

AWARENESS OF GESTATIONAL DIABETES MELLITUS AND ITS DETERMANTS AMONG PREGNANT WOMEN ATTENDING PRIMARY HEALTHCARE CENTERS IN AL_ADEL SECTOR BAGHDAD, IRAQ 2023-2024

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Abstract

Background: Research conducted globally reveals a lack of public knowledge and comprehension about several aspects of diabetes. To minimise the number of complications and co-morbidities in the diabetic population, it is essential to ensure sufficient education, increase awareness, identify difficulties at an earlier stage, and enhance the quality of care.

Objectives: To assess the level of awareness of gestational diabetes mellitus, its determinants and its relation to sociodemographic characteristics among pregnant women attending primary healthcare centers in Al adel sector 2023-2024.

Methods: A cross sectional study, a randomly selected sample of 400 pregnant women selected conveniently who attended primary health care centers for routine antenatal care visits or for health problems and agree to participate in this study. The study will be conducted in Baghdad province (alkarkh) in Al-adel sector for PHCs from November 2023 to march 2024.

Results: A total of 400 women receiving antenatal care took part in this study. The minimal age of the participants was less than 19 years old, maximum age was 40-49 years old and the mean age was 30 years $\pm$ 6 years, more than (32%)of the participants had an aged range of 30-39 years, only 44% of the participants had been graduated and about 38%% of the participants were housewives

Conclusions: Only a minority of the individuals demonstrated a significant level of awareness. Advanced age, higher levels of education, employment, having multiple children, being in the third trimester of pregnancy, experiencing previous birth complications, having a history of gestational diabetes or diabetes, and having a family history of diabetes or gestational diabetes were associated with a high level of awareness. A significant number of participants lacked knowledge on the precise diagnostic test and optimal timing for Gestational Diabetes Mellitus (GDM). Target women aged 35 and below, as well as those with a primary education or lower, for health education workshops aimed at increasing their awareness of Gestational Diabetes Mellitus (GDM).

Key words : Diabetes Mellitus (DM), gestational diabetes mellitus(GDM), Poor awareness,good awareness, fair awareness.

Introduction:

Diabetes Mellitus (DM) is a group of metabolic illnesses characterised by elevated levels of glucose in the bloodstream resulting from problems with the secretion of insulin, its activity, or both. Diabetes is

associated with chronic elevation of blood sugar levels, which can cause long-term damage, dysfunction, and impairment in various organs, including the eyes, kidneys, nerves, heart, and blood vessels. Iraq is a prominent nation in the prevalence of type 2 diabetes ⁽¹⁾. The increasing incidence of individuals with type 2 diabetes is a worldwide problem ⁽²⁾, resulting from a combination of environmental and genetic factors ⁽³⁾. The worldwide prevalence of adult diabetes is expected to rise from 135 million in 1995 to 380 million by 2025⁽⁴⁾. Most of the population increase will occur in developing nations. Diabetes is widespread among the senior population in industrialised Western nations, whereas in poorer countries it mainly impacts those between the ages of 35 and 64 ⁽⁵⁾.

- First-trimester screening can identify preexisting diabetes and early-onset gestational diabetes mellitus (GDM) in order to rapidly implement strategies to regulate glucose levels. Effectively managing gestational diabetes mellitus (GDM) can reduce the likelihood of complications and should commence with making modifications to one's lifestyle. Insulin is the preferred first-line medicine for people who are unable to attain normal blood sugar levels alone by lifestyle modifications. Patients who have poor glycemic control or require medication should undergo foetal surveillance starting at 32 weeks of gestation. Physicians must assess all patients diagnosed with gestational diabetes mellitus for foetal macrosomia, which refers to a greater estimated foetal weight. Complications associated with gestational diabetes mellitus (GDM) include macrosomia (excessive birth weight), neonatal hypoglycemia (low blood sugar in newborns), polycythemia (abnormally high red blood cell count), shoulder dystocia (difficulty delivering the baby's shoulders), hyperbilirubinemia (high levels of bilirubin in the blood), neonatal respiratory distress syndrome (difficulty breathing in newborns), and increased perinatal mortality (higher risk of death around the time of birth) ⁽⁶⁾. Maternal consequences encompass hypertension, preeclampsia, heightened susceptibility to diabetes mellitus, and caesarean delivery ⁽⁷⁾. Effective diabetes management for individuals with diabetes necessitates the acquisition of self-care knowledge. Patients who may not obtain enough information on diabetes and related illnesses may have persistent concerns, anxiety, lack of confidence, and anger⁽⁸⁾.

Methods: A cross sectional study from November 2023 to March 2024.

The study included a sample of 400 pregnant women selected conveniently who attended Baghdad province (alkarkh) in Al-adel sector visits or health problems and agree to participate in this study.

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 8:30 a.m. to 2 p.m. About twenty samples had been collected per a week. A questionnaire is developed after reviewing available literature. Data will be collected by directly interviewing the participants. The questionnaire will be adapted from previous study that searched the awareness about gestational diabetes ⁽⁹⁾. Its composed of two parts; part 1 was made up of sociodemographic data with obstetrical and medical history, while part 2 comprised of questions on awareness of GDM. Questions 1-15 were used to calculate the awareness score. As each question investigates different aspects of GDM, all fifteen questions included in the awareness score were weighted equally. The answer options provided were yes, no, I don't know for all awareness related questions except question number 15. Question 15 is about the screening time of GDM and the correct answer is between 24-28 weeks of pregnancy. Each correct response will be given a score of 1, while incorrect answer will be given zero and each participant was scored out of a

total of 15. For a maximum score of 15 points (100%), and the average awareness score was calculated as:

Subject awareness score divided by maximum awareness score then multiplied by 100%. Levels of awareness were classified into three groups:

poor awareness: 0 -49%, fair awareness: 50 -69% and good awareness: 70 -100% .

we depended on Appendix1 (Study questionnaire) and Appendix11(Awareness related questions)

Statistical analysis:

- Spss will be used in data entry and analysis.
- Descriptive data will be presented as tables and graphs.
- Categorical data will be tested using the chi-square.
- Quantitative data will be analyzed using t-test or z test.
- P value of less than 0.05 will be used to assess the level of significance.

Results:

A total of 400 women receiving antenatal care took part in this study. The minimal age of the participants was less than 19 years old, maximum age was 40-49 years old and the mean age was 30 years $\pm$ 6 years, more than (32%)of the participants had an aged range of 30-39 years, only 44% of the participants had been graduated and about 38%% of the participants were housewives . Other characteristics are shown in table 2. In regard to awareness about the occurrence of diabetes during pregnancy, about more than half of participants were aware about that. 46.4% of them were aware that GDM is related to family history of DM, 51.4 of them knew that pre-pregnancy obesity could lead to GDM and 46.4% were aware that diabetes in previous pregnancy is a predisposing factor for GDM. Only 36.9% of the participants were knew that GDM is linked to rapid weight gain in pregnancy. With regard to awareness about the management of GDM, 79.5% of the participants were aware that diet are 74.2% and exercise 1.4% are a treatment choice for GDM, while 19.3% of them knew that insulin injections can be used in the management of GDM. while oral hypoglycemic agents About 50.1% . Only about 26.9% of pregnant women were aware of the fact that GDM disappears after delivery. 40.8% of the participants were aware that the fetus may be affected if the mother is left untreated, while 26.9% of them were aware that aware that GDM can lead to type 2DM in the future. The awareness of the participants regarding screening time and type for GDM, about 26.9% of the participants answered the right time of diagnosis in second trimester while about 30.6% 3rd trimester.

Table 1: Awareness of participants on various aspects of gestational diabetes mellitus:

Awareness Question	YES	NO	I DON'T KNOW
Can Diabetes Occur During Pregnancy	220 51%	64 14.8%	116 26.9%
Can Family History Of DM Is A Risk Factor For Gestational Diabetes	200 46.4%	66 15.3%	134 31.1%

Can Pre-Pregnancy Obesity A Risk Factor For Diabetes In Pregnancy?	216 51.4%	54 12.5%	130 30.2%
can Diabetes In Previous Pregnancy A Risk Factor For GDM	200 46.4%	42 9.7%	158 36.7%
Can Rapid Weight Gain In Pregnancy A Risk Factor For Diabetes In Pregnancy?	158 36.9%	96 22.3%	146 33.9%
Diet is A Treatment Choice For GDM	320 74.2%	60 13.9%	20 4.6%
Exercise Are A Treatment Choice For GDM	6 1.4%	260 60.3%	134 31.1%
Insulin Injections Can Be Administered For Treating GDM	83 19.3%	263 61.0%	54 12.5%
Oral Hypoglycemic Agent Injections Can Be Administered For Treating GDM	216 50.1%	92 21.3%	92 21.3%
GDM Disappear After Pregnancy	116 26.9%	72 16.7%	212 49.2%
Is The Baby At Risk If Gdm Is Not Treated?	176 40.8	50 11.6%	174 40.4%
Women With GDM Are At A Risk Of Developing Type II DM	116 26.9%	72 16.7%	212 49.2%
Have You Heard About Blood Test For Diabetes After Glucose Tolerance	284 65.9%	10 2.3%	104 24.1%
Testing For Diabetes In Pregnancy Is Necessary	164 38.1%	58 13.5%	178 41.3%

Screening time for GDM

1 st	2 nd	3 rd
150 34.8%	116 26.9%	132 30.6%

Association between obstetrical and medical history of the participants with level of awareness is shown in table 6. Statistically significant association was found between awareness about GDM with Age, gestational stage, parity, history of birth complications, history of GDM, personal history of DM, family history of DM and family history of GDM ($P < 0.05$).

Age Group Differences : Across all age groups, the majority of individuals fall into the "Poor awareness" category, with the proportion decreasing as age increases. The <19 years age group has the highest proportion of individuals with "Poor awareness," while the 40-49 years age group has the highest proportion with "Good awareness."

Parity Differences: Primiparous individuals (first-time mothers) tend to have a higher proportion of individuals with "Poor awareness" compared to multiparous individuals (those who have had multiple children) (4%).

Multiparous individuals have a higher proportion of individuals with "Fair awareness" and "Good awareness" compared to primiparous individuals (24%).

Previous Birth Complications Differences:

Individuals with no previous birth complications have a higher proportion of individuals with "Poor awareness" compared to those with previous birth complications. Also There was a significant higher proportion of good awareness among participants in second trimester (13%) as a compared with those in first and 3rd trimesters (8% and 7 % respectively).

Past Medical History of GDM Differences: Individuals with a past medical history of GDM have a higher proportion of individuals with "Fair awareness" and "Good awareness" compared to those without such history.

Individuals without a past medical history of GDM have a higher proportion of individuals with "Poor awareness."

There was a significant higher proportion of POOR awareness among participants who had a history of GDM, personal history of DM, family history of DM and family history of GDM than those who had not the mentioned medical histories as shown in the following table 2.

Table2 : Level Of Awareness About GDM Among Participants With Obstetrical And Medical History:

Variables		Level of awareness			X ²	P value
		Poor awareness (0-49%)	Fair awareness (50-69%)	Good awareness (70-100%)		
Age	<19 Years	46 (11.5%)	18 (4.5%)	0 (0%)	23.1 2	0.001 HS
	20-29 Years	77 (19.25%)	19 (4.75%)	4 (1%)		
	30-39 Years	103 (25.75%)	26 (6.5%)	9 (2.25%)		
	40-49 Years	55 (13.75%)	28 (7%)	15 (3.75%)		
	Total	281 (70.25%)	91 (22.75%)	28 (7%)		
Educational	Illiterate	141 (35.25%)	33 (8.25%)	16 (4%)	10.3 5	0.111 NS
	Primary	73 (18.25%)	24 (6%)	5 (1.25%)		

	Secondary	42 (10.5%)	23 (5.75%)	3 (0.75%)		
	Higher	25 (6.25%)	11 (2.75%)	4 (1%)		
	Total	281 (70.25%)	91 (22.75%)	28 (7%)		
Parity	Primiparus	141 (35.25%)	39 (9.75%)	4 (1%)	13.6 7	0.001 HS
	Multiparus	140 (35%)	52 (13%)	24 (6%)		
	Total	281 (70.25%)	91 (22.75%)	28 (7%)		
Previous Birth Completion s	Yes	15 (3.75%)	1 (0.25%)	0 (0%)	4.47 1	0.107 NS
	NO	266 (66.5%)	90 (22.5%)	28 (7%)		
	Total	281 (70.25%)	91 (22.75%)	28 (7%)		
Past Medical History Of Gdm	Yes	56 (14%)	24 (6%)	8 (2%)	2.42	0.298 NS
	NO	225 (56.25%)	67 (16.75%)	20 (5%)		
	Total	281 (70.25%)	91 (22.75%)	28 (7%)		
Past Medical History Of Dm	Yes	57 (14.25%)	25 (6.25%)	8 (2%)	2.67	0.263 NS
	NO	224 (56%)	66 (16.5%)	20 (5%)		
	Total	281 (70.25%)	91 (22.75%)	28 (7%)		
Family History Of Dm	Yes	58 (14.5%)	28 (7%)	8 (2%)	4.35	0.113 NS
	NO	223 (55.75%)	63 (15.75%)	20 (5%)		
	Total	281 (70.25%)	91 (22.75%)	28 (7%)		

Family History Of Gdm	Yes	54 (13.5%)	29 (7.25%)	7 (1.75%)	6.41	0.040 S
	NO	227 (56.75%)	62 (15.5%)	21 (5.25%)		
	Total	281 (70.25%)	91 (22.75%)	28 (7%)		
Gestation Age	1st	45(11.25%)	31(7.75%)	8(2%)	14.78	0.005 HS
	2ND	149(37.25%)	40(10%)	13(3.25%)		
	3RD	87(21.75%)	20(5%)	7(1.74%)		
	Total	281 (70.25%)	91 (22.75%)	28 (7%)		

Total Levels of Awareness

About of the subjects (70.25%) of the participants had a poor level of awareness as shown in figure

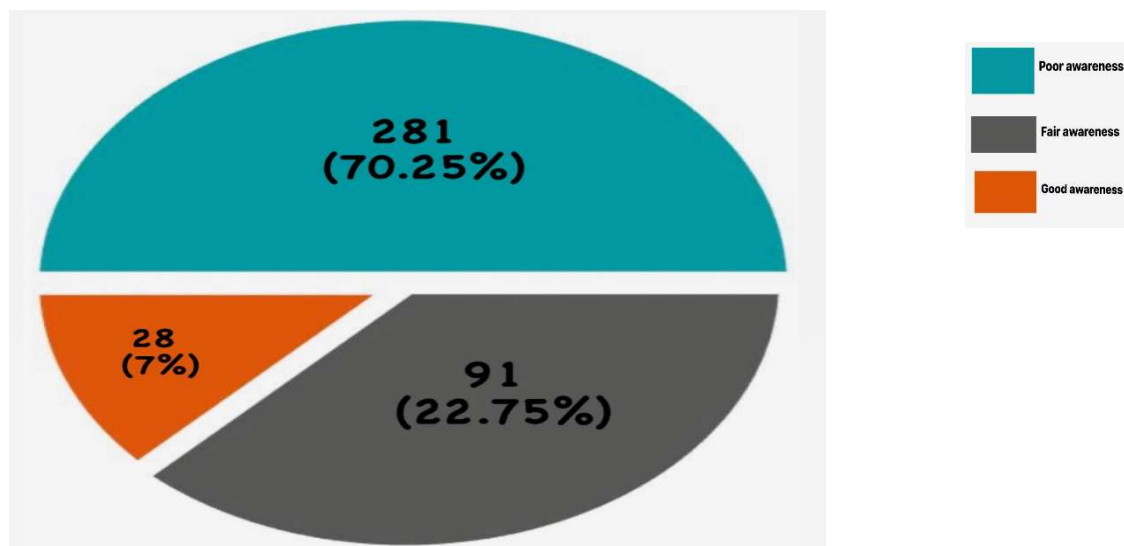


Figure 1: Levels Of Awareness

Discussion

Gestational diabetes mellitus is a significant worldwide public health issue that is linked to negative health consequences for both mothers and their infants in the immediate and long-term. Healthcare experts are currently showing significant interest in it. In order to mitigate the risk of gestational diabetes mellitus (GDM), it is imperative to provide women in their reproductive years with comprehensive education regarding GDM, its contributing causes, and the potential long-term consequences. The low understanding of gestational diabetes in our study may be attributed to disparities in health literacy

across different demographic groups. In this study, 70.5% of the participants showed a limited understanding of Gestational Diabetes Mellitus (GDM) in relation to their family's history of Diabetes Mellitus (DM). This result may be linked to the dominant ideas in our community that GDM is not inherited. Furthermore, another notion to consider is that chronic diseases such as diabetes mellitus can be inherited after the age of 50, namely after menopause. Further health education is necessary to augment their awareness concerning that topic. More than half of the survey participants had knowledge of the correlation between pre-pregnancy obesity and gestational diabetes mellitus (GDM), whereas 36.9% were aware of the link between GDM and excessive weight gain during pregnancy. According to a study conducted in Saudi Arabia by Alharthi et al. (2018), 24.7% of pregnant women were knowledgeable with the notion that gaining weight before pregnancy increases the risk of GDM. Additionally, 57.1% of the participants were aware that gaining weight rapidly during pregnancy might lead to GDM⁽¹⁰⁾. While less than half of the study participants (1.4%) aware that exercise are a treatment choice for GDM. This result could be related to the general concepts in our community that the Exercise harms the pregnant woman and may cause miscarriage. Further health education is needed to improve their understanding of the issue. Regarding awareness of GDM treatment, 50.1% of participants knew that oral hypoglycemic agents are an option, and 19.3% were aware of insulin injections as a treatment for GDM. The results of our study align with those of a study conducted in Saudi Arabia by Alharthi et al. (2018). They found that 65.4% of pregnant women were aware that oral hypoglycemic agents are included in the treatment plan for GDM, and 23.7% knew that insulin injections can be used for GDM treatment⁽¹⁰⁾. The limited awareness regarding insulin injection for managing GDM may be due to misconceptions in our community that any injection during pregnancy is risky, or that insulin in general is harmful and can lead to addiction. According to the recent study, 26.9% of pregnant women knew that gestational diabetes mellitus (GDM) could resolve after delivery. The results of our study supported the findings of Elamurugan and Arounassalame (2016), indicating that 31% of pregnant women knew that gestational diabetes mellitus (GDM) resolves after giving birth. This limited understanding in our research may be associated with the concept that gestational diabetes mellitus (GDM) is a chronic condition related to diabetes mellitus⁽⁹⁾. Participants under 20 years old exhibited a markedly lower level of awareness in comparison to older age groups, as indicated by the study. The findings were supported by further studies carried out by Alharthi et al. (2018), Alnaeem (2019), and Dhyan et al. (2018)^(10,11,12). There is a favorable correlation between age and awareness levels. As individuals age, they tend to acquire more health information. Older pregnant women are curious and actively seek out information.

Conclutions

A small proportion of the individuals exhibited a high degree of awareness. Good awareness was found to be associated with factors such as advanced age, higher levels of education, employment, having multiple children, being in the third trimester of pregnancy, experiencing previous birth complications, having a history of gestational diabetes or diabetes, and having a family history of diabetes or gestational diabetes. The majority of participants exhibited a deficiency in their understanding of the accurate diagnostic test and optimal time for Gestational Diabetes Mellitus (GDM). Health education programs should primarily target women under the age of 35 and those with an elementary education or lower in

order to enhance their understanding of GDM.

Recommendations

Recommend Public health educational resources aimed at women should be distributed via mass media and health education pamphlets to enhance knowledge regarding GDM. It is imperative to include healthcare practitioners in the future planning of health promotion for Gestational Diabetes Mellitus (GDM) in primary healthcare services. This entails enhancing healthcare personnel' knowledge regarding GDM, encompassing its risk factors, appropriate timing and testing for diagnosis, treatment alternatives, and the consequences for both the mother and her fetus. Additional investigation is needed to examine the level of knowledge of Gestational Diabetes Mellitus (GDM) among healthcare professionals. Public health educational information should be distributed to women via mass media and health education pamphlets in order to enhance awareness regarding GDM. It is imperative to engage healthcare practitioners in future health promotion planning for Gestational Diabetes Mellitus (GDM) within primary healthcare services. This entails raising awareness about GDM, encompassing its risk factors, accurate diagnostic processes and timing, treatment alternatives, and the potential repercussions for both the mother and fetus. It is recommended to conduct further research on the understanding of gestational diabetes mellitus (GDM) among healthcare providers.

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