Knowledge on Gestational Diabetes and Associated Factors among Pregnant Women Attending Antenatal Care Clinic at Isolo General Hospital

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Abstract
This study aimed to evaluate the knowledge and associated factors related to gestational diabetes among pregnant women attending the antenatal clinic at Isolo General Hospital, Lagos State. The specific objectives included assessing the participants' understanding of gestational diabetes, their awareness of its risk factors, and their knowledge of its prevention and management strategies. A simple random sampling method was used to select 167 pregnant women, with 162 respondents ultimately included in the final analysis. Data were gathered using a researcher-designed questionnaire and analyzed using SPSS version 25 and Microsoft Excel 2010, with results presented in frequency and percentage tables. The findings indicated that the participants had a generally good knowledge of gestational diabetes, a moderate awareness of its risk factors, and a good understanding of preventive and management practices. A statistically significant relationship was observed between the participants' level of education and their knowledge of gestational diabetes ($p < .05$). The study concluded that efforts should be made to maintain and enhance the knowledge and awareness of gestational diabetes and its associated factors among pregnant women.

Keywords: Antenatal, Care, Diabetes, Gestation, Pregnancy

Chapter One
Introduction
1.1. Background to the Study
Gestational diabetes mellitus (GDM) is an increasingly prevalent public health concern worldwide. It is characterized by glucose intolerance that is first identified during pregnancy, typically in the second or third trimester, and results from the diabetogenic effects of placental hormones on glucose metabolism (Dissassa et al., 2023). GDM is associated with a wide range of maternal and neonatal complications, including preeclampsia, macrosomia, shoulder dystocia, birth trauma, increased rates of cesarean delivery, neonatal hypoglycemia, jaundice, respiratory distress syndrome, polycythemia, and hypocalcemia. Additionally, both mothers diagnosed with GDM and their offspring face a significantly increased lifetime risk of developing type 2 diabetes mellitus and obesity. Studies have shown that up to 50% of women with GDM may progress to overt diabetes within two decades postpartum (Prabhu et al., 2021). Despite its growing burden, knowledge and awareness of GDM remain inadequate, particularly in low- and middle-income countries. In Africa, for instance, knowledge levels among pregnant women have been reported to be low: only 31% in Kampala, 48% in Ethiopia, and just 26.2% in Nigeria demonstrated adequate understanding of the condition (Dissassa et al., 2023). Enhancing knowledge among pregnant women is crucial for the prevention, early detection, and

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effective management of GDM. Improved awareness not only fosters health-seeking behavior and lifestyle modification but also plays a key role in health literacy, which is essential for understanding and adhering to recommended medical interventions. A variety of factors are associated with GDM risk. These include obstetric factors such as primigravidity, a previous history of GDM, macrosomic deliveries, stillbirth, and preterm birth. Socio-demographic variables—such as maternal age and educational level of both the woman and her partner—as well as socio-economic indicators like occupation, income level, and social class also play significant roles. According to Zhang et al. (2021), these factors are strongly linked to the risk of developing GDM. Identifying and understanding these associated factors is vital for timely intervention, counseling, and management, especially for at-risk pregnant women. The persistent gap in knowledge and late detection of GDM continues to hinder the timely planning and implementation of effective management strategies. To address this, the present study seeks to assess the knowledge of GDM and its associated risk factors among pregnant women attending antenatal clinics at Isolo General Hospital, Lagos State. By identifying the level of awareness, this research aims to inform targeted educational and preventive interventions that can improve maternal and neonatal outcomes.

1.2. Statement of Problem

Globally, the incidence of Gestational Diabetes Mellitus (GDM) is on the rise; however, it remains an under-recognized health concern, particularly in low-resource settings where it poses significant risks to both maternal and fetal health (Muche et al., 2019). GDM is a metabolic disorder that demands urgent attention due to its potential to cause serious complications during pregnancy and childbirth. The condition has profound implications for neonatal health, including growth abnormalities and postnatal metabolic disturbances, often requiring neonatal intensive care. Infants born to mothers with poorly controlled GDM are frequently large for gestational age (macrosomic), while those whose mothers have well-managed GDM may present as small for gestational age or experience intrauterine growth restriction (IUGR). Macrosomia, which affects approximately 12% of pregnancies in non-diabetic women, occurs in 15–45% of pregnancies complicated by GDM (Kamana et al., 2015). This significantly elevates the risk of operative deliveries, including cesarean sections and instrumental vaginal deliveries, and increases the likelihood of delivery-related complications such as shoulder dystocia. The Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study has shown that poorly managed GDM is associated with a higher likelihood of delivering large-for-gestational-age infants. Furthermore, GDM increases the risk of intrapartum hypoxia regardless of fetal size. Neonates born to mothers with uncontrolled blood glucose levels are also at greater risk of complications such as neonatal hypoglycemia, jaundice, polycythemia, hypocalcemia, and hypomagnesemia. Additionally, untreated GDM interferes with fetal lung development, predisposing infants to respiratory distress syndrome due to delayed surfactant production. Despite its clinical significance, limited research exists on pregnant women's knowledge of GDM and its associated risk factors. Understanding the level of awareness among expectant mothers is essential, as increased knowledge facilitates early detection, timely diagnosis, and improved outcomes through appropriate lifestyle modifications and healthcare-seeking behaviors. Educated women are more likely to engage in preventive practices and adhere to management protocols, thereby

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reducing adverse maternal and neonatal outcomes. Multiple factors contribute to the development of GDM. These include obstetric factors such as primigravidity, a history of GDM, previous macrosomic births, stillbirths, and preterm deliveries. Socio-demographic determinants—such as advanced maternal age and low educational attainment of the mother and her partner—also play critical roles. Additionally, socio-economic status, including occupation, household income, and social class, has been identified as a significant contributor to GDM risk, with lower-income and socially disadvantaged women being more vulnerable. Given the increasing prevalence of GDM and the persistent gaps in awareness, this study was undertaken to assess the level of knowledge regarding gestational diabetes mellitus and its associated factors among pregnant women attending antenatal clinics at Isolo General Hospital, Lagos State. Findings from this research are expected to inform targeted interventions aimed at improving maternal health literacy and reducing the burden of GDM.

1.3. Objectives of the Study

Broad Objective

ObjectiveotheStudy

The primary aim of this study is to evaluate the level of knowledge and awareness of gestational diabetes mellitus (GDM) and its associated risk factors among pregnant women attending antenatal care at Isolo General Hospital, Lagos State.

Specific Objectives

1. To assess the level of knowledge of gestational diabetes mellitus among pregnant women receiving antenatal care at Isolo General Hospital.
2. To evaluate the awareness of risk factors that predispose pregnant women to gestational diabetes among those attending antenatal clinics at Isolo General Hospital.
3. To determine the level of awareness regarding preventive and management strategies for gestational diabetes among pregnant women at the antenatal clinic of Isolo General Hospital.

1.4 Research Questions

1. What is the level of knowledge about gestational diabetes mellitus among pregnant women attending antenatal care at Isolo General Hospital?
2. To what extent are pregnant women at Isolo General Hospital aware of the risk factors associated with gestational diabetes mellitus?
3. What is the level of awareness regarding the prevention and management of gestational diabetes mellitus among pregnant women receiving antenatal care at Isolo General Hospital?

1.5 Hypotheses

- **Null Hypothesis (H_0):** There is no statistically significant relationship between the educational level and knowledge of gestational diabetes mellitus among pregnant women attending antenatal care at Isolo General Hospital.
- **Alternative Hypothesis (H_1):** There is a statistically significant relationship between the educational level and knowledge of gestational diabetes mellitus among pregnant women attending antenatal care at Isolo General Hospital.

1.6.SignificanceoftheStudy

The findings of this study are expected to highlight existing gaps in knowledge regarding gestational diabetes mellitus (GDM) among pregnant women, thereby promoting improved understanding of the condition. Enhancing awareness is crucial, as limited knowledge may result in inadequate

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self-care, delayed diagnosis, and missed opportunities for timely intervention.

By increasing awareness, the study aims to empower pregnant women to adopt healthier lifestyles, adhere to medical recommendations, and seek early medical attention—ultimately contributing to the reduction of adverse maternal and neonatal outcomes associated with GDM.

For healthcare professionals, particularly nurses, the study provides insights into current practices in GDM prevention and management, equipping them to deliver more effective education and support to expectant mothers. The findings also offer valuable input for hospital administrators seeking to improve patient-provider communication and increase compliance with medical advice, thereby enhancing the overall quality of antenatal care services. Furthermore, the study will inform policymakers, public health stakeholders, and healthcare planners on the critical need for awareness campaigns and targeted interventions aimed at preventing and managing GDM, especially in low-resource settings. Lastly, this research will serve as a useful reference for future studies, contributing to the broader academic and clinical discourse on maternal health and gestational diabetes.

1.7 Scope and Delimitation Of The Study

This study is confined to pregnant women receiving antenatal care at Isolo General Hospital, Lagos State. The research sample comprised 167 pregnant women who were systematically selected from the antenatal clinic population within the hospital.

1.8 Operational Definitions Of Terms

1. **Associated Factors:** These refer to the various variables or determinants that influence the level of knowledge about gestational diabetes mellitus among pregnant women attending antenatal care. Such factors include socio-demographic characteristics (age, educational level, occupation, marital status), socio-economic status (income, social class), and obstetric history (body mass index, previous stillbirth, history of delivering a macrosomic infant).
2. **Gestational Diabetes Mellitus (GDM):** A condition characterized by glucose intolerance leading to hyperglycemia of varying severity, which is first identified or diagnosed during pregnancy.
3. **Health Literacy:** The capacity of an individual to obtain, comprehend, and utilize health information effectively to make informed decisions regarding their health.
4. **Knowledge:** The level of information, understanding, and awareness that pregnant women possess concerning gestational diabetes mellitus.
5. **Pregnancy Outcome:** The end result of a pregnancy, which may include live birth, stillbirth, preterm birth, or other birth outcomes.
6. **Awareness:** The extent of knowledge or understanding that pregnant women have regarding gestational diabetes mellitus.

Chaptertwo

2.1 Conceptual Review

Gestational Diabetes Mellitus: Knowledge, Causes,andRiskFactors

Gestational diabetes mellitus (GDM) is a form of hyperglycemia first recognized during pregnancy, resulting from pregnancy-induced alterations in maternal glucose metabolism and insulin sensitivity (Msollo et al., 2019). The global incidence of GDM has been rising steadily, making it one of the most prevalent complications associated with pregnancy. This conceptual review examines pregnant women's knowledge of GDM, the factors influencing that knowledge, and highlights current preventive and management strategies.

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Knowledge of Gestational Diabetes Mellitus

While awareness of diabetes mellitus exists among pregnant women, research indicates a significant knowledge gap regarding gestational diabetes specifically. Many are unaware that GDM is a condition that arises uniquely during pregnancy (Karthiga et al., 2021). Recent studies have consistently reported low levels of awareness and understanding of GDM among expectant mothers. Offomiyor et. al., (2023) emphasized the need for targeted health education at primary healthcare levels due to the limited awareness observed among antenatal care attendees. Similarly, Dissassa et al. (2023) identified various sociodemographic and obstetric factors associated with GDM knowledge. These include age, residence, marital status, educational level (both of the respondent and their partner), history of GDM or other chronic conditions, family history of diabetes, hypertension, gravidity, history of preconception care, and prior delivery of macrosomic infants. Notably, pregnant women aged 15–24 were found to have over three times higher odds of possessing adequate knowledge about GDM compared to those aged 35–49.

Furthermore, those with secondary education or higher were four times more likely to demonstrate sufficient knowledge than those without formal education. A history of GDM increased the likelihood of sufficient knowledge by more than threefold, and women who received preconception care were three times more likely to be knowledgeable compared to those who did not.

Etiology of Gestational Diabetes Mellitus

Although the exact pathophysiology of GDM remains unclear, it is believed to be linked to hormonal changes during pregnancy. The placenta, which supports fetal development by providing nutrients and hormones, produces several hormones—such as estrogen, cortisol, and human placental lactogen—that can interfere with insulin activity. This phenomenon, known as the "contra-insulin effect," typically begins between the 20th and 24th week of gestation. As the placenta grows, hormone levels increase, potentially exacerbating insulin resistance. In a typical pregnancy, the pancreas compensates by producing more insulin. However, when this compensatory mechanism is insufficient, glucose regulation fails, leading to the development of GDM.

Risk Factors for Gestational Diabetes Mellitus

Several risk factors contribute to the likelihood of developing GDM, including:

- Overweight or obesity
- A family history of diabetes mellitus
- A previous delivery of a baby weighing more than 9 pounds (macrosomia)
- Maternal age over 25 years
- Belonging to high-risk ethnic groups (African-American, American Indian, Asian American, Hispanic/Latina, or Pacific Islander)
- A diagnosis of prediabetes

Associated Factors Predisposing Pregnant Women to Gestational Diabetes Mellitus (GDM)

Multiple interrelated factors contribute to the development of gestational diabetes mellitus among pregnant women. These include socio-demographic variables (such as age, educational attainment, occupation, and marital status), socioeconomic status (including income level and social class), and obstetric characteristics (such as body mass index [BMI], previous stillbirth, or delivery of a macrosomic infant).

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Socio-Demographic Factors

Socio-demographic attributes play a pivotal role in influencing the risk of GDM. Variables such as family history of diabetes, maternal education level, health literacy, and both maternal and partner's occupation are significant. Lewandowska (2021) reported that the coexistence of a family history of diabetes and pre-pregnancy overweight or obesity nearly doubled the risk of GDM, even among women with a normal BMI. Additionally, certain types of familial diabetes history emerged as independent risk factors for GDM.

Health literacy, defined as the ability to access, comprehend, and apply health-related information to make informed healthcare decisions, has a notable influence on GDM awareness and outcomes. Women with higher health literacy levels are more likely to engage in health-promoting behaviors, adhere to management recommendations, and seek preventive care, thereby reducing their risk.

Socioeconomic Factors

Socioeconomic determinants, such as household income and social class, significantly affect the likelihood of developing GDM. Women from higher-income households with greater access to health resources are better positioned to adopt healthier lifestyles, maintain appropriate diets, access prenatal care, and utilize physical activity programs.

Social determinants—such as media exposure, community health support, and cultural norms—further influence perceptions and knowledge of GDM. Khan et al. (2023) found that women of lower socioeconomic status were at increased risk for poor pregnancy outcomes, including GDM, perinatal mortality, and preterm births. Their study noted that 60.2% of GDM-affected women lacked formal education and were unaware of the condition. Similarly, Roustaei et al. (2023) reported that up to 64% of socioeconomic disparities in GDM incidence could be attributed to BMI, and 5.5% to smoking.

Obstetric Factors

Key obstetric risk factors for GDM include advanced maternal age, elevated BMI, multiparity, prior delivery of a macrosomic infant, history of stillbirth, and family history of diabetes. According to the American Diabetes Association (ADA), women at low risk for GDM are typically under 25 years of age, have a BMI ≤ 25 kg/m², lack a family history of diabetes, belong to non-high-risk ethnic groups, and have no adverse obstetric or glucose intolerance history (Rani et al., 2016). Obesity and maternal age are among the most impactful independent risk factors. Li et al. (2020) found that pre-pregnancy obesity (BMI ≥ 30 kg/m²), weight gain during early pregnancy, and maternal age (particularly between 30–34 years) significantly increased GDM risk.

Prevention and Management of Gestational Diabetes Mellitus

Preconception Planning and Counseling

Approximately 84% of hyperglycemia cases in pregnancy are attributable to GDM, with the remainder due to pre-existing type 1 or type 2 diabetes mellitus—collectively termed diabetes in pregnancy (DIP). Studies highlight that hyperglycemia during early gestation (organogenesis) increases the risk of congenital anomalies and spontaneous abortion, but that glycemic control prior to and during pregnancy significantly reduces these risks (Wang et al., 2016).

Preconception counseling is essential for women with a history of GDM or other diabetes-related risk factors.

Lifestyle Modifications

Lifestyle interventions remain the cornerstone of both prevention and

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management of GDM. These include:

- **Medical Nutrition Therapy (MNT):** A well-balanced diet tailored for pregnancy (typically 2,000–2,500 kcal/day) is essential. The dietary approach should emphasize low glycemic index carbohydrates, fiber-rich foods, and distribution of carbohydrate intake throughout the day to minimize blood glucose fluctuations.
- **Physical Activity:** Moderate exercise enhances insulin sensitivity and glucose uptake in muscles, contributing to glycemic control and reduced gestational weight gain. Zakaria et al. (2023) reported significant improvements in glycemic outcomes when exercise was incorporated as an adjunct therapy.
- **Self-Monitoring of Blood Glucose (SMBG):** This enables tailored dietary and pharmacologic adjustments based on individual glycemic responses.

  Counseling on folic acid supplementation, healthy lifestyle, and structured multidisciplinary care is essential to optimizing maternal and fetal outcomes.

Pharmacological Management

Pharmacotherapy is indicated when lifestyle interventions fail to achieve glycemic targets. Gestational diabetes managed without medication is categorized as A1GDM, while cases requiring pharmacologic treatment are labeled A2GDM.

- **Insulin Therapy:** Considered the gold standard, insulin is introduced when dietary and exercise measures are insufficient.

  Insulin analogs offer improved glycemic control with a lower risk of hypoglycemia compared to human insulin (Alfadhli, 2015).
- **Oral Antidiabetic Agents:** Metformin is increasingly used in pregnancy, particularly when insulin is contraindicated or refused. However, up to 46% of women on metformin may still require insulin supplementation. Evidence regarding the long-term safety of other oral agents remains limited (Oskovi-Kaplan et al., 2020).

  Women with well-controlled GDM may await spontaneous labor unless obstetric concerns necessitate intervention. In contrast, those with poorly controlled GDM or on insulin therapy are often recommended for elective induction at term.

Postpartum Follow-up

Insulin resistance typically resolves rapidly postpartum due to the decline in diabetogenic placental hormones. Most institutions monitor blood glucose levels after delivery and recommend a 2-hour 75g oral glucose tolerance test (OGTT) within 4–12 weeks postpartum to assess for persistent glucose abnormalities (Dude et al., 2018). Follow-up care is critical, as women with a history of GDM are at increased risk of developing type 2 diabetes later in life. The initial postpartum evaluation is generally scheduled between 6–12 weeks after childbirth.

2.2 Theoretical Framework

This study on the knowledge of gestational diabetes mellitus (GDM) and its associated factors among pregnant women attending antenatal clinics at Isolo General Hospital, Lagos State, is underpinned by two well-established behavioral theories: the **Health Belief Model (HBM)** and **Social Cognitive Theory (SCT)**. These frameworks provide a foundation for understanding how individual perceptions, knowledge, and contextual factors influence health behavior, particularly in the context of gestational diabetes prevention and management.

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Health Belief Model (HBM)

The Health Belief Model, developed in the 1950s by social psychologists Irwin M. Rosenstock, Godfrey M. Hochbaum, S. Stephen Kegeles, and Howard Leventhal at the U.S. Public Health Service, was originally created to explain the failure of individuals to participate in disease prevention programs such as tuberculosis screening. Over time, the model has evolved to become a central theory in health behavior research, widely applied in studies on preventive health behaviors, chronic disease management, and adherence to medical advice.

The HBM posits that an individual's engagement in health-related behaviors is influenced by a set of core perceptions:

- **Perceived Susceptibility**: This refers to an individual's subjective perception of the risk of acquiring a health condition. In the context of GDM, pregnant women who believe they are at risk—due to family history, obesity, or other factors—are more likely to adopt preventive behaviors, such as dietary changes or attending antenatal screenings. Conversely, those with low perceived susceptibility may underestimate their personal risk, leading to complacency or risky behaviors.
- **Perceived Severity**: This component involves one's belief about the seriousness of a condition and its potential consequences. Pregnant women who perceive GDM as a serious health threat—associated with complications such as macrosomia, preterm labor, or long-term metabolic disorders—are more motivated to engage in preventive or health-promoting actions. Perceived severity encompasses not physicalconsequences but also the social and economic impacts of the condition.
- **Perceived Threat**: This is the combined effect of perceived susceptibility and perceived severity. The greater the perceived threat of a condition like GDM, the more likely an individual is to adopt behaviors aimed at reducing risk. Importantly, the level of perceived threat is often shaped by the individual's knowledge of the condition and its outcomes.

The model also considers **perceived benefits** (beliefs about the effectiveness of preventive actions), **perceived barriers** (obstacles to taking those actions), **cues to action** (triggers for behavior change, such as advice from healthcare providers), and **self-efficacy** (confidence in one's ability to perform the required behavior). Collectively, these constructs help explain why some individuals are more proactive about GDM prevention and management than others. By applying the HBM, this study seeks to understand how pregnant women's perceptions of risk and severity influence their knowledge and behaviors regarding The Health Belief Model (HBM) incorporates several constructs that collectively explain why individuals adopt or avoid specific health-related behaviors. These constructs go beyond perceived susceptibility and severity to include perceived benefits, perceived barriers, modifying variables, cues to action, and self-efficacy. Each of these plays a critical role in shaping health decisions, especially within the context of gestational diabetes mellitus (GDM) prevention and management.

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Perceived Benefits

Perceived benefits refer to an individual's evaluation of the positive outcomes of engaging in a health behavior. This includes the belief that a specific action will reduce susceptibility to a health threat or lessen its severity. The stronger the perceived benefits, the more likely an individual is to adopt preventive or health-promoting behaviors—even if the actual efficacy of the action is not scientifically confirmed. For instance, a pregnant woman who believes that adhering to dietary recommendations and attending regular antenatal appointments will reduce her risk of developing GDM is more inclined to take those actions, irrespective of the objective data on outcomes.

Perceived Barriers

Despite recognizing a health threat and believing in the benefits of taking action, individuals may still avoid behavior change due to perceived barriers. These are the individual's assessment of potential obstacles to engaging in the behavior, such as cost, inconvenience, side effects, or emotional discomfort. Behavior change is more likely when perceived benefits outweigh these perceived barriers. For example, a pregnant woman might understand the value of glucose screening but may be deterred by long waiting times at clinics, fear of needles, or lack of transportation—thus impeding early diagnosis and intervention for GDM.

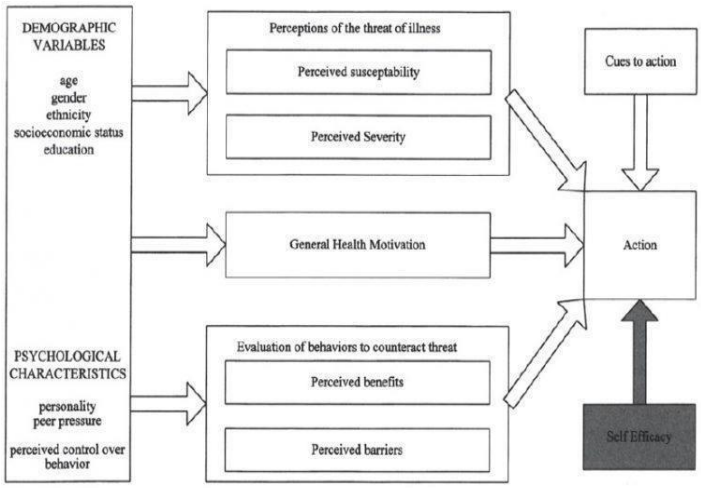

Figure 1. The health belief model [the model with self-efficacy represents the modified HBM suggested by Rosenstock et al. (1998)].

Modifying Variables

Individual-level characteristics can influence perceptions of susceptibility, severity, benefits, and barriers. These modifying variables include demographic factors (e.g., age, ethnicity, education), psychosocial factors (e.g., social norms, peer influence), and structural factors (e.g., access to healthcare, prior health experiences, knowledge of GDM). These variables do not directly determine behavior but exert their influence through the HBM constructs. For instance, higher education may be associated with greater knowledge of gestational diabetes, which in turn heightens perceived

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susceptibility and perceived benefits of preventive actions.

Cues to Action

Cues to action are stimuli that activate readiness and prompt individuals to adopt health behaviors. These cues may be internal (e.g., experiencing fatigue or physical symptoms) or external (e.g., advice from a healthcare provider, mass media messages, or observing the health struggles of others). The intensity and effectiveness of cues vary based on the individual's existing beliefs about the health threat. For example, a woman who perceives herself at high risk for GDM may be more responsive to a reminder from a midwife or a health campaign, while someone with low perceived risk may require repeated and more persuasive messaging to take preventive action.

Self-Efficacy

Introduced into the HBM framework in 1988, self-efficacy refers to an individual's belief in their capacity to successfully execute a specific health behavior. This addition was especially relevant for explaining sustained behavioral change, such as dietary adjustments, regular exercise, and medication adherence. Self-efficacy is critical in the context of GDM, where management often requires long-term commitment to lifestyle modifications.

A pregnant woman who feels confident in her ability to maintain a healthy diet, monitor her glucose levels, and follow medical advice is more likely to adhere to recommended health behaviors throughout her pregnancy.

Application of the Health Belief Model to Gestational Diabetes Mellitus (GDM)

The Health Belief Model (HBM) provides a useful framework for understanding the cognitive factors influencing pregnant women's knowledge and behaviors related to gestational diabetes mellitus (GDM). The model outlines how individual perceptions shape health-related decision-making and behavior.

1. **Perceived Susceptibility**
   According to the HBM, individuals' perception of their vulnerability to a health condition influences their motivation to engage in preventive or management strategies. In the context of this study, pregnant women's perceived susceptibility to developing GDM plays a key role in motivating them to seek information and adopt behaviors aimed at mitigating the risk.
2. **Perceived Severity**
   The degree to which individuals view a condition as serious impacts their willingness to act. If pregnant women perceive GDM as a condition with significant health consequences—for both themselves and their unborn child—they are more likely to pursue knowledge and engage in preventive practices, such as dietary changes and regular monitoring.
3. **Perceived Benefits and Perceived Barriers**
   The likelihood of adopting a health behavior is influenced by the perceived benefits of action weighed against the perceived barriers.
   Understanding how pregnant women assess the advantages of being informed about GDM (e.g., early detection, better outcomes) in relation to potential obstacles (e.g., lack of time, limited access to information or healthcare) is crucial for developing effective educational interventions.
4. **Cues to Action**
   Cues to action are environmental or internal stimuli that prompt individuals to adopt health-related behaviors. These cues may include advice from healthcare

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providers, health education materials, or observing others with similar conditions. Identifying the specific cues that effectively trigger knowledge-seeking and preventive behavior among pregnant women can inform targeted health promotion strategies.

5. **Self-Efficacy**
   Self-efficacy, or an individual's belief in their ability to perform a behavior, significantly impacts health behavior adoption. Pregnant women's confidence in their ability to understand GDM-related information and implement recommended health practices (e.g., glucose monitoring, healthy eating) contributes to their engagement in GDM prevention and management.

Collectively, the application of the HBM to gestational diabetes suggests that pregnant women's behaviors and knowledge levels are shaped by their perceived risk, perceived severity of GDM and its complications, perceived benefits of preventive actions, perceived barriers to those actions, environmental cues, and confidence in their ability to act.

Social Cognitive Theory and Its Relevance to Gestational Diabetes

In addition to the HBM, the **Social Cognitive Theory (SCT)** offers a complementary perspective on health behavior, emphasizing the role of personal agency, observational learning, and environmental context. Originally developed from Social Learning Theory by Albert Bandura (1986), SCT is grounded in the idea that behavior change is influenced by a dynamic interplay of personal, behavioral, and environmental factors. SCT is particularly relevant to chronic conditions like GDM, where sustained behavior change—such as adherence to diet, physical activity, and regular monitoring—is essential.

Key Constructs of SCT:

1. **Reciprocal Determinism**
   This central concept posits that an individual's behavior, personal factors (e.g., knowledge, beliefs), and environmental influences interact dynamically. For example, a pregnant woman's dietary behavior may be influenced by her knowledge of GDM, her family's eating habits, and the availability of healthy food options in her community.
2. **Behavioral Capability**
   This refers to an individual's actual knowledge and skills necessary to perform a behavior. Pregnant women with higher health literacy and better understanding of GDM are more likely to engage in preventive behaviors. Educational background and willingness to learn play vital roles in enhancing behavioral capability.
3. **Observational Learning (Modeling)**
   Individuals can adopt behaviors by observing others, particularly those within their social environment. For example, seeing peers or family members effectively manage GDM may encourage pregnant women to adopt similar health behaviors.
4. **Reinforcements**
   These are responses—internal or external—that influence the continuation of a behavior. Positive reinforcements, such as praise from a healthcare provider or experiencing improved health outcomes, can strengthen health-promoting behaviors. Conversely, negative experiences or lack of support may discourage engagement.
5. **Expectations**
   Expectations refer to the anticipated outcomes of a behavior. Pregnant women who believe that following GDM-related advice will lead to healthier pregnancies and safer deliveries are more likely to

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adopt such behaviors. These expectations are shaped by past experiences, peer influence, and perceived value of outcomes.

6. **Self-Efficacy**
   Aligned with the HBM, SCT emphasizes self-efficacy as a determinant of behavior. The higher an individual's confidence in their ability to perform a task (e.g., adhering to dietary guidelines or managing blood glucose), the greater the likelihood of successful behavior change. This belief is affected by personal experiences, social support, and environmental facilitators or barriers.

Conclusion:

The integration of the Health Belief Model and Social Cognitive Theory provides a comprehensive theoretical foundation for exploring pregnant women's knowledge and behavioral responses to gestational diabetes. While HBM emphasizes individual perceptions and motivation, SCT accounts for the influence of social context, observational learning, and skill development. Together, these models guide the design of effective interventions aimed at improving awareness, self-management, and health outcomes among women at risk of or diagnosed with GDM.

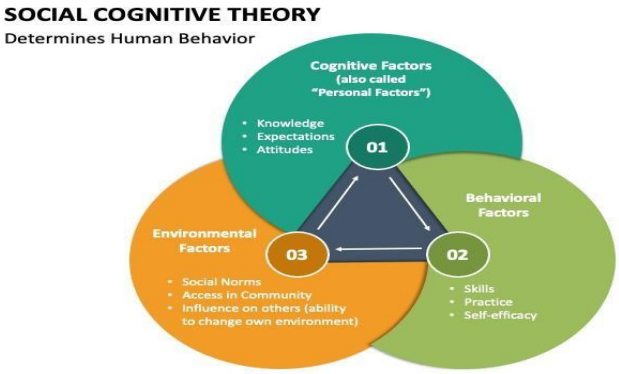

Fig 2.2 Diagram of social cognitive model

Application of Social Cognitive Theory to

Diabetes Mellitus (GDM) Among Pregnant Women

Social Cognitive Theory (SCT), developed by Albert Bandura, provides a comprehensive framework for understanding how individuals acquire and apply knowledge, make health-related decisions, and engage in behavioral change. In the context of gestational diabetes mellitus (GDM), SCT offers valuable insights into the cognitive, behavioral, and environmental factors that shape pregnant women's awareness, beliefs, and practices related to prevention and management.

Knowledge and Associated Factors on Gestational

1. Observational Learning

Observational learning, also referred to as modeling, is a core component of SCT. It involves acquiring new behaviors through observing others and the outcomes of their actions. Pregnant women may observe peers, family members, or community figures managing GDM through dietary control, physical activity, and regular medical monitoring. Observing the positive health outcomes associated with these behaviors—such as reduced maternal complications or healthy birth weights—can motivate them to emulate these actions. Conversely, witnessing negative outcomes linked to poor

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management may reinforce avoidance of unhealthy practices.

2. Reinforcement

Reinforcement refers to the consequences of behavior that influence the likelihood of its recurrence. Positive reinforcement—such as praise from healthcare providers, family support, or observable health improvements—can encourage adherence to healthy lifestyle practices. Self-reinforcement, such as personal rewards for meeting health goals, also plays a critical role in sustaining behaviors like balanced eating and regular physical activity, both crucial in GDM prevention (Schunk & DiBenedetto, 2020).

3. Self-Efficacy

Self-efficacy, or the belief in one's ability to execute a behavior successfully, is pivotal in managing GDM. A pregnant woman's confidence in her capacity to monitor blood glucose levels, follow dietary recommendations, and engage in physical activity greatly influences her engagement in these behaviors. Higher self-efficacy has been associated with better adherence to GDM management protocols and improved health outcomes.

4. Reciprocal Determinism

Reciprocal determinism—the dynamic interplay between personal factors, behaviors, and environmental influences—is central to SCT. In relation to GDM, a pregnant woman's choices are shaped by her beliefs and knowledge, which are, in turn, influenced by her environment. For example, access to health education, supportive family structures, or culturally sensitive healthcare services can promote positive behaviors. On the other hand, environmental barriers such as food insecurity or cultural myths (e.g., that exercise is harmful during pregnancy) can hinder healthy behavior adoption.

5. Expectations

Expectations pertain to the anticipated consequences of actions. Pregnant women are more likely to engage in GDM-preventive behaviors when they believe these actions will result in favorable outcomes, such as a healthier pregnancy or baby. These expectations are shaped by prior experiences, cultural norms, and perceived benefits. For instance, cultural values that prioritize caregiving over self-care may limit a woman's capacity to invest in her own health during pregnancy. Tailoring educational interventions to address and reshape these expectations is essential to improving behavioral outcomes.

6. Behavioral Capability

Behavioral capability refers to an individual's knowledge and skills to perform a specific behavior. A pregnant woman's ability to manage or prevent GDM is influenced by her understanding of the condition and her competence in implementing lifestyle changes. Women with high behavioral capability are better equipped to incorporate dietary and physical activity guidelines into their daily routines, while those with limited knowledge or skills may struggle to take effective action, thereby increasing their GDM risk.

Conclusion

The application of Social Cognitive Theory to the understanding of GDM illustrates the complex interplay between cognitive, behavioral, and environmental determinants of health behavior. By addressing constructs such as observational learning, reinforcement, self-efficacy, reciprocal determinism, expectations, and behavioral capability, health educators and practitioners can design more effective interventions.

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These approaches can empower pregnant women to adopt preventive behaviors and manage GDM more effectively, ultimately contributing to better maternal and neonatal outcomes.

2.3 Empirical Review

The global prevalence of gestational diabetes mellitus (GDM) varies significantly, largely due to differences in diagnostic criteria across countries and healthcare systems. A growing body of research has investigated pregnant women's knowledge of GDM and the factors influencing their awareness. This section reviews recent empirical studies on this topic across various settings.

Knowledge of Pregnant Women on GDM and Associated Factors

A cross-sectional study conducted by **Dissassa et al. (2023)** assessed the knowledge of GDM and associated factors among pregnant women attending antenatal care (ANC) clinics in public hospitals within the North Shewa Zone, Oromia Region, central Ethiopia. Among the 417 participants, only 48% demonstrated adequate knowledge of GDM. The study identified a statistically significant relationship between GDM knowledge and several factors, including maternal age, educational status of both women and their partners, prior preconception care, history of GDM, and gravidity. The authors emphasized the need for targeted community-based health education initiatives to address these gaps. Similarly, **Byakwaga et al. (2021)** conducted a cross-sectional survey at the Kawempe National Referral Hospital in Uganda, involving 403 pregnant women, most of whom were in their third trimester (≥30 weeks gestation) and aged between 20 and 24 years. The study revealed that only 31% of participants were aware of GDM. The findings underscored the urgent need to enhance health education strategies to improve GDM awareness among expectant mothers. In southern Nigeria, **Ogu et al. (2020)** carried out a descriptive cross-sectional study involving 2,595 women of reproductive age across five local government areas. Employing a multistage sampling method and achieving a 100% response rate, the study found that only 38.2% of participants were aware that diabetes could first occur during pregnancy, while just 26.2% had good knowledge of GDM.

Notably, 49.8% had heard about GDM from friends, 34.6% from healthcare providers, and 10.4% from mass media. The authors concluded that large-scale educational interventions targeting women of reproductive age and their partners are essential for the prevention and control of GDM. In India, **Thomas et al. (2020)** investigated awareness and knowledge of GDM among antenatal women through a three-phase study. Phase I included 523 antenatal women, while Phases II and III involved 33 participants identified as aware of GDM. The Kruskal-Wallis H test revealed significant differences in knowledge across trimesters, and the Mann-Whitney U test showed variations between participants with and without a history of diabetes. The study identified electronic and print media as the primary sources of information. The findings highlight the need for tailored educational strategies to improve GDM awareness throughout pregnancy. In Saudi Arabia, **Abdulaziz et al. (2022)** assessed GDM knowledge among women attending a primary healthcare center in Almadinah Almunawarah. The results showed that 53.45% of participants had poor knowledge of GDM, and only 7.8% exhibited good understanding. However, awareness regarding dietary and lifestyle management was relatively acceptable. Factors positively associated with higher knowledge levels included younger age, urban residency,

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higher education, obesity, having personal or familial experience with GDM, and having a relative employed in the healthcare sector. The study highlighted the need to strengthen education on risk factors, diagnostic processes, and insulin use in GDM management.

Chapter Three
Methodology
3.0 Research Methodology
This section presents the methodology employed in the study, including the research design, setting, target population, sampling techniques, data collection instrument and procedures, instrument validity, and ethical considerations.

3.1 Research Design
This study employed a **descriptive survey research design**. This design was chosen as it enables the collection of detailed information from a defined population to describe existing phenomena, opinions, or behaviors—in this case, the knowledge and associated factors related to gestational diabetes mellitus (GDM) among pregnant women.

3.2 Research Setting
The study was conducted at **Isolo General Hospital**, located in **Isolo Local Government Area**, Lagos State, Nigeria. Nigeria is divided into six geopolitical zones: South-West, South-East, South-South, North-Central, North-East, and North-West. Lagos State, situated in the South-West, is the most populous city in Africa, with an estimated population of 15.3 million. It serves as a major economic and financial hub for Nigeria and the West African region.

3.3 Target Population
The target population for this study includes **pregnant women attending the antenatal clinic at Isolo General Hospital**, Lagos State. These women represent a diverse demographic and are actively engaged in maternal healthcare services, making them suitable for assessing knowledge and associated factors related to gestational diabetes mellitus.

3.4. Sample Size
The sample size in this study was determined by a single proportion/probability. This was estimated using a finite proportion/formula.

Formula for sample size: $n = \frac{z^2 p}{d^2}$

Where;

n=sample size

z=standard normal deviation set of 1.96

p=estimate of proportion of the target population

q= (1-p) =1-0.5=0.5

d= desired degree of accuracy (taken at 0.05)

There the sample size of this study is;

$n = \frac{Z^2pq}{d^2}$

$n = \frac{(1.96)^2 (0.5)(0.5)}{(0.05)^2}$

$n = \frac{3.816 \times 0.5}{0.025}$

n= 384.16

n= 384

However, since the sampling is from a finite population of size N=250 and the sample is done without replacement, Williams (1978) suggested that the sample estimated was calculated using;

$Nf = \frac{n}{1+(n/N)}$

Where;

Nf= the desired sample from finite population

n=sample estimated using the formula

n=pq =384

$Nf = \frac{384}{}$

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1+(384÷250)
Nf = 384/ 1+(1.536)
Nf = 384÷2.536
Nf = 151.419
To compensate for non-respondent rate, 10% of the desired sample size was added to the calculated sample size

Nf = 151.419

Attrition = 10% of 151.419

10÷100 × 151.419 = 15.1419

Sample size estimation= Nf + attrition

= 151.419+15.1419

N= 166.560

N= 167

3.5 Sampling Technique
A simple random sampling method was employed to select a total of 167 participants for the study.

3.6 Data Collection Instrument
Data were collected using a self-developed, adapted questionnaire comprising four sections with both open and closed-ended questions:

- **SectionA:** Socio-demographic characteristics, including age, religion, ethnicity, educational level, and occupation of the pregnant women.
- **SectionB:** Knowledge related to gestational diabetes mellitus (GDM) and its risk factors.
- **Section C:** Awareness of factors associated with GDM risk, covering socioeconomic variables (such as income and occupation) and obstetric history (including number of pregnancies, live births, and macrosomic babies).
- **Section D:** Awareness of preventive measures and management strategies for GDM.

3.7 Validity of the Instrument
The validity of the questionnaire was established through face and content validation by the research experts in the field. Their feedback was incorporated to refine and improve the instrument prior to its administration.

3.8 Reliability of the Instrument
To assess reliability, a pilot study was conducted in which 10% of the questionnaire copies were administered to pregnant women attending the antenatal clinic at Alimosho General Hospital, Lagos State. This process ensured consistency and clarity of the instrument.

3.9 Data Collection Procedure
The researcher personally administered the 167 questionnaires during antenatal clinic visits over a four-week period.
Questionnaires were completed on a one-on-one basis and collected immediately upon completion to minimize loss. Before participation, respondents were fully informed about the study's purpose and provided informed consent.

3.10 Data Analysis
Data analysis involved both descriptive and inferential statistics using IBM SPSS software version 23. Results were summarized using frequency and percentage tables. Pearson's chi-square test was applied to test the study hypotheses.

3.11 Ethical Considerations
The study adhered to ethical standards governing research with human participants. Ethical approval was obtained from the Lagos State Health Service Commission and the Health Research Ethics Committee (HREC) of Lagos University Teaching Hospital (LUTH). Participants were fully informed about the study's benefits and voluntarily gave consent. The researcher

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ensured respondents' anonymity and confidentiality by using questionnaires that did not collect identifiable information. Participation was entirely voluntary, without coercion or preferential treatment. All data were handled with strict confidentiality, and findings were reported truthfully and accurately.

Chapter Four
Results of Findings

This chapter presents the analysis of data collected for the study, utilizing the Statistical Package for the Social Sciences (SPSS) version 25 and Microsoft Excel 2010.
Descriptive statistics, including frequencies and percentages, were employed to summarize and interpret the data.
A self-developed questionnaire comprising thirty-eight (38) items was administered to a sample of one hundred and sixty-seven (167) pregnant women. Of these, one hundred and sixty-two (162) valid responses were received and analyzed, resulting in a response rate of 97.0%. The tables below present the frequency and percentage distributions, alongside the analyses conducted to address the research questions.

4.1 Presentation and Analysis of Data

Table 1: Respondents' Socio-demographic Characteristics

Table 1a

Variables	Frequency (N=162)	Percentage (%)
Age		
15-24 years	**16**	**9.9**
25-34 years	**97**	**59.9**
≥ 35 years	**49**	**30.2**
Marital status		
Single	**8**	**4.9**
Married	**138**	**85.2**
Divorced/separated	**16**	**9.9**
Educational level		
None	**5**	**3.1**
Primary	**8**	**4.9**
Secondary	**55**	**34.0**
Tertiary	**94**	**58.0**
Nationality		
Nigerian	**158**	**97.5**
Others (Togolese & Benin republican)	**4**	**2.5**
Ethnicity		
Yoruba	**77**	**47.5**
Igbo	**63**	**38.9**
Hausa	**10**	**6.2**
Others (Ibibio, Ijaw, Egun, Igala, Urhobo, & Itsekiri)	**12**	**7.4**

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Table 1b

Variables	Frequency (N=162)	Percentage (%)
Partner's educational status		
None	**4**	**2.5**
Primary	**16**	**9.9**
Secondary	**60**	**37.0**
Tertiary	**82**	**50.6**
Occupation		
Full time housewife	**20**	**12.3**
Employed	**61**	**37.7**
Self-employed	**73**	**45.1**
Others (Student)	**8**	**4.9**
Partner's occupation		
Self-employed	**102**	**63.0**
Employed	**60**	**37.0**
Monthly household income		
< #50,000	**21**	**13.0**
#50,000 - #150,000	**57**	**35.2**
#151,000 - #400,000	**64**	**39.5**
> #400,000	**20**	**12.3**

Socio-DemographicCharacteristicsOf Respondents

The table 1 above presents the socio-demographic profile of the respondents. A majority, 97 (59.9%), were between the ages of 25 and 34 years; 49 (30.2%) were aged 35 years and above; while 16 (9.9%) fell within the 15–24 age range. The mean age of the respondents was 31.5 ± 1.1 years. Most participants, 138 (85.2%), were married, while 16 (9.9%) were divorced or separated, and 8 (4.9%) were single. In terms of educational attainment, more than half, 94 (58.0%), had completed tertiary education, whereas only 5 (3.1%) had no formal education. The study population was predominantly Nigerian, with 158 (97.5%) identifying as such, and a minority of 4 (2.5%) from Togo and the Republic of Benin. Ethnically, 77 (47.5%) were Yoruba, 63 (38.9%) were Igbo, and 12 (7.4%) identified with other ethnic groups including Ibibio, Ijaw, Egun, Igala, Urhobo, and Itsekiri. The Hausa ethnic group accounted for 10 (6.2%) of the respondents.

Regarding their partners' educational background, 82 (50.6%) had attained tertiary education, 60 (37.0%) had secondary education, 16 (9.9%) had primary education, and 4 (2.5%) had no formal education. Employment status among the respondents showed that 73 (45.1%) were self-employed, 61 (37.7%) were in formal employment, 20 (12.3%) were full-time housewives, and 8 (4.9%) were students. The majority of their partners, 102 (63.0%), were self-employed, while 60 (37.0%) were formally employed. In terms of household income, 64 (39.5%) reported a monthly income between ₦150,000 and ₦400,000; 57 (35.2%) earned between ₦51,000 and ₦150,000; 21 (13.0%) earned less than ₦50,000; and 20 (12.3%) reported earning more than ₦400,000.

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Table 2: Respondents' Knowledge on Gestational Diabetes Mellitus

Table 2a: Awareness of Gestational Diabetes Mellitus

Variables	Parameters	Frequency (N=162)	Percentage (%)
Have you heard of diabetes mellitus?	Yes No Not sure	89 64 9	54.9 39.5 5.6
Can diabetes mellitus occur for the first time in pregnancy?	Yes No Not sure	65 27 70	40.1 16.7 43.2
Do you think having a family history of diabetes is a risk factor for diabetes in pregnancy?	Yes No Not sure	104 27 31	64.2 16.7 19.1
Is pre-pregnancy obesity a risk factor for diabetes in pregnancy?	Yes No Not sure	85 23 54	52.5 14.2 33.3
Do you think having diabetes in the previous pregnancy is a risk factor for diabetes in pregnancy?	Yes No Not sure	101 11 50	62.3 6.8 30.9
Is rapid weight gain in pregnancy a risk factor for diabetes in pregnancy?	Yes No Not sure	64 50 48	39.5 30.9 29.6

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Table 2b: Awareness about Screening and Treatment for Gestational Diabetes

Variables	Parameters	Frequency (N=162)	Percentage (%)
Have you heard about blood test for diabetes after glucose load?	Yes No Not sure	92 58 12	56.8 35.8 7.4
Is testing for diabetes in spregnancy necessary?	Yes No Not sure	133 11 18	82.1 6.8 11.1
Can diet and exercises treat gestational diabetes mellitus?	Yes No Not sure	90 12 60	55.6 7.4 37.0
Insulin or drugs are required to treat gestational diabetes mellitus.	Yes No Not sure	88 15 59	54.3 9.3 36.4

Table 2c: Awareness about Gestational Diabetes Consequences

Variables	Parameters	Frequency (N=162)	Percentage (%)
Does gestational diabetes disappear after pregnancy?	**Yes** **No** **Not sure**	**45** **28** **89**	**27.8** **17.3** **54.9**
Is the baby at risk if gestational diabetes is not treated?	**Yes** **No** **Not sure**	**94** **13** **55**	**58.0** **8.0** **34.0**
Are mothers with gestational diabetes mellitus at risk of diabetes later in life?	**Yes** **No** **Not sure**	**62** **20** **80**	**38.3** **12.3** **49.4**

Respondents' Knowledge of Gestational Diabetes Mellitus

As shown in Table 2 above, just over half of the respondents, 89 (54.9%), indicated that they had heard of diabetes mellitus, while 64 (39.5%) had not, and 9 (5.6%) were unsure. Fewer than half, 65 (40.1%), were aware that diabetes mellitus can first occur during pregnancy, whereas 70 (43.2%) were uncertain, and 27 (16.7%) disagreed. A majority of respondents, 104 (64.2%), correctly identified a family history of diabetes as a risk factor for developing diabetes during pregnancy. However, 31 (19.1%) were unsure, and 27 (16.7%) did not believe it to be a risk factor.

Similarly, 85 (52.5%) recognized pre-pregnancy obesity as a risk factor, while 54 (33.3%) were uncertain, and 23 (14.2%) disagreed. Furthermore, 101 (62.3%) acknowledged that having diabetes in a previous pregnancy increases the risk of recurrence, while 50 (30.9%) were uncertain

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and 11 (6.8%) disagreed. With regard to rapid weight gain during pregnancy, 64 (39.5%) considered it a risk factor, 50 (30.9%) disagreed, and 48 (29.6%) were unsure. In terms of screening, 92 (56.8%) had heard of a blood test for diabetes following a glucose load, while 58 (35.8%) had not, and 12 (7.4%) were uncertain. A significant majority, 133 (82.1%), agreed that testing for diabetes during pregnancy is necessary, whereas 18 (11.1%) were unsure and 11 (6.8%) disagreed. Regarding treatment, 90 (55.6%) believed that diet and exercise can be effective in managing gestational diabetes, although 60 (37.0%) were unsure and 12 (7.4%) disagreed. Additionally, 88 (54.3%) recognized the potential need for insulin or medication, while 59 (36.4%) were unsure and 15 (9.3%) disagreed. When asked about the resolution of gestational diabetes, only 45 (27.8%) believed it disappears after pregnancy, while more than half (54.9%) were uncertain, and 28 (17.3%) disagreed. A majority, 94 (58.0%), understood that untreated gestational diabetes poses risks to the baby, although 55 (34.0%) were unsure and 13 (8.0%) disagreed.

Finally, 62 (38.3%) of respondents recognized that women with gestational diabetes are at increased risk of developing diabetes later in life. However, nearly half (49.4%) were uncertain, and 20 (12.3%) disagreed. Overall, the findings suggest that the respondents demonstrated a moderate to good level of knowledge regarding gestational diabetes mellitus, though notable gaps in awareness and understanding remain in key areas.

Table 3: Respondents' Awareness of Factors Predisposing Pregnant Women to Gestational Diabetes

Table 3a

Variables	Parameters	Frequency (N=162)	Percentage (%)
Do you know that having gestational diabetes mellitus in previous pregnancy can predispose a pregnant woman to gestational diabetes?	**Yes** **No** **Not sure**	**101** **11** **50**	**62.3** **6.8** **30.9**
Having a family history of gestational diabetes mellitus predisposes a pregnant woman to gestational diabetes.	**Yes** **No** **Not sure**	**104** **27** **31**	**64.2** **16.7** **19.1**
Having a history of hypertension can predispose a pregnant woman to gestational diabetes.	**Yes** **No** **Not sure**	**29** **98** **35**	**17.9** **60.5** **21.6**

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Table 3b

Variables	Parameters	Frequency (N=162)	Percentage (%)
Do you know that previous birth of a macrosomic (big) baby weighing 3.6kg or above increases the risk of gestational diabetes in a pregnant woman?	Yes No Not sure	63 80 19	38.9 49.4 11.7
Do you know that having a history of stillbirth can predispose a pregnant woman to gestational diabetes?	Yes No Not sure	11 124 27	6.8 76.5 16.7
Do you know that poor attendance of antenatal care clinics increases the risk of gestational diabetes?	Yes No Not sure	128 16 18	79.0 9.9 11.1
Having a medical history of any chronic disease can predispose a pregnant woman to gestational diabetes.	Yes No Not sure	20 125 17	12.3 77.2 10.5

Respondents' Awareness of Risk Factors for Gestational Diabetes Mellitus

As shown in Table 3 above, the majority of participants, 128 (79.0%), agreed that poor attendance at antenatal care (ANC) clinics increases the risk of developing gestational diabetes mellitus (GDM). In contrast, 18 (11.1%) were uncertain, and 16 (9.9%) disagreed. A total of 104 respondents (64.2%) acknowledged that a family history of GDM predisposes pregnant women to the condition, while 31 (19.1%) were unsure and 27 (16.7%) disagreed. Similarly, 101 (62.3%) agreed that a previous diagnosis of GDM in an earlier pregnancy increases the risk of recurrence, whereas 50 (30.9%) were uncertain and 11 (6.8%) disagreed. Regarding the delivery of a macrosomic baby (birth weight ≥ 3.6 kg), only 63 (38.9%) identified it as a risk factor for GDM, while 80 (49.4%) disagreed and 19 (11.7%) were unsure. When asked whether a history of hypertension could predispose a woman to GDM, only 29 (17.9%) responded affirmatively. A significant majority, 98 (60.5%), disagreed, and 35 (21.6%) were unsure. Similarly, just 20 (12.3%) believed that having a chronic medical condition increases the risk of GDM, while 125 (77.2%) disagreed and 17 (10.5%) were unsure. Awareness was lowest regarding stillbirth as a potential risk factor. Only 11 participants (6.8%) agreed that a history of stillbirth could predispose a woman to GDM, whereas 124 (76.5%) disagreed and 27 (16.7%) were unsure. Overall, the findings indicate that while participants demonstrated a fair level of awareness regarding common risk factors such as family history, poor ANC attendance, and previous GDM, knowledge was considerably lower for less commonly discussed factors like macrosomia, hypertension, chronic illness, and stillbirth.

Table 4: Respondents' Awareness of Preventive and Management Measures for Gestational Diabetes

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Table 4a

Variables	Parameters	Frequency (N=162)	Percentage (%)
Can maintaining a healthy weight prevent gestational diabetes?	**Yes** **No** **Not sure**	**105** **6** **51**	**64.8** **3.7** **31.5**
Do you think eating healthy can prevent gestational diabetes?	**Yes** **No** **Not sure**	**128** **3** **31**	**79.0** **1.9** **19.1**
Can regular exercise and healthy diet prevent gestational diabetes?	**Yes** **No** **Not sure**	**124** **3** **35**	**76.5** **1.9** **21.6**

Table 4b

Variables	Parameters	Frequency (N=162)	Percentage (%)
Do you think attending antenatal care regularly can prevent gestational diabetes?	Yes No Not sure	92 26 44	56.8 16.0 27.2
Can lifestyle changes help in the management of gestational diabetes?	Yes No Not sure	107 5 50	66.0 3.1 30.9
Do you think medications and insulin therapy can help in managing gestational diabetes?	Yes No Not sure	120 6 36	74.1 3.7 22.2
Can early diagnosis of gestational diabetes help to prevent complications?	Yes No Not sure	131 7 24	80.9 4.3 14.8

Respondents' Awareness of Preventive and Management Measures for Gestational Diabetes Mellitus

As presented in Table 4 above, the majority of respondents, 131 (80.9%), affirmed that early diagnosis of gestational diabetes mellitus (GDM) can help prevent complications. Meanwhile, 24 (14.8%) were uncertain, and only 7 (4.3%) disagreed. Similarly, 128 respondents (79.0%) agreed that consuming a healthy diet can reduce the risk of GDM, while 31 (19.1%) were unsure and 3 (1.9%) disagreed. Most of the participants, 124 (76.5%), recognized that a combination of regular exercise and a healthy diet plays a preventive role in GDM, although 35 (21.6%) were not sure and 3 (1.9%) disagreed. In terms of treatment, 120 respondents (74.1%) agreed that medication and insulin therapy are effective in managing the condition, while 36 (22.2%) were uncertain and 6 (3.7%) disagreed. Additionally, 107 respondents (66.0%) acknowledged that lifestyle modifications are important in the management of GDM, although 50 (30.9%) were unsure and 5 (3.1%) disagreed. A total of 105 participants (64.8%) believed that maintaining a healthy

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weight can help prevent the onset of GDM, with 51 (31.5%) uncertain and 6 (3.7%) in disagreement.

Furthermore, 92 respondents (56.8%) recognized the importance of regular antenatal care attendance as a preventive measure, while 44 (27.2%) were unsure and 26 (16.0%) disagreed.

Overall, the findings suggest that respondents exhibited a relatively good level of awareness regarding both the prevention and management of gestational diabetes, particularly in areas related to early detection, healthy lifestyle practices, and treatment options.

4.2 Hypothesis Testing

NullHypothesis(H_0):

There is no significant relationship between the educational level and knowledge of gestational diabetes among pregnant women attending antenatal care at Isolo General Hospital.

AlternativeHypothesis(H_1):

There is a significant relationship between the educational level and knowledge of gestational diabetes among pregnant women attending antenatal care at Isolo General Hospital.

AnalysisPlan:

The test was conducted at a 5% level of significance ($\alpha = 0.05$).

DecisionRule:

If the p-value associated with the correlation coefficient is less than 0.05, the null hypothesis will be rejected, indicating a statistically significant relationship between the two variables. Conversely, if the p-value is greater than 0.05, the null hypothesis will not be rejected, suggesting no significant relationship.

Table 5: Testing of Research Hypothesis

		Educational Level	Knowledge on Gestational Diabetes
Educational Level	**Pearson's Correlation**	**1**	**.648**
	Sig. (2-tailed)		**.000**
	N	**162**	**162**
Knowledge on Gestational Diabetes	**Pearson's Correlation**	**.648**	**1**
	Sig. (2-tailed)	**.000**	
	N	**162**	**162**

r=0.648; p-value is <0.00001. The result is significant at p < 0.05

The analysis revealed a statistically significant relationship between the educational level and knowledge of gestational diabetes among pregnant women attending antenatal care at Isolo General Hospital ($p < 0.05$).

4.3 Response To Research Questions

Research Question 1: *What is the level of knowledge on gestational diabetes among pregnant women attending antenatal care at Isolo General Hospital?*

Based on the data presented in Table 2 above, 54.9% of respondents indicated they had heard of diabetes mellitus. A majority (64.2%) recognized a family history of diabetes as a risk factor during pregnancy, while 62.3% acknowledged that a previous history of diabetes in pregnancy increases risk. Additionally, 52.5% identified pre-pregnancy obesity as a risk factor, and 40.1%

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agreed that diabetes mellitus could first appear during pregnancy. Regarding screening and treatment, 82.1% agreed that testing for diabetes during pregnancy is necessary, and 56.8% reported awareness of glucose load testing. More than half of the respondents (55.6%) believed that diet and exercise could manage gestational diabetes, and 54.3% affirmed that medication or insulin may be required. Furthermore, 58.0% recognized risks to the baby if the condition remains untreated, while 38.3% were aware of the long-term risk of diabetes for mothers. **These findings suggest that the majority of the participants have a good level of knowledge about gestational diabetes.**

Research Question 2: *What is the level of awareness of risk factors predisposing pregnant women to gestational diabetes?*

As shown in Table 3 above, 79.0% of respondents identified poor attendance at antenatal care clinics as a risk factor for gestational diabetes. Additionally, 64.2% acknowledged that a family history of the condition increases the risk, and 62.3% affirmed that a previous history of gestational diabetes predisposes one to recurrence. However, only 38.9% recognized prior birth of a macrosomic baby (≥3.6kg) as a risk factor.

Lower proportions of respondents identified other risk factors: 17.9% mentioned hypertension, 12.3% mentioned chronic medical conditions, and 6.8% recognized a history of stillbirth as a risk factor. **Overall, these results indicate that the respondents demonstrate a fair level of awareness regarding the risk factors associated with gestational diabetes.**

Research Question 3: *What is the level of awareness of preventive and management measures for gestational diabetes among pregnant women?*

Data from Table 4 above shows that 80.9% of participants agreed that early diagnosis can help prevent complications associated with gestational diabetes. A large majority (79.0%) believed that healthy eating can serve as a preventive measure, while 76.5% recognized the benefits of regular exercise and a balanced diet. Furthermore, 74.1% agreed on the effectiveness of medication and insulin therapy for management. Lifestyle changes were acknowledged as helpful by 66.0%, and 64.8% agreed that maintaining a healthy weight could serve as a preventive measure. Additionally, 56.8% affirmed the importance of regular antenatal visits in preventing gestational diabetes. **These findings suggest that respondents possess a good level of awareness regarding preventive and management strategies for gestational diabetes.**

Chapter Five
Discussion, Conclusion and Recommendations

This chapter presents a comprehensive discussion of the study's findings in relation to previous research. It further explores the implications of the results for nursing practice and concludes with a summary, conclusions, recommendations, and suggestions for future research.

5.1 Discussion Of Findings

Gestational diabetes mellitus (GDM) is increasingly recognized as a global health concern, with significant implications for both maternal and fetal outcomes. Despite its rising prevalence, GDM remains underdiagnosed and insufficiently addressed, particularly in low-resource settings. This study evaluated the level of knowledge and awareness of gestational diabetes and its associated risk, preventive, and management factors among pregnant women attending antenatal care at Isolo General Hospital, Lagos State, Nigeria.

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Key Findings

DemographicCharacteristics

The majority of participants were between 25 and 34 years old, with a mean age of 31.5 ± 1.1 years. Most respondents were married, and over half had attained tertiary education. The population was predominantly Nigerian, with fewer than half identifying as Yoruba. Approximately half of the participants' partners also had tertiary education. Less than half of the women were self-employed, whereas the majority of their partners were self-employed. Household income levels varied, with a significant proportion reporting a monthly income between ₦150,000 and ₦400,000.

Objective 1: Knowledge of Gestational Diabetes Mellitus

The findings indicate that the respondents generally demonstrated a good level of knowledge concerning gestational diabetes. Over half reported being aware of diabetes mellitus and blood glucose testing. A significant proportion identified family history and prior gestational diabetes as key risk factors. More than half recognized pre-pregnancy obesity as a contributing factor, and the necessity of testing during pregnancy was widely acknowledged. Furthermore, most participants were aware that gestational diabetes could be managed through diet, exercise, and medical interventions such as insulin or medications. A majority also recognized the risk posed to the baby if GDM remains untreated and were aware of the long-term risk of type 2 diabetes in affected mothers. These results are in partial contrast with those of **Dissassa et. al., (2023)**, who found that fewer than half of their respondents had adequate knowledge of GDM. Similarly, **Byakwaga et. al., (2021)** reported low awareness among pregnant women, and **Ogu et. al., (2020)** observed that only one-quarter of their respondents had good knowledge, with less than half having heard of GDM through informal sources such as friends. The comparatively higher awareness found in the present study may reflect differences in educational attainment or antenatal education efforts at the study site.

Objective 2: Awareness of Risk Factors for Gestational Diabetes

Respondents demonstrated a fair level of awareness regarding factors that increase the risk of GDM. A large majority agreed that infrequent antenatal clinic attendance, a family history of GDM, and a prior diagnosis of GDM increase the likelihood of developing the condition during subsequent pregnancies. While a substantial number identified previous birth of a macrosomic baby (≥3.6 kg) as a risk factor, fewer participants recognized the roles of hypertension, chronic illnesses, or previous stillbirths.

The relatively limited recognition of these latter risk factors indicates potential gaps in antenatal health education that warrant targeted intervention.

Objective 3: Awareness of Preventive and Management Strategies

The participants generally showed a strong awareness of preventive and management strategies for GDM. Most acknowledged the importance of early diagnosis in reducing complications, and the majority agreed that healthy eating, regular exercise, and lifestyle modification could serve as preventive measures. Furthermore, the role of medications and insulin therapy in managing GDM was well recognized. More than half of the respondents affirmed that consistent attendance at antenatal care clinics contributes to GDM prevention. These findings underscore a positive level of engagement with health information among the study population and highlight the potential impact of antenatal care programs in disseminating vital health education.

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5.2 Implications For Nursing Practice

The findings of this study highlight the current level of knowledge regarding gestational diabetes and its associated factors among pregnant women. To enhance and maintain this knowledge, nurses should implement targeted educational programs during antenatal visits, emphasizing key aspects such as risk factors, symptoms, prevention, and management of gestational diabetes mellitus. Healthcare providers are encouraged to distribute informative materials—such as leaflets, posters, and brochures—in local languages to effectively communicate essential information about gestational diabetes and its risks. Early screening for gestational diabetes should be integrated into routine antenatal care, particularly for high-risk individuals, to facilitate timely diagnosis and intervention. Personalized counseling sessions tailored to each woman's health profile and risk factors can improve understanding and engagement in managing the condition.

Nurses should also provide comprehensive guidance on healthy dietary practices that regulate blood glucose levels and promote exercises suitable for pregnant women, incorporated within antenatal care services. Utilizing local media platforms, including radio and television broadcasts in indigenous languages, can broaden community awareness of gestational diabetes. Establishing peer support groups within clinics, where women with prior experience of gestational diabetes share their insights, may foster community learning and empowerment. Furthermore, nurses should organize outreach programs in communal settings such as churches, markets, and community centers to reach women who may have limited access to regular antenatal care. It is also important to involve family members, particularly partners, in education efforts to ensure they can provide appropriate support to pregnant women managing gestational diabetes.

5.3 Limitations Of The Study

This study was limited by time and financial constraints, which prevented expansion to other secondary healthcare facilities in Lagos State for comparative analysis of pregnant women's knowledge on gestational diabetes and related factors.

5.4 Summary

This descriptive survey assessed knowledge and awareness of gestational diabetes and associated factors among pregnant women attending antenatal care at Isolo General Hospital, Lagos State. A total of 167 women were randomly selected, with 162 valid responses analyzed using a self-developed questionnaire and processed with SPSS version 25 and Microsoft Excel 2010. The study revealed a generally good level of knowledge about gestational diabetes, a fair awareness of predisposing factors, and a good understanding of preventive and management measures. Notably, a significant association was found between educational level and knowledge of gestational diabetes ($p < .05$).

5.5 Conclusion

The study demonstrates that pregnant women attending antenatal care at Isolo General Hospital possess a fair to good understanding of gestational diabetes and its associated factors. To sustain and improve this knowledge, it is critical to conduct regular educational sessions during antenatal visits, ensure early and consistent screening for gestational diabetes, promote peer support networks within clinics, and actively involve male partners in educational and management efforts. Failure to enhance awareness and knowledge may lead to worsening maternal and neonatal morbidity and mortality linked to complications of

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gestational diabetes.

5.6 Recommendations

Based on the findings, the following recommendations are proposed to improve knowledge and awareness of gestational diabetes among pregnant women at Isolo General Hospital:

i. Nurses should routinely conduct educational sessions on gestational diabetes during antenatal visits, covering risk factors, symptoms, prevention, and treatment.

ii. Healthcare providers should distribute informational materials in local languages to reinforce key messages about gestational diabetes.

iii. Gestational diabetes screening should be integrated early and consistently throughout antenatal care, especially for high-risk patients.

iv. Individualized counseling sessions should be offered to ensure each woman understands her health status and risk factors.

v. Nutritional education emphasizing blood sugar regulation should be provided to pregnant women.

vi. Exercise programs suitable for pregnancy should be incorporated into antenatal care clinics.

vii. Local radio and TV stations should be engaged to broadcast educational programs about gestational diabetes in local languages.

viii. Peer support groups should be established within clinics, encouraging women with previous gestational diabetes to share their experiences.

ix. Community-based talks should be organized in local venues to reach women with limited antenatal attendance.

x. Family members, especially partners, should be educated on gestational diabetes and their role in supporting affected women.

5.7 Suggestions For Further Research

Given the study's limitations in scope due to time and funding constraints, future research should extend to other secondary and tertiary healthcare facilities in Lagos State to obtain more representative data. Further studies could also evaluate the quality of antenatal care services provided, to identify areas for improvement in gestational diabetes education and management.

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