



RESEARCH ARTICLE

Awareness Of Gestational Diabetes Mellitus And Its Determants Among Pregnant Women Attending Primary Healthcare Centers In Department Of Obstetrics And Gynecology At AL-Yarmouk -Teaching Hospital 2023-2024

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ARTICLE INFO	ABSTRACT
Received: Feb 22, 2024 Accepted: May 9, 2024	<p>Gestational diabetes mellitus is a frequently encountered issue during pregnancy. Women of reproductive age can be educated to avoid gestational diabetes mellitus. The objective of this study is to evaluate the existing level of knowledge regarding gestational diabetes mellitus, its associated risk factors, and its correlation with sociodemographic features among pregnant women in Department of Obstetrics and Gynecology at AL-Yarmouk -Teaching Hospital. In this cross-sectional study, a sample of 380 pregnant women was randomly selected from those who visited primary health care clinics for normal prenatal care visits or health issues and agreed to take part. Engage in academic pursuits. The data collecting period spanned from September to April. It involved conducting direct interviews utilizing a specifically designed questionnaire for the study. The levels of awareness were categorized into three distinct groups: low awareness (0 - 49%), fair awareness (50 - 69%), and high awareness (70 - 100%). The data was analyzed using the SPSS program, specifically version 24. A p-value is deemed significant if it is less than 0.05. Approximately 20.3% of the participants shown a high degree of awareness of gestational diabetes mellitus. In contrast, 39.5% had a moderate level of awareness, and 40.3% had a low level of awareness. Excellent Awareness was associated with factors such as advanced age, higher education levels, employment, having multiple pregnancies, being in the third trimester of pregnancy, experiencing previous birth complications, having a history of gestational diabetes mellitus or diabetes mellitus, and having a family history of diabetes mellitus or gestational diabetes mellitus. Only a minority of the individuals had a high level of awareness. Factors such as older age, higher levels of education, employment, having multiple children, being in the third trimester of pregnancy, experiencing previous delivery difficulties, having a history of gestational diabetes mellitus (GDM) or diabetes mellitus (DM), and having a family history of DM or GDM were associated with good awareness.</p>
Keywords	
Gestational Diabetes Mellitus (GDM)	
Diabetes Mellitus (DM)	
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INTRODUCTION

Gestational diabetes mellitus (GDM) is a condition where there is a lack of ability to process glucose during pregnancy. GDM can be categorized into two types: A1GDM and A2GDM. Diet-controlled gestational diabetes (GDM) or A1GDM is a term used to describe gestational diabetes that is managed without the use of medication and shows improvement with dietary intervention. A2GDM stands for

gestational diabetes mellitus, which is managed with medicine to regulate blood glucose levels within the appropriate range.⁽¹⁾The conventional approach to screening for gestational diabetes involved assessing individuals' medical history, obstetric outcomes, and familial history of type 2 diabetes mellitus. Notwithstanding its utilization, it was considered unsuitable. Roughly 50% of pregnant women with GDM were not identified with this screening approach. In 1973, a significant study suggested that the 50 g 1-hour oral glucose tolerance test is a dependable screening technique for gestational diabetes. Approximately 95% of obstetricians in the United States extensively employ this test to screen for gestational diabetes mellitus (GDM) during pregnancy. In 2014, the U.S. Preventive Services Task Force recommended that all pregnant women undergo screening for gestational diabetes mellitus (GDM) at 24 weeks of gestation.^(2,3)Gestational diabetes is believed to be caused by malfunctioning pancreatic beta-cells or a delayed response to glycemic levels, together with severe insulin resistance caused by the release of placental hormones. Human placental lactogen is the main hormone responsible for the heightened insulin resistance observed in gestational diabetes mellitus (GDM). Other hormones involved in the development of this syndrome include growth hormone, prolactin, corticotropin-releasing hormone, and progesterone. These hormones play a function in facilitating insulin resistance and elevated blood sugar levels during pregnancy.^(4,5)Human placental lactogen is a hormone that is released by the placenta while a woman is pregnant. During pregnancy, this hormone, which has a composition comparable to growth hormone, induces substantial metabolic alterations to support the nutritional needs of the developing fetus. This hormone has the potential to elicit alterations in the insulin receptors. These molecular alterations appear to be linked to decreased glucose uptake in peripheral organs. A genetic alteration occurs in the beta-subunit of the insulin receptor. , The process of activating tyrosine kinase through phosphorylation is diminished and Alterations are observed in insulin receptor substrate-1 and phosphatidylinositol 3-kinase.⁽⁶⁾ Maternal hyperglycemia is transferred to the fetus through the placenta, resulting in raised blood glucose levels in the fetus. Elevated blood glucose levels stimulate the activation of the fetal pancreas. Insulin's anabolic effects enhance the growth of embryonic tissue at a faster rate. There is a correlation between higher body mass index and obesity with low-grade inflammation. Prolonged inflammation stimulates the synthesis of xanthurenic acid, which is associated with the development of pre-diabetes and gestational diabetes mellitus.^(7,8)

Study population and Sampling technique

The study included a sample of 380 pregnant women who attended Department of Obstetrics and Gynecology at AL-Yarmouk –Teaching Hospital for routine ANC visits or health problems and agree to participate in this study.

SUBJECTS AND METHODS

A cross sectional study from September 2023 to April 2024. Data was collected by directly interviewing the participants, the time needed for each interview was 10-15 minutes, About four days per week (from Sunday to Wednesday) start at 9 a.m. to 1 p.m. About twenty samples had been collected per a week.

Statistical analysis

Data entry and analysis was done using SPSS version 24 computer software (statistical package for social sciences), categorical variables were presented as frequencies and percentages. Figures were used as needed. Chi square test was also used to show the association between awareness levels and variables $P \leq 0.05$ and $\chi^2 \geq 0.75$ for 12 awareness questions.

RESULTS

- **Sociodemographic variables of the participants:** A total of 380 women receiving antenatal care took part in this study. The minimal age of the participants was 15 years old, maximum age

was 43 years old and the mean age was 25 years \pm 6 years, more than half (55.8%) of the participants had an aged range of 20_29 years, only 18.2% of the participants had been graduated and about 86.1% of the participants were housewives. Other characteristics are shown in table1.

Table 1: Sociodemographic variables of the participants

Variables	Categories	Number	Percent
Age	less than 20	65	17.1
	20_29	212	55.8
	30-39	92	24.2
	40 and above	11	2.9
Educational level	Illiterate	24	6.3
	Primary education	155	40.8
	Secondary education	132	34.7
	Graduated	69	18.2
Occupation	Housewife	327	86.1
	Working	45	11.8
	Student	8	2.1

➤ **Participants' obstetrical and medical histories**

In terms of the obstetrical history of the participants, 41.6% were in their second trimester of pregnancy. Approximately 71.3% of the participants had given birth before, and just 5.3% had a history of previous births. The incidence of difficulties is as follows: 2.1% for preterm labor, 1.6% for stillbirth, 1.1% for small for gestational age, and 0.5% for macrosomia. The remaining 94.7% of participants did not have any previous delivery issues or this is their first pregnancy. In terms of medical history, a significant majority of the participants (97.4% and 98.4% respectively) did not have a personal history of GDM or DM. Additional attributes are displayed in table 2.

Table 2: Obstetrical and medical history of the participants.

Variables	Categories	Number	Percent
Gestational age	1st trimester	122	32.1
	2nd trimester	158	41.6
	3rd trimester	100	26.3
Parity	Primiparous	109	28.7
	Multiparous	271	71.3
Previous birth Complications	Yes	20	5.3
	No	251	66
Type of Birth complication	First Pregnancy	109	28.7
	Stillbirth	6	1.6

	Small for gestational age	4	1.1
	Macrosomia	2	0.5
	Preterm labor	8	2.1
	No birth complications	360	94.7
Past history of GDM	yes	10	2.6
	No	370	97.4
Personal History of DM	yes	6	1.6
	no	374	98.4
Family history of DM	Yes	210	55.3
	No	170	44.7
Family history of	yes	16	4.2
	no	364	95.8

➤ **Awareness of participants on various aspects of gestational diabetes mellitus.**

55.5% of the participants were cognizant of the association between GDM and a family history of DM. Additionally, 43.9% of the participants had knowledge regarding the potential link between pre-pregnancy obesity and GDM. Furthermore, 58.7% of the participants were aware that a history of diabetes in a prior pregnancy increases the likelihood of developing GDM. Only 31.3% of the participants were aware of the association between GDM and accelerated weight gain during pregnancy. Regarding understanding of GDM management, 79.5% of participants were aware that diet and exercise are a treatment option for GDM, whereas 23.7% understood that insulin injections can be used for GDM control. Approximately 65.8% of pregnant women have knowledge on the transient nature of GDM following childbirth. Regarding the potential negative consequences of GDM, 83.2% of the participants were conscious of the fact that if left untreated, the fetus might be damaged. Additionally, 48.2% of them were aware that GDM can increase the risk of developing type 2DM in the future. Regarding the screening time and type for GDM, only 13.7% of the participants correctly identified the appropriate time for diagnosis, which is between 24 and 28 weeks. Additionally, only 2.6% of the participants were aware that the blood test following an oral glucose load is the diagnostic test for GDM.

Table 3: Awareness of participants on various aspects of gestational diabetes mellitus

Awareness question	Yes	No	I don't
Can diabetes occur during pregnancy?	320 84.2	9 2.4	51 13.4
Do you know that family history of DM is a risk factor for gestational diabetes?	211 55.5	51 13.4	118 31.1
Is a pre-pregnancy obesity a risk factor for diabetes in pregnancy?	167 43.9	74 19.5	139 36.6
Is diabetes in previous pregnancy a risk factor for GDM?	223	35	122

	58.7	9.2	32.1
Is rapid weight gain in pregnancy a risk factor for diabetes in pregnancy?	119 31.3	129 34	132 34.7
Are you aware that diet and exercise are a treatment choice for GDM?	302 79.5	18 4.7	60 15.8
Are you aware that insulin injections can be administered for treating GDM?	90 23.7	106 27.9	184 48.4
Does GDM disappear after pregnancy?	250 65.8	17 4.5	113 29.7
Is the baby at risk if GDM is not treated?	316 83.2	13 3.4	51 13.4
Are you aware that women with GDM are at a risk of developing type II DM?	183 48.2	35 9.2	162 42.6

➤ **Association of level of awareness about GDM among participants with obstetrical and medical history**

The relationship between the obstetrical and medical histories of the participants and their level of consciousness is presented in table 6. A statistically significant correlation was observed between knowledge of gestational diabetes mellitus (GDM) and factors such as gestational stage, parity, history of delivery difficulties, and personal medical history. The study found a significant association between a personal history of diabetes mellitus (DM), a family history of diabetes mellitus (DM), and a family history of gestational diabetes mellitus (GDM) ($P < 0.05$). The proportion of individuals with good awareness was significantly greater in the third trimester (32%) compared to the first and second trimesters (11.5% and 19.6% respectively). Primiparous participants had a significantly larger proportion (51.4%) of low awareness compared to multiparous participants (35.8%). Participants who experienced delivery problems had a significantly greater percentage of good awareness (50%) compared to those without a history of birth issues (19.1%) and first-time mothers (17.4%). The table demonstrates that individuals with a history of GDM, personal history of DM, family history of DM, and family history of GDM had a notably greater proportion of excellent awareness compared to those without these medical histories.

Table 5: Association of level of awareness about GDM among participants with obstetrical and medical history.

Variables		Level of awareness			X ²	P value
		Poor	Fair	Good		
Gestational age	1st trimester	52 42.6%	56 45.9%	14 11.5%	34.53	0.002
	2nd trimester	60 38%	67 42.4%	31 19.6%		
	3rd trimester	41 41.0%	27 27%	32 32%		
	Total	153 40.3%	150 39.5%	77 20.3%		
Parity	Primiparous	56 51.4%	34 31.2%	19 17.4%	7.948	0.01
	Multiparous	97 35.8%	116 42.8%	58 21.4%		
	Total	153 40.3%	150 39.5%	77 20.3%		
Previous birth complications	Yes	0 0 %	10 50%	10 50%	23.81	0.0001
	No	97 38.6%	106 42.2%	48 19.1%		
	First Pregnancy	56 51.4%	34 31.2%	19 17.4%		
	Total	153 40.3%	150 39.5%	77 20.3%		
Past history of GDM	Yes	0 0.0%	1 8.3%	11 91.7%	39.21	0.0001
	No	153 41.6%	149 40.5%	66 17.9%		
	Total	153 40.3%	150 39.5%	77 20.3%		
Personal history of DM <input type="checkbox"/>	Yes	2 33.3%	0 0.0%	4 66.7%	8.95	0.01
	No	151 40.4%	150 40.1%	73 19.5%		
	Total	153 40.3%	150 39.5%	77 20.3%		
Family history of DM	Yes	67 31.9%	90 42.9%	53 25.2%	15.24	0.0001
	No	86 50.6%	60 35.3%	24 14.1%		
	Total	153 40.3%	150 39.5%	77 20.3%		
Family history of GDM	Yes	2 12.5%	4 25.0%	10 62.5%	18.79	0.0001
	No	151 41.5%	146 40.1%	67 18.4%		
	Total	153 40.3%	150 39.5%	77 20.3%		

DISCUSSION

Gestational diabetes mellitus is now recognized as a significant worldwide public health issue, and it has been linked to negative health consequences for both mothers and their newborns in the short and long run ⁽⁹⁾. The high percentage of knowledge of the occurrence of DM during pregnancy in our study may be attributed to the fact that these moms had recently been informed about GDM, and therefore may not accurately reflect their actual knowledge on the subject. In this study, a majority of the participants (55.5%) demonstrated knowledge on the association between gestational diabetes mellitus (GDM) and a family history of diabetes mellitus (DM). A study conducted in Bangalore, India, had a similar outcome, reporting that 49.3% of pregnant women were aware that a family history of diabetes mellitus is a risk factor for gestational diabetes mellitus (GDM) ⁽¹⁴⁾. Less than 50% of the participants in the study (43.9%) were aware that being obese before pregnancy can result in gestational diabetes mellitus (GDM), and only 31.3% recognized that GDM is associated with excessive weight gain during pregnancy. In a study conducted in Saudi Arabia by Alharthi et al.

(2018), it was found that 24.7% of pregnant women were aware that gaining weight before pregnancy increases the risk of gestational diabetes mellitus (GDM), whereas 57.1% recognized that gaining weight rapidly during pregnancy can also contribute to GDM⁽¹⁰⁾. A majority of the survey participants (58.7%) were knowledgeable about the concept that having diabetes in a previous pregnancy increases the likelihood of developing gestational diabetes mellitus (GDM). Unlike a study conducted in Samoa by Price et al. (2017), which reported that 15% of pregnant women had a prior history of gestational diabetes mellitus (GDM) as a risk factor for GDM⁽¹²⁾. Women who have previously had gestational diabetes mellitus (GDM) may possess greater knowledge as a result of their increased exposure to information about diabetes. In terms of knowledge regarding the treatment of GDM, 79.5% of the participants in the survey were aware that diet and exercise are viable treatment options for GDM, while 23.7% of them were aware that insulin injections can be utilized in the management of GDM. They reported that 65.4% of pregnant women were aware that diet and exercise are components of the GDM treatment plan, and 23.7% of them knew that insulin injections can be used for GDM therapy⁽¹⁰⁾. The limited awareness regarding the use of insulin injections for managing gestational diabetes mellitus (GDM) can be linked to misconceptions prevalent in our community. These misconceptions include the notion that any injection during pregnancy is risky and that insulin itself is dangerous and potentially addictive. In the current study, it was shown that 65.8% of pregnant women were cognizant of the fact that gestational diabetes mellitus (GDM) has the potential to resolve itself after childbirth. In a study conducted by Elamurugan and Arounassalame (2016), it was observed that a smaller percentage of pregnant women, specifically 31%, were aware of the fact that gestational diabetes mellitus (GDM) resolves after giving birth⁽¹³⁾. In terms of participants' awareness of GDM diagnosis, 13.7% of them were knowledgeable about the correct timing for diagnosis, which is between 24 and 28 weeks. Additionally, 2.6% of the participants were aware that the ideal test for diagnosing GDM is the Oral Glucose Tolerance Test (OGTT). In a study conducted by Alharthi et al. (2018), it was shown that there was a limited understanding of the diagnosis of GDM. Specifically, only 22.2% of pregnant women were aware of the suggested timing for diagnosis, and only 9.7% knew the most effective test for screening GDM⁽¹⁰⁾. The current investigation revealed that 20.3% of the participants exhibited a commendable level of awareness. The study conducted by Alharthi et al. (2018) revealed a significantly lower outcome, stating that only 11.4% of the participants had a high level of awareness. This disparity may be attributed to variations in the style of the questionnaire and the method used for scoring. The study found that participants under the age of 20 had a much lower proportion of good awareness compared to older age groups. These findings were corroborated by several investigations conducted by Alharthi et al. (2018), Alnaeem (2019), and Dhyani et al. (2018)^(10,14,15). Therefore, a positive correlation was observed between advancing age and a heightened level of awareness. Health knowledge tends to expand as one gets older. Elderly pregnant women exhibit a strong inclination towards acquiring knowledge and actively engage in seeking information⁽¹⁶⁾. Among the different categories, participants who had completed their education had the largest proportion (40.6%) of good awareness, while participants who were illiterate had the lowest proportion (8.3%) of good awareness. The correlation between education and awareness of GDM in this study is not unexpected, as it was previously seen by Hussain et al. (2015), who found that lower educational attainment is linked to limited understanding⁽¹⁷⁾. Primiparous participants had a significantly larger proportion (51.4%) of low awareness compared to multiparous participants (35.8%). Primiparous pregnant women may lack sufficient knowledge and expertise about pregnancy-related health issues and relevant information. In addition, experiences from numerous pregnancies may have served as a means of acquiring more comprehensive health information. Participants who experienced birth problems had a significantly higher percentage of good awareness (50%) compared to those without a history of birth complications (19.1%). One possible explanation for this direct correlation could be because the presence of previous birth difficulties may prompt mothers to investigate the potential causes of these complications. Individuals having a prior diagnosis of gestational diabetes

mellitus (GDM), personal history of diabetes mellitus (DM), and family history of both DM and GDM were found to have a strong correlation with high levels of awareness. These findings were corroborated by additional research conducted by Alharthi et al. (2018). In a study conducted by Bhowmik et al. (2018), it was discovered that a high knowledge score is strongly linked to personal and/or family histories of diabetes mellitus (DM) and gestational diabetes mellitus (GDM) ^(10,17).

CONCLUSION

Only a minority of the individuals had a high level of awareness. Factors such as older age, higher levels of education, employment, having multiple children, being in the third trimester of pregnancy, experiencing previous delivery difficulties, having a history of gestational diabetes mellitus (GDM) or diabetes mellitus (DM), and having a family history of DM or GDM were associated with good awareness. Most participants lacked knowledge regarding the correct diagnostic test and timing for GDM. Additionally, they relied on information from friends, relatives, and media rather than healthcare providers or instructional pamphlets.

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