



Original Article

Knowledge of Gestational Diabetes Mellitus among Pregnant Women Attending Antenatal Care in North West, Nigeria

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Abstract

Introduction: Gestational diabetes mellitus (GDM) is one of the most common medical complications of pregnancy. It is a condition in which women without previously diagnosed diabetes mellitus exhibit high blood glucose levels during pregnancy. Hyperglycemia in pregnancy results in both maternal and fetal complications. The prevalence is rising worldwide, however there is poor knowledge of the condition among pregnant women. **Objective** The study aimed to determine the knowledge of GDM among women attending antenatal clinic (ANC) at Federal Teaching Hospital (FTH) BirninKebbi. **Methodology:** A cross sectional study was carried out among 130 women attending ANC at FTH, BirninKebbi. An interviewer administered semi-structured questionnaire was used to obtain the bio-data and other relevant information which were imputed into an SPSS computer statistical software version 20 and analyzed. **Results** The mean age of study participants was 27.4 ± 4.5 years. Awareness of DM was high (90%), while that of GDM was low 41%. The major sources of information were friends/ neighbors (35%). However, only 18.5% of the respondents had overall good knowledge for GDM. Some of them were aware of commonest risk factors for GDM such as family history of type 2 DM (53.8%) and obesity (43.8%). Majority, 71.5%, were aware of fasting blood sugar as diagnostic test. However only 18.5% of the respondents were aware of the appropriate gestational age for the screening of GDM. **Conclusion:** From the study there is poor knowledge of GDM. Hence, more public enlightenment programs are needed to improve awareness among the populace and to encourage regular screening at the ANC.

Key words: Knowledge, Gestational Diabetes Mellitus, North west Nigeria (GDM)

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How to cite: Ladan AA, Ibrahim UA. Knowledge of Gestational Diabetes Mellitus among Pregnant Women Attending Antenatal Care in North West, Nigeria. NJGP. 2023;21(2):68 - 77

Quick Response Code:



Introduction

Gestational diabetes mellitus is defined as any degree of glucose intolerance with onset or first recognition during pregnancy¹. It is a condition in which women without previously diagnosed diabetes mellitus exhibit high blood glucose levels during pregnancy (especially during the third trimester).

The first evidence that screening, diagnosis and treatment of hyperglycaemia in women not previously known to have diabetes improve outcomes was provided by O'Sullivan et al. in the 1960s¹. The prevalence of gestational diabetes (GDM) is increasing all over the world². Prevalence of GDM is increasing alongside rising levels of obesity and inactivity, which can increase insulin resistance, mirroring the increasing rate of type 2 diabetes mellitus among the non-pregnant women. Sub-Saharan Africa, like the rest of the world, is experiencing an increasing prevalence of diabetes alongside other non-communicable diseases³. The estimated number of cases of hyperglycaemia in pregnancy from previous studies, shows that Africa ranks second after South-East Asia⁴.

As one of the most serious medical conditions complicating pregnancy, gestational diabetes mellitus (GDM) affects an estimated 8.3% of pregnancies worldwide. The prevalence rate of GDM in the US is 3–4%, affecting upwards of 110 000 women annually, and this increase is probably because of increasing rates of overweight and obesity^{5,6}.

Despite the rising incidence of GDM in developing countries, a previous study in Nigeria had reported poor knowledge, attitude and practice about the management of gestational diabetes mellitus among antenatal care providers⁷. The awareness of DM was generally high, while that of GDM was low. A cross sectional study from Rivers state, South-south Nigeria among women of reproductive age group had reported awareness of 90.6% for DM and 38.2% for GDM⁸. From Ibadan South-west Nigeria, another study among pregnant women had revealed poor knowledge of GDM and the prevention among the majority of women (56%)⁹. Another study from India had reported poor knowledge of GDM of 6.3% among women attending ANC¹⁰. The knowledge among the healthcare providers varies at the primary level because of lack of pre-service and on-the job training on GDM¹¹. Knowledge of GDM and practices differ between nursing professionals and doctors, even when the women are diagnosed with GDM they are generally referred to specialists for further management¹¹.

Despite these untoward effects, there is a dearth of data on the awareness of the condition, and its risk factors in Northern Nigeria. It is in the light of this that this study was carried out with the aim to determine the knowledge of GDM among women attending ANC at FTH Birnin Kebbi. Findings from the study would help to create public awareness about this emerging disease condition and its consequences.

Methodology

The study was conducted at Federal Teaching Hospital Birnin Kebbi, Kebbi state. It is a Tertiary Health institution providing to the people Kebbi State and the neighbouring Sokoto and Niger states including Niger and Benin Republics. The hospital has 500 beds capacity, dedicated to providing tertiary health care in Obstetrics & Gynaecology, Medicine, Surgery, Paediatrics, Ophthalmology, Ear Nose and Throat and other specialized care.

Study design: The study utilised a cross sectional design.

Study population: This involved all pregnant women who attended ANC from November, 2021 to July, 2022 and consented to participate in the study.

The minimum sample size was determined using the formula for cross sectional study¹².

$$n = \frac{Z_{1-\alpha/2}^2 pq}{d^2}$$

n = estimated sample size

p = prevalence of GDM from a previous study = 8.3% = 0.083¹³

$$n = \frac{1.96^2 \times 0.083 \times 0.917}{0.05^2}$$

$$n = 117$$

considering a 10% non-response rate = $117/0.9 = 130$.

Therefore 130 women attending ANC were recruited for the study.

Sampling method: Systematic sampling was utilised to select eligible participants. Each patient presenting was assessed for her eligibility to participate based on gestational age. The list of all the eligible participants on the respective clinic days was created to form the sampling frame. On the average 20 eligible participants were seen per clinic day, out of which 5 were selected based on sampling interval of 1:4. The first subject was picked randomly by selecting a number between 1 and 4 through balloting. Thereafter every Nth patient (based on the sampling interval obtained is selected) until the required sample size for the clinic day was obtained.

Methods of data collection

The women were recruited at each ANC clinics and an interviewer administered semi-structured questionnaire was used to obtain bio-data and other relevant information.

Data were analyzed using the IBM SPSS version 20 computer statistical software package. Respondents' knowledge of gestational diabetes mellitus was scored and graded on a 9-point scale. One point was awarded for a correct response, while a wrong response or I don't know response received no points. This gives a minimum score of '0' and a maximum score of '9' points. Those that scored ≥ 6 of 9 points were considered as having 'good' knowledge; those that scored 4 to 5 of 9 points were graded as having 'fair' knowledge, while those that scored ≤ 3 of 9 points were graded as having 'poor' knowledge. Quantitative variables were summarized using mean and standard deviation, while categorical variables were summarized using frequencies and percentages. Frequency distribution tables were constructed; and cross tabulations were done to examine the relationship between categorical variables. The Chi square test was used for bivariate analysis involving categorical variables. All levels of significance were set at $p < 0.05$

Ethical Consideration

Approval for the study was obtained from the Health Research Ethics Committee of the Federal Teaching Hospital, BirninKebbi. Informed written consent was obtained from the study participants. A consent form was given to the study participants to sign after explaining the objectives of the study to them, prior to commencement of the interview. Participants were given the option to withdraw at any stage of the study.

Results

There were 130 ANC attendees, who participated in the study between November, 2021 and July, 2022.

Table 1A Socio-demographic characteristics of the study participants

| Variables | Frequency n=130 | Percentage (%) |
|------------------------------|-----------------|----------------|
| Age in years | | |
| 15- 19 | 5 | 3.8 |
| 20-24 | 32 | 24.6 |
| 25-29 | 52 | 40.0 |
| 30-34 | 29 | 22.3 |
| ≥ 35 | 12 | 9.2 |
| Mean ± SD | 27.4±4.5 years | |
| Occupation | | |
| Housewife | 72 | 55.4 |
| Civil servant | 36 | 27.7 |
| Trader/Business woman | 22 | 16.9 |
| Tribe | | |
| Hausa/Fulani | 92 | 70.8 |
| Igbo | 16 | 12.3 |
| Yoruba | 6 | 4.6 |
| Others (Dakarkari, Zabarmwa) | 16 | 12.3 |
| SD = Standard Deviation | | |

Table 1B Socio-demographic characteristics of the study participants

| Variables | Frequency n=130 | Percentage (%) |
|-----------------|-----------------|----------------|
| Religion | | |
| Islam | 99 | 76.2 |
| Christianity | 31 | 23.8 |

Educational status

| | | |
|----------------|----|------|
| Quranic school | 13 | 10.0 |
| Primary | 10 | 7.7 |
| Secondary | 29 | 22.3 |
| Tertiary | 79 | 60.8 |

Family setting

| | | |
|------------|-----|------|
| Monogamous | 103 | 79.2 |
| Polygamous | 27 | 20.8 |

The mean age of the women was 27.4 ± 4.5 years; age range was 17-37 years. Majority of the women (50.8%) were housewives, and predominantly Muslims (76.2%). Majority of the women were Hausa/Fulani (70.8%). Among the women, 82.3% had secondary level of education and above and greater percent were in monogamous setting.

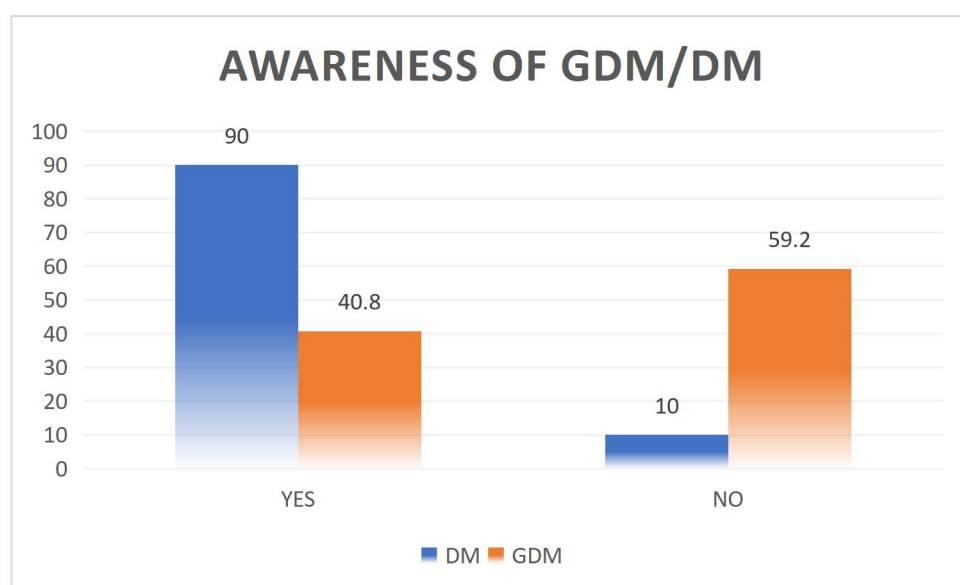


Figure I Awareness of DM/GDM among the study participants

The findings from the study showed that 117 out of 130 study participants (90%) were aware of Diabetes mellitus. However only Fifty-three (40.8%) of the 130 participants were aware of GDM.

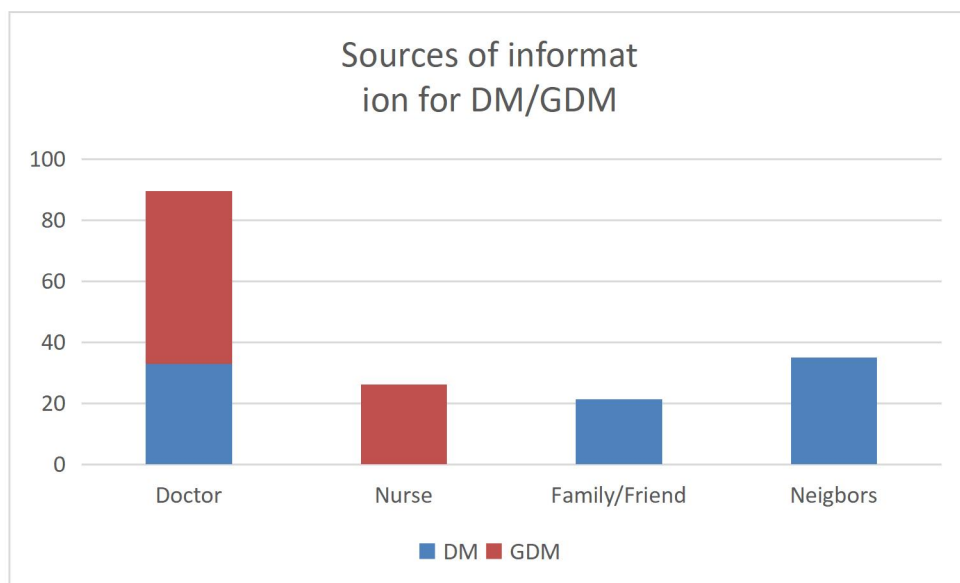


Figure II Sources of information on DM/GDM

The major sources of information about DM were friends/neighbors 41(35%), while the major sources of information about GDM were Doctors 26(56.5%) and Nurses 12(26.1%).

Table 2 Knowledge GDM/DM among the study participants

| Knowledge of risk factors | Correct Response Frequency (%) n = 130 |
|---|---|
| Family history of DM | 70 (53.8%) |
| Obesity | 57 (43.8%) |
| Excessive weight gain in pregnancy | 50 (38.5%) |
| GDM/DM in previous pregnancy | 42 (32.3%) |
| Pregnant mother being too old | 26 (20.0%) |
| Knowledge of diagnostic tests | |
| Fasting Blood Sugar | 93 (71.5%) |
| Random blood sugar | 47 (36.2%) |
| Oral glucose tolerance test (OGTT) | 32 (24.6%) |
| Knowledge of appropriate gestation for diagnosis | |
| 24-28 weeks | 34 (26.2%) |
| Knowledge grade | |
| Good | 24 (18.5%) |

Fair 43 (33.1%)

Poor 63 (48.5%)

Only few respondents have good knowledge of GDM 24 (18.5%). The commonest risk factors identified were; family history of Type 2 DM 53.8%, Obesity 43.8% and Excessive weight gain in pregnancy.

Majority (71.5%) were aware of fasting blood sugar as the diagnostic test for GDM/DM among the study participants.

Only 26.2% of the participants were aware of the appropriate gestational age (24 -28 week) for the screening of GDM.

Table 4 Factors associated with knowledge of Gestational Diabetes Mellitus among the study participants. N = 130

| Socio-demographic variables | Good Knowledge N (%) | Fair Knowledge N (%) | Poor Knowledge N (%) | Test Statistics |
|-----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|
| Age | | | | |
| 15-19 | 0 (0) | 1 (20) | 4 (80) | FE χ^2 p = 0.709 |
| 20-24 | 6 (18.8) | 9 (28.1) | 17 (53.1) | |
| 25-29 | 10 (19.2) | 15 (28.8) | 27 (51.9) | |
| 30-34 | 5 (17.2) | 13 (44.8) | 11 (37.9) | |
| ≥35 years | 3 (25.0) | 5 (41.7) | 4 (33.3) | |
| Tribe | | | | |
| Hausa/Fulani | 17 (18.5) | 30 (32.6) | 45 (48.9) | FE χ^2 p = 0.021 |
| Igbo | 3 (18.8) | 6 (37.5) | 7 (43.8) | |
| Yoruba | 4 (66.7) | 2 (33.3) | 0 (0) | |
| Others | 0 (0) | 5 (31.2) | 11 (68.8) | |
| Education | | | | |
| Formal Educ. | 23 (19.8) | 38 (32.8) | 55 (47.4) | χ^2 = 6.154, p = 0.505 |
| No Formal Educ. | 1 (7.1) | 5 (35.7) | 8 (57.1) | |
| Occupation | | | | |
| Employed | 15 (23.4) | 24 (37.5) | 25 (39.1) | χ^2 = 6.154, p = |

| | | | | |
|-----------------|-----------|-----------|-----------|-----------------------------|
| Housewife | 9 (13.6) | 19 (28.8) | 38 (57.6) | 0.094 |
| Religion | | | | |
| Islam | 21 (21.2) | 32 (32.3) | 46 (46.5) | $\chi^2 = 6.154, p = 0.347$ |
| Christianity | 3 (9.7) | 11 (35.5) | 17 (54.8) | |

There was significant association between the knowledge of GDM and the tribe of the respondents.

Discussion

Gestational diabetes mellitus (GDM) is a major public health problem and threat to maternal and child health.³

The mean age of the study participants of 27.4 ± 4.5 years is around the age fertility peaks in Nigeria¹⁴. The high proportion of Muslims and Hausas in this study is a reflection of the study area which predominantly comprises of Muslims and people of Hausa tribe. Majority of the study participant were housewives and were not gainfully employed. Among the study participant majority had secondary level of education and above, which reflects level of enrolment and emphasis on girl child education. The report from the national demographic health survey (NDHS) had revealed percentage of women with no education has decreased since 2003, from 42% to 35%¹⁴. The survey had shown that urban women are better educated than rural women; only 16% of urban women have no education, as opposed to 51% of rural women¹⁴. Therefore, it is assumed the literacy in the urban area where the study was conducted was higher than the semi-urban and rural areas.

It was found from this study almost all respondents were aware of DM, while less than half of the respondents were awareness of GDM. The findings were in consonance with previous studies both within and outside Nigeria. The awareness from a study in Rivers state, South-South, Nigeria had revealed awareness of 90.6% for DM but only 38.2% were aware of GDM⁸. However a study from Owerri South-East, Nigeria had revealed a relatively higher awareness of 56%¹⁵. Another study from South India among women attending ANC had revealed awareness of DM to be 85%, while that of GDM to be 68.3%¹⁶.

The major sources of information about DM were Friends/Neighbours, Health workers and Family members which are similar to findings from another study in South-South, Nigeria where major sources of information on GDM were from friends (49.8%), health workers (34.6%) and mass media (10.4%)⁸. The major sources from India were Television/Radio (40%), Neighbours/Friends (34%) and family members (29.2%)¹⁷.

The common known risk factors identified by the participants were; family history of Type 2 DM, maternal obesity and mother being too old. The family history of Type II DM was the commonest risk factor identified as the risk of GDM. This was similar to study from Owerri, South-East, Nigeria where family history of type 2 DM (27%), past history of GDM (24%) and maternal obesity (23%)¹⁵ were the identified risk factors. The awareness of risk factors can positively affect the health seeking behaviour of the pregnant women and improve healthy life style.

Most of the study participants were aware of the fasting blood sugar as a diagnostic test for GDM while the awareness was least for OGTT. The OGTT is the gold standard for screening of GDM. From the study only 24.6% of the participants were aware of the appropriate gestational age (24 -28 weeks) for the screening of GDM, another study from India had revealed lower awareness of 8.3%¹⁶. The factor with significant association with awareness of GDM was the tribe of the respondents.

Conclusion and Recommendations

Conclusion

The awareness of DM was generally high; however, the awareness of GDM was low. The major sources of information for the awareness were friends/neighbors and health workers. The overall knowledge was poor. The knowledge of common risk factors for GDM/DM were mainly family history of type 2 DM and obesity.

Recommendations

In view of the findings, the following recommendations are suggested:

1. There is need for awareness of GDM among pregnant women and women of reproductive age group.
2. There is also need for more public enlightenment programmes to improve awareness of GDM.

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