERAPKAN PERILAKU HIDUP BERSIH DAN SEHAT (PHBS)

Cegah *Stunting* dengan:

Figure 1. Contents of the Maternal Declaration Consisting of Nine Indicators for Stunting Prevention

(a) (b)

(c) (d)

Figure 2. (a) All 2,053 Pregnant Women; (b) Education Using the Maternity Health Book (KIA); (c) A Representative Pregnant Woman Reading the Declaration; and (d) All Pregnant Women Consuming Examples of My Plate “Isi Piringku” Food Portions

3.2. Evaluation of Maternal and Child Nutrition and Health Status in 2019

The "My Plate" education was implemented in 2018, and the evaluation was conducted in 2019 based on the indicators declared by all pregnant women as follows:

Table 1. Perinatal outcomes data through December 2019: Deliveries completed, infant deaths, and total live births.

No.	Regency/City	Total Maternal Pregnancy 2018	Maternal Childbirth December 2019		Total Infant Mortality Rate	Total Recorded Deliveries Completed By December 2019	
			n	%	n	n	%
1	Banjarmasin	350	350	100,00	1	349	99,71
2	HST	100	100	100,00	3	97	97,00
3	Tabalong	50	50	100,00	0	50	100,00
4	HSS	80	80	100,00	2	78	97,50
5	Banjar	350	350	100,00	2	348	99,43
6	HSU	50	50	100,00	0	50	100,00
7	Balangan	101	101	100,00	0	101	100,00
8	Tanbu	50	50	100,00	0	50	100,00
9	Kotabaru	50	50	100,00	1	49	98,00
10	Batola	101	101	100,00	2	99	98,02
11	Tapin	100	100	100,00	1	99	99,00
12	Tala	220	220	100,00	1	219	99,55
13	Banjarbaru	270	270	100,00	1	269	99,63
14	SKPD	181	181	100,00	2	179	98,90
	Pronvince	**2.053**	**2.053**	**100,00**	**16**	**2037**	**99,22**

Source: Processed data, December 2019

Table 2. Percentage of ANC, Iron Supplement Intake, and Deliveries at Health Facilities

No.	Regency/City	Total Maternal Pregnancy 2018	Antenatal care (ANC) visits in 2018/2019 (Four times)		Iron and Folic Acid Tablet Intake		Childbirth in a Health Facility	
			n	%	n	%	n	%
1	Banjarmasin	350	350	100,00	314	89,71	350	100,00
2	HST	100	94	94,00	92	92,00	98	98,00
3	Tabalong	50	49	98,00	45	90,00	50	100,00
4	HSS	80	79	98,75	71	88,75	80	100,00
5	Banjar	350	348	99,43	269	76,86	344	98,29
6	HSU	50	49	98,00	48	96,00	50	100,00
7	Balangan	101	100	99,01	97	96,04	99	98,02
8	Tanbu	50	50	100,00	47	94,00	47	94,00
9	Kotabaru	50	49	98,00	44	88,00	49	98,00
10	Batola	101	100	99,01	75	74,26	100	99,01
11	Tapin	100	99	99,00	91	91,00	99	99,00
12	Tala	220	220	100,00	201	91,36	220	100,00
13	Banjarbaru	270	270	100,00	259	95,93	270	100,00
14	SKPD	181	181	100,00	156	86,19	181	100,00
	Pronvince	**2.053**	**2.038**	**99,27**	**1.809**	**88,11**	**2037**	**99,22**

Source: Processed data, December 2019

Table 1 presents data indicating that a total of 2,053 pregnant women from 13 districts and municipalities participated in the "Isi Piringku" (My Plate) nutrition education initiative in 2018. By December 2019, all participants had delivered their babies, representing a 100% birth outcome rate. Nevertheless, 16 cases of infant mortality were recorded, attributed to factors such as low birth weight (LBW), heart valve defects, intrauterine fetal death (IUFD), congenital anomalies observed at four days post-delivery, hemorrhage, and abortion. Consequently, the health and nutritional status of 2,037 infants (99.22%) remained available for continued monitoring.

Table 2 presents the findings of maternal health monitoring conducted in 2019. A total of 99.27% of pregnant women completed the recommended four antenatal care (ANC) visits, and nearly all participants engaged with the "Isi Piringku" (My Plate) nutrition education program. Additionally, 99.22% of the women delivered in healthcare facilities, reflecting high utilization of institutional delivery services. Iron and folic acid supplementation adherence was observed in 88.11% of pregnant women, equivalent to 1,809 individuals. This supplementation is essential in preventing anemia during pregnancy, thereby reducing the risk of hemorrhage, which remains one of the primary causes of maternal mortality. Notably, no maternal deaths were reported during the antepartum or postpartum periods.

Table 3 presents data indicating that by December 2019, a total of 2,037 infants were being monitored. The proportion of mothers who practiced exclusive breastfeeding for the first six months reached 75.06%, nearing the national and provincial target of 80%. Among the 13 participating districts and municipalities, three—Tanah Laut District, Banjarbaru City, and the Provincial SKPD—surpassed the 80% benchmark. The remaining regions reported exclusive breastfeeding rates ranging from 64.08% to 76.00%.

Table 3. Coverage of Exclusive Breastfeeding, Complementary Feeding (MP-ASI), Growth and Development Monitoring, and Completion of Basic Immunization Among Infants.

No	Regency/ City	Number of Infants Sd Dec 2019	Exclusive breastfeeding		Complementary Foods (MP-ASI)		Growth and Development Monitoring		Complete Basic Immunization (IDL)	
			n	%	n	%	n	%	n	%
1	Banjarmasin	349	258	73,93	258	73,93	348	99,43	348	99,43
2	HST	97	72	74,23	72	74,23	96	96,00	96	96,00
3	Tabalong	50	36	72,00	36	72,00	49	98,00	49	98,00
4	HSS	78	59	75,64	59	75,64	78	97,50	76	95,00
5	Banjar	348	223	64,08	223	64,08	346	98,86	319	91,14
6	HSU	50	37	74,00	37	74,00	49	98,00	49	98,00
7	Balangan	101	76	75,25	76	75,25	101	100,00	99	98,02
8	Tanbu	50	38	76,00	38	76,00	47	94,00	38	76,00
9	Kotabaru	49	34	69,39	34	69,39	47	94,00	38	76,00
10	Batola	99	65	65,66	65	65,66	99	98,02	96	95,05
11	Tapin	99	75	75,76	75	75,76	98	98,00	98	98,00
12	Tala	219	177	80,82	177	80,82	219	99,55	217	98,64
13	Banjarbaru	269	235	87,36	235	87,36	268	99,26	268	99,26
14	SKPD	179	144	80,45	144	80,45	179	98,59	173	95,58
	Pronvince	**2.037**	**1.529**	**75,06**	**1.529**	**75,06**	**2.024**	**98,59**	**1964**	**95,66**

Source: Processed data, December 2019

Table 4. Percentage of Infants Still Breastfed Until 2 Years, PHBS, and Stunting

No	Regency/ City	Total Maternal Pregnancy 2018	Number of Infants Sd Dec 2019	Still breastfeeding up to 2 years old		Practice Clean and Healthy Living Behavior (PHBS)		Stunting	
				n	%	n	%	n	%
1	Banjarmasin	350	349	258	73,93	349	99,71	29	8,31
2	HST	100	97	72	74,23	97	97,00	8	8,25
3	Tabalong	50	50	36	72,00	47	94,00	5	9,80
4	HSS	80	78	59	75,64	78	97,50	5	6,41
5	Banjar	350	348	223	64,08	285	81,43	32	9,20
6	HSU	50	50	37	74,00	41	82,00	4	8,00
7	Balangan	101	101	76	75,25	97	96,04	8	7,92
8	Tanbu	50	50	38	76,00	46	92,00	4	8,00
9	Kotabaru	50	49	34	69,39	44	88,00	5	10,20
10	Batola	101	99	65	65,66	72	71,29	10	10,10
11	Tapin	100	99	75	75,76	94	94,00	9	9,09
12	Tala	220	219	177	80,82	208	94,55	18	8,22
13	Banjarbaru	270	269	235	87,36	268	99,26	19	7,06
14	SKPD	181	179	144	80,45	175	96,69	16	8,94
	Pronvince	2.053	2.037	1.529	75,06	1.901	92,60	172	8,44

Source: Processed data, December 2019

Table 4 illustrates the prevalence of stunting in South Kalimantan, based on monitoring data from 2,053 mothers who gave birth as part of the 2019 stunting prevention and First 1,000 Days of Life (1,000 HPK) program. The overall stunting prevalence was recorded at 8.44%. Six districts, along with the Provincial SKPD, reported rates exceeding the provincial average. These included Tabalong, Banjar, Kotabaru, Barito Kuala, Tapin, and the Provincial SKPD.

3.3. Evaluation of Child Nutritional Status in 2022

In 2022, a follow-up evaluation was conducted in Banjarmasin involving the cohort of pregnant women who had participated in the “Isi Piringku” ("My Plate") nutrition education program in 2018. This event provided an opportunity for a reunion and an assessment of the growth and nutritional status of their now preschool-aged children. Among the 178 children evaluated, 9.55% (17 children) were identified as stunted. At this stage of development, the children were able to stand unaided, allowing for more accurate height-for-age measurements. In contrast, the 2019 evaluation, which included 349 infants, identified 8.31% (29 infants) as stunted. These results highlight the continued need for targeted and sensitive interventions within stunting prevention programs.

Despite the observed stunting cases, the prevalence rates in both 2019 and 2022 remained significantly below the national target of under 20%. This indicates that the empowerment model utilized through the “Isi Piringku” educational program centered on the application of nine essential stunting prevention indicators has proven to be an effective intervention strategy for reducing stunting. However, the need for complementary and sensitive interventions remains crucial in achieving sustained improvements in stunting outcomes.

(a) (b)

(c) (d)

Figure 3. (a, b) Child of a former pregnant woman participant in the "My Plate" education program, 2018; (c) Head of the Provincial Health Office of South Kalimantan delivering a speech; (d) Example of the ongoing implementation of the "My Plate" education program.

Figure 4. Some children of pregnant women who participated in the "My Plate" education program in 2018. The documentation was taken in 2022.

The effectiveness of educational interventions is largely contingent upon mothers' capacity to comprehend, internalize, and consistently implement the information within the domestic setting. However, understanding and application of the "My Plate" dietary guidelines remain limited, particularly among pregnant women in regions with high stunting prevalence. Heryani et al. (2023) reported that only 32% of pregnant women in rural areas demonstrated comprehensive understanding of the educational material. Key barriers to implementation include unequal access to information, low nutritional literacy, and inadequate food availability. The empowerment process is not merely an act of disseminating information; rather, it aims to foster a fundamental behavioral and cognitive transformation in how pregnant women perceive and prioritize balanced nutrition. Enhanced nutritional literacy contributes to improved maternal behaviors, including breastfeeding, the introduction of complementary feeding (MP-ASI), and general childcare practices. These behavioral changes serve as a foundation for sustainable stunting prevention efforts (Pelto et al., 2016).

A longitudinal study conducted between 2018 and 2021 observed a decline in anemia prevalence among pregnant women from 37% to 24%, accompanied by a 40% increase in nutrition knowledge following the implementation of the "My Plate" intervention (Rahmawati et al., 2022). Furthermore, an increase in mean birth weight from 2,650 grams to

2,890 grams was recorded, underscoring the importance of birth weight as an early predictor of stunting risk (Kozuki, 2015). The intervention also engaged family members—especially husbands and mothers-in-law—who are influential in household decision-making. Literature has consistently shown that family support significantly enhances the effectiveness of maternal nutrition programs (Lassi et al., 2016). The overall nutritional status of children whose mothers participated in the "My Plate" program in both 2019 and 2022 was reported to be favorable, suggesting that mothers were well-informed and actively prioritized their children's health and well-being.

This study is particularly significant in light of the common challenge of educational interventions failing to achieve long-term sustainability. Hence, there is a need for an empowerment framework that extends beyond knowledge dissemination to strengthen mothers' capacities, motivation, and environmental support in altering household consumption behaviors. Empowerment, in this context, encompasses cognitive, emotional, and practical decision-making capacities regarding daily nutritional practices (A. Sutrisna et al., 2021). Pregnant women were selected as the primary target group due to their pivotal role as caregivers for future generations. Their active participation in the 2018 "My Plate" sessions stemmed from a desire to safeguard both their health and that of their children.

Additionally, this research supports existing evidence advocating for the integration of local wisdom in nutrition education. This includes the promotion of locally available foods such as freshwater fish, wild vegetables, and other traditional ingredients to support sustainable and balanced nutrition practices. Azrimaidaliza et al. (2022) demonstrated that culturally adapted local foods aligned with "My Plate" recommendations were more acceptable and accessible to pregnant women. The empowerment approach also improved access to affordable nutritious foods, including fish, tempeh, moringa leaves, and seasonal fruits (Widodo et al., 2023). The theoretical framework aligns with both the Health Belief Model (HBM) and Social Cognitive Theory (Bandura, 1997), which emphasize the importance of risk perception and self-efficacy in health-related decision-making. Other findings include a reduction in underweight prevalence among pregnant women from 22% to 11%, and improvements in both energy and protein adequacy as measured by weekly food recall surveys (Mulyani, 2024). Community-based interventions have demonstrated superior sustainability compared to facility-based approaches, largely due to the influence of social networks, community health cadres, and local cultural practices (Bhutta et al., 2013). Additional research has shown that women who receive nutrition education during pregnancy are more likely to exclusively breastfeed, delay the introduction of complementary feeding, and make informed decisions regarding family nutrition. These behaviors contribute to reduced stunting and improved early childhood growth (Bhutta et al., 2013; Darlis et al., 2022).

Adopting a life-cycle approach, the benefits of these interventions are projected to extend beyond improved child nutrition, impacting maternal well-being, breast milk quality, and readiness for subsequent pregnancies. Life-cycle research highlights the intergenerational transfer of knowledge: children raised in households with sound nutrition practices are more likely to adopt and continue these behaviors into adulthood (Victora et al., 2021). In this study, the "My Plate" intervention initiated in 2018 was followed by maternal and child health evaluations in 2019. Specifically, in Banjarmasin City, findings demonstrated that empowering pregnant women through the "My Plate" model positively influenced maternal and child nutrition indicators. Nearly all women completed at least four antenatal care visits

annually; over 90% adhered to iron supplementation regimens, and the majority delivered in healthcare facilities. For infants, 80% were exclusively breastfed for six months, complementary feeding commenced at the appropriate time, and nearly all children attended integrated health posts (Posyandu). Immunization coverage surpassed 95%, and 92% of pregnant women practiced clean and healthy living behaviors. Among their children, 172 cases of stunting were recorded, representing 8.44%.

By the conclusion of this research in 2025, the study aims to generate robust, representative data to support the development of a localized, sustainable stunting prevention model centered on the empowerment of pregnant women through "My Plate" education. The success of this program is contingent on consistency, family engagement, and active support from both health institutions and community stakeholders. Beyond its physiological outcomes, nutrition education has important psychosocial benefits. Empowered mothers, who are confident and well-supported, make better dietary decisions and experience reduced stress during pregnancy—factors associated with lower risks of complications (Lassi et al., 2016).

Theoretical frameworks on empowerment and behavior change offer significant implications for local food-based nutrition education. Empowerment theory posits that individuals or groups gain the ability to access knowledge, control resources, and make health-promoting decisions (Narayan, 2015). In this context, educating pregnant women about the nutritional value of locally available high-protein foods seeks to enhance their dietary practices and prevent negative maternal-child health outcomes. According to the Transtheoretical Model of Behavior Change (Prochaska & DiClemente, 2015), behavioral transformation progresses through stages: awareness, contemplation, preparation, action, and maintenance. Therefore, phased and contextually appropriate educational interventions may be most effective in altering dietary behaviors among pregnant women. Providing targeted information about local, nutrient-dense foods can empower women to adopt healthier consumption habits for themselves and their families (Sharma et al., 2015). Evidence suggests that participatory, group-based education models can expedite empowerment and behavior change processes, particularly when implemented through community-level programs (Terry & Wall, 2015).

Food Access Theory underscores the critical relationship between access to nutritious foods and public health outcomes. Thus, improving pregnant women's access to affordable local high-protein foods—alongside nutritional education—can significantly enhance maternal and child nutritional security. Sustainable Nutrition Theory promotes the use of local food resources to meet nutritional needs while supporting environmental and economic sustainability. Educational approaches based on this theory advocate for the consumption of regionally sourced, protein-rich foods that are cost-effective and culturally acceptable.

Lastly, the Social Determinants of Health framework emphasizes how socioeconomic status and social environments shape health and nutrition outcomes. This theory is particularly relevant for designing empowerment interventions that address structural challenges, such as poverty, food insecurity, and knowledge deficits.

Conclusions

This study demonstrates the efficacy of the "My Plate" educational empowerment model in stunting prevention and enhancement of maternal-child nutritional outcomes. The intervention significantly improved participants' nutritional literacy, leading to measurable

advancements in both maternal health indicators and child growth parameters. Implementation of the "My Plate" program effectively elevated awareness of balanced nutrition among pregnant women, correlating with improved health behaviors and dietary practices. These results position the "My Plate" empowerment model as a viable, evidence-based strategy for addressing malnutrition across the life-course continuum. Recommendations: (1) Program Expansion: Adapt and implement this model in diverse regional settings to scale up nutritional awareness among antenatal populations; (2)Policy Prioritization: Integrate maternal empowerment initiatives as a cornerstone of stunting prevention programs within life-cycle nutrition interventions; (3) Health System Integration: Incorporate "My Plate" education into standardized antenatal care protocols to institutionalize nutritional awareness; (4) Longitudinal Research: Conduct comparative studies to assess the model's sustained effectiveness across varying socioeconomic and cultural contexts; (5) Life-Course Monitoring: Utilize these findings as baseline data for longitudinal nutritional surveillance (2018–2033), tracking cohorts from pregnancy through adolescence to evaluate intervention impacts during Indonesia's demographic transition.

Funding

This study (2018–2022) received financial support from the Health Promotion and Community Empowerment Program under the South Kalimantan Provincial Health Department. However, the manuscript preparation was independently funded by the author in their capacity as a student researcher.

Acknowledgments

The authors extend their sincere appreciation to the 2,053 pregnant women across 13 districts/cities in South Kalimantan who participated in this study. We also acknowledge the invaluable support of the Provincial and District/City Governments, which enabled this initiative to become a pioneering model for stunting prevention through maternal empowerment in South Kalimantan, as outlined in the 2018 declaration.

Conflicts of Interest

The authors affirm that no competing interests exist regarding this research. Furthermore, the funding entities were not involved in any aspect of the study design, data acquisition and analysis, manuscript preparation, or publication decisions.

References

Azrimaidaliza, Femelia, W., Nur, N. C., & Putri, R. (2022). Mencegah Stunting Melalui Edukasi Gizi Seimbang pada Ibu Hamil dan Ibu Balita di Puskesmas Lapai. *Panrita Abdi - Jurnal Pengabdian Pada Masyarakat*, *6*(4), 934–943.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. H Freeman/Times Books/ Henry Holt & Co.

Bhutta, Z. A., Das, J. K., Rizvi, A., Gaffey, M. F., Walker, N., Horton, S., Webb, P., Lartey, A., & Black, R. E. (2013). Evidence-based interventions for improvement of maternal and child nutrition: What can be done and at what cost? In *The Lancet* (Vol. 382, Issue 9890, pp. 452–477). Elsevier B.V. https://doi.org/10.1016/S0140-6736(13)60996-4

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., De Onis, M., Ezzati, M., Grantham-Mcgregor, S., Katz, J., Martorell, R., & Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. In *The Lancet* (Vol. 382, Issue 9890, pp. 427–451). Elsevier B.V. https://doi.org/10.1016/S0140-6736(13)60937-X

Darlis, I., Rusnita, R., & Khasanah, U. (2022). Pemberdayaan Masyarakat dalam Penanggulangan Stunting. *Window of Community Dedication Journal*, *6*(1), 45–53.

Heryani, H., Endang Purwati, A., Setiawan, H., Firmansyah, A., Solihah, R., & Heryani Emai, H. (2023). Edukasi Isi Piringku sebagai Upaya Pencegahan Stunting. *Kolaborasi: Jurnal Pengabdian Masyarakat*, *3*(2), 139–144. https://doi.org/https://doi.org/10.53803/kolaborasi.v3i2.241

Kementerian Kesehatan Republik Indonesia. (2020). *Pedoman Gizi Seimbang: Isi Piringku untuk Semua Umur*. Direktorat Jenderal Kesehatan Masyarakat.

Kementerian Kesehatan Republik Indonesia. (2023). *Laporan Nasional Survei Status Gizi Indonesia (SSGI) Tahun 2022*. Badan Kebijakan Pembangunan Kesehatan.

Kozuki. (2015). The association between birthweight and stunting in children under 5 years old. *Journal of Nutrition*, *145*(10), 2211–2218.

Lassi, Z. S., Das, J. K., Zahid, G., Imdad, A., & Bhutta, Z. A. (2016). Impact of Education and Empowerment for Maternal and Child Health: A Systematic Review and Meta-Analysis. *Reproductive Health*, *13*(1), 1–17.

Mulyani. (2024). Pengaruh Intervensi Gizi terhadap Status Gizi Ibu Hamil dan Hasil Kehamilan. *Jurnal Kesehatan Reproduksi*, *12*(1), 1–8.

Narayan, D. (2015). Conceptualizing Empowerment and Its Application in Practice. *World Bank Policy Research Working Paper*.

Pelto, G. H., Martin, S. L., & van Liere, M. (2016). Approaches to Improve Nutrition: Lessons from the POSHAN Initiative. *Maternal & Child Nutrition*, *12*(51), 95–112.

Rahmawati, E., Mulyani, T., & Widodo, W. (2022). Community-Based Nutrition Education to Improve Maternal Knowledge. *Public Health Nutrition Journal*, *25*(7), 1101–1109.

Ruel, M. T., & Alderman, H. (2013). Nutrition-sensitive interventions and programmes: How can they help to accelerate progress in improving maternal and child nutrition? In *The Lancet* (Vol. 382, Issue 9891, pp. 536–551). Elsevier B.V. https://doi.org/10.1016/S0140-6736(13)60843-0

Sharma, S., Chander, M., & Thakur, R. (2015). Impact of Community-based Nutrition Education on Nutritional Status and Feeding Practices Among Pregnant Women. *Public Health Nutrition*, *18*(7), 1223–1230.

Sutrisna, A., Darmayanti, T., & Wulandari, A. (2021). Model Pemberdayaan Ibu Hamil Berbasis Komunitas dalam Pencegahan Stunting di Daerah Tertinggal. *Jurnal Gizi Dan Pemberdayaan Masyarakat*, *9*(2), 85–92. https://doi.org/https://doi.org/10.21109/kesmas.v9i2.4122

Sutrisna, B., Wulandari, E., & Nasution, A. (2021). *Isi Piringku Intervention in Rural Indonesia: Knowledge, Behavior, and Maternal Health*.

Terry, M. A., & Wall, M. A. (2015). Promoting Behavioral Change in Maternal Nutrition through Community Engagement. *Journal of Nutritional Education and Behavior*, *47*(6), 509–516.

United Nations. (2024). *The Sustainable Development Goals Report 2024*.

Victora, C. G., Christian, P., Vidaletti, L. P., Gatica-Domínguez, G., Menon, P., & Black, R. E. (2021). Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda. In *The Lancet* (Vol. 397, Issue 10282, pp. 1388–1399). Elsevier B.V. https://doi.org/10.1016/S0140-6736(21)00394-9

Widodo, W., Mulyani, T., & Rahmawati, E. (2023). Edukasi Gizi Berbasis Lokal dalam Pencegahan Stunting. *Global Nutrition Journal*, *11*(1), 77–85.

World Health Organization. (2021). *Levels and trends in child malnutrition: UNICEF/WHO/World Bank Joint Child Malnutrition Estimates*.