KNOWNLEDGE, PERCEPTION AND PRACTICE ON GESTATIONAL DIABETES MELLITUS AMONG HEALTH CARE PROVIDERS IN PRIMARY HEALTH CARE FACILITY IN EGOR AND OVIA NORTH EAST LOCAL GOVERNMENT AREA.

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UNIVERSITY OF BENIN,

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EDO STATE

NOVEMBER 2025

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SUPERVISED BY PHARM (MRS) .M. A. AGHAHOWA

IN PARTIAL FULFILMENT OF REQUIREMENT

FOR THE AWARD FOR THE AWARD OF DOCTOR OF PHARMACY

(PHARM.D) DEGREE

DEPARTMENT OF CLINICAL PHARMACY

AND PHARMACY PRACTICE

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UNIVERSITY OF BENIN,

BENIN CITY

EDO STATE

NOVEMBER 2025

CERTIFICATION

This is to certify that this project work was carried out by Favour Idowu Aigbodion with matriculation number PHA1810372 in the department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, University of Benin, Benin City, in Partial fulfilment of the requirement for the award of Doctor of Pharmacy Degree (Pharm.D).

FAVOUR IDOWU AIGBODION	**DATE**
(PROJECT STUDENT)	
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(HEAD OF DEPARTMENT)	

DEDICATION

I dedicate this work to God Almighty for seeing me through and also to my Parents for all the encouragement, prayers and financial support through these past years.

ACKNOWLEGDEMENT

I extend my profound appreciation to the Almighty God for His countless blessings and the grace to successfully complete this programme.

My deepest gratitude goes to my beloved parents, Prof F. I Aigbodion and Mrs Patience Aigbodion, for their unwavering support, love, and understanding.

I am sincerely grateful to Pharm M.A AGAHOHWA my teacher and project supervisor, whose dedication and guidance provided me with the right direction and focus in completing this work.

Special thanks to my lovely siblings God bless you.

Finally, I extend my sincere appreciation to the students of the University of Benin, Ugbowo Campus, Benin City, for their cooperation and assistance in facilitating this research.

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ABSTRACT

Background:
Gestational Diabetes Mellitus (GDM) is a major public health concern associated with adverse maternal and neonatal outcomes. Healthcare providers play a crucial role in early detection, management, and education regarding GDM, yet their knowledge and practices remain inconsistent in many low- and middle-income settings.

Objective:
This study assessed the knowledge, perception, and practice related to GDM among healthcare providers in primary healthcare facilities in Egor and Ovia North-East Local Government Areas, Benin City, Edo State, Nigeria.

Methods:
A descriptive cross-sectional study was conducted among 176 healthcare providers selected from 25 primary health facilities using a structured, self-administered questionnaire. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 22. Associations between knowledge and demographic variables were tested using Fisher's Exact Test and Chi-square analysis at a significance level of $p < 0.05$. The reliability of the knowledge scale was assessed using Cronbach's alpha.

Results:
Most respondents were female (84.1%) and nurses or midwives (43.8%). About 78.4% had heard of GDM, and 50.6% reported receiving formal training on it. The overall knowledge level was fair, with 52.8% scoring in the "fair knowledge" range, 37.5% poor, and 9.7% good. Years of professional experience showed a significant association with GDM knowledge ($p = 0.045$). Significant relationships were also observed between GDM knowledge and variables such as prior training ($p = 0.020$) and location of screening practices ($p = 0.037$). Cronbach's alpha of 0.744 indicated good internal consistency of the questionnaire.

Conclusion:
Healthcare providers demonstrated moderate awareness and fair knowledge of GDM, influenced significantly by years of experience and prior training. Continuous professional education and standardized screening protocols are recommended to improve GDM management practices and ultimately enhance maternal and neonatal outcomes.

Keywords:
Gestational Diabetes Mellitus, Knowledge, Perception, Practice, Healthcare Providers, Primary Health Care in Nigeria.

CHAPTER ONE

INTRODUCTION

1.0BACKGROUND OF STUDY

Gestational diabetes mellitus (GDM) is defined as hyperglycaemia first identified during pregnancy (Ye W,luo C, HuangJ, et al). Globally, the prevalence of GDM continues to rise, largely attributable to epidemiological factors such as increasing obesity among women of reproductive age and advance maternal age. According to the international Diabetes Federation, the global Prevelance of GDM was approximately 14.0% in 2021(sweeting A, WongJ,Murphy HR, et al). Rates vary substantially across regions, including Europe (10.9%) (wangH, Li N, chiveseT, et al), Canada and USA (13.7%) (PauloMS, AbdoNM, Bettencourt SilvaR, et al), LloydM, Morton, Teede H, et al.

GDM is associated with a higher risk of adverse pregnancy outcomes, such as spontaneous abortion, congenital malformations, preeclampsia, stillbirth, macrosomia, neonatal hypoglycemia , hyperbilirubinemia and respiratory distress syndrome(Ye W,luo C, HuangJ, *et al*). Beyond perinatal complications, it also confers long term health consequenes for both mother and child. (chukwuemeka S, chivese T, Gopinath A, *et al*). Women with history of GDM are at increased risk of

type 2 diabetes and cadivascular dieases, and their offspring face elevated risk of

obesity, impaired glucose metabolism and cardiovascular disorders. (MoonJH, JangHC. XieW, Wang Y, Xiao S, *et al*).

Given the large number of pregnant women affected by GDM in china, effective management and intervention are critical important. Comprehensive GDM management includes early prevention, timely diagnosis and treatment, and postpartum follow up. Early preventive measures involve screening high risk populations, providing dietary and lifestyle guidance and monitoring gestational weight gain. Robust evidence indicates that such strategies reduce both perinatal and long term health risks. Lifestyle modifications, include dietary adjustment and physical activity, represent the first line treatment for GDM and significantly lower the risk of diseases progression among high risk women. (chukwuemeka S, chivese T, Gopinath A, et al). However, 15-30% of women with GDM do not achieve glycemic control with lifestyle measures alone, necessitating pharmacological treatment.

Gestational diabetes (GDM) is defined as impaired glucose tolerance (IGT) with onset or first recognition during pregnancy. Worldwide, one in ten pregnancies is associated with diabetes, and 90% of these cases are GDM. Undiagnosed or inadequately treated GDM can lead to significant maternal and fetal complications (Ministry of Health and Family Welfare, 2018).

In India, one of the most populous countries globally, rates of GDM are estimated to be 10.0–14.3%, which is much higher than in the West. As of 2010, there were an estimated 22 million women with diabetes between the ages of 20 and 39 years, as well as 54 million women with IGT or pre-diabetes, with the potential to develop GDM if they become pregnant, in this age group. In a field study conducted in the state of Tamil Nadu, of the 4151, 3960 and 3945 pregnant women screened in urban, semi-urban and rural areas, respectively, the prevalence of GDM was 17.8%, 13.8% and 9.9% (Seshiah et al, 2008).

Diagnosis of GDM in a woman predisposes her and her offspring to developing glucose intolerance and obesity in the future. GDM may play a crucial role in the increasing prevalence of diabetes and obesity and, hence, has become a public health priority (Veeraswamy et al, 2012). Furthermore, GDM carries risks for the mother and neonate. The large, multinational HAPO (Hyperglycemia and Adverse Pregnancy Outcomes) cohort study demonstrated that risk of adverse maternal, fetal and neonatal outcomes continuously increased as a function of maternal blood glucose levels at 24–28 weeks, even within ranges that were previously considered normal for pregnancy (HAPO Study Cooperative Research Group, 2008). For most complications, there was no threshold for risk. These results have led to careful reconsideration of the diagnostic criteria for GDM (American Diabetes Association, 2016).

GDM complicates up to 18% of pregnancies in the world(2-5). The prevelance of developing countries is put at 1.7% while the prevelance in Nigeria is about3/1000. Prevelance of gestational diabetes is determined primariliy by that of diadetes in the general population. There is increasing prevelance in GDM in advance countries probably due to overweight and obesity. Obesity has become a public health issue in west African nations including Nigeria and women are more affected . increase in prediabetes in the population is another factor contributing to the rise in GDM.

1.1LITERATURE REVIEW

KNOWLEDGE, PERCEPTION AND PRATICE ON GESTATIONAL DIABETES MELLITUS AMONG HEALTHCARE PROVIDERS IN PRIMARY HEALTH FACILITY.

Studies have shown that the implication of GDM can be detrimental to the mother, foetus and the newborn. The fetus tends to be macrosomic and large for gestational age (LGA), due to excess glucose transfer from maternal hyperglycemia leading to feotal hyperinsulinemia which converts excess glucose and nutrient into energy and produce organomegaly especially of the pancrease and the liver. During delivery the baby is at risk of a birth trauma due to complications of shoulder dystocia and cephalopelvic disproportion CPD. Delivery may be followed by early

neonatal hypoglycemia all leading to increase in perinatal mortality (*Adeleke N A, et al).*

Maternal risk includes prolonged and difficult labour, that often ended in operative delivery. The woman also has increased risk of developing type 2 diabetes mellitus later in life.

In view of adverse effects of GDM on pregnant women and her baby, attention had been focused on its screening, diagnosis and management in develop world. Even though there is no uniform approach yet, there are recommendation for practice, such as world Health Organisation (WHO) approach of a single step screening and diagnoses using 75g Oral glucose tolerance test OGTT. In the United states of America ACOG recommends two step approach, initial 50g Oral glucose challenge test GCT for all pregnant women, those who have elevated blood glucose of 170mg/dl and above at 1hour are further subjected to 100g OGTT. However, in the United Kingdom, national institute for health and clinical excellence (NICE) recommendation is adopted. There is no such position of practice in most developing Nations including Nigeria.

In Nigeria each center adopts its own practice based on human capacity, infrastructure and equipment available. The secondary health care is at a disadvantage, as only few Specialist health workers are available, in addition to

challenges in infrastructure and equipment availability confronting this level of health care (*Adeleke N A, et al*).

Emerging evidence suggest that maternal iron overload may contribute to GDM pathogenesis through pro-oxidant mechanism. Excess iron catalyses the generation of reactive oxygen species , leading to oxidative damage of pancreatic beta-cells and impairing insulin signaling in the liver and skeletal muscle. Serum ferritin(SF), a biomarker of body stores, is the most frequently studied indicator in relation to GDM risk (*Zhang C,Rawal S. Dietary iron intake*). Prospective studies have shown that elevated SF concentration in early pregnancy are associated with higher risk of GDM (*Rawal S, Hinkle SN, Bao W, et al*). Moreover, evidence indicates that routine iron supplementation for iron- replete pregnant women may be inadvisable because of the potential increasesd risk of GDM. Therefore assessing iron status in early pregnancy is crucial for guiding indiviualised supplementation strategies that prevent maternal iron deficiency while minimizing GDM risk. However current GDM guidelines do not explicitly address the relationship between high iron stores and GDM risk.(*Zhang X, Wu M, ZhongC, et al*)

A study in morocco, where antenatal care (ANC) attendance is as high as 77.1%, first level healthcare providers, particularly nurses and midwife, are usuaslly the first point of contact for pregnant women. Fasting glucose testing in the first and the second trimester form part of the Moroccan ANC recommendations and

currently three national guidelines containing GDM recommendations are available. However, their information is always congruent. Some national guideline suggests selective screening while others recommend universal screening of women with risk factors such as, history of GDM, diabetes of a family member, overweight, advance age (35 years older), repeated urinary tract infections, macrosomia, intrauterine fetal or neonatal death, malformation or more than two abortions with a glucose challenge and/or oral glucose tolerance test at a gestational age of between 24 and 28 weeks. According to best practice recommendation, insulin should be prescribed if glucose values are not stable within seven to ten days of dietary measures. Self-monitoring of glucose several times a day is recommended testing method and a monthly follow up of affected women whose GDM is well balanced, is suggested. Cesarean section is only indicated when birthweight of 4500g or more is estimated at a gestational age of 39weeks. Re-testing by fasting glucose is proposed for third postnatal care visit which usually takes place six weeks postpartum.

1.2GESTATIONAL DIABETES MELLITUS

GDM is a significant pregnancy complication in which women who have never had diabetes acquire chronic hyperglycemia during their gestational period. In most cases, hyperglycemia is caused by impaired glucose tolerance caused by

pancreatic beta cell dysfunction in the background of chronic insulin resistance. Being overweight or obese, having an older mother age, and having a family history of any type of diabetes are all risk factors for developing GDM. GDM consequences include a higher risk of maternal cardiovascular disease (CVD) and type 2 diabetes, as well as macrosomia and delivery difficulties in new born. There is a large term risk of obesity, type 2 diabetes and cardiovascular disease in infant. Premature birth, hypoglycemia at birth, and shoulder dystocia are also a few of the fetal problem that can results from GDM. Unfortunately, there is no widely acknowledge treatment or preventative strategy for GDM at the moment, except lifestyle modification (diet and Exercise) and, on occasion, insulin therapy, which is only limited value due to insulin resistance that is commonly present. Although new oral medications for diabetes management, such as glyburide and metformin, show potential, there are ongoing worries regarding their safety over an extended period for both the mother and the child. By identifying gaps in the research, it calls for further investigations and multidisciplinary approach, ultimately aiming to enhance the management and care for women with GDM, which would impact these affected individuals indubitably. Gestational diabetes mellitus: diagnostic approaches and maternal offspring complications. Moon JH, Jang HC 2022.

The incidence of hyperglycemia in pregnancy increases with age. According to Mosses et al., GDM was diagnosed in 6.7% of pregnancies in general, but in 8.5%

of women over 30 years of age. showed the highest risk of developing GDM at the ages of 35–39 compared with younger pregnant women (OR 95% CI: 10.85 (7.72–15.25) vs. 2.59 (1.84–3.67)) . These observations were confirmed by IDF data showing the highest percentage of pregnancies with GDM reaching 37% at the ages of 45–49, which was also conditioned by a lower number of pregnancies with an accompanying general higher percentage of diabetes in this population. The delivery of a macrosomic child(refers to a condition in which a newborn has excessive birth weight) is another important factor that may increase the risk of both GDM and DM2 by up to 20% . Even after taking into account the age of the woman, pluriparity remains in a linear relationship to the incidence of GDM. GDM in a previous pregnancy increases the risk of reoccurrence by more than six times. In women with a BMI of at least 30 kg/m2, the GDM frequency is 12.3%, and in women with first-line relatives that have a history of GDM, it is 11.6%. The combination of these two factors increases the risk of GDM up to 61% of cases. More than twice the percentage of pregnancies with GDM was observed in women that were previously treated for polycystic ovary syndrome (PCOS). Recent studies indicated that the prevalence of GDM is related to the season and that GDM prevalence increases during the summer compared with winter. Moreover, a 50% increase in the incidence of GDM in pregnancies resulting from in vitro fertilization was described.

1.3STATEMENT OF PROBLEM

A significant problem exists due to inconsistent Knowledge, perception and practice on GDM am healthcare providers in a primary health facility. This gap has serious implications for maternal and neonatal health, as effective management of GDM is critical for preventing adverse perinatal outcome and long term health complications.

Knowledge gaps among healthcare providers

Despite being crucial to screening and management, many healthcare providers have insufficient knowledge of GDM.

Studies have shown that healthcare providers lack in-depth knowledge regarding GDM risk factors, complications, and appropriate screening and diagnostic tests. For example, some may not know the correct gestational age for screening or the specific criteria for diagnosis.

There is also a demonstrated lack of understanding among some providers about how GDM differs from other types of diabetes, which can lead to misperception and inappropriate management.

Also, many healthcare providers report never having received special training on GDM, with some relying on pre- service knowledge that may be outdated.

Many healthcare facilities do not have routine GDM screening protocols, especially in rural or under – resourced areas. The lack of structured guidelines or protocols for GDM management in many facilities create inconsistencies in care.

Healthcare providers often fail to provide comprehensive education to women eith GDM regarding diet, exercise, blood glucose monitoring, and long term health implications for both mother and child.

Postpartum screening and follow up are critical for women who have had GDM but many healthcare providers fail to ensure this is carried out, missing a key opportunity for long term diabetes prevention.

1.4JUSTIFICATION OF PROBLEM

This justification outlines the significance and rationale for conducting a study on this topic. A comprehensive understanding of the knowledge, perception and practice on gestational diabetes mellitus among healthcare providers in primary health facility in EGOR AND OVIA NORTH EAST LGA, Benin city is crucial in identifying the gaps in their knowledge and addressing the risk factors that comes with GDM.

Assessing the knowledge on GDM management among healthcare providers, provides them a better understanding on how to carry out appropriate GDM

pratices to prevent GDM complications which involves maternal risk of increased risk of preeclampsia, birth trauma, and future development of type 2 diabetes.

Also, prevents fetal/Neonatal risk: higher risk of macrosomia, birth injuries (e.g shoulder dystocia), hypoglycemia and obesity and diabetes later in life.

1.5AIMS AND OBJECTIVES OF STUDY

The present study aims to ascertain the knowledge, perception and practice on Gestational Diabetes mellitus among healthcare providers in private and primary health facilities in Egor and Ovia North East local government area, Benin city, Edo state.

Objectives

1. To assess the knowledge of healthcare providers in primary healthcare facility regarding GDM.
2. To determine association of the knowledge of health care providers regarding GDM with socio-demographic variables.

CHAPTER TWO

METHODS

Study Setting

The study setting encompassed various healthcare providers located in rural, urban and suburban areas in Egor and Ovia north east local government area, Benin City, Edo State.

Study Design

The study employed a cross- sectional observational design to assess the knowledge, perception and practice on Gestational Diabetes Mellitus among healthcare providers in primary Health facilities.

The design allowed the collection of data from randomly selected centers in Egor and Ovia North east local government area, Benin city. The facilities had antenatal sections, and healthcare providers where randomly selected following administrative ethical approval and informed consent from the study participants, a structured questionnaire was administered to the healthcare providers to collect the required information from each participant.

Study Population

The study population for this study comprises of healthcare providers in rural, urban and suburban areas of Egor and Ovia North-East Local Government areas, Benin city, Edo state.

Inclusion criteria

This study involved all healthcare providers in a primary health facility in Egor and Ovia North East local government area and also private clinic/ hospitals.

Nurses, Midwives, Pharmacist, Physicians, Community health extension workers (CHEW), Public Health Nurses and medical laboratory Scientist/Tecnologist who were willing to participate in the study.

Exclusion criteria

All healthcare providers unwilling to participate or provide consent for the study.

Sample size determination

The sample size was determined using Cochran's formula for estimating sample size in studies assessing proportions:

$n = (Z^2 \times p \times (1-p))/e^2$

Where:

- n= initial sample size for an infinite population
- Z = Z-score corresponding to 95% confidence level = 1.96
- p = Estimated proportion = 0.14(maximum variability, most conservative)
- e = Margin of error = 0.05

Substituting the values;

$n= (1.96^2 \times 0.14 \times (1-0.14))/0.05^2$

$n= (3.8416 \times 0.1204))/0.0025$

$n= 0.4625/0.0025$

n= 185

A total of 176 responded to the study which was used for the analysis.

Sampling technique

A convenient sampling technique was used to select the primary health centers and about 22(twenty-five primary health center in Egor and Ovia North East LGA where visited to obtain the results needed from the respondent.

Data were randomly collected form each primary health centers in Egor and Ovia north east LGA and Each facility had antenatal clinic period. The study was carried out at a single point in time. It was a descriptive cross sectional study. The study was carried out for a period of one month.

Data were also collected using a structured questionnaire, which was self-administered to the health workers in the facility.

ETHICAL CONSIDERATIONS

Ethical approval for this study was obtained from the ministry of Health, Edo state, prior to the commencement of data collection. All participants were informed about the purpose of this study. Confidentiality of information was strictly maintained throughout the research process, and all data where anonymized to ensure respondents privacy.

DATA COLLECTION INSTRUMENT

Data was collected using a structured questionnaire which was modified from previous studies on knowledge of GDM in primary healthcare setting. *Utz B, Assarag B, Essolbi A et al (2017) Knowledge and practice related to gestational diabetes among primary health care providers in Morocco:*

The questionnaire comprises of three major sections,

Firstly, we had the socio-demographics of the participants, years of experience, profession, highest level of qualification as well as primary work setting.

Secondly, the questionnaire also involved various training and screening practices of the healthcare providers in a primary health facility. This showed the various screening practices carried out in the various health center. Also, the questionnaire assessed if the various respondent has heard of GDM before or not.

On the third section which tested the knowledge of each participant were divided in four sub sections also. The full scale for the questionnaire had 0-15 and a reliability test was carried out on SPSS version 22 also called chronbach alpha test and it gave a reliability value of 0.744 which indicates a good scale.

Each subsection contained various multiple choice questions.

First subsections show the knowledge about GDM risk factors which had five correct option under it. Increase in the number of pregnancy results in increased risk of developing GDM, while prior personal history of GDM results in increased risk of future GDM. Weight gain preconception results in increase in the risk of developing GDM. Family history results in increased risk of future GDM. Excessive weight gains in pregnancy results in increased risk of future GDM.

Second subsection tested the knowledge of GDM diagnosis in which the Gold standard test to screen for GDM is OGTT. The optimum time to conduct GDM test is at 24-28 weeks of pregnancy.
Third sub section tested on the knowledge about GDM treatment. This section showed the most correct option as lifestyle and diet modification as a part of GDM management plan and eating of foods lower in fats decreases the risk for heart disease. this options also showed metformin can be used in absence of insulin in GDM management plan and high blood glucose may be exacerbated by infection.
Fourth subsections answered questions on GDM consequences and complication. Untreated GDM increase the risk of congenital anomalies which is most correct. GDM consequences results in the risk of future type 2 diabetes and usually disappears after delivery. This data instrument gave a total score of 15 with less than 5 resulting in poor, 6-10 results in fair knowledge while 11-15 gave good knowledge on GDM.

METHOD OF DATA ANALYSIS

The collected data will be coded and entered into an excel spreadsheet, then analyzed using the Statistical Package for the Social Sciences (SPSS) version 22 and Microsoft excel
Socio- demographics variable where compared with knowledge of GDM using fishers exact test. For comparisons between groups, fisher's exact tests were applied to test for associations between categorical variables at a significance level of $p < 0.05$
Results will be presented using tables, charts and graphs to enhance clarity and facilitate interpretation where needed. Finding will be discussed in relation to existing literature and the objectives of the study.

CHAPTER THREE

RESULTS

Summary of Results

A total of 176 healthcare providers participated in the study, assessing their knowledge, perception, and practice regarding Gestational Diabetes Mellitus (GDM) in Egor and Ovia North-East Local Government Areas of Benin City. Most respondents were female (84.1%), while 15.9% were male. The majority were Christians (96%) and belonged mainly to the Edo ethnic group (56.3%), followed by Igbo (13.1%), Yoruba (10.8%), and others (14.8%). Over 62.5% were single, while 37.5% were married.

Regarding professional distribution, nurses and midwives constituted the largest proportion (43.8%), followed by community health extension workers (21%), pharmacists (14.2%), medical laboratory technicians (5.7%), and physicians (2.8%). The majority of respondents (56.3%) had between 1–5 years of professional experience, while 26.7% had less than one year, 11.4% had more than 10 years, and only **5.7%** had 6–10 years of experience.

In terms of educational background, **21%** held CHEW certificates, 16.5% RN, 14.8% B.NSc, **8%** Pharm.D, **6.3%** B.Pharm, and **2.8%** MBBS. Most respondents **(67.6%)** worked in **primary** healthcare facilities, while **32.4%** were in private hospitals or clinics. The predominant workplace positions were staff nurses/public health nurses (43.8%), followed by **CHEWs (21%),** pharmacists (14.2%), and other

N=176

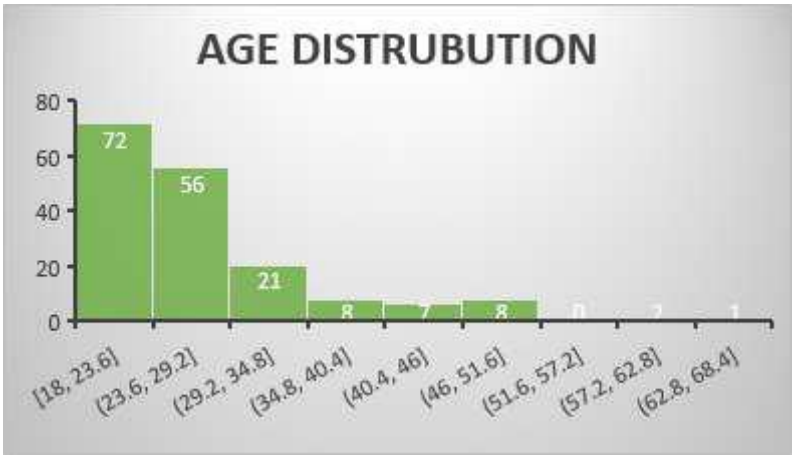

FIGURE1.0: FREQUENCY TABLE

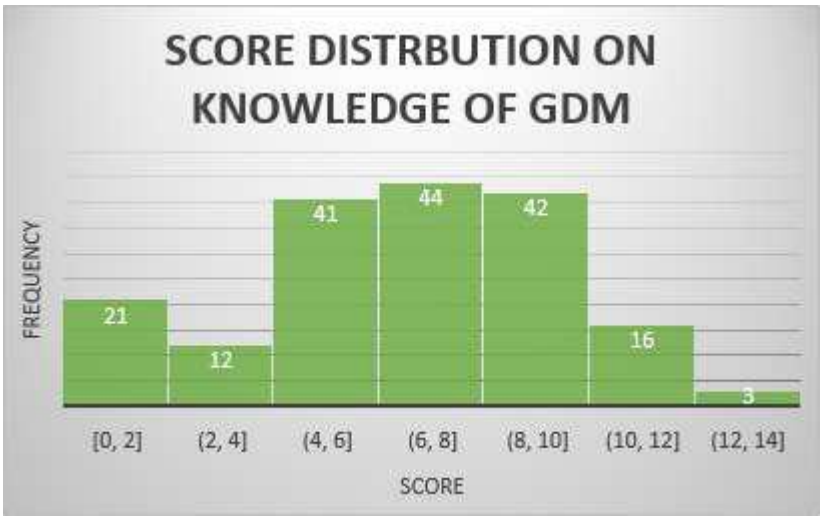
SCORE DISTRBUTION ON KNOWLEDGE OF GDM
FREQUENCY
21
12
41
44
42
16
3
[0, 2]
(2, 4]
(4, 6]
(6, 8]
(8, 10]
(10, 12]
(12, 14]
SCORE

FIGURE 1.2

TABLE1.0: SOCIO-DEMOGRAPHICS VARIABLE

n=176

S/N	VARIABLE	FREQUENCY	PERCENTAGE
1	GENDER		
	Male	28	15.9
	Female	148	84.1
2	RELIGION		
	Christian	169	96.0
	Islam	7	4.0
3.	MARITAL STATUS	66	37.5
	Married	110	62.5
	Single		
4	TRIBE		
	Edo	99	56.3
	Yoruba	19	10.8
	Igbo	23	13.1
	Hausa	9	5.1
	Others	26	14.8

TABLE 1.0 QUALIFICATION OF HEALTHCARE PROVIDERS

S/N	VARIABLE	FREQUENCY	PERCENTAGE
1	PROFESSION		
	Physicians	5	2.8
	Nurses/midwives and public health nurses	77	43.8
	Community Health extension workers(CHEW)	37	21.0
	Pharmacist	25	14.2
	Medical laboratory technicians	10	5.7
	Others	22	12.5
2	YEARS OF EXPERIENCE AS HEALTHCARE PROFESSIONAL		
	Less than 1 year	47	26.7
	1-5 years	99	56.3
	6-10 years	10	5.7
	More than 10 years	20	11.4
3	HIGHEST EDUCATIONAL QUALIFICATION		
	CHEW	37	21.0
	RN	29	16.5
	RM	22	12.5
	B.NSC	26	14.8
	MBBS	5	2.8
	B. Pharm	11	6.3
	Pharm.D	14	8.0
	OTHERS	32	18.2

4	PRIMARY WORK SETTING		
	Primary health care	119	67.6
	Private Hospital/ clinic	57	32.4
5	POSTION OCCUPIED IN WORK PLACE		
	Staff nurses/ public health nurse and matrons	77	43.8
	Pharmacist in charge	25	14.2
	Physicians	5	2.8
	Community health extension workers/ chief officer in charge	37	21.0
	Others	32	18.2

GDM TRANING AND SCREENING PRATICES

	VARIABLE	FREQUENCY	PERCENTAGE(%)
1	HAVE YOU RECEIVED ANY FORMAL ACADEMIC TRANING ON GDM?		
	Yes	89	50.6
	No	87	49.4
2	IF YES WHEN WAS YOUR LAST TRANING ON GDM		
	Within the last 1 year	41	23.3
	1-3 years ago	38	21.6
	More than 3 years ago	10	5.7
	None applicable	87	49.4
3	IF YES, WHERE WAS YOUR LAST TRANING ON GDM		
	During mandatory academic professional training only	29	16.5
	During my mandatory continuing professional training	28	15.9
	During seminars/ conferences	32	18.2
	None applicable	87	49.4
4	DO YOU THINK SCREENING PREGNANT WOMEN FOR GDM IS NECESSARY?		
	Yes	163	92.6
	No	13	7.4
5	DO YOU DO ANY GDM SCREENING IN YOUR FACILTY		
	Yes	142	80.7
	No	34	19.3
6	IF YES, WHAT TYPE OF GDM SCREENING TEST DO YOU CONDUCT IN YOUR		

	FACILITY		
	Random blood glucose (RBG)	68	38.6
	Fasting Blood Glucose (FBG)	51	29.0
	Oral Glucose tolerance test(OGTT)-75g	6	3.4
	OGTT-100g	0	0
	Glycated Hemoglobin (HbA1c)	0	0
	Urinalysis for glucose	17	9.7
	Not aware of any specific methods	34	19.3
7	WHERE WAS THE SCREENING PROCESS CARRIED OUT?		
	Primary health center	66	37.5
	Private laboratory	71	40.3
	Others please specify	39	22.2
8	WHAT ARE THE CHALLENGES YOU ENCOUNTER WITH PATIENT IN CONDUCTING THIS SCREENING?		
	Financial factors	48	27.3
	Stigma/ Patients attitude and health beliefs	68	38.6
	Work over load from the part of the Health care providers	18	10.2
	Healthcare providers not willing.	8	4.5

9	HAVE YOU HEARD OF GDM BEFORE?		
	Yes	138	78.4
	No	38	21.6
10	KNOWLEDE ON GDM		
	Less than 5 poor	66	37.5
	6-10 Fair	93	52.8
	11-15 Good	17	9.7

TABLE 1.1: DESCRIPTIVE TABLE
N=176

DESCRIPTIVE DATA	MEAN_+SD	SD
AGE		
18-30	27.137	8.989
31-40		
41-50		
51-60		
61-70		
Minimum age	18	
Maximum age	63	
SCORE ON KNOWLEGDE ON GDM	6.8114	9.014

TABLE 1.2: SOCIO-DEMOGRAPHIC VARIABLE WITH KNOWLEGDE OF GDM

Less than 5- poor

6-10: fair

11-15 Good

Variable	Frequency	Knowledge of GDM			Value	p-value
Age		less than5	6-10	11-15		
18-30	135	56	69	10		
31-40	22	4	14	4	12.055	0.085
41-50	15	5	8	2		
51-60	2	1	0	1		
61-70	2	0	2	0		
Sex						
Male	28	11	16	1	1.158	0.622
Female	148	55	77	16		
MARITAL STATUS						
Married	66	22	36	8	1.261	0.546
Single	110	44	57	9		
Religion						
Christian	169	63	89	17	0.328	1.000
Islam	7	3	4	0		
TRIBE						
Edo	99	28	58	13		
Igbo	19	12	6	1		
Yoruba	23	11	11	1	10.787	0.176
Hausa	9	4	5	0		
Others	26	11	13	2		
PROFESSION						
Physician	5	1	4	0		
Nurse/midwife	77	32	36	9		
CHEW	37	13	20	4		
Pharmacist	25	8	17	0	7.779	0.625

Medical laboratory scientist	10	3	5	2		
Others	22	9	11	2		
Years of Experience						
Less than a year	47	21	23	3	12.051	0.045
1-5 years	99	37	55	7		
6-10 years	10	5	4	1		
More than 10 years	20	3	11	6		
Highest educational qualification						
CHEW	37	12	22	3		
RN	29	13	13	3		
RM	22	10	10	2	15.097	0.372
B.NSC	26	10	12	4		
MBBS	5	0	4	1		
B.Pharm	11	6	5	0		
Pharm.D	14	2	12	0		
Others	32	13	15	4		
Primary work setting.						
Primary healthcare facilty	119	51	59	0	5.305	0.073
Private Hospitals/ clinics	57	15	34	0		
Position occupied in						

work place.						
Staff nurse/public health educator	77	32	36	9		
Pharmacist in charge	25	7	16	2	7.573	0.450
Physicians	5	0	5	0		
CHEW	37	12	21	4		
Others	32	15	15	2		

TABLE 1.3: FISHER EXCACT TEST AND CHI SQUARE TEST

VARIABLE *KNOWLEDGE ON GDM	VALUE	DF	ASSUMP.SIGN 2 SIDED	EXACT TWO SIDED	EXACT ONE (linear by linear association)	FISHERS EXACT
Have you received any training on GDM	7.798	2	0.020	0.020	0.040	7.863
When was your last training on GDM	10.205	6	0.116	0.114 0.128	0.056	9.496
Where was your last training on GDM carried out?	13.145	6	0.041	0.039 0.033	0.382	13.138
Do you do any screening of GDM in your facility	9.312	4	0.054	0.111 0.019	0.076	10.165
Where was the screening process carried Out	13.387	6	0.037	0.053 0.017	0.003	14.213
What type of GDM screening was carried out?	15.293	8	0.054	0.052 0.047	0.017	14.674
Have you heard of GDM before?	11.226	2	0.004	0.004 0.002	0.041	11.456
Years of experience	10.208	8	0.251	0.239 0.167	0.448	10.678

CHRONBACH ALPHA TEST

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
increase in the number of pregnancies	6.38	9.460	.310	.735
prior personal history of GDM	6.26	9.257	.391	.726
Weight gain preconception	6.19	8.999	.514	.713
the family history of GDM	6.13	8.994	.555	.710
Excessive weight gain in pregnancy	6.31	9.108	.435	.721
gold standard test to screen for GDM	6.48	9.314	.375	.728
optimum timing of gdm	6.44	9.436	.323	.733
lifestyle and diet modification	6.23	9.102	.458	.719
lifestlye and diet two	6.72	10.193	.153	.746
gdm management	6.31	9.039	.460	.718
gdm management two	6.69	10.365	.064	.753
insulin dose	6.36	9.341	.350	.730
untreated gdm risk	6.61	9.737	.271	.738
gdm consequences	6.65	10.115	.145	.748
gdm consequences 2	6.34	9.470	.307	.735

Chronbach alpha reliability test gave a value of 0.744 which shows the scale isreliable.

CHAPTER FOUR

DISCUSSION

The questionnaire results comprise of demographics profile of respondents and the response to each of the questionaries' where assessed. More than half of the total respondent where female and majority from the nursing profession. The assessment of knowledge, perception and practice of GDM among healthcare providers shows that healthcare providers had a fair knowledge on GDM in Egor and Ovia North East Local Government areas. This is in accordance of the study carried out in Morocco, which involved the assessment of healthcare providers and the results showed that healthcare providers which include nurses, physicians etc. showed to have basic knowledge about GDM and most of them had contact with women affected by GDM. *Utz et al*

From the results also, more than half of the respondent responding positively to have heard of GDM. Respondent with between 1- 5 years of experience show a high significance to the knowledge of GDM. Years of experiences also results in more awareness and training on GDM knowledge.

There was a statistic significance between years of experience and knowledge of GDM which tells us that years of practice can influence one's knowledge and awareness

Screening and training practices were also evaluated and the respondents however carried out GDM screening in private laboratory. This aligns with a study conduced in Morroco where the primary healthcare providers indicated that the screening is carried out in private laboratory or at referral hospitals. According to the national screening recommendation, GDM is carried out using venous blood samples which is conducted in private laboratory. *B.Utz, B. Assarag, A et al.*

This study also aligns with a study that revealed limited knowledge of GDM diagnosis and management among obstetric and gynecological healthcare workers in Hubei Province, China, despite positive attitudes and relatively good practices. Specific knowledge deficiencies were identified. Participants aged 30–50 years and those with intermediate professional titles demonstrated significantly better practices than younger or junior-title groups. These findings provide insights to inform the design and implementation of targeted education and training programmes to strengthen GDM awareness among this workforce. Overall knowledge levels were low. Most participants were familiar with the adverse outcomes of poor glycemic control, glycemic targets and lifestyle advice. However, major gaps persisted, particularly concerning GDM risk factors, maternal and neonatal complications, and recommended gestational weight gain. Correct response rates varied widely, likely reflecting differences in item.

Most prior KAP studies on GDM have focused on patients or high-risk pregnant women with few assessing healthcare workers, limiting direct comparisons. Nonetheless, our results align with international findings. For example*, Riaz et al* surveyed 210 physicians in Pakistani cities in 2018, reporting inconsistent diagnostic and screening practices. *Utz et al* examined 259 gynecologists and endocrinologists across low- and middle-income countries in 2016, finding substantial variability in GDM management. (*Bimson et al)* similarly observed significant variation in diagnostic and management practices among Society for Maternal-Fetal Medicine members in the USA. Collectively, these findings highlight the need

for healthcare workers to actively engage with updated consensus guidelines to strengthen knowledge and standardize GDM care. Attitudes were largely positive: nearly all respondents acknowledged the importance of diet, exercise and lifestyle modification. Practices were also generally good, including routine GDM screening, health education for high-risk women, individualized lifestyle advice for patients, promotion of breastfeeding and recommendation of postpartum OGTT at 4–12 weeks. Over 60% reported advising iron metabolism testing, monitoring ferritin in high-risk women and restricting supplementation to indicated cases. These results differ from *Utz et al*,who in 2016 reported an 88.50% referral rate in Morocco, likely reflecting differences in professional composition, as their survey

included general practitioners, nurses and midwives, whereas our study focused on obstetric and gynecological healthcare workers.

This results also aligns with a study *Utz et al (2017)* conducted to assess the knowledge and practices related to GDM among primary healthcare providers in Morocco. Although 56.8% of the doctors had some pre-service training on GDM, most nurses and midwives lacked such training. The present study also concludes that the majority of nurses working in maternity units have average knowledge regarding GDM and its management.

Devi et al (2020) conducted a study to assess the effect of an education programme on GDM knowledge among nurses in Pune, India. Mean GDM knowledge scores increased from 14.0 to 15.4, and the awareness programme was found to be effective in refining the awareness of nurses regarding GDM. The current study also shows that training is associated with improved knowledge regarding GDM and suggests that nurses have inadequate knowledge regarding certain aspects of the management of GDM, and thus need training.

Kukreti et al (2020) assessed the effectiveness of national guidelines on diagnosis and managing GDM, developed by the Indian Ministry of Health and Family Welfare, in terms of knowledge among Nurse Educators in selected colleges of nursing in New Delhi. The findings suggested that the majority had good

knowledge regarding general aspects of GDM and average knowledge regarding screening of mothers for the condition. The majority had average knowledge regarding assessment and diagnosis of GDM, management and follow-up of patients. The present study also supports these findings.

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CHAPTER FIVE

CONCLUSION

The findings of this study revealed a high statistical significance of years of experience in healthcare setting to knowledge of GDM. This is to say the GDM management comes with adequate knowledge, screening practice and training which all translate to the experience of the healthcare providers.

GDM poses great maternal and neonatal health risk hence the need for healthcare providers to be fulling aware and knowledgeable on the subject matter.

Maternal risk includes prolonged and difficult labor, that often ended in operative delivery. The woman also has increased risk of developing type 2 diabetes mellitus later in life.

In view of adverse effects of GDM on pregnant women and her baby, attention had been focused on its screening, diagnosis and management in develop world.

The study also demonstrates that knowledge of GDM among healthcare professionals is significantly influenced by formal training, awareness, and involvement in screening activities**,** strengthening continuous professional education and promoting active engagement in GDM diagnosis and management are vital strategies to improve maternal and neonatal health outcomes.

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APPENDIX

QUESTIONNAIRE

I am a 600L Pharmacy Student carrying out a Research project on Knowledge, Perception and Practice on Gestational Diabetes Mellitus among Health Care Providers in Primary Health Care Facility in EGOR AND OVIA NORTH EAST LGA, Edo state. You are therefore requested to give your response about each statement as your response would be treated with utmost confidentiality, hence no name required.

Your honest responses will help in understanding current knowledge gaps and informing future educational interventions.

Instructions: Please tick the appropriate box or write your answer in the space provided.

SECTION A: SOCIAL DEMOGRAPHICS

1. AGE (as at last birthday) _____ years
2. Sex: Male [ ] Female[ ]
3. Marital status: married [ ] Single[ ] Cohabiting[ ] divorced[ ] widowed[ ]
4. Religion: Christian [ ] Islam[ ] Traditionalist[ ]
5. Tribe: Edo[ ] Yoruba [ ] Igbo[ ] Others specify
6. Profession:
   [ ] Doctor (General Practitioner, Obstetrician, Physician, etc
   [ ] Nurse/Midwife
   [ ] Community Health Extension Worker (CHEW)
   [ ] Pharmacist
   [ ] Laboratory Scientist/Technician

[ ] Others (please specify): _____

7. Years of Experience as a Healthcare professional:

[ ] Less than 1 year

[ ] 1-5 years

[ ] 6-10 years

[ ] More than 10 years

8. Highest educational qualification: “Please tick as apply”

[ ] CHEW

[ ] RN,

[ ]RM,

[ ]B.NSC

[ ] MBBS

[ ] B.Pharm,

[ ]Pharm.D

[ ] CONSULTANT,

[ ]PHD

Others please specify: _____

9. Primary Work Setting:

[ ] Primary Healthcare Center (PHC)

[ ] Private hospital/clinic

10. What position do you occupy in work place? _____

11. please specify: Have you received any formal academic training or continuing mandatory professional development (MCPD) on GDM?

[ ] Yes [ ] No

12. If Yes, when was your last training on GDM?

[ ] Within the last 1 year

[ ] 1-3 years ago

[ ] More than 3 years ago

[] none applicable

13. If Yes, where was your last training on GDM?

[ ] During mandatory Academic professional training only

[ ] During my mandatory continuing professional development training

[ ] During seminars/ conferences

[ ] none applicable

14. Do you think Screening Pregnant women for GDM is necessary?

Yes [ ] No [ ]

15. Do you do any GDM screening in your Facility

Yes [ ] No [ ]

16. If yes, what type of GDM screening test do you conduct in your facility? (Please select all that apply)

[ ] Random Blood Glucose (RBG)

[ ] Fasting Blood Glucose (FBG)

[ ] Oral Glucose Tolerance Test (OGTT) – 75g

[ ] Oral Glucose Tolerance Test (OGTT) – 100g

[ ] Glycated Hemoglobin (HbA1c)

[ ] Urinalysis for glucose

[ ] Not aware of any specific test methods

17. Where was the screening process carried out?

[] Primary health center

[ ] Private laboratory

Others please Specify: ——————————

18. What are the challenges you encounter with patient in conducting this screening (please thick all that is applicable)? [ ] Economic [ ] Financial[ ] stigma [ ] work over load from the part of HCP[ ] Patient attitude and health beliefs [ ] HCP not willing

SECTION B: KNOWLEDGE OF GDM

19. Have you Heard of GDM before? Yes [ ] No [ ]

Knowledge about Gestational Diabetes Mellitus (GDM) among healthcare providers

GDM is hyperglycemia detected for the first time during pregnancy.

Please thick the most appropriate options below.

Knowledge about GDM risk factors
1. Increase in number of pregnancies a) increases the risk of developing GDM b) does not have effect on the risk of developing GDM c) decreases the risk of developing GDM d) All of the above
2. Prior personal history of GDM a) decreases the risk of future GDM

b) has no association with the risk of future GDM

c) increase the risk of future GDM

d) none of the above is applicable

3. Weight gain preconception

a) has no association with the risk of developing GDM?

b) increases the risk of developing GDM

c) decreases the risk of developing GDM

d) none is applicable to the risk of developing GDM

4. The family history of GDM

a) increases the risk of future GDM

b) decreases the risk of future GDM

c) has no likely association with risk of future GDM

d) none is applicable

5. Excessive weight-gain in pregnancy

a) decreases the risk of future GDM

b) is normal and expected

c) increases the risk of future GDM

d) none of the above

Knowledge about GDM diagnosis

6. Gold standard test to screen for GDM is

a) FBG

b) OGTT

c) HbAic /Glycated hemoglobin test

d) Urine glucose test/ glycosuria

7. Which of the following is/are correct?

   a) The optimum time to do OGTT is in first trimester

   b) The optimal time to do OGTT is 24-28 weeks

   c) The optimal time to do OGTT is ≥ 28 weeks

   d) The optimal time to do OGTT is ≤ 28weeks

Knowledge about GDM treatment

8. Which of the following is/are correct as part of lifestyle and diet modification in GDM management plan?

   a) Diabetes diet is not a healthy diet for most people

   b) Lifestyle and diet modifications are part of the GDM management plan

   c) For a woman in good glucose control, exercise has no effect on her Blood glucose level

   d) Eating foods lower in fats decreases the risk for heart disease

9. Which of the following is/are correct about GDM management?

   a) In the absence of insulin as an appropriate GDM management plan, metformin could be used

   b) A low blood glucose reaction may be caused by too little exercise

   c) Low blood glucose may be caused by too little insulin

   d) High blood glucose may be exacerbated by infection

10. A GDM client who realized just before lunch that she forgot to take her insulin dose at breakfast, is advised to:

    a) take the insulin dose she usually take at breakfast immediately

    b) skip the lunch to lower her blood glucose

c) take twice as much insulin as she usually taken at breakfast

d) check her blood glucose to decide how much insulin dose she is expected to take

Knowledge about GDM consequences/complications

11. Untreated GDM increases the risk of neonatal complications such as

a) hypoinsulinemia

b) Hyperglycemia

c) Hypercalcemia

d) Congenital anomalies

12. Which of the following is /are correct about GDM consequences?

a) GDM usually disappears after delivery

b) GDM Increases the risk of future type 2 diabetes

c) Maturity onset diabetes of the young is usually not associated with offspring from GDM pregnancy.

d) Obesity is not usually associated with offspring from GDM pregnancy