



## EARLY SCREENING OF PREGNANT WHO RISK OF GESTATIONAL DIABETES AS AN EFFORT TO PREVENT STUNTING BIRTHS IN COASTAL AREAS

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### ABSTRACT

Stunting is a condition of growth failure in children due to chronic malnutrition during growth and occurs from the womb to the age of two years which has an impact on the physical, cognitive, social development of children. One of the causes of stunting is pregnant women who suffer from Gestational Diabetes. Objective: To conduct an early examination of pregnant women at risk of gestational diabetes in coastal areas. Method: Descriptive with purposive sampling approach. Data collection techniques, namely: Determine the research problem followed by a literature study. The implementation stage of the study was carried out by examining temporary blood sugar, blood pressure, weight, height, abdominal circumference, and arm circumference. Furthermore, a pretest was conducted to assess the level of knowledge of pregnant women regarding the prevention of stunting and understanding related to gestational diabetes. Data analysis with univariate analysis. Results and Discussion: The age of most respondents was 20-35 years (80.8%), Real-time Blood Sugar: > 125 mg/dL (30.7%), 101-125 mg/dL (40.4%) and < 101 mg/dL (28.8%). Systolic Blood Pressure was mostly in the range of 90-120 mmHg (57.7%), Diastolic Blood Pressure 60-90 mmHg (86.5%). The Body Weight of most respondents was 35-60 Kg (55.8%), Respondents Height was 151-168 cm (53.8%), Abdominal Circumference about 92-107 cm (61.5%) and Arm Circumference was 21-27 cm (63.4%). Conclusions: Gestational diabetes can be one of the factors causing the birth of stunted children. Therefore, early examination is needed in pregnant women to find out health problems so that they can be prevented as early as possible such as conducting examinations, blood sugar, blood pressure, weight, height, arm circumference and conditions during pregnancy. Suggestion: Early detection of pregnant women is very important in health facilities such as health centers and hospitals. This right can determine the health condition of pregnant women and identify health problems early, so as to prevent complications. Efforts that can be made include managing a healthy diet, maintaining nutrition for the fetus during pregnancy and are expected to prevent the risk of gestational diabetes complications such as the birth of stunted children.

Keywords: blood sugar; gestational diabetes; stunting birth

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## INTRODUCTION

The prevalence of stunting in Indonesia is still high, based on data from the Indonesian Ministry of Health, stunting cases in 2023 are 21.5%, only down 0.1% from the previous year 21.6%. The problem of stunting is a serious and complex public health issue. Stunting is a condition of growth failure in children due to chronic malnutrition that occurs during the growth period, usually from the womb to the age of two years. This can adversely affect a child's physical, cognitive and social development and increase the risk of chronic diseases later in life. Stunted children are also at risk of reduced learning quality at school and long-term economic losses for Indonesia (Amelia, 2019). In Pekanbaru, the stunting rate was reported to increase from 11.4% in 2021 to 16.8% in 2022, indicating increased attention to risk factors such as gestational diabetes. Puskesmas Limapuluh and Puskesmas Rejosari are the health centers with the highest incidence of stunting in Pekanbaru City in 2021. Puskesmas Lima Puluh noted the high rate of stunting in children born due to LBW and not receiving exclusive breastfeeding, which can be attributed to the condition of gestational

diabetes in their mothers (Fitri, 2018). Monitoring blood sugar levels and good nutritional management during pregnancy need to be done as an effort to reduce stunting rates in Pekanbaru.

Gestational Diabetes Melitus is the most prevalent disease among pregnant women, affecting up to 15-25% of pregnancies worldwide (Choudhury, AA & Rajeswari, VD, 2021). The incidence of stunting is also associated with gestational diabetes experienced by pregnant women (Hod, M., Kapur, A & McIntyre, HD. 2019). Gestational diabetes can affect fetal development, increase the risk of premature birth, and low birth weight (Sudargo & Aristasari, 2018). When a pregnant woman has diabetes, her body cannot use insulin effectively, causing high blood sugar levels that can cross the placenta and reach the fetus resulting in various complications during pregnancy and childbirth, such as macrosomia (large birth weight), birth injuries, increased risk of cesarean delivery, disorders of the heart, lungs, brain and nervous system. The prevalence of gestational diabetes varies by population, but generally affects 7-10% of all pregnancies. In Indonesia, the prevalence of gestational diabetes is estimated to be around 5-10%, with increasing incidence rates associated with lifestyle changes and increased obesity among women of reproductive age. Diabetics have impaired metabolism of carbohydrates, fats and proteins due to a lack of insulin which functions to carry nutrients to cells and tissues for energy. Insulin is a hormone produced by the pancreas that regulates blood glucose levels and facilitates the absorption of glucose by body cells. Impaired insulin production leads to high blood sugar levels. This has a negative impact on fetal growth and development as the nutrients required by the fetus to grow optimally are not adequately provided. Lack of nutrition during pregnancy is a risk factor for stunting in children. Therefore, stunting prevention efforts need to be carried out from early pregnancy to the first two years of a child's life (the first 1000 days) to ensure optimal growth and development. It is important for pregnant women with diabetes to manage their condition well through strict blood glucose control, healthy diet and regular medical supervision so as to prevent the risk of complications due to gestational diabetes and can maintain nutrition for the fetus during pregnancy.

## **METHOD**

The research method uses a Descriptive method with Purposive Sampling approach. Data collection techniques, namely: Determine the research problem followed by a literature study. The implementation stage of the study was carried out by examining temporary blood sugar, blood pressure, weight, height, abdominal circumference, and arm circumference. Furthermore, a pretest was conducted to assess the level of knowledge of pregnant women regarding the prevention of stunting and understanding related to gestational diabetes. Data analysis with univariate analysis. Prior to data collection, ethical approval was obtained from the Health Research Ethics Committee of Institut Kesehatan Payung Negeri Pekanbaru, with Registration Number: 247/IKES PN/KEPK/VII/2024.

## **RESULT**

The results of research conducted from August to September 2024 in the working area of Puskesmas Umban Sari and Rumbai Bukit with 52 pregnant women respondents. Table 1 shows that the age of most respondents is 20-35 years (80.8%), Blood Sugar > 125 mg/dL (30.7%), 101-125 mg/dL (40.4%), < 101 mg/dL (28.8%), Systolic Blood Pressure is mostly in the range of 90-120 mmHg (57.7 %), Diastolic Blood Pressure 60-90 mmHg (86.5 %), 29 respondents (55.8 %) had a Body Weight of 35-60 Kg, Height of respondents (53.8 %) ranged from 151-168 cm, Abdominal Level 92-107 cm (61.5 %) and Arm Circumference 21-27 (63.4 %). Table 2 shows that most of the respondents' average answers with results in numbers 5-6

mean that respondents have "LACK" knowledge about Gestational Diabetes can lead to the birth of stunted children.

Table 1.  
Distribution of Respondent Characteristics

Characteristics	Total	
	f	%
<b>Age</b>		
20-35 years	42	80.8
>35 years old	9	17.3
<20 years	1	1.9
<b>Real-time Blood Sugar</b>		
> 125 mg/dL	16	30.7
101-125 mg/dL	21	40.4
< 101 mg/dL	15	28.8
<b>Systolic Blood Pressure</b>		
90-120 mmHg	30	57.7
>120 mmHg	17	32.7
<90 mmHg	5	9.6
<b>Diastolic Blood Pressure</b>		
60-90 mmHg	45	86.5
>90 mmHg	5	9.6
<60 mmHg	2	3.8
<b>Body Weight</b>		
35-60 Kg	29	55.8
61-102 Kg	23	44.2
<b>Height</b>		
142-150 cm	24	46,2
151-168 cm	28	53.8
<b>Abdominal Circumference</b>		
72-91 cm	20	38.4
92-107 cm	32	61.5
<b>Arm Circumference</b>		
21-27 cm	33	63.4
28-35 cm	19	36.5

Table 2.  
The score of Test Questionnaire about Gestational Diabetes melitus

	N	Minimu m	Maximu m	Sum	Mean	Std. Deviation
Question 1	52	2	7	265	5	.975
Question 2	52	4	7	276	5	.853
Question 3	52	2	7	265	5	.975
Question 4	52	4	7	276	5	.853
Question 5	52	4	7	265	5	.774
Question 6	52	4	7	263	5	1.018
Question 7	52	4	7	277	5	.810
Question 8	52	4	7	281	6	.799
Question 9	52	4	7	277	5	.706
Question 10	52	4	7	273	5	.764
Valid N (listwise)	52					

Average of knowledge level of respondent before the health check, the researcher gave a Test in the form of a Questionnaire consisting of 10 questions to 52 respondents. As a measuring tool for respondents' knowledge about gestational diabetes. With the provisions of the questionnaire point results, namely variable questions 1 to question 10 have a minimum value

of 1-7 in the "LACK" category, which means that the respondent does not know well about the problem of Gestational Diabetes, while the maximum value of 8-10 is "GOOD", which means that the respondent knows well about the problem of Gestational Diabetes which is presented in table 2 as follows.

## **DISCUSSION**

Gestational diabetes can affect fetal growth through several mechanisms such as nutritional disorders, diabetes can affect the metabolism and absorption of nutrients, which are essential for fetal growth. In addition, health complications can occur, mothers with gestational diabetes are at risk of complications such as preeclampsia, which can affect blood and oxygen flow to the fetus. (Basolo et al., 2021). Inflammatory mechanisms can also occur in mothers with gestational diabetes as it causes increased levels of inflammation in the mother's body, which can affect fetal development. Prolonged inflammation can interfere with normal growth and contribute to the risk of stunting in children. (Rodolaki et al., 2023). Mothers with gestational diabetes may experience complications that affect blood flow and nutrient supply to the fetus. This can lead to stunted fetal growth, which contributes to the risk of stunting after birth. Research shows that children born to mothers with gestational diabetes tend to have lower birth weight and a higher risk of stunting (Fasoulakis et al., 2023). The results of this study are in line with research conducted by Victora et al. who said that pregnant women who suffer from chronic diseases such as hypertension, heart disease, or autoimmune disorders can face complications during pregnancy that can adversely affect fetal growth. These conditions can lead to inadequate nutrient absorption and poor health outcomes for the child, increasing the likelihood of stunting. Chronic maternal health problems can also complicate pregnancy, leading to premature birth and low birth weight, both of which are risk factors for stunting.

The World Health Organization (2024) states that mothers who experience malnutrition during pregnancy significantly increase the risk of stunted child growth. Maternal malnutrition affects fetal growth and can lead to low birth weight, which is closely related to growth retardation. Studies have shown that inadequate intake of essential nutrients during pregnancy is directly associated with higher rates of child stunting. Children born to mothers with diabetes are not only at risk of stunting, but also have a higher likelihood of developing long-term health problems, including obesity and type 2 diabetes. This suggests that good management of gestational diabetes during pregnancy is crucial for the long-term health of the child (Santosa et al., 2022). According to Li et al. (2020) Short maternal height is a strong predictor of child stunting. Research shows that women of short stature (often defined as those below 145 cm in height) are more likely to give birth to stunted children. This is due to the intergenerational cycle of malnutrition and poor growth, where mothers of short stature often have limited nutritional status, impacting the growth of their children.

## **CONCLUSIONS**

Based on the data obtained from 52 pregnant women respondents according to age, the most are 20-35 years (80.8%), Blood Sugar > 125 mg/dL (30.7%), 101-125 mg/dL (40.4%), < 101 mg/dL (28.8%), Systolic Blood Pressure is mostly in the range of 90-120 mmHg (57.7 %), Diastolic Blood Pressure 60-90 mmHg (86.5 %), 29 respondents (55.8 %) had a Body Weight of 35-60 Kg, Height of respondents (53.8 %) ranged from 151-168 cm, Abdominal Level 92-107 cm (61.5 %) and Arm Circumference 21-27 (63.4 %). During the examination, some respondents also complained of difficulty sleeping at night, dizziness, and fatigue. At less than 24 weeks gestation, the majority of pregnant women reported difficulty eating due to morning sickness (nausea and vomiting). Almost all respondents did not have their Haemoglobin (Hb) levels checked regularly. Nutritional management does not meet the

standard nutritional needs of pregnant women. The average knowledge of Pretest respondents is 5.08, and the standard deviation is 0.269. The results of this study indicate that the average respondent does not know in depth about Gestational Diabetes and one of its complications that can give birth to stunted children. Pregnant women need to get special education and attention both from their physical health and psychological health, such as asking about the condition of the mother and fetus and checking blood sugar levels, womb, and health regularly. So that the mother and fetus get optimal health.

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