

Knowledge of Pregnant Women about Gestational Diabetes Mellitus in Indonesia

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Abstract

Diabetes mellitus is a complication that occurs during pregnancy. However, some pregnant women are lack of knowledge on the risk of diabetes mellitus. This is because diabetes mellitus rarely shows specific symptoms. This study aims to assess the knowledge of pregnant women about gestational diabetes mellitus. This study is descriptive design with a cross-sectional approach. This involved 109 pregnant women who came to the primary of health care. The sampling technique was using purposive sampling and collecting data using the D3MG application. Overall result study, the mother's knowledge of what is meant by gestational diabetes mellitus is enough (53%). The mother's knowledge about risk factors and complications for gestational diabetes mellitus is lacking 91% and 67%. Mothers understand well about the prevention of gestational diabetes mellitus 48%. So, can be concluded knowledge of risk factors and complications of gestational diabetes mellitus is poor among pregnant women. Promotion efforts through health education for pregnant women need to be done before becoming pregnant. This is the first step in increasing maternal knowledge about gestational diabetes mellitus.

Keywords: knowledge, gestational diabetes mellitus

1. Introduction

Diabetes mellitus is called the silent killer because diabetes mellitus initially starts quietly and is absent symptoms [1]. Diabetes mellitus is one of the most well-known metabolic syndrome diseases in the world [2]. Nearly 70% of the causes of death in the world is to non-communicable diseases due to lack of knowledge and awareness [3]. One non-communicable disease that contributes to morbidity is diabetes mellitus [4]. Diabetes mellitus is a chronic disease that is not contagious [5].

The Prevalence of diabetes mellitus in the world in 2017 is 451 million and it will continue to increase to 693 million in 2045. Indonesia is included in the territory of the risk of diabetes mellitus. The prevalence of diabetes mellitus in Indonesia in 2017 amounted to 10,578,401 cases and the majority occurred in women is more than 199 million. 21.3 million live births of women are estimated to have hyperglycemia in pregnancy [4]. Therefore, women need to get special attention because of the possible risk of developing diabetes mellitus during pregnancy.

This asserts that during pregnancy the mother can get diabetes mellitus. This situation is due to hormonal and tissue changes that become increasingly sensitive resulting in hyperglycemia [6]. Gestational diabetes mellitus is the most common medical complication in pregnancy. Therefore, it is necessary to maintain glucose levels in normal blood so that glucose intolerance does not occur [7]-[8].

The prevalence of gestational diabetes mellitus in each country varies depending on the characteristics of the population. However, globally the prevalence of gestational diabetes

mellitus is around 1% to 28% [9]. The prevalence hyperglycemia in pregnancy in the world was 16.9% in 2013 [10]. The highest prevalence of gestational diabetes mellitus in the world is in the Middle East and North Africa, Southeast Asia, and Western Pacific regions [11]. 10.1% of gestational diabetes mellitus occurs in East and Southeast Asia [12].

Risk factors for gestational diabetes mellitus are age [13], body mass index more than 30 kg/m² [14]-[15], history of gestational diabetes mellitus [16]-[17], family history of diabetes [18]-[19], history of giving birth to a baby with an abnormality [20], history of preeclampsia [21], and history of abortion [17].

Diabetes mellitus rarely shows certain signs and symptoms so that most women do not know the risk of developing diabetes mellitus during pregnancy [8]. Therefore, the knowledge of pregnant women about gestational diabetes mellitus is very important. The effort that can be done is to realize the awareness of pregnant women by providing information in the form of knowledge about gestational diabetes mellitus [22].

Increased knowledge is the first step to reduce the risk of diabetes mellitus in pregnancy [23]. There are several studies related to maternal knowledge about gestational diabetes mellitus. Research in India, knowledge of pregnant women about gestational diabetes mellitus is very bad, especially in rural areas [24]. Research in Nepal, mothers' knowledge of diabetes mellitus is poor. Health education and health promotion programs are needed as an effort to prevent gestational diabetes mellitus [25].

Knowledge of pregnant women about gestational diabetes mellitus is very needed [26]. Mother's knowledge about gestational diabetes mellitus can be started from understanding the understanding of gestational diabetes mellitus, causes, risk factors, and prevention. Mothers can get information from health workers, print or electronic media, brochures, posters, and others. The aim of this study was to determine the knowledge of pregnant women about gestational diabetes mellitus.

2. Methodology

This descriptive study was conducted at the primary health center care of the Gunungkidul district, Yogyakarta Province. This Research lasts for three months. There are four the Primary Health Center involved in this research were Semanu I primary health center care, Wonosari II, Ponjong I, and Saptosari. Yogyakarta Province is one of the provinces in the Indonesian island of Java. This research was conducted in Gunungkidul District because of the high maternal mortality rate. There were 10 cases in 2017. The cause of maternal mortality is non-communicable diseases. Most suffered by women

Diabetes mellitus is a non-communicable disease. Moreover, diabetes mellitus is called the silent killer because most people do not know they have diabetes mellitus. At the time of pregnancy, the body is diabetogenic so that the possibility of gestational diabetes mellitus. Therefore, knowledge about gestational diabetes mellitus is needed. This research was approved by the ethics committee of the Universitas Aisyiyah Yogyakarta.

2.1 Sampling

This research was conducted on all pregnant women in Gunungkidul Regency which were recorded in the health office report. There are 8965 pregnant women who check their pregnancy to the primary health care center. The researcher selected all populations to get a sample, the technique used was cluster random sampling. A total of 109 pregnant women were selected in this study. There are four Primary Health Center Care involved in this research. Samples were taken according to inclusion and exclusion criteria

Inclusion criteria were first-trimester pregnant women, single pregnancy, had never suffered from diabetes mellitus before becoming pregnant, physically and mentally healthy. Exclusion criteria were mothers suffering from heart disease, asthma, immune system disorders, human immunodeficiency virus (HIV), and hepatitis.

The implementation system in this research is two stages. The first stage the researcher was in the primary health center care in the morning. Researchers directly approached pregnant women who want to check their pregnancy. The researchers sought the consent of pregnant women to be willing to be involved in the research after explaining the aims and procedures of the study.

The second stage, the researchers visited respondents' homes during the day based on data from the medical record. The implementation of data collection was assisted by village health cadres. Researchers contacted the cadre to confirm and schedule the meeting to the patient's home according to data obtained from the primary health center care. Previously, the researchers have obtained approval from the respondent through a cadre.

Respondents were accompanied by researchers when filling out the questionnaire. The researcher gave two questionnaire sheets are identity sheets and knowledge questionnaire sheets. If the respondent has difficulty reading, the researcher helps the mother by reading the questionnaire statement to the mother and asking for the answer from the mother. The researcher examines each sheet and statement from the questionnaire to ensure that all data is filled. Data that have been collected will be analyzed to determine the level of knowledge of pregnant women about gestational diabetes mellitus. The level of knowledge consists of good if the value $\geq 76\%$ - 100%, fair if the value of 56% - 75%, and less if the value $<56\%$.

2.2 Questionnaire Design

The questionnaire uses a closed statement, consists of two parts namely the demographic characteristics of respondents and questions of knowledge of pregnant women about gestational diabetes mellitus. The first part contains the demographic characteristics was of the mother's age, mother's education, mother's occupation, gravida, family income in one month. Second part, the statement of knowledge of pregnant women about gestational diabetes mellitus with the answer choices "yes" and "no".

The knowledge questionnaire was divided into four items from 22 statements. The first item about the understanding of gestational diabetes mellitus consists of three statements. The second item about risk factor knowledge consists of 13 statements. The third item about complication consists of three statements and the fourth item consists of three statements about the prevention of gestational diabetes mellitus.

3. Result and Discussion

3.1 Characteristics of Respondents

A total of 109 pregnant women were included in this study, maternal age < 20 years old (5.5%), 20 – 24 years old (23.9%), 25 – 29 years old (29.4%), 30 – 34 years old (28.4%), 35 – 39 years old (11.0%), and ≥ 40 years old (1.8%). Mother's last education were elementary school (13.8%), junior high school (32.1%), senior high school (41.3%), diploma (4.6%), and bachelor (8.3%). Most of the mothers were housewives (78%), office employees (11.9%). 2.8% mothers work as farmer, entrepreneur, and teacher. Moreover, there are mothers who work as civil servants (1.8%). 66.1% of respondents were primigravida while 33.9% were multigravida. The family income per month is less than Rp 1,600,000.00 (67%) and more than Rp 1,600,000.00 (33%) (table 1). We can conclude

that most pregnant women aged 25 years to 35 years. The last education was a high school. Almost all mothers are housewives. Most mothers are primigravida mothers. The average family income is below the regional minimum wage. The regional minimum wage is the standard for a district's wage.

Table 1. Characteristics of Respondents

Characteristics of Respondents	Frequency (n=109)	Percentage (%)	<i>p-Value</i>
Age (years)			
< 20	6	5.5	0.633
20 – 24	26	23.9	
25 – 29	32	29.4	
30 – 34	31	28.4	
35 – 39	12	11.0	
≥ 40	2	1.8	
Education			
Elementary School	15	13.8	0.939
Junior High School	35	32.1	
Senior High School	45	41.3	
Diploma	5	4.6	
Scholar	9	8.3	
Occupations			
Housewife	85	78.0	0.752
Farmer	3	2.80	
Entrepreneur	3	2.80	
Teacher	3	2.80	
Office employees	13	11.9	
Civil servants	2	1.80	
Gravida			
Multigravida	37	33.9	1.002
Primigravida	72	66.1	
Family Income (per month)			
> 1.600.000 million	36	33.0	1.515
< 1.600.000 million	73	67.0	

Significant *p-value* < 0.05

3.2 Mother's Knowledge about Definition of Gestational Diabetes Mellitus

Based on statements about gestational diabetes mellitus definitions. Mothers who answered "yes" or knew that during pregnancy they could be exposed to gestational diabetes mellitus of 55.0% and 45% of mothers answered "no". Mothers who answered "yes" that gestational diabetes mellitus is characterized by high blood sugar levels (14%). Mothers who did not know that high blood sugar levels were at risk of developing gestational diabetes mellitus of 86%. Mothers know gestational diabetes mellitus including non-communicable diseases (89%) and mothers who don't know this 11% (Figure 1). We can conclude that almost all mothers do not know high blood sugar as a sign of gestational diabetes mellitus.

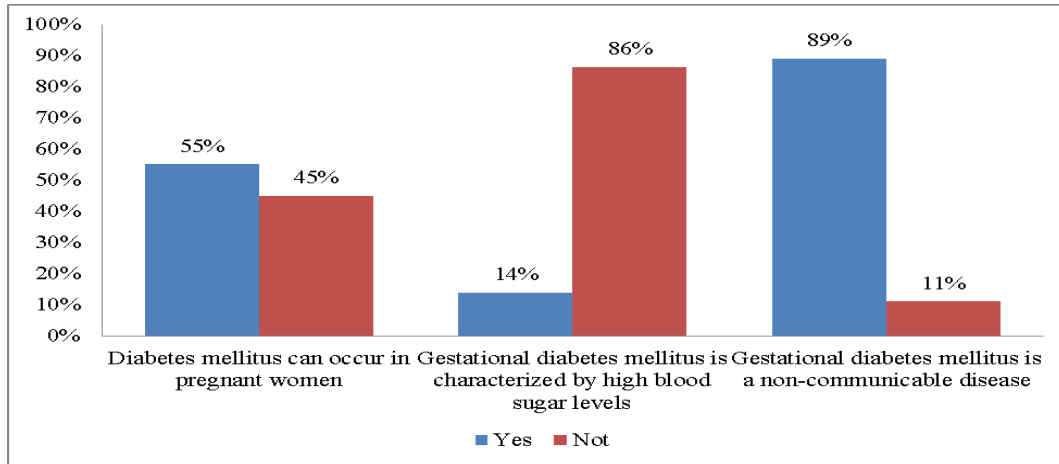


Figure 1. Mother's Knowledge about Definition of Gestational Diabetes Mellitus

3.3 Mother's Knowledge about Risk Factors of Gestational Diabetes Mellitus

Pregnant women who answered the statement "yes" about risk factors for gestational diabetes mellitus, were Body Mass Index (46%), family history of diabetes mellitus (24%), history of childbirth macrosomia (18%), maternal age ≥ 25 years old (24%), history of gestational diabetes mellitus (54%), history of birth defects or abnormalities (60%), history of preeclampsia (19%), history of polycystic ovary syndrome (20%), history of abortion (8%), history of giving birth to a dead baby with no known cause (7%), pregnant women smoke (68%), short duration of night sleep (71%), depression in pregnant women of 17% (Figure 2). The results showed the highest frequency distribution of statements from mothers who answered not or did not know was the history of giving birth to a dead baby with no known cause (93%) and a history of miscarriage (92%). We can conclude that most mothers do not know the risk factors for gestational diabetes mellitus so early detection of diabetes mellitus in pregnant women is very necessary since trimester I.

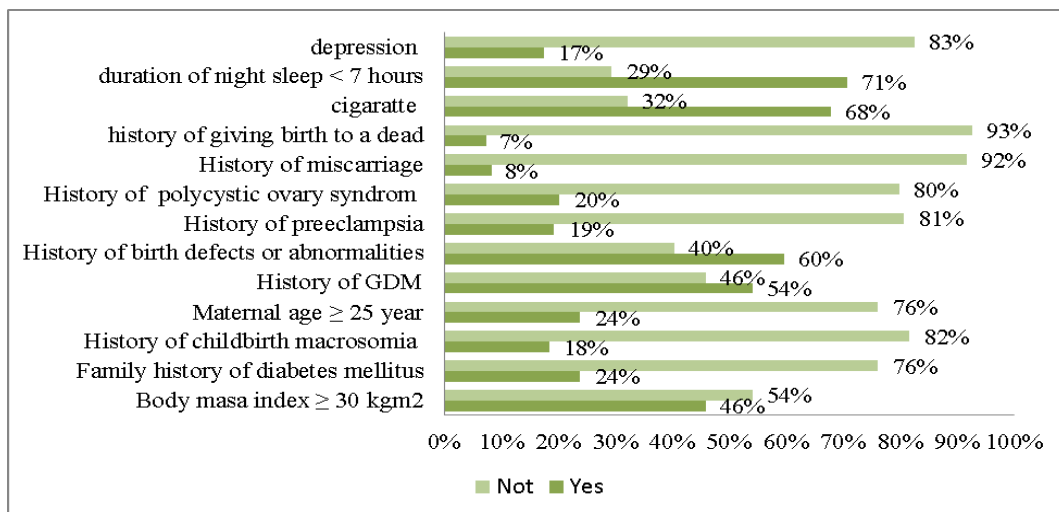


Figure 2. Mother's Knowledge about Risk Factors of Gestational Diabetes Mellitus

3.4 Mother's Knowledge about Complication of Gestational Diabetes Mellitus

51% of pregnant women know the complications of gestational diabetes Mellitus were babies born premature and mothers who did not know of 49%. Moreover, Mothers who

say "yes" that gestational diabetes mellitus can cause death for both mother and baby of 66%, mothers who do not know that of 34%. Mothers know that diabetes mellitus during pregnancy can result in children suffering from diabetes mellitus too of 80% and 20% mother did not know at all (Figure 3). We can conclude that almost all mothers do not know the long-term complications that can occur in infants of mothers with gestational diabetes mellitus. Monitoring of mother and baby during pregnancy until the puerperium needs to be done to reduce the risk of greater complications.

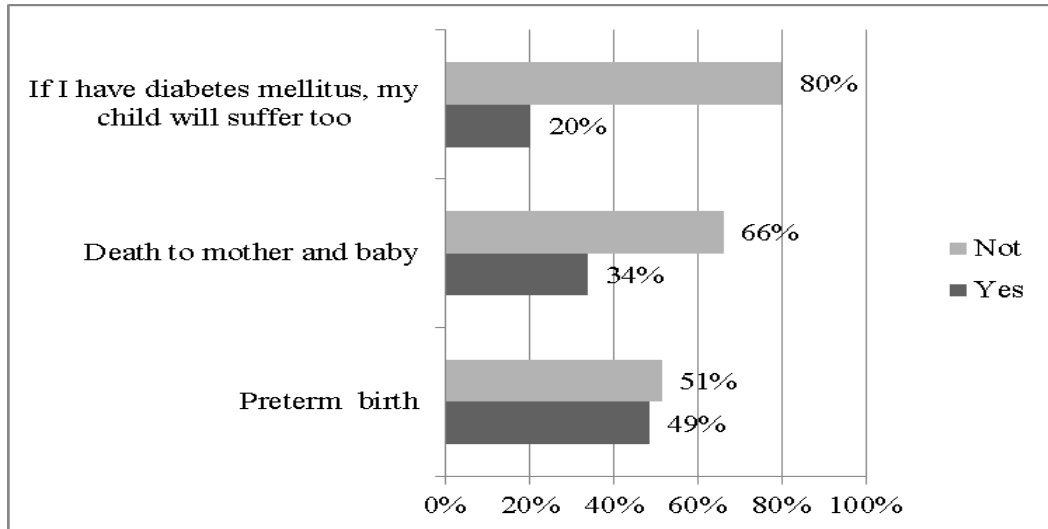


Figure 3. Mother's Knowledge about Complication of Gestational Diabetes Mellitus

3.5 Mother's Knowledge about Prevention of Gestational Diabetes Mellitus

Mothers who answered "yes" or knew that controlling pregnancy regularly could prevent gestational diabetes mellitus of 72%. The mother answered the statement "no" of 28%. Mothers who know that counseling during pregnancy needs to be done to anticipate the occurrence of gestational diabetes mellitus of 70%. Moreover, there is a statement that mothers who consume sweet foods and high cholesterol can increase blood sugar levels, mothers who answered "yes" of 24% and "no" of 76% (Figure 4). We can conclude that mothers know things that can reduce the risk of gestational diabetes mellitus. Ways that can be done by avoiding foods that contain high cholesterol, diligent pregnancy control at least four times during pregnancy, and participate in health counseling in preparing for pregnancy

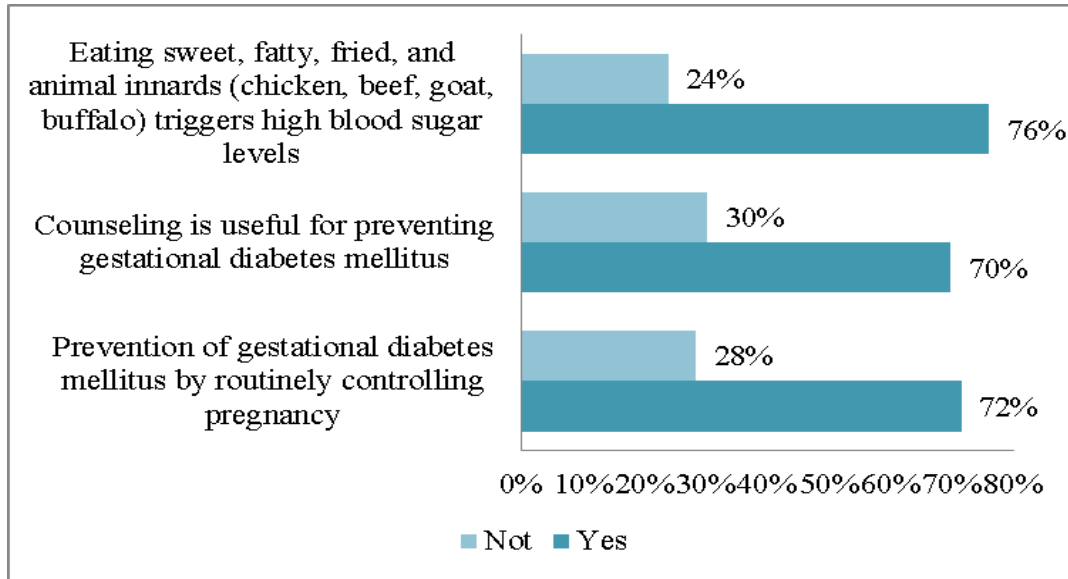


Figure 4. Mother's Knowledge about Prevention of Gestational Diabetes Mellitus

3.6 Distribution Frequency Knowledge about Gestational Diabetes Mellitus

Knowledge of pregnant women about the understanding of gestational diabetes mellitus is good (39%), sufficient (53%), and lacking (8%). Knowledge of gestational diabetes mellitus risk factors is good (1%), enough (8%), and lacking (91%). Knowledge of complications of gestational diabetes mellitus is good (6%), enough (27%), and lacking (67%). Knowledge about the prevention of gestational diabetes mellitus is good (48%), sufficient (26%), and lacking (27%). Based on Figure 5, the mother's understanding of both the definition and prevention of gestational diabetes mellitus is good. The mother's knowledge about complications gestational diabetes mellitus is lack. However, the mother's knowledge is less about the risk factors for gestational diabetes mellitus so that the need for understanding and awareness of pregnant women about the risks that can occur during pregnancy. Besides, that health workers can give health education early to mothers.

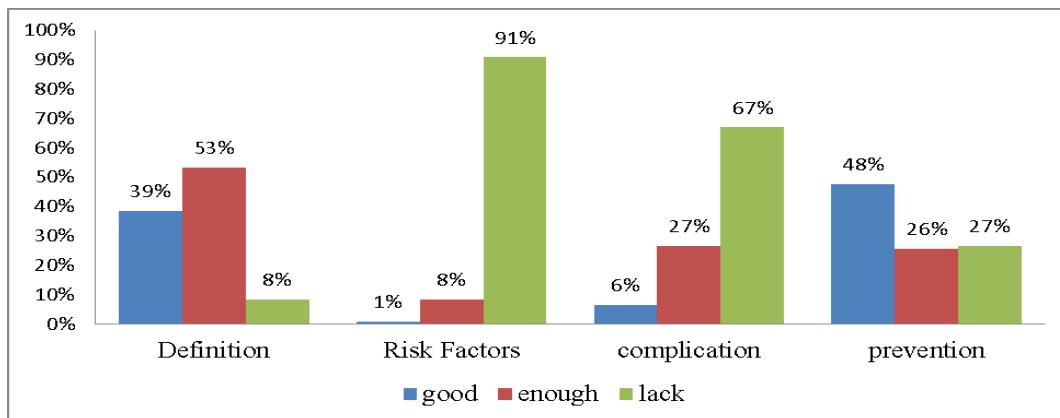


Figure 5. Mother's Knowledge about Prevention of Gestational Diabetes Mellitus

3.6.1. What is gestational diabetes mellitus

Gestational diabetes mellitus occurs in pregnant women who have never been diagnosed with diabetes and show abnormal blood sugar levels [27]. Gestational diabetes mellitus is hyperglycemia which first appears during pregnancy [28]. Gestational diabetes

mellitus is almost asymptomatic. Therefore, it is necessary to understand correctly about gestational diabetes mellitus. This can be started from the understanding, risk factors, complications that can occur, and prevention of gestational diabetes mellitus.

The mother's knowledge about what is meant by gestational diabetes mellitus is enough of 53% (Figure 5). However, some pregnant women do not know that gestational diabetes mellitus can occur due to high maternal blood sugar levels. This finding is in line with the results of research by [29], mother's knowledge both about the definition of gestational diabetes mellitus and the mother had heard about it. In contrast the results of a study by [25], maternal knowledge about the definition of poor gestational diabetes mellitus. However, mothers have heard of gestational diabetes mellitus of 41%.

Gestational diabetes mellitus occurs because of metabolic activity during pregnancy increases. Need to maintain glucose homeostasis in the body so that the mother does not experience hyperglycemia. Hyperglycemia occurs due to pancreatic β -cell dysfunction which results in chronic insulin resistance during pregnancy. This situation can make an increase in glucose in the fetus [8].

3.6.2. Risk factors for gestational diabetes mellitus

The results showed the mother's knowledge about low-risk factors. Researchers found several pregnant women who did not know about risk factors for gestational diabetes mellitus such as Body Mass Index (BMI) $\geq 30 \text{ kg} / \text{m}^2$, family history of diabetes mellitus, history of childbirth macrosomia, maternal age, history of gestational diabetes mellitus, history of birth defects, history preeclampsia, history of polycystic ovary syndrome, history of abortion, history of childbirth with no known cause, smoking habits, short duration of sleep, and depression (Figure 2).

This finding is the same as research conducted on pregnant women in Tunisia, the majority of pregnant women have limited knowledge about risk factors for gestational diabetes mellitus [30]. Research in India, there are pregnant women who do not know the risk factors for gestational diabetes mellitus [24]. Knowledge of risk factors and diagnosis of gestational diabetes mellitus is low. Precautionary measures and appropriate treatment as well as good knowledge about risk factors and the impact of gestational diabetes mellitus need to be done [22].

Excessive BMI and the category of overweight or obesity as a risk factor for gestational diabetes mellitus. In the questionnaire there was a statement about the risk factors for gestational diabetes mellitus is BMI $\geq 30 \text{ kg} / \text{m}^2$, mothers who answered "yes" or knew 46%, meaning that 54% of mothers did not know that BMI as a risk factor for gestational diabetes mellitus.

This finding is the same as research by [31], women who had a BMI $\geq 30 \text{ kg} / \text{m}^2$ before and there was an increase in body weight in the first trimester is one of the early signs of gestational diabetes mellitus. Pregnant women with a BMI $\geq 30 \text{ kg} / \text{m}^2$ have a risk of developing diabetes mellitus during pregnancy of four times [13]. An increase in BMI during pregnancy affects the development of gestational diabetes mellitus [32].

76% of pregnant women do not know that a family history of diabetes mellitus is a risk factor for gestational diabetes mellitus. The results of this study are the same as in India, women who live in rural areas do not know that family history of diabetes as a risk factor for gestational diabetes mellitus of 48.8% [24].

Research conducted by [16], pregnant women who have a family history of the mother's side (women) have a risk of getting diabetes mellitus during pregnancy even though the mother does not have a history or suffer from diabetes mellitus. Similarly, in

[33] stated that pregnant women who have a family history of diabetes mellitus are twice as likely to exposed gestational diabetes mellitus.

The results of this study also showed that mothers did not know about the history of macrosomia as a risk factor for gestational diabetes mellitus. Research conducted by [34], macrosomia can be a risk factor for gestational diabetes mellitus even though the mother never gave birth to a baby over 4000 grams. Moreover, this study also shows that the majority of mothers do not know age above 25 years as a risk factor for gestational diabetes mellitus (Figure 2). This is supported by the statement, maternal age is a risk factor for gestational diabetes mellitus [14].

Based on a questionnaire statement of the risk factor of gestational diabetes mellitus. Mothers who answered "yes" that the history of gestational diabetes mellitus as a risk factor of 54% means, the majority of mothers already know that. Mothers who answered "no" of 46% (Figure 2). This is in line with the research of [16] that mothers who have had gestational diabetes mellitus in a previous pregnancy are at risk of developing gestational diabetes mellitus again.

Research conducted by [35], women who have given birth to babies with congenital abnormalities has a risk of developing diabetes mellitus the next pregnancy. Moreover, mothers with a history of preeclampsia have a risk of gestational diabetes mellitus [36]. This happens because of pathophysiological changes that lead to gestational diabetes mellitus due to endothelial dysfunction [21].

93% and 92% of mothers answered not knowing that a history of abortion and the baby died as a risk factor in gestational diabetes Mellitus (Figure 2). Research [35], women who have a history of abortion and a baby died to have a twice fold risk of developing diabetes mellitus in subsequent pregnancies. The study by [37] also stated that mothers who had given birth to a baby in a dead condition and did not know the cause had a risk of developing gestational diabetes mellitus in subsequent pregnancies six times.

Based on Figure 2, most of the mothers do not know the short sleep duration and depression as risk factors for gestational diabetes mellitus. Research by [38], short sleep duration was <7 hours/night. This situation can affect glucose metabolism during pregnancy. Efforts can be made to overcome the lack of sleep at night, the mother can replace it with sleep during the day.

3.6.3. Knowledge about complication

This study also shows that pregnant women know that the possible complications that can occur from gestational diabetes mellitus such as death, giving birth to premature, and children can be affected by gestational diabetes mellitus as well (Figure 3).

High awareness of pregnant women that untreated gestational diabetes mellitus can have a negative impact on the baby before birth [22]. Based on the results of the study, mothers did not know that diabetes mellitus can cause children to develop diabetes mellitus of 80% (Figure 4). This situation is a long-term complication that can occur in babies born to women with gestational diabetes mellitus.

This finding is in line with the results of research conducted in India by [24]. Women in cities and villages do not know the long-term complications that can occur in infants in the future. Research by [39] concluded that pregnant women with hyperglycemia can be strong triggers of poor prenatal outcomes.

3.6.4. Knowledge about prevention

The mother's knowledge of gestational diabetes mellitus prevention is good (Figure 5). The mother knows that routine control of pregnancy is an effort to reduce the risk of

gestational diabetes mellitus. In addition, counseling during pregnancy helps mothers to obtain information about pregnancy. Prevention and control of gestational diabetes mellitus by providing information, education, and communication to women of reproductive age need to be done [29]. Moreover, prevention can be done by reducing foods that contain high cholesterol. The way that can be done by regulating a healthy lifestyle and regulating a diet to eat during pregnancy according to the advice of health workers. This finding is in line with research by Farrar, one of the goals of treatment of gestational diabetes mellitus is to reduce hyperglycemia through modifying eating diets and a healthy lifestyle [28].

Health education and health promotion can also be carried out for the initial steps in preventing gestational diabetes mellitus [25]. There is a need for training for doctors, paramedics, and the community on gestational diabetes mellitus and health education programs to increase public awareness especially pregnant women and health promotion of gestational diabetes mellitus in all health care centers [26]. Knowledge of pregnant women about diabetes mellitus is very important as an early effort to be aware of the risks that may occur during pregnancy. Moreover, appropriate care is needed in an effort to manage the risk of diabetes because most women are at moderate to high risk. So that does not cover the possibility that a woman will have a greater risk for exposure to gestational diabetes mellitus when they are pregnant [2]. And early screening for gestational diabetes mellitus is very important to minimize the long-term or short-term adverse effects on both mother and baby [40].

4. Conclusion

Mother's knowledge of what is meant by gestational diabetes mellitus is good. The mother knows how to prevent gestational diabetes mellitus. However, mothers do not know risk factors for gestational diabetes mellitus and complications that can occur, both short and long term. Therefore, health education and provision of information need to be given as a first step in increasing maternal knowledge about the risk of disease that can occur during pregnancy, if not done early screening and prevention. Also, counseling and routine pregnancy checks need to be done especially for mothers who already have a history of risk factors.

Acknowledgments

The authors would like to thank pregnant women in the Gunungkidul district of Yogyakarta for their contribution to this research. The author wishes also to acknowledge Universitas Aisyiyah Yogyakarta, Indonesia, and Primary Health Care the Gunungkidul district of Yogyakarta for providing logistic and venue for this research

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