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FAMILY PREPARATION FOR A FUTURE WITHOUT STUNTING

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Abstract

Stunting is a condition in which children under five years of age fail to achieve optimal growth as a result of chronic inadequate nutritional intake. As a consequence, their height is significantly below the average for their age group. This condition negatively affects both physical and cognitive development, increases the risk of chronic diseases later in life, and ultimately reduces the quality of a nation's human resources. In Indonesia, stunting remains a major public health concern, influenced by multiple factors including maternal nutritional status, maternal height, limited access to adequate antenatal care (ANC), low birth weight (LBW), and short birth intervals. Adequate maternal nutrition is particularly crucial, as it has a direct impact on fetal growth and development. On July 7, 2025, pregnant women and women of reproductive age in RW 07, Tanah Tinggi, Johar Baru District, participated in a health education program aimed to strengthen family knowledge about stunting, so it can be prevented in children both now and in the future. The activity consisted of a pre-test assessment, followed by the distribution of educational topics covering the definition, prevalence, causes, consequences, and preventive strategies related to stunting. Additional topics addressed maternal nutrition, danger signs in pregnancy, and risk factors that may compromise fetal development. A post-test was administered afterward to evaluate the improvement in participants' knowledge. The evaluation demonstrated a substantial increase in knowledge. The average score improved from 5.4 on the pre-test to 9.6 on the post-test. These findings indicate that health education is effective in enhancing the understanding of pregnant women and women of reproductive age regarding stunting prevention and maternal health. Sustained and comprehensive educational interventions are expected to contribute significantly to national efforts to reduce stunting prevalence and support the development of healthier future generations in Indonesia.

Keywords: Stunting, Maternal Nutrition, Health Education, Prevention

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INTRODUCTION

Stunting represents a chronic impairment in children's growth and development under five years old, resulting in height for age below -2 standard deviations from WHO growth standards, primarily due to prolonged malnutrition[1]. The Indonesian Ministry of Health describes stunting, as a condition where toddlers are shorter than the average height for their age group, while the World Health Organization (WHO) classifies it as a form of malnutrition leading to stunted height relative to peers. Malnutrition can originate in utero or immediately post-birth, with visible growth deficits typically emerging after age two, underscoring the critical window of the first 1,000 days of life from conception to a child's second birthday[2].

Indonesia's national stunting prevalence declined to 19.8% in 2024 from 21.5% in 2023, according to the Indonesian Nutritional Status Survey (SSGI), equating to about 4.48 million affected children under five. This progress exceeded the 2024 target of 20.1% set by BAPPENAS, though rates remain high in provinces like West Java and Central Java. The decline reflects multisectoral efforts, advancing toward the 2025 goal of 18.8%, 14.2% by 2029 under the National Medium-Term Development Plan (RPJMN), and 5% by 2045 per the National Long-Term Development Plan (RPJPN) [3–5]

Stunting disrupts physical growth, cognitive development, productivity, and immune function, heightening disease susceptibility and generating substantial economic losses estimated at 2-3% of GDP annually through diminished human capital. Affected children endure lifelong deficits, such as IQ reductions of 10-15 points, lower school attainment, and 20% decreased adult earnings, alongside elevated mortality risks up to fivefold in early years. In Indonesia, this threatens the "Golden Generation" vision for 2045, as stunted individuals contribute less to innovation, workforce efficiency, and national competitiveness, positioning children as vital assets for advanced development [6–9].

Maternal factors like short stature, poor nutrition preconception and during pregnancy, low education, and anemia strongly predict stunting via intrauterine growth restriction. Inadequate antenatal care (ANC), low birth weight (LBW), short birth length, multiparity (>3 children), and non-exclusive breastfeeding amplify risks. Nutritional problems must be addressed as early as possible, beginning from the fetal period, as maternal nutritional status directly influences fetal growth and development. Household, socioeconomic conditions, and limited access to healthcare further exacerbate vulnerability, while maternal nutritional knowledge plays a critical role in shaping dietary practices during pregnancy [10–13]

Nutritional deficiencies in early life have long-term consequences, including Restricted Fetal Growth (RFG), Low Birth Weight (LBW), short stature, thinness, impaired immune function, and increased mortality risk (14). Maternal nutritional status is an important indicator of whether households have adequate access to food. Pregnancy is a period of increased metabolic demand; when a pregnant woman’s dietary intake does not meet physiological requirements, the body must compensate for these deficits. As such, pregnant women require additional energy and nutrients to support fetal growth and development, enlargement of reproductive organs, and necessary physiological and metabolic adaptations. Inadequate intake of essential nutrients during pregnancy may therefore lead to abnormal fetal development[15,16].

Nutritional interventions must target the fetal period, as maternal status directly shapes fetal growth via placental nutrient transfer. Household poverty, food insecurity (affecting 15.7% of families), and rural healthcare gaps compound vulnerabilities, with maternal

knowledge deficits leading to suboptimal diets high in rice but low in protein, vitamins, and minerals. Early deficiencies precipitate restricted RFG, LBW, subsequent short stature, wasting, weakened immunity, and mortality risks doubling in stunted cohorts [8–11]

Pregnancy elevates energy needs by 340 kcal/day in the second trimester and 450 kcal/day in the third trimester, plus 25-50 g protein and micronutrients like iron (27 mg/day) and calcium (1,000 mg/day). Deficient intake triggers maternal fat mobilization over fetal prioritization, yielding abnormal development such as neural tube defects or organ undergrowth. Maternal nutritional status signals community food access, undernourished mothers (BMI <18.5, 17% prevalence) perpetuate intergenerational cycles, as their shorter stature impairs future pregnancies [8–11].

METHOD

This community service initiative was designed and implemented through a series of structured phases to ensure that the activities were conducted systematically, effectively, and in alignment with the needs of the target population. The program sought to strengthen the knowledge and awareness of pregnant women, women of reproductive age, reproductive age couples, and other member of family regarding maternal nutrition, pregnancy health, parenting, and stunting prevention. A comprehensive and participatory approach was employed to maximize community engagement and improve learning outcomes.

The initiative began with an extensive planning phase, which served as the foundation for all subsequent activities. This phase included several key components: initial data collection, preliminary coordination with local community leaders, development of a formal proposal, agreement on program timelines, preparation of educational materials, and final scheduling of outreach activities. Data collection involved gathering information on the demographic profile of the target population and the predominant maternal and child health issues within RW 007, Tanah Tinggi Village, Johar Baru District. These data were crucial in determining the thematic focus of the program, particularly the emphasis on nutrition, pregnancy health risks, and stunting.

Preliminary coordination involved discussions with community representatives, including neighborhood leaders and cadres, to ensure that the activities aligned with local needs and to facilitate participant recruitment. Detailed proposal was prepared outlining the objectives, expected outcomes, timeline, methodology, and resource requirements. Educational materials, including PowerPoint presentations, leaflets, and assessment tools, were prepared in advance to ensure consistency and accuracy of health information. The planning phase commenced on June 24, 2025, providing an adequate preparation period prior to implementation.

The program targeted a total of 25 participants, comprising pregnant women, women of reproductive age, reproductiveage couples, and other family member. These groups were selected due to evidence that maternal nutritional status, parental knowledge, and household decision making critically influence child health outcomes, including stunting prevention. Engaging couples fosters shared responsibility for family nutrition and health practices, enhancing intervention efficacy.

Opening Activities

The implementation phase began with opening activities that set the tone for the program. Upon arrival, participants were asked to complete an attendance list, which served not only as a record of participation but also as a mechanism for collecting preliminary demographic data. The facilitator initiated the session with greetings and expressions of appreciation for the participants' willingness to attend. A brief introduction to the program was provided, outlining the purpose of the initiative, the sequence of planned activities, and the instructional media that would be used throughout the session.

A pre-test assessment was then administered through a Google Form link displayed on a PowerPoint slide. The pre-test functioned as an essential baseline measurement to assess the participants' initial level of knowledge related to maternal nutrition, pregnancy health risks, parenting practices, and stunting. Instructions on how to complete the pre-test were clearly communicated, ensuring that participants understood the process. The use of digital assessment tools facilitated efficient data collection and allowed for immediate comparison with post-test results.

Delivery of Educational Materials

The core component of the program was the educational session. The session incorporated evidence-based information, visuals, and practical examples to support understanding. The educational content covered nutrition education, warning signs, and risk factors for pregnant women.

This section emphasized the critical role of nutrition during pregnancy and its direct impact on fetal growth and development. Participants were informed about the types of nutrients essential for maternal and fetal health, the consequences of nutritional deficiencies, and strategies to improve dietary intake within limited household resources. Additionally, the discussion addressed the warning signs of pregnancy, such as severe headaches, bleeding, edema, and decreased fetal movement, which require immediate medical attention. Risk factors, including anemia, infections, teenage pregnancy, and short birth intervals, were also highlighted to promote early detection and prevention.

The second section focused on parenting practices and their influence on child development. The concept of responsive parenting, stimulation for early childhood development, and hygiene practices was introduced. The discussion then transitioned to stunting, covering its definition, causes, long term consequences, and prevention strategies. Stunting was presented as not only a nutritional issue but also a multidimensional problem influenced by environmental sanitation, parenting behaviors, and maternal health.

The presentation was followed by a discussion session. This interactive component enabled participants to seek clarification on complex topics, relate the information to their personal experiences, and address concerns about pregnancy and child health. The facilitator used PowerPoint slides and informational leaflets to reinforce explanations and ensure that key messages were clearly understood.

Closing Activities

The closing activities aimed to evaluate learning outcomes and formally conclude the program. Participants completed a post-test using another Google Form link displayed on the screen. This test was identical in structure to the pre-test, enabling direct comparison of knowledge before and after the educational intervention. The post-test served as a critical indicator of program effectiveness.

RESULTS

The community service event took place on Monday, July 7, 2025, from 9:00 to 12:00 a.m. in the Community Interaction Building, Neighborhood Association (RW 07), Tanah Tinggi, Johar Baru District, attended by 19 pregnant women and women of childbearing age.

The proposed team leader spoke first, and then the midwifery students introduced themselves. Then, participants were told to take a pre-test on Google Forms to see how much they already knew about stunting and maternal health [(17)].

After the pre-test, an icebreaker session was held with penguin exercises to get everyone more involved [(18)] Two students, with the help of a supervisor, gave the presentation, using interactive lecture methods and brainstorming to find out what the participants already knew [(19)].

The topics covered are the definition of stunting, how common it is, what causes it, what it looks like, what it means, how to avoid it, nutrition for pregnant women, warning signs during pregnancy, and risk factors for pregnant women. Participants displayed significant engagement, as evidenced by a question and answer session [(20)]. After the presentation, participants took a test to see how well they understood [(21)]. The results of the assessment were describe into table below:

Table 1. Comparasion score pre-test and post-test

Score	Pre-test	Post-test
Maximum	10	10
Minimum	0	8
Mean	5.4	9.6

The results of the community service activity demonstrate a substantial improvement in participants' knowledge regarding stunting prevention, maternal nutrition, and pregnancy related risk factors. As shown in Table 1, the mean pre-test score of 5.4 increased to 9.6 in the post-test, with the minimum score rising from 0 to 8. This significant increase indicates that the health education intervention was effective in enhancing participants' understanding of the material presented.

This finding aligns with Notoatmodjo's (2014) opinion that health education can increase knowledge and foster more positive attitudes toward health care efforts [(17)]. Furthermore, the measurable increase in knowledge from this activity aligns with research by Mariani, Wulandari and Pertiwi, which found that direct education about stunting can improve pregnant women's understanding of stunting prevention [(22)]. This shows that the outreach program was successful in raising awareness about how to prepare families for stunting [(23)]

The increase in post-test scores reflects the immediate cognitive impact of the educational intervention. Knowledge acquisition is a critical first step in promoting behavior change, particularly in community health contexts. The findings are consistent with the Health Belief Model (HBM), which asserts that increasing individuals' awareness and understanding of a health issue enhances their perceived susceptibility, perceived severity, and their likelihood of adopting preventive behaviors [24,25]

Similarly, by exposing participants to evidence based information about stunting, maternal nutrition, and the risks associated with inadequate prenatal care, the intervention strengthened their health literacy. Literature supports that health literacy directly influences decision making, care seeking behavior, and adherence to recommended maternal and child health practices [26]

The improved knowledge gained through this targeted intervention contributes meaningfully to broader public health outcomes at both individual and population levels. Stunting remains a multifactorial public health challenge in Indonesia, yet maternal knowledge and associated practices consistently emerge as central, modifiable determinants with high leverage potential [11,27]

The Developmental Origins of Health and Disease (DOHaD) framework provides a comprehensive understanding of how maternal nutrition and health behaviors during pregnancy exert long lasting effects on the offspring's health trajectory. According to this framework, the intrauterine environment functions as a critical determinant of immediate birth outcomes and shapes long term physical growth, cognitive development, and metabolic functioning across the life course. Maternal nutritional adequacy, health practices, and exposure to biological or social stressors during gestation influence fetal programming, thereby predisposing children to either optimal development or heightened vulnerability to disease.

Within this context, strengthening maternal knowledge becomes a strategic intervention point for improving both maternal and child health outcomes. By equipping mothers with evidence-based information on nutrition, antenatal care, and risk identification, educational programs help mitigate the adverse pathways described in the DOHaD model. Enhanced maternal knowledge enables healthier behaviors during pregnancy, reducing the likelihood of undernutrition and poor gestational health.

Consequently, this intervention contributes to breaking the well-documented intergenerational cycle of malnutrition, in which inadequate maternal health and nutritional intake lead to low birth weight, followed by childhood stunting, adult short stature, and increased obstetric risks in subsequent pregnancies. By interrupting these sequential vulnerabilities, maternal education not only improves current pregnancy outcomes but also fosters healthier trajectories for future generations. Thus, fortifying maternal knowledge represents a high-impact, strategic intervention point yielding enduring intergenerational benefits for population health [11,28].

CONCLUSION

The community service activity conducted on July 7, 2025, in RW 07, Tanah Tinggi Village, was implemented successfully and received a positive response from participants. The target actively engaged throughout all stages of the activity, including the pre-test, educational session, and post-test assessment.

The evaluation revealed a significant improvement in participants' knowledge. The mean pre-test score of 5.4 increased markedly to 9.6 in the post-test, indicating that the educational content was effectively delivered and well understood.

The educational materials, which covered fundamental concepts of stunting including its definition, causes, consequences, and preventive strategies as well as the importance of adequate maternal nutrition, provided essential information for participants, particularly pregnant women. This emphasis aligns with World Health Organization (WHO) recommendations (2023), which highlight maternal health during the first 1,000 days of life as a decisive factor in preventing stunting.

Overall, this community service activity demonstrated effectiveness in increasing knowledge among pregnant women and women of reproductive age regarding stunting prevention and maternal health. Although the number of participants was relatively limited and no follow-up assessment has yet been conducted to determine changes in long-term behaviors, the results nevertheless indicate that targeted health education can yield meaningful improvements in community understanding. These findings reinforce the importance of sustained health education initiatives as an integral component of broader efforts to reduce stunting and improve maternal and child health outcomes.

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