UNIVERSITY OF HEALTH SCIENCES
COLLEGE OF NURSING

Assessment of Knowledge and Awareness of Pregnant Women Regarding Gestational Diabetes Mellitus and Its Impact on Maternal and Fetal Outcomes

Graduation Research Proposal

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Proposed study site:
Obstetrics and Gynecology Department, Dongola, Northern State, Sudan

Proposed study duration:
One month

CHAPTER ONE: INTRODUCTION

Gestational diabetes mellitus (GDM) is a condition in which high blood glucose is first recognised during pregnancy and is not clearly overt diabetes that existed before pregnancy. It is an important maternal health concern because it can affect both the pregnant woman and her baby. Many women with GDM do not experience obvious symptoms, making antenatal screening and accurate health information important.

1.1 Background

During pregnancy, placental hormones increase the body's resistance to insulin. If the pancreas cannot produce enough insulin to meet this increased demand, blood glucose levels rise and GDM may develop. GDM is associated with maternal complications such as hypertensive disorders and caesarean delivery, as well as fetal and neonatal complications such as excessive fetal growth, birth injury, and neonatal hypoglycaemia. Timely diagnosis, healthy nutrition, appropriate physical activity, glucose monitoring, and treatment when required can help reduce these risks. Pregnant women's knowledge and awareness may influence their understanding of risk factors, screening, management, and possible complications (McIntyre et al., 2019; Kaaja & Rönnemaa, 2008; Vambergue & Fajardy, 2011).

1.2 Problem Statement

GDM may occur without noticeable symptoms, and limited knowledge can make it difficult for pregnant women to recognise risk factors, understand the importance of screening, or appreciate possible consequences for themselves and their babies. Antenatal care provides an opportunity for early detection and health education; however, the level of knowledge and awareness of GDM among pregnant women attending Dongola Obstetrics and Gynecology Hospital, Northern State, Sudan, has not yet been established for this proposed study. Assessing this knowledge can help identify educational needs and guide appropriate counselling.

1.3 Justification and Significance of the Study

Gestational Diabetes Mellitus (GDM) represents a growing maternal health concern due to its potential acute and long-term adverse outcomes for both mothers and neonates. Despite these potential risks, many pregnant women lack adequate awareness regarding risk factors and screening. Assessing pregnant women's knowledge and awareness is critical to promoting early detection and appropriate management. Currently, baseline data regarding GDM knowledge among pregnant women in Dongola, Northern State, Sudan, is lacking. The findings of this study will address this local research gap and assist healthcare providers, especially nurses, in designing targeted health education programs during antenatal care to improve maternal and neonatal outcomes.

1.4 Objectives of the Study

1.4.1 General Objective

To assess the knowledge and awareness of pregnant women regarding gestational diabetes mellitus and its effects on maternal and fetal health at Dongola Obstetrics and Gynecology Hospital, Northern State, Sudan, 2026.

1.4.2 Specific Objectives

- To assess the level of knowledge of pregnant women regarding gestational diabetes mellitus.
- To assess pregnant women's knowledge regarding the definition and nature of gestational diabetes mellitus.
- To assess their knowledge regarding the risk factors associated with gestational diabetes mellitus.
- To assess their knowledge regarding the signs and symptoms of gestational diabetes mellitus.
- To assess their knowledge regarding screening and diagnostic methods for gestational diabetes mellitus.
- To assess their knowledge regarding the management of gestational diabetes mellitus, including diet, physical activity, glucose monitoring and pharmacological treatment.
- To assess their knowledge regarding the maternal complications associated with gestational diabetes mellitus.
- To assess their knowledge regarding fetal and neonatal complications associated with gestational diabetes mellitus.
- To determine the association between pregnant women's knowledge/awareness of GDM and selected sociodemographic characteristics.
- To determine the association between pregnant women's knowledge/awareness of GDM and selected obstetric or pregnancy-related characteristics.

1.5 Research Questions

1. What is the level of knowledge of pregnant women regarding gestational diabetes mellitus (GDM) at the Obstetrics and Gynecology Department in Dongola?
2. What is the level of awareness among pregnant women regarding the risk factors and clinical manifestations of gestational diabetes mellitus?
3. What is the level of knowledge of pregnant women regarding the possible maternal and fetal complications associated with gestational diabetes mellitus?
4. What is the level of awareness among pregnant women regarding the methods of prevention, screening, diagnosis, and management of gestational diabetes mellitus?
5. Is there a relationship between pregnant women's knowledge and awareness of gestational diabetes mellitus and their sociodemographic characteristics, such as age, educational level, occupation, and parity?
6. What are the main sources of information about gestational diabetes mellitus among pregnant women attending the Obstetrics and Gynecology Department in Dongola?

CHAPTER TWO: LITERATURE REVIEW

2.1 Definition of Gestational Diabetes Mellitus

Gestational Diabetes Mellitus (GDM) is high blood glucose first recognized during pregnancy. It occurs when the body cannot produce enough insulin to meet the increased needs of pregnancy. GDM may affect both maternal and fetal health (McIntyre et al., 2019).

2.2 Prevalence and Risk Factors

GDM is a common complication of pregnancy. Studies conducted in Khartoum, Sudan, reported prevalence rates ranging from 12% to 18.5% among the studied women. Risk factors include obesity, advanced maternal age, previous GDM, family history of diabetes, previous delivery of a macrosomic baby, and polycystic ovary syndrome (PCOS) (McIntyre et al., 2019).

2.3 Signs and Symptoms

Many women with GDM have no symptoms. Possible symptoms include increased thirst, frequent urination, fatigue, and blurred vision. Therefore, screening is essential for early detection (McIntyre et al., 2019).

2.4 Screening and Diagnosis

GDM screening is usually performed between 24 and 28 weeks of pregnancy. The Oral Glucose Tolerance Test (OGTT) is commonly used for diagnosis. Early detection helps reduce complications (McIntyre et al., 2019).

2.5 Management and Prevention

Management includes a healthy diet, appropriate physical activity, regular blood glucose monitoring, medication when necessary, and antenatal follow-up. Healthy lifestyle practices and appropriate screening help reduce complications (McIntyre et al., 2019).

2.6 Knowledge and Awareness of Pregnant Women

Knowledge of GDM includes understanding its risk factors, symptoms, screening, management, and complications. Healthcare professionals, especially nurses, play an important role in providing accurate health education to pregnant women.

2.7 Maternal and Fetal Outcomes

Maternal outcomes: GDM may increase the risk of preeclampsia, cesarean delivery, and future type 2 diabetes mellitus (McIntyre et al., 2019; Kaaja & Rönnemaa, 2008).

Fetal and neonatal outcomes: Complications may include macrosomia, birth injuries, neonatal hypoglycemia, and respiratory problems. Proper management helps reduce these risks (McIntyre et al., 2019; Vambergue & Fajardy, 2011).

2.8 Role of Nurses

Nurses educate pregnant women about GDM, healthy nutrition, physical activity, blood glucose monitoring, medication use, and regular antenatal visits. They also provide emotional support and encourage adherence to treatment plans.

2.9 Previous Studies

Study in Sulaimani, Iraq (Mahmood & Khalil, 2023): A study conducted among pregnant women at Maternity Teaching Hospital in Sulaimani City assessed knowledge regarding gestational diabetes mellitus. The reported findings showed that 59.3% of participants had fair knowledge, 36.4% had poor knowledge, and 4.3% had good knowledge. These results indicate that many participants had incomplete knowledge of GDM and that antenatal education may be needed.

Study in Northern Borders Province, Saudi Arabia (Alenezi et al., 2025): A cross-sectional study assessed GDM awareness among 461 women using a structured online questionnaire. Overall, 42.3% had fair awareness, 34.3% had good awareness, and 23.4% had poor awareness. Knowledge of particular complications varied; for example, 70% recognised the risk of emergency caesarean section, while 8.2% recognised the increased risk of pre-eclampsia. The authors recommended targeted educational interventions.

Study among Jordanian women (Almahadin et al., 2026): A cross-sectional study evaluated knowledge, attitudes, and practices regarding GDM among Jordanian women. The study revealed that approximately 39% of participants demonstrated moderate knowledge regarding GDM, along with an overall good attitude and self-management practice. Significant correlations were identified between knowledge scores, monthly income, and pregnancy stage.

Summary and research gap: The studies above show that awareness levels differ by setting and that important gaps may remain in knowledge of risk factors and maternal or neonatal complications. The available studies do not establish the level of knowledge among pregnant women attending Dongola Obstetrics and Gynecology Hospital. The present study will address this local gap.

References cited in this section: Mahmood & Khalil (2023); Alenezi et al. (2025); Almahadin et al. (2026).

CHAPTER THREE: METHODOLOGY

3.1 Study Design
A descriptive cross-sectional hospital-based study will be conducted to assess the knowledge and awareness of pregnant women regarding gestational diabetes mellitus (GDM) and its impact on maternal and fetal outcomes.

3.2 Study Area
The study will be conducted at the Obstetrics and Gynecology Department of Dongola Hospital, Northern State, Sudan.

3.3 Study Population
The study population will consist of pregnant women attending the Obstetrics and Gynecology Department during the study period.

3.4 Study Duration
The study will be conducted over a duration of one month (from October to November 2026).

3.5 Sample Size
The sample size was calculated using the single population proportion formula:

$n = [Z^2 \times P \times (1 - P)] / d^2$

where $Z = 1.96$, $P = 0.18$, and $d = 0.05$.

$n = [(1.96)^2 \times 0.18 \times (1 - 0.18)] / (0.05)^2 = 226.7 \approx 227$.

Therefore, the required sample size is **227 pregnant women**.

3.6 Sampling Technique
A non-probability convenience sampling technique will be used to select eligible pregnant women who attend the hospital during the data collection period and agree to participate in the study.

3.7 Data Collection Tool
Data will be collected using a structured questionnaire consisting of the following sections:

- Section A: Sociodemographic characteristics.
- Section B: Obstetric history.
- Section C: Knowledge and awareness of gestational diabetes mellitus.
- Section D: Risk factors, signs and symptoms, screening, and diagnosis.
- Section E: Prevention, management, and possible maternal and fetal complications.
- Section F: Sources of information about gestational diabetes mellitus.

3.8 Validity and Reliability

The questionnaire will be reviewed by experts in nursing and maternal health to assess its content validity. A pilot study will be conducted on a small number of pregnant women to assess the clarity and suitability of the questions. Necessary modifications will be made before the main data collection.

3.9 Data Collection Procedure

After obtaining the necessary administrative and ethical approvals, eligible pregnant women will be approached and informed about the purpose of the study. Data will be collected using the structured questionnaire after obtaining informed consent from participants.

3.10 Data Analysis

The collected data will be coded, entered, and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies and percentages, will be used to summarize the findings. Appropriate statistical tests may be used to examine associations between participants' knowledge levels and their sociodemographic characteristics. The results will be presented in tables and figures where appropriate.

3.11 Ethical Considerations

Ethical approval and the necessary administrative permissions will be obtained before data collection. Participation will be voluntary, and informed consent will be obtained from all participants. Confidentiality and privacy will be maintained, and participants will have the right to withdraw from the study at any time without affecting their healthcare services.

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