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INCREASING CAPACITY OF WOMEN AND CADRES TO PREVENT GESTATIONAL DIABETES AND STUNTING AT POSYANDU TERATAI 8 TANGERANG

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ABSTRACT

Stunting and gestational diabetes are critical health issues that need to be addressed among pregnant women and children. The impact of stunting extends beyond the present, affecting the future of children as the younger generation, both in terms of growth and cognitive development, which influences their academic achievements. It is essential to prevent nutritional deficiencies or excesses to address these issues effectively. This initiative aims to empower women of reproductive age and the Posyandu Teratai cadres in Teluknaga Village, Tangerang Regency, in preventing stunting and gestational diabetes. The methods used include health education programs on stunting and gestational diabetes, the Specific, Measurable, Achievable, Rational, and Time (SMART) Self-Homecare method as a guideline for pregnancy preparation, health maintenance during pregnancy, and postnatal care, as well as training on stunting anthropometry and blood glucose and hemoglobin measurements for the cadres. The results of this program showed a significant increase in knowledge among women of reproductive age regarding stunting, gestational diabetes, and the SMART Self-Homecare method ($p<0.001$), and a 100% improvement in the cadres' skills in using stunting anthropometry tools and blood glucose and hemoglobin measuring instruments. The conclusion of this program is that health education and training programs for cadres and women of reproductive age can assist healthcare workers in enhancing the knowledge and skills of the target groups, contributing to the prevention of stunting and gestational diabetes.

Keywords : Empowerment; SMART self-homecare; stunting; gestational diabetes

ABSTRAK

Stunting dan diabetes gestasional menjadi masalah kesehatan yang penting untuk ditangani pada ibu hamil dan anak. Dampak stunting tidak hanya pada masa ini, namun mempengaruhi masa depan anak sebagai generasi muda, baik dari aspek pertumbuhan maupun aspek kognitif dalam pencapaian prestasinya. Faktor nutrisi yang kurang dari kebutuhan atau berlebih dari kebutuhan harus dicegah untuk mengatasi masalah tersebut. Tujuan kegiatan ini adalah untuk memberdayakan wanita usia subur dan kader Posyandu Teratai Desa Teluknaga

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Kabupaten Tangerang dalam pencegahan stunting dan diabetes gestasional. Adapun metode yang digunakan adalah program pendidikan kesehatan mengenai stunting dan diabetes gestasional, metode Specific Measurable Achievable Rational and Time (SMART) Self-Homecare sebagai acuan dalam persiapan kehamilan, pemeliharaan kesehatan saat hamil, dan saat bayi dilahirkan, serta pelatihan antropometri stunting dan pengukuran gula darah dan hemoglobin pada kader. Hasil dari program ini adalah terdapat peningkatan pengetahuan yang signifikan pada wanita usia subur tentang stunting, diabetes gestasional, dan mengenal metode SMART Self-Homecare ($p< 0.001$) dan terdapat 100% peningkatan keterampilan kader dalam penggunaan antropometri stunting dan alat ukur gula darah dan hemoglobin. Kesimpulan program ini adalah bahwa pendidikan kesehatan dan pelatihan pada kader dan wanita usia subur dapat membantu tenaga kesehatan untuk meningkatkan pengetahuan dan keterampilan sasaran sebagai upaya pencegahan stunting dan diabetes gestasional.

***Kata Kunci**: Pemberdayaan; SMART self-homecare; stunting; diabetes gestasional*

INTRODUCTION

Nutritional imbalances in mothers and children have become significant health concerns, both globally and in Indonesia. Many individuals are still unaware that they are at high risk for diabetes (Sukarno et al., 2023). Gestational diabetes and stunting are examples of nutritional imbalances that can have wide-ranging effects, not only on pregnant women but also on the development of children as the next generation (International Diabetes Federation, 2021; Young & Ramakrishnan, 2020).

It is estimated that 4-16.5% of pregnant women worldwide are affected by gestational diabetes (Sartayeva et al., 2022), and previous data indicates that 1.9-3.6% of pregnant women in Indonesia suffer from gestational diabetes (Purnamasari et al., 2014). The impact of gestational diabetes on children includes an increased risk of cardiovascular disease, type 2 diabetes, macrosomia, respiratory infections in infants, attention deficit hyperactivity disorder (ADHD) in childhood, colorectal cancer, and mental disorders in adulthood (Dalrymple et al., 2022; Purnamasari et al., 2014).

Previous studies have reported that gestational diabetes is associated with an increased risk of stunting in children in Bali, Indonesia (Noviyanti et al., 2019). Stunting is defined as growth failure characterized by a height-for-age ratio of less than -2 Z-scores (Kang et al., 2018). Stunting is a major health issue in children, particularly in developing countries (Li et al., 2020). The prevalence of stunting in children in Indonesia is 37-38.8% (Beal et al., 2018; Li et al., 2020). The health impacts of stunting include delayed growth, reduced learning ability, and decreased cognitive function in children (Kang et al., 2018). Additionally, the economic losses caused by stunting amount to 0.89%-3.88% of the Gross Domestic Product (GDP) (Suryana & Azis, 2023).

The United Nations has committed to collaborating with the Indonesian government to achieve the second Sustainable Development Goal (SDG), which aims to end hunger, and the third SDG, which focuses on ensuring good health and well-being for all age groups (SDGs, 2023). Based on the prevalence data on gestational diabetes and stunting previously presented, it is evident that improving health and addressing nutritional imbalances among women of reproductive age and children is crucial to creating an excellent future generation.

Nutritional management for women before and during pregnancy is strongly emphasized to support the health of both the mother and the

child in the future (Young & Ramakrishnan, 2020). However, pregnant women's knowledge of nutrition during pregnancy remains suboptimal (Maulidanita & Zakiyah, 2023), and motivation to prevent stunting is still very low in Indonesia (Mediani et al., 2022). Many pregnant women still perceive stunting as a hereditary disease (Hall et al., 2018). Furthermore, most mothers believe that overweight children are healthy. This indicates the importance of increasing knowledge about nutrition before and during pregnancy and correcting misconceptions related to the complications of nutritional imbalances for mothers and children, especially gestational diabetes and stunting.

Most mothers obtain health information, particularly about stunting, from Posyandu (Integrated Health Post) (West et al., 2018). Posyandu Teratai 8 is an integrated health service center that provides health information to women of reproductive age and pregnant women through routine health programs. Posyandu Teratai 8 is located in Kampung Karawiling RT 2 RW 8, Teluk Naga Village, Teluknaga Subdistrict, Tangerang Regency, with a total membership of 100 women of reproductive age. The majority of members are housewives and entrepreneurs.

Based on a problem survey, 9 young marriages were reported, 11 children were affected by stunting, 17 women had diabetes during pregnancy, 23 women had hypertension during pregnancy, and 2 premature babies were born. Additionally, 100% of Posyandu members were unaware of the importance of maintaining nutritional balance before pregnancy, and they did not know how to detect and prevent gestational diabetes and stunting in children. Given this background, a program is needed to introduce the concept of self-care in health maintenance, specifically regarding diabetes (Sukarno et al., 2024).

SMART Self-Homecare stands for Specific, Measurable, Achievable, Rational, and Time-bound, and is designed as a simple technique for detecting and preventing gestational diabetes and stunting that can be practiced by mothers at home. This technique educates mothers on how to prepare for pregnancy, screen for gestational diabetes, manage nutrition as part of pre-pregnancy planning, maintain health during pregnancy, and detect and prevent stunting in children. This method is based on guidelines from the American Diabetes Association, Indonesian Endocrinology Association, Indonesian Ministry of Health, UNICEF, and other related organizations (American Diabetes Association, 2021; Kementerian Kesehatan Republik Indonesia, 2020, 2021; Perkumpulan Endokrinologi Indonesia (PERKENI), 2021; UNICEF South Asia, 2015).

One of the components, gestational diabetes, a risk factor for type 2 diabetes in both mother and child, has been studied and validated by the authors of this community service proposal (Nadiyatussholeha & Sukarno, 2022). The results of this study provide evidence-based information to educate the community that gestational diabetes is a serious issue that needs to be addressed to prevent further complications, and that self-care methods should be implemented as an initial preventive measure.

METHOD

The Preparation of the Programs

Before conducting the program, the committee discussed the problem being studied with the cadre of the Posyandu Teratai (Integrated Health Service Post Teratai). Integrated Health Service Post Teratai is located at Karawiling Village RT 2 RW 8 Teluk Naga, Tangerang. Integrated Health Service Post Teratai 8 is the center of this community service that provides health education for productive age and pregnant women as well as health screening.

According to the problem discussed, the committee found that there were 100 productive age women and most of them were housewives and entrepreneurs. Moreover, the number of young marriages was 9 couples, stunting cases were found among 11 children,

gestational diabetes and hypertension during the pregnancy were 17 and 23 women, respectively. In addition, two children were born premature. According to these health problems, the committee and cadres agreed to develop the health programs, as follows:

1) The first stage involves health education on stunting and gestational diabetes for women of reproductive age at Posyandu Teratai 8.
2) The second stage involves training in the use of the SMART Self-Homecare method as a guide for pregnancy preparation, prenatal care, and postnatal care for women of reproductive age at Posyandu Teratai 8.
3) The third stage involves training in the use of stunting anthropometry and tools for measuring blood sugar and hemoglobin levels for Posyandu Teratai cadres.

The Implementation of the Programs

After achieving the agreement regarding the programs, the committee and cadres conducted the programs to achieve some aims, following:

1) Enhancing the knowledge of women of reproductive age about stunting and gestational diabetes and their impact on mothers and children's future.
2) Increasing the knowledge of women of reproductive age on health management, pregnancy preparation techniques, and nutrition before and during pregnancy, as well as child nutrition, through the SMART Self-Homecare method.
3) Improving the skills of Posyandu cadres in using stunting anthropometry, and measuring blood sugar and hemoglobin levels.

Before the day of the implementation, the cadres from Posyandu Teratai I- VIII helped to broadcast the poster and the invitation of the program through a productive age women WhatsApp group. It was a consecutive sampling, therefore, any cadres and women with productive age could participate in the programs.

The schedules of the program were from July 28th to 30th 2024 and the participants were the cadres and women of reproductive age at Posyandu Teratai 8, Teluknaga Village, Tangerang Regency. The materials of the programs stated in the Discussion Section. The rundown as follows:

1) The health education on stunting and gestational diabetes for women of reproductive age at Posyandu Teratai 8 on 28 July 2024 at 9 am to 15.00 pm.
2) The training in the use of the SMART Self-Homecare method as a guide for pregnancy preparation, prenatal care, and postnatal care for women of reproductive age at Posyandu Teratai 8 on 29 July 2024 at 9 am to 15.00 pm.
3) The training in the use of stunting anthropometry and tools for measuring blood sugar and hemoglobin levels for Posyandu Teratai cadres on 30 July 2024 at 9 am to 15.00 pm.

The Evaluation of the Programs

1) Stunting and Gestational Diabetes Knowledge Questionnaire

   Knowledge improvement among women of reproductive age participating in this community service program was measured using pre-test and post-test questionnaires, each consisting of 20 questions. The final score was calculated by multiplying the number of correct answers by 5.
2) SMART Self-Homecare Method Knowledge Questionnaire

   Knowledge improvement in women of reproductive age on the SMART Self-Homecare method was measured using pre-test and post-test questionnaires, each consisting of 20 questions. The final score was calculated by multiplying the number of correct answers by 5.
3) Child Growth Chart and Stunting Anthropometry Measurements Simulation

   Simulation of child growth chart assessments and stunting anthropometry measurements was conducted by 55

community health workers (Posyandu cadres) in Teratai Village, Teluknaga, Tangerang. The simulation was supervised by the community service team. Growth chart assessments used the Integrated Management of Childhood Illness chart (Manajemen Terpadu Balita Sakit 2021 [MTBS 2021]) (Kementerian Kesehatan Republik Indonesia, 2022).

The assessment evaluated stunting indicators by measuring height-for-age ratios in children aged 0–2 years. Stunting is defined as a height-for-age ratio < -2 SD. Stunting anthropometry measurements used baby scales (≤ 20 kg), child scales (> 20 kg), baby height measurements, and child height measurements (stadiometers).

4) Blood Glucose and Hemoglobin Measurement Devices Simulation.

The simulation of blood glucose and hemoglobin measurement device usage was conducted by 55 cadres of Posyandu Teratai, Teluknaga, Tangerang, using the AccuPro device, under the supervision of the community service team.

5) Data Analysis

Data analysis was performed using descriptive statistics (mean and standard deviation) and paired t-tests to assess the significance before and after the counseling and training sessions.

RESULT AND DISCUSSION

The Demographic Characteristics of the Participants

The majority of the productive age women completed secondary level of education (52.72%) and were housewives (67.27%). The number of pregnant women was 11 people. In addition, the cadres achieved tertiary level of education (81.91%) and worked as entrepreneurs (63.63%).

Table 1. The Demographic Characteristics of the participants

No.		Productive Age Women (N=55)	Cadres (N=55)
1.	Age (Mean±SD)	47.71±2.33	48.52±2.17
2.	Education level:		
	- Primary		
	- Secondary	15 (27.27)	0 (0)
	- Tertiary	29 (52.72)	10 (18.19)
		11 (20)	45 (81.81)
3.	Status of Pregnancy		
	- Pregnant	11 (20)	0 (0)
	- No	44 (80)	55 (100)
4.	Occupation		
	- Housewife	37 (67.27)	13 (23.74)
	- Enterpreneur	18 (32.73)	35 (63.63)
	- Employee	0 (0)	7 (12.73)

(Source: Author's analysis, 2024)

Note: Descriptive statistics; SD: Standard Deviation; Education level, status pregnancy, and occupation using frequency and percentage (%).

What was Done and Given during the Training

During the training, we successfully implemented health education, training, focus group discussion, and health instruments practices among the participants. One of the major topics given to the participants was how to implement SMART Self-Homecare.

The SMART Self-Homecare method is a self-care approach that can be used by women of reproductive age as a guide to planning pregnancy and preventing gestational diabetes and stunting in children. The SMART Self-Homecare method stands for Specific (specific program), Measurable (measurable target), Achievable (achievable outcome), Rational (rational program), and Time (timely program implementation).

1) Spesific (S) dan Measurable (M)
   a) Pre-pregnancy weight with a Body Mass Index (BMI) = 18.5 – 24.9 kg/m², a weight gain = 0.45 kg/week, a newborn weight = 2500–3000 grams, and monitoring of the baby's weight post-birth using growth charts.

b) Hemoglobin levels during pregnancy between 10.5–11 g/dL
c) Fasting blood glucose levels during pregnancy < 92 mg/dL
d) Normal blood pressure at 120/80 mmHg.

2) Achievable (A)
a) Nutritional intake rich in animal protein, consumption of folic acid (400 mcg pre-pregnancy and 600–800 mcg during pregnancy), 27 mg/day of iron, 600–800 IU/day of vitamin D, and 1.9 mg/day of vitamin B6.
b) Exclusive breastfeeding for at least 6 months up to 2 years, with complementary foods rich in animal protein and varied, and limiting sugar intake to <15 grams/day (1 tablespoon).
c) Healthy lifestyle practices, such as abstaining from smoking and alcohol, maintaining cleanliness, and exercising.
d) Care and nurturing from both parents (mother and father).

3) Rational (R)

Based on research evidence, hemoglobin levels <11 g/dL are associated with a risk of low birth weight and miscarriage, while hemoglobin levels >13 g/dL are linked to preeclampsia and gestational diabetes (Young et al., 2019). Maternal anemia is also associated with impaired brain structure development in children (Wedderburn et al., 2022).

4) Time (T)
a) The pregnancy program recommends the maternal age of 20–35 years, with an ideal number of children <3 and a spacing of 2–3 years between pregnancies. Pre-pregnancy hemoglobin levels should be 11 g/dL, and both parents should be prepared.
b) Prenatal visits should occur once a month during weeks 0–28, three times a month during weeks 28–36, and weekly during weeks 36–40, or as needed.
c) Blood glucose monitoring should be conducted between weeks 24–28 of pregnancy.
d) Maximize child development during the first 1000 days of life.

Moreover, simulation of child growth chart assessments and stunting anthropometry measurements was conducted by 55 community health workers (Posyandu cadres) in Teratai Village, Teluknaga, Tangerang. The simulation was supervised by the community service team. Growth chart assessments used the Integrated Management of Childhood Illness chart (Manajemen Terpadu Balita Sakit 2021 [MTBS 2021]) (Kementerian Kesehatan Republik Indonesia, 2022).

Stunting anthropometry measurements used baby scales (≤ 20 kg), child scales (> 20 kg), baby height measurements, and child height measurements (stadiometers). The simulation of blood glucose and hemoglobin measurement device usage was conducted by 55 cadres of Posyandu Teratai, Teluknaga, Tangerang, using the AccuPro device, under the supervision of the community service team.

Increase in Knowledge of Stunting and Gestational Diabetes among Women of Reproductive Age

There was a significant increase in knowledge about stunting and gestational diabetes among women of reproductive age before and after the counseling sessions ($p < 0.001$).

Table 2. Knowledge of Stunting and Gestational Diabetes among Women of Reproductive Age Before and After Counseling (N=55 people)

Variable	Pretest	Posttest	*P*
	Mean± SD	**Mean± SD**	
Stunting and Gestational Diabetes Knowledge	66.75± 1.73	83.77± 2.01	< 0.001

(Source: Author's analysis, 2024)
Note: Paired t-test analysis; SD: Standard Deviation.

Increase in Knowledge of the SMART Self-Homecare Method among Women of Reproductive Age

There was a significant increase in knowledge about the SMART Self-Homecare method among women of reproductive age before and after the counseling sessions ($p < 0.001$).

Table 3. The Knowledge of SMART Self-Homecare among Women of Productive Age Before and After the Health Education (N=55 people).

Variable	Pretest	Posttest	*p*
	Mean± SD	**Mean± SD**	
SMART Self-Homecare Knowledge	53.15± 1.88	87.13± 2.13	< 0.001

(Source: Author's analysis, 2024)

Note: Paired t-test analysis; SD: Standard Deviation.

Enhancing knowledge among women of reproductive age in pregnancy preparation, health maintenance during pregnancy and postpartum is essential for achieving optimal child health. According to data, the prevalence of stunting in children is 37–38.8% in Indonesia (Beal et al., 2018; Li et al., 2020). The adverse effects of stunting on child health include impaired height growth, reduced learning ability, and cognitive function (Kang et al., 2018). Additionally, the economic loss due to stunting amounts to 0.89% – 3.88% of the total Gross Domestic Product (GDP) (Suryana & Azis, 2023).

Through this counseling and training program, women of reproductive age can identify key health indicators, such as the importance of maternal weight, hemoglobin levels, blood glucose levels, blood pressure, and the benefits of nutrition and micronutrients to support child growth and development.

Improvement in Skills of Community Health Workers (Posyandu Cadres) in Teratai Village, Teluknaga, Tangerang

Based on the training conducted, all 55 community health workers (100%) successfully performed independent simulations of child growth chart assessments to determine stunting categories.

The training on interpreting and completing growth charts benefited the workers, enabling them to identify children at risk of stunting. They can record and report their findings to healthcare services for early intervention.

Community-based training methods have been implemented in previous studies, successfully stimulating active participation from community health workers and the community in early disease detection and prevention (Hoffman et al., 2007; Irawati, 2022; Siswati et al., 2022).

Figure 1. Health Workers Completing the Child Growth Chart (MTBS 2021)
(Source: Author, 2024)

According to the findings of the training conducted, there were 55 cadres (100%) have completed the independent simulation to practice stunting anthropometric (stadiometer, baby scale, and height scale).

Figure 2. Health Workers Using a Stadiometer for Height Measurement
(Source: Author, 2024)

Figure 3. Health Workers Measuring Weight
(Source: Author, 2024)

Additionally, all 55 community health workers (100%) successfully performed independent simulations of using the AccuPro device to measure blood glucose and hemoglobin levels. The skill of measuring hemoglobin among community health workers is crucial in helping women of reproductive age access hemoglobin level monitoring. This is supported by previous studies reporting that hemoglobin levels significantly impact maternal and infant health and influence brain structure development in children (Wedderburn et al., 2022; Young et al., 2019).

Figure 4. Health Workers Measuring Blood Glucose and Hemoglobin Levels
(Source: Author, 2024)

Empowerment programs for community health workers and families can reduce the risk of pregnancy complications (Irawati, 2022). Health education and training for community health workers and the public have been reported as effective methods for improving knowledge, motivation, and skills in health maintenance and the prevention of gestational diabetes and stunting (Hoffman et al., 2007; Mediani et al., 2022; Patel & Vyas, 2018; Siswati et al., 2022).

CONCLUSION

The health education and training provided can improve knowledge and skills among women of reproductive age and community health workers in recognizing stunting and gestational diabetes and utilizing methods to prevent these conditions. The findings recommend this program to be implemented and disseminated in other community health services. Healthcare providers should collaborate with cadres or volunteers to increase capacity of women of productive age to prevent stunting and diabetes gestational.

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