



UNIVERSITI PUTRA MALAYSIA

***KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING GESTATIONAL
DIABETES MELLITUS AND ITS CONTROL AMONG ANTENATAL WOMEN
ATTENDING ANTENATAL CLINIC IN HOSPITAL SERDANG***

NURUL EZZAH BINTI MOHD AZMI

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SEPTEMBER 2022

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**THESIS SUBMITTED TO THE FACULTY OF MEDICINE AND
HEALTH SCIENCES, UNIVERSITI PUTRA MALAYSIA, IN
FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF BACHELOR IN NURSING**

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ABSTRACT

KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING GESTATIONAL DIABETES MELLITUS AND ITS CONTROL AMONG ANTENATAL WOMEN ATTENDING ANTENATAL CLINIC IN HOSPITAL SERDANG

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Background: Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance that causes hyperglycaemia of varying severity and develops during pregnancy. GDM is related with an increased risk of preeclampsia in pregnant women and an increased risk of macrosomia, and more. Appropriate knowledge and a good attitude towards disease are closely associated to preventing disease complications through proper disease management. **Objective:** To determine knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang. **Methods:** This study is a cross-sectional study where 117 antenatal women from study location which is antenatal clinics in Hospital Serdang are participated in this study. The non-probability convenience sampling are used in the study and the questionnaire are given to the prospective participants. SPSS version 28.0 was used for data entry and analysis. **Results:** Overall there are 117 respondents that involved in this study. The findings in this study showed that 59%, 94.9% and 76.9% of the respondents had a good level of knowledge, attitude and practice respectively. The correlation between knowledge towards practice were positively correlated as ($r = 0.460$, $p = < 0.001$), and also correlation between attitude and practice were positively correlated ($r = 0.356$, $p = < 0.001$) by using Pearson Correlation. **Conclusion:** This study provides information regarding the knowledge, attitude and practice of GDM and its control among antenatal women attending antenatal clinic in Hospital Serdang serve as future reference for healthcare provider or related health committee to improve more health education and activities related to GDM and its control.

Keywords: Knowledge, Attitude, Practice (KAP), Gestational Diabetes Mellitus, Control, Antenatal Women and Antenatal Clinic

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Last but not least, an infinite gratitude I wish to all those who had been involved directly and indirectly in this research. May Allah give you all the best in return.

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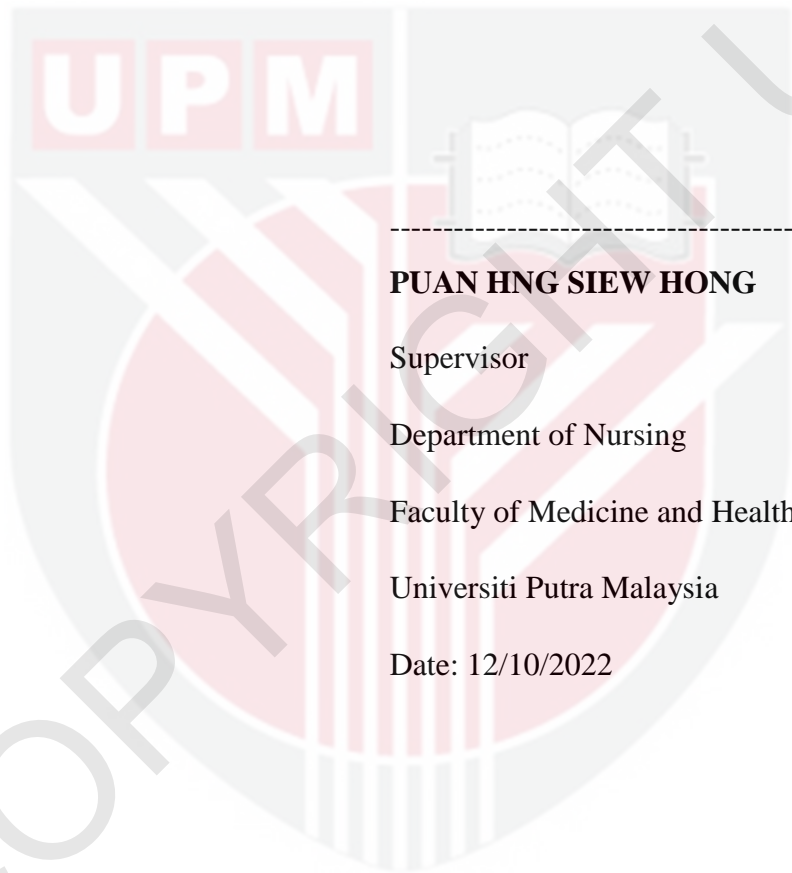
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LIST OF ABBREVIATIONS	
CDC	Centres for Disease Control and Prevention
CRC	Clinical Research Centre
GDM	Gestational Diabetes Mellitus
IDF	International Diabetes Federation
JKEUPM	Jawatankuasa Etika Untuk Penyelidikan Melibatkan Manusia
KAP	Knowledge, Attitude and Practice
MREC	Medical Research and Ethics Committee
NHS	National Health Service
NMRR	National Medical Research Register
OADs	Oral Antidiabetic Medications
OGTT	Oral Glucose Intolerance Test
SKVE	South Kajang Valley Expressway
SPSS	Statistical Package for the Social Sciences
UPM	Universiti Putra Malaysia

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CHAPTER 1

INTRODUCTION

1.1 Background

In 2019, International Diabetes Federation found that gestational diabetes mellitus affected an estimated 223 million women between the ages of 20 and 79. Their estimate for 2045, this number is expected to rise to 343 million (“Gestational diabetes,” n.d.). Based on the IDF report on 2019, Malaysia is in the top three with 22.5% of GDM prevalence after Thailand and Singapore (Kunasegaran et al., 2021). Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance that causes hyperglycaemia of varying severity and develops during pregnancy (Baz, Riveline & Gautier, 2016). In January 2014, the prevalence of GDM was 27.9 percent among newly registered antenatal women in Selangor, which was higher than the 24.9 percent recorded in a 2001 study (Logakodie et al., 2017).

GDM is related with an increased complications of preeclampsia in pregnant women and an increased complications of macrosomia, hypoglycaemia, jaundice, respiratory distress syndrome, polycythaemia, and hypocalcaemia in babies (Ansarzadeh, Salehi, Mahmoodi & Mohammadbeigi, 2020). According to the 7th International Diabetes Federation (IDF) Diabetes Atlas published in 2015, 20.9 million

(16.2 percent) live births were impacted by hyperglycaemia during pregnancy, with GDM accounting for approximately 85.1% of those instances (Bhowmik et al., 2018).

The higher risk of macrosomia in GDM is mostly caused by the mother's greater insulin resistance. In gestational diabetes, a greater amount of blood glucose enters the foetal circulation through the placenta. Extra glucose in the foetus is then retained as body fat, creating macrosomia, often known as 'large for gestational age' ("E-Mail Gestational Diabetes Mellitus and Macrosomia: A Literature Review by Kamana KC et al," 2015). Other than that, preeclampsia and gestational diabetes appear to share numerous mechanisms: Alterations in glucose metabolism caused by gestational diabetes, for example, generate vascular changes such as arteriosclerosis and glomerular filtration failure, which might result in a propensity to preeclampsia. As a result, several authors have recently highlighted gestational diabetes as a risk factor for preeclampsia and preeclampsia as a potential outcome of gestational diabetes. This is reinforced by the fact that a prospective random trial found that treating gestational diabetes lowered the rate of preeclampsia by 30%. According to these findings, treating gestational diabetes would be an effective method of preventing preeclampsia (Schneider, Freerksen, Röhrig, Hoeft & Maul, 2012).

Appropriate knowledge and a good attitude toward disease are closely associated to preventing disease complications through proper disease management, which enables people to live more comfortably with their sick condition (Hussain, Yusoff & Sulaiman, 2015). Perception of GDM among pregnant women will implement a healthier lifestyle, a more proactive approach to healthcare, and improved

self-care, resulting in illness prevention and early detection (Shriraam, Rani, Sathiyasekaran & Mahadevan, 2013).

Due to the ideal chance for recognising and avoiding problems of GDM during the prenatal period, two generations can be safeguarded from the contradictory consequences of diabetes mellitus. Many of individuals are unaware of the conditions associated with GDM. Even after being diagnosed, they are unaware of the significance of following a strict diet and present with complications late in pregnancy (Shafaiyaz & Rohini, 2021). Hence, this study was aimed to identify the level of knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

1.2 Problem Statements

The National Obstetrics Registry 6th Report in 2020 reported that the incidence of diabetes in pregnancy was 20217 women (21.95%) which translates to 1 in 5 pregnant women with diabetes in pregnancy or known as gestational diabetes. From the same report, incidence of gestational diabetes in Selangor 2020 was second higher which is 3239 women (27.32%) (Jeganathan & Karalasingam, 2021).

According to a study, gestational diabetes is most prevalent among women who live in urban areas (Li, Naik, Alexander & Mathad, 2018). As an urban location, there are too many food options, and some people struggle to limit their food intake. Healthy food and nutrition choices not only aid the current pregnancy with gestational diabetes, but also help reduce the risk of future obesity and overt diabetes. (Krige, 2020). The most important is early check-up for gestational diabetes can help the mother to manage better in their pregnancy with diabetes. Gestational diabetes mellitus typically manifests in the second trimester and is detected by a physician between 24 and 26 weeks of pregnancy (“Gestational Diabetes and Pregnancy | CDC,” n.d.).

As the gestational diabetes mellitus has become the worldwide problem, the community need to have a good knowledge and good attitude towards gestational diabetes and its control but there are still some pregnant mother does not have the awareness. Since the disease is can be detect on early pregnancy and the mother can manage during pregnancy, the control of nutrition intake is one of strategies for the

mother can used and easy to plan in daily routine. To the knowledge of author, there is only paucity of study towards knowledge, attitude and practice of gestational diabetes and its control at the urban area in Malaysia. It is important area because urban area contribute to the increasing cases of gestational diabetes mellitus (Mwanri, Kinabo, Ramaiya & Feskens, 2014).



1.3 Significant of Study

Antenatal mothers are the main population that are involved in this kind of disease and there are lacking of research of knowledge, attitude and practice on gestational diabetes and its control. The finding of this study will identify the level of knowledge, attitude and practice regarding gestational diabetes mellitus among women attending antenatal clinic in Hospital Serdang. The study finding result will give a better understanding of gestational diabetes mellitus which help mothers to improve their nutrition intake and habit of control during pregnancy with diabetes mellitus. Other than that, this study will help perception antenatal women towards gestational diabetes which they will understand better the factors and complication of gestational diabetes mellitus that happen to them. This also can establishes the awareness about variety of practices to control diabetes during pregnancy which antenatal women will have an idea how to plan and overcome the problem. The existing health education regarding gestational diabetes that usually given in antenatal clinic can be improvised by more focused on nutrition intake and the way control GDM during pregnancy especially for those mother that having gestational diabetes. This finding also will provide a better understanding for future study.

1.4 Research Question

1. What is the level of knowledge, attitude and practice of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.
2. What is the relationship between knowledge and practice of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.
3. What is the relationship between attitude and practice related to gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.
4. What is the relationship between socio-demographic with knowledge, attitude and practice of gestational diabetes mellitus and its control among women attending antenatal clinic in Hospital Serdang.

1.5 Research Objectives

1.5.1 General Objectives

To determine knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

1.5.2 Specifics Objectives

1. To determine the level of knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.
2. To identify the relationships between knowledge and practice of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.
3. To identify the relationship between attitude and practice related to gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.
4. To identify the relationship between socio-demographic with knowledge, attitude and practice of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

1.6 Conceptual Framework

Diagrammatic illustration of the study framework which explains the study proposed below:

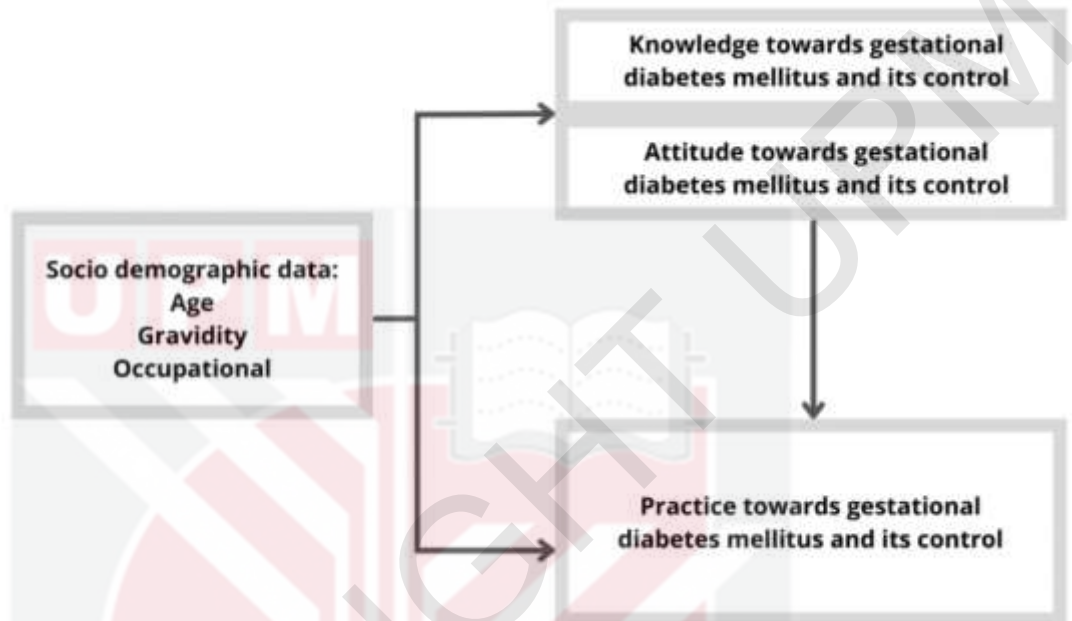


Figure 1: Conceptual framework

The above framework consists of independent variable and dependent variable in the study. The independent variables are knowledge and attitude towards gestational diabetes mellitus and its control. Meanwhile, the dependent variable is practice towards gestational diabetes mellitus and its control. The demographic data including, age, group, gravidity and occupational are consider as independent variable that may affect the knowledge, attitude and practice towards control of gestational diabetes mellitus.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In this chapter introduce about literature use in this study which consist of background, knowledge of gestational diabetes mellitus and its control, attitude of gestational diabetes mellitus and its control and practice of gestational diabetes mellitus and its control.

2.2 Gestational Diabetes Mellitus

According to the World Health Organization (2013), pregnant women who match the criteria for diabetes mellitus or impaired glucose intolerance are categorised as having gestational diabetes mellitus (GDM). The World Health Organization's criteria for GDM diagnosis in 1999 were an Oral Glucose Intolerance Test (OGTT) 75 g anhydrous glucose in 250-300 ml water and measuring plasma glucose after 2 hours fasting; if the result after 2 hours is 7.8 and above, it is categorised as gestational diabetes mellitus (“Diagnostic Criteria and Classification of Hyperglycaemia First Detected in Pregnancy,” 2013).

When compared to controlled GDM, untreated GDM not only results in four times rising in perinatal death, but it also results in four times rising in perinatal morbidity. (Hassan, Ching, Ling, Jaffar & Lee, 2019). GDM is associated with a significant health burden, both in the short term and long term. Mother and child with GDM are at increased risk of difficulties during pregnancy and delivery than other pregnant women (Teng et al., 2021) However, if the illness is diagnosed early and adequately controlled, the risks of complications can be reduced. Pregnant mothers with gestational diabetes can lower their risks of having complications with their pregnancy by regulating their blood sugar levels by modifying their diet and exercise habits. (NHS, 2019).

2.3 Gestational Diabetes Mellitus in Malaysia

It is estimated that around 11.5 percent of expectant moms in Asia suffer from gestational diabetes mellitus (GDM). The prevalence of GDM in Malaysia varied from 8.8 to 11.1 percent in 2012 and it is anticipated that this number would continue to rise in the years to come. This is due to the fact that the prevalence of diabetes mellitus in Malaysia grew significantly between the years 2006 and 2015, ranging from 11.6% to 17.5% (Lee et al., 2020).

According to the findings of a research that was carried out at the Hospital Pulau Pinang, pregnant women had the lowest knowledge score for the management

of the condition. This is because the majority of their subjects had gestational diabetes mellitus, which is a condition that lasts for a shorter amount of time, and these patients had less experience with self-management strategies when compared to patients with type 2 diabetes mellitus who had already been afflicted with the condition for a longer amount of time. (Hussain et al., 2015)

According to Chew Wai Fong et al. (2012), women who have GDM are at risk of developing postpartum glucose intolerance, and their findings shown that the prevalence of type 2 diabetes mellitus in their study was higher than the prevalence reported by the National Health & Morbidity Survey (NHMS) III study among the female population in Malaysia. In addition, their findings shown that the prevalence of type 2 diabetes mellitus in their study was higher than the prevalence reported by Chew Wai F. Nevertheless, this is because the age groupings of the women in the two different cohorts are different from one another (Chew et al., 2012).

2.4 Knowledge of gestational diabetes mellitus and its control

Knowledge about gestational diabetes mellitus is essential among pregnant women who are suffering from this type of disease in order to determine their level of awareness regarding their control and management. To promote an awareness, health education should be provided to all pregnant women who are at risk of developing gestational diabetes mellitus. It includes the complications of gestational diabetes mellitus as well as the control of the disease when the condition is present. An

understanding of gestational diabetes mellitus will play a significant role in preventing its complications (Veeraswamy, Vijayam, Gupta & Kapur, 2012).

According to Hussain, Yusoff & Sulaiman (2015) majority of respondents from Hospital Pulau Pinang, Malaysia answer correct on knowledge of gestational diabetes. The pregnant women are aware that gestational diabetes mellitus is a kind of diabetes that occurs during pregnancy, and the study found that patients had the most knowledge about nutrition and dietary values. According to the researchers, the majority of the study participants were undergoing diet management therapy, which is the most likely explanation for their findings. The lowest level of knowledge was reported for disease management, which may lead to challenges for patients in adhering to self-control strategies, an increase in the risk of complications, and a decrease in coping abilities for diabetes and related illnesses. From analysis of National Obstetrics Registry 6th Report 2018 – 2020 showed gestational diabetes case from a hospital in Selangor increasing number of cases which from 2761 on 2019 to 3239 on 2020. There are a lot of cases and need to put more attention on it such health education about complications and its control regarding GDM in antenatal clinic where present of pregnant women that having gestational diabetes. Therefore, an understanding of antenatal women's baseline knowledge, attitudes and practices (KAP) of gestational diabetes is essential for effective complications control.

2.5 Attitude of gestational diabetes mellitus and its control

Attitude is a key construct to understand an individual's trend to adopt and maintain certain behavioural standards. A study by Islam et al. (2017) explained that positive attitudes are associated with improved disease-associated stress reduction, increased treatment acceptance, trust in the multi professional team, increased self-esteem, a sense of self-awareness, a more positive perception of health and cultural acceptance in diabetes mellitus treatment management. Positive attitudes toward treatment resulted from shared knowledge and decision-making with patients, guided by their values, in addition to recognizing limitations to self-care, motivation, and proposed aims.

According to Shafaiyaz & Rohini (2021) study, approximately 54.21 percent of individuals expressed a favourable attitude toward screening for gestational diabetes mellitus, and many pregnant mothers agreed that all pregnancies should have been routinely checked for GDM. This is because reduction in the rate of neonatal macrosomia has been correlated to the routine screening for GDM, which involves monitoring fasting and post-prandial blood glucose levels (Maher, Mcauliffe & Foley, 2012). According to a similar study conducted in Vietnam, a significant majority of the women attended the hospital on a regular basis to be screened for GDM. However, the study also discovered that women experienced feelings of uncertainty, worry, and guilt due to of having gestational diabetes, and many of them believed that their unborn child was at a greater danger of dying as a result. They were worried that GDM could

be passed on through breast milk; thus, some mothers had made plans to stop breastfeeding (Hirst et al., 2012).

2.6 Practice of gestational diabetes mellitus and its control

The most crucial thing is knowledge and attitude play a significant role in the practise of community. It is necessary to improve the understanding and belief of the community in order to motivate them to follow good practices in control of gestational diabetes mellitus. Eat balanced food, regular antenatal check-up, moderate activity, and medications are the way to implement the practice of gestational diabetes control. (Shafaiyaz & Rohini, 2021).

A previous trial on pregnant women with GDM found that a moderate-intensity resistance exercise programme using elastic bands helped lower the proportion of patients who required insulin and improved glycaemic control. Moreover, the study's most significant discovery was that moderate-intensity exercise practised during pregnancy dramatically lowered the risk of GDM-related problems, especially macrosomia (Barakat, Pelaez, Lopez, Lucia & Ruiz, 2013). Antenatal GDM management aims to lower blood glucose levels with diet, glucose self-monitoring, and insulin has been shown to be effective in two large recent randomised trials. These led to a significant reduction in perinatal complications compared to women with GDM who received standard prenatal care alone. Some have advocated the use of oral

antidiabetic medications (OADs) as an alternative to insulin when diet alone is insufficient (Jiwani et al., 2012).

According Shafaiyaz & Rohini (2021), the study discovered that most pregnant women did not adhere to a precise food routine during their antenatal period. Only a small percentage of expectant mothers take nutrients when they are starving. In the final stages of pregnancy, antenatal moms tend to consume a high-carbohydrate diet, which may raise the risk of GDM. So these shows that the antenatal mother are still low in practice. In conclusion, proactive and sustainable efforts are needed to bring a behavioural change among communities in order to control and lower the cases in the area involved.

2.7 Operational Definition

Variable	Conceptual Definition	Operation Definition
Knowledge	Based on Cambridge dictionary (n.d), knowledge is the skill in, the understanding of or an information about something, which a person gets by experience or study	In this study, knowledge is defined as understanding toward gestational diabetes. It is include the understanding risk factor, proper nutrition, modality for control GDM and complications. It is measures using KAP tools by Shafaiyaz & Rohini (2021). A total of 12 items included using “Yes”, “No”, “Don’t know” and some answer option that respondent need to choose in the questions.
Attitude	Based on Collins dictionary (n.d), attitude is the way a person views something or tends to behave towards it, often in an evaluative way	In this study, attitude is the respondent feeling regarding GDM and its control. It is measure using KAP tools by Shafaiyaz & Rohini (2021). A total of 7 items is included in this tool using “Agree” and “Disagree” choices.
Practice	Based on Merriam-Webster (n.d), practice is to do something regularly or	An action of the antenatal women towards GDM and its control. It is measure using KAP tools by Shafaiyaz & Rohini (2021). A total of 14 items is included two part in

	constantly as an ordinary part of life	this tools. First part, using “Yes” and “No” questions. Second part, using “Yes”, “No”, “Don’t know” and some answer option that respondent need to choose in the questions.
Antenatal women	Based on Cambridge dictionary (n.d), antenatal relating to the medical care given to pregnant women before their babies are born.	In this study, may be consisting of Malay, Chinese, Indian and non-Malaysian such Indonesia.

Table 1: Operation definition

CHAPTER 3

METHODOLOGY

3.1 Introduction

In this chapter consist of study design, study setting, population of study, study sampling, inclusion and exclusion criteria needed, sample size calculation, data collection, collection process, and data analysis. Ethical concerns are also explained in this chapter.

3.2 Study Design

The study is conducted as cross-sectional design to investigate knowledge, attitude and practice regarding gestational diabetes mellitus among antenatal women attending antenatal clinic in Hospital Serdang. Cross sectional study is a design to collect data from many participants at single point of time as to examine the relationship between the variable. It is chosen as it is economical compare to longitudinal study. It also can benefit in cost effectiveness as the research does not require a follow up session, so fewer resources needed to run this study.

3.4 Study Setting

This study is conducted at antenatal clinic in Hospital Serdang, Selangor. The antenatal clinic is under department of obstetrics and gynaecology in Hospital Serdang. The clinic is for in-patient and out-patient to refer their cases that related to. For the antenatal clinic schedule, it is available on Monday and Thursday at 8.00 am until 1.00 pm. Serdang Hospital is located in Mukim Dengkil, Sepang District, Selangor Darul Ehsan. The location is bordered by the South Kajang Valley Expressway (SKVE) on the east and the UPM Medical Faculty on the west. The construction of this hospital is to provide medical services to approximately 570,000 residents in the areas of Serdang, Putrajaya, Kajang and Bangi. The study area is chosen by researcher because this hospital is a referral and local maternity facility for women residing in Serdang area and the surrounding urban provinces. Meanwhile, it help to know level of knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women.

3.5 Study Population

Target population in this study are consisted of antenatal women with different ethnicity. The total population is 130,755 which the female population data are taken from Department of Statistics Malaysia who live in under Mukim Dengkil (Department of Statistics Malaysia, 2020). Antenatal women that attending antenatal clinic are chosen for this study population and included for an adult mother which is 18 years old and above. This study are involved pregnant mother above 18 years old

only. If there any pregnant mother below 18 years old, they are not included in the research because gestational diabetes most common among pregnant women 25 years old and above.

3.6 Sampling Method

The non-probability convenience sampling method is used in this study. This method is referred to as convenience sampling since the sample element is chosen by the researcher based on their ease of availability and closeness (Taherdoost, 2016). This is a simple method of conducting the study because it is inexpensive, requires less time and also the questionnaire are directed distributed to the participants involve in this study. Aside from the convenience factor, this method is chosen because of the sample size that could be obtained at that time and the period during which the study is conducted. Respondents are chosen because they are in the right place at the appropriate time, and any member of the population has an equal probability of being a respondent. The inclusion and exclusion criteria used in this sample approach are extremely important for the recruitment of participants for this study and also the sample selection process is repeated until the required sample size is reached.

3.7 Inclusion and Exclusion Criteria

3.6.1 Inclusion Criteria

- i. Women diagnosed with gestational diabetes mellitus (GDM)
- ii. Age 18 and above

3.6.2 Exclusion Criteria

- i. Normal pregnancy women

3.8 Sample Size

Sample size is calculated using Raosoft calculator. It is created to assist researchers in determining the appropriate sample size for their research as well as managing their survey software database files (“Sample Size Calculator by Raosoft,” n.d.) The formula for this calculation is retrieved from www.raosoft.com :

Formula sample size (Barghouthi & Imam, 2018):

$$n = N \times (N-1) E^2 + x$$

Where:

n = Required sample size

x = Z value (eg: 1.96 for 95% confidence level)

N = Population size (41911 person)

E = Degree of accuracy (9%), expressed as a portion (.09); it is margin error

$$n = (130755)(0.95) / [(130755-1) 0.09^2 + 0.95] = 117.18$$

n = 117 number of respondents

Knowing that the estimated total population of women under Mukim Dengkil, Selangor is 130,755 persons. The researcher is used the margin error of 9% due to acceptable margins of error should be between 5% and 10% (Suresh & Chandrashekara, 2012). The confidence level set to 95%, the minimum recommended for sample size is 117 samples.



3.9 Study Instrument

3.9.1 Instrument

In this study, the researcher used interview based on questionnaire. The questionnaire has been adapted from KAP regarding gestational diabetes mellitus (GDM) and its control by Shafaiyaz & Rohini (2021). In this questionnaire, there are two section of question which are Section A and Section B. Section B include of 3 parts which are B1 is knowledge of GDM and its control, B2 is attitude of GDM and its control and B3 is practice of GDM and its control.

Section A: Socio-demographic

Researcher concerned about social demographic data such the basic information of respondents. Demographic information are included age, nation, education level, occupation, total number of family member and monthly household income.

Section B: KAP on GDM and its control question

This questionnaire is adapted from KAP on GDM and its control questionnaire by Shafaiyaz & Rohini (2021), to observe the knowledge, attitude and practice regarding GDM and its control among antenatal women attending antenatal clinic.

Section B1: Knowledge of GDM and its control

This section researcher concerned of respondents understanding towards gestational diabetes mellitus. It is included the understanding of risk factor, proper nutrition, modality for GDM and complications. This section is consisted of 8 questions where are answered using “Yes”, “No”, “Don’t know”

and some answer option that respondent need to choose for. The total score range from 0 to 8. Each question answered correctly is given one point and zero for wrong or no answer as well as unsure response (Shafaiyaz & Rohini, 2021).

Section B2: Attitude of GDM and its control

For attitude questions consists of 7 items which are scored with one point for “Agree” and zero for “Disagree” answer. The total score range from 0 to 7 (Shafaiyaz & Rohini, 2021).

Section B3: Practice of GDM and its control

The practice of gestational diabetes and its control item have two part which is total questions is 14 questions. For the part 1, 6 questions are scored as one point for “Yes” and zero for “No” answer. The total score range from 0 to 6. For the part 2 item are consisted of 8 questions using the same method as knowledge item as the correct answer is given one point and wrong or no answer is given zero point. Total score range from 0 to 8 (Shafaiyaz & Rohini, 2021).

A total KAP questionnaire is 33 questions together. Respondents are classified as good or poor level based on their total score in each domain (knowledge, attitude, and practice) used an 80 percent cut-off for each domain (Suwanbamrung et al., 2021).

3.9.2 Validity and Reliability

The questionnaire is adopted and modified to be used in this study. The questionnaire have been reviewed by the panel of experts to ensure the face validity. The panel of experts consisted of 3 person which is an endocrinologist from medical department, a nursing lecturer from nursing department and an English teacher for review all items in questionnaire.

However in term of reliability, the questionnaire is considered as consistent and reliable if the Cronbach's alpha value is in between 0.70 and 0.91. A general rule thumb of Cronbach's alpha of 0.70 and above is considered good, 0.80 and above is considered better, and 0.90 and above is considered excellent (Taber, 2018).

3.9.3 Pre-test

Data had been collected and a pilot study is carried out among antenatal women at the study setting which is antenatal clinic in Hospital Serdang after obtained approval from Medical Research and Ethics Committee (MREC) and CRC Hospital Serdang. 30 respondents are selected based on inclusion and exclusion criteria and these respondents are excluded from the sample. The pilot test's finding had been analysed by using Statistical Package for the Social Science (SPSS) Version 28.0 to get the Cronbach's alpha value for reliability. The Cronbach's alpha for knowledge, attitude and practice is 0.69.

3.10 Data Collection Process

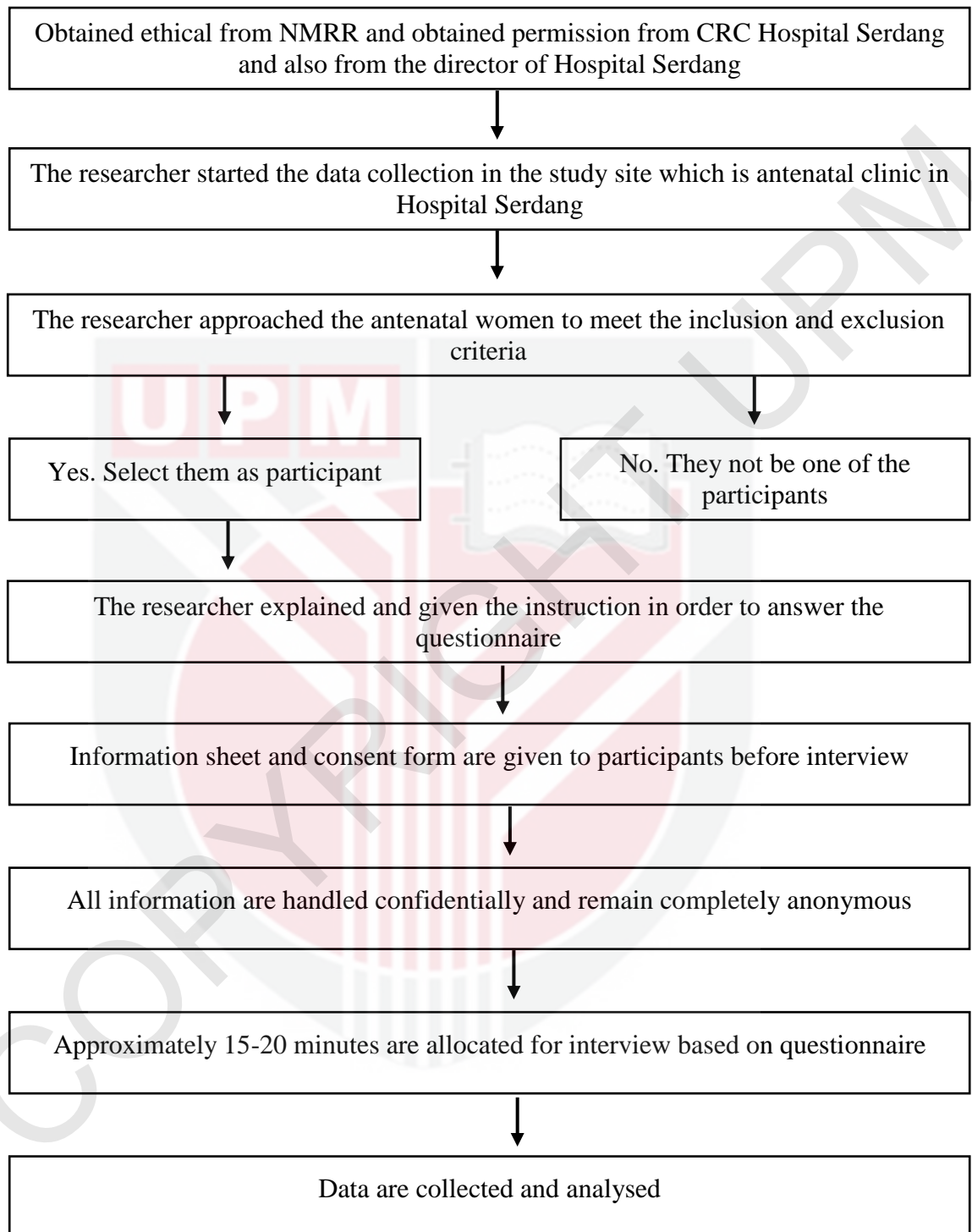


Figure 2: Data collection process

The collection of data begin after researcher obtained ethical from National Medical Research Register (NMRR) and permission from Clinical Research Centre (CRC) Hospital Serdang and also from the director of Hospital Serdang. The researcher started the data collection at the study site which is antenatal clinic in Hospital Serdang. Then, the researcher started to approach antenatal women there to meet the inclusion criteria, meanwhile for those who does not meet the inclusion criteria are not one of participants. The antenatal women that meet the inclusion criteria then are included in this study. The researcher explained about this study and given instruction regarding interview. After that, participant signed consent before start the interview. All personal information are never disclosed and remain anonymous as it is confidential. The interview are taken around 15-20 minutes per session. Lastly, the data collected are analysed by researcher.

3.12 Ethical Consideration

The ethical approval process is critical to the research process because it protected both the researchers and the participants. Also, the ethical approval process is completed prior to the start of the research. The Medical Research and Ethics Committee (MREC) approval for this research is obtained initially through online registration and application through the National Medical Research Register (NMRR). Following approval, MREC given the researcher with a written ethical approval letter. The researcher sent a written ethical permission letter to the Jawatankuasa Etika Untuk Penyelidikan Melibatkan Manusia (JKEUPM), along with a copy of the proposal, informing them about the study. Following that, a written permission letter is filed to the Clinical Research Centre (CRC) and the director of Hospital Serdang seeking permission to perform this study in their respective hospitals.

Eligible participants are informed adequately about the study. The researcher discussed the study in detail, the role of participants in the study, and offered participants with an information sheet. Participants have the right to request clarifications about the study and their involvement in it. Participants' participation is voluntary, and they have the opportunity to withdraw from the study at any moment without incurring any penalty. The interview session are not interfered with participants' doctor appointments. It is carried out in the interim as the pregnant woman waits to see the doctor at the clinic. Participants are required to provide informed consent. Before signing, participants are completely aware. On consent, an individual with no link to and independence from this study is designated as a witness.

The witness is a companion or acquaintance of the participants or a researcher who has no other benefit from the research.

The data are stored in a secure location. Any identifiable information collected, such as the participant's name, identification card number, and income, are kept in a registry file, and the participant's identity are replaced by an alphanumeric or pseudonym to conceal the participant's identity. As data are collected, they are stored on a password-protected computer, thumb drive, or hard disc, or in a password-protected cloud account (i.e. drop box or google drive), and are accessible only to the researcher or researchers' members (i.e. supervisor and co-supervisor) to ensure the study is conducted properly and participant data is recorded correctly. All information provided is regarded as confidential. As this is a survey study, the researcher retained the data for at least five years before permanently destroying or deleting it. If hardcopy information is available, it is kept in the researcher supervisor's office in a locked drawer.

3.13 Data Analysis

All the data collected are analysed by using Statistical Analysis Package for Social Sciences (SPSS) Version 28. All data collected are coded and entered into system. Data are cleaned to identify outlier. Data are explored to determine either the distribution is normal or not. The analyses data are stated in the table below:

Objectives	Variables	Type of Variables	Statistical Measurement
To determine the level of knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.	Level of knowledge	Categorical	Frequency and Percentage
	Knowledge regarding gestational diabetes mellitus and its control	Continuous (Score)	Mean and Standard Deviation
	Level of attitude	Categorical	Frequency and Percentage
	Attitude regarding gestational diabetes mellitus and its control	Continuous (Score)	Mean and Standard Deviation
	Level of practice	Categorical	Frequency and percentage
	Practice regarding gestational diabetes mellitus and its control	Continuous (Score)	Mean and Standard Deviation

<p>To identify the relationships between knowledge and practice of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang</p>	<p>Knowledge regarding gestational diabetes mellitus and its control</p> <p>Practice regarding gestational diabetes mellitus and its control</p>	<p>Continuous (Score)</p> <p>Continuous (Score)</p>	<p>Pearson Correlation</p>
<p>To identify the relationship between attitude and practice related to gestational diabetes mellitus and its control among antenatal women attending antenatal clinics in Hospital Serdang</p>	<p>Attitude regarding gestational diabetes mellitus and its control</p> <p>Practice regarding gestational diabetes mellitus and its control</p>	<p>Continuous (Score)</p> <p>Continuous (Score)</p>	<p>Pearson Correlation</p>

To identify the relationship between socio-demographic with knowledge, attitude and practice of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang	Age	Continuous	Mean and standard deviation
	Age and Attitude regarding gestational diabetes mellitus and its control	Continuous and Continuous (Score)	Pearson Correlation
	Gravidity	Categorical	Frequency and percentage
	Gravidity and Knowledge regarding gestational diabetes mellitus and its control	Categorical and Continuous (Score)	One Way Independent ANOVA
	Gravidity and Practice regarding gestational diabetes mellitus and its control	Categorical and Continuous (Score)	One Way Independent ANOVA
	Highest Educational Level	Categorical	Frequency and percentage
	Educational Level and Knowledge regarding gestational diabetes mellitus and its control	Categorical and Continuous (Score)	One Way Independent ANOVA

	Occupational	Categorical	Frequency and percentage
	Occupational and Knowledge regarding gestational diabetes mellitus and its control	Categorical and Continuous (Score)	One Way Independent ANOVA
	Occupational and Practice regarding gestational diabetes mellitus and its control	Categorical and Continuous (Score)	One Way Independent ANOVA

Table 2: Data analysis

3.14 Summary

As a conclusion, this chapter discussed about methodology for the study. The study is conducted as a cross-sectional design and is carried out at an antenatal clinic in Hospital Serdang. Estimation 117 antenatal mothers are selected using non-probability convenience sampling method. Participants are given questionnaire that consists two section which are socio-demographic and knowledge, attitude and practice regarding gestational diabetes mellitus and its control. Data are analysed using The Statistical Analysis Package for Social Sciences (SPSS) version 28.

CHAPTER 4

RESULT

4.0 Introduction

This study is carried out among antenatal women that attending antenatal clinic in Hospital Serdang. The results of this study are based on the data collected through questionnaire which include two section which are Section A and Section B. Section A is about socio-demographic characteristics meanwhile Section B consists of three sub-sections, which are Section B1 is about knowledge of gestational diabetes mellitus and its control, Section B2 is about attitude of gestational diabetes mellitus and Section B3 is about practice of gestational diabetes mellitus.

In this chapter, the descriptive analysis of Section A and Section B were carried out and presented in table form. Lastly, relationship between knowledge and attitude with practice of gestational diabetes mellitus and relationship between socio-demographic characteristics and level of knowledge, attitude and practice regarding gestational diabetes mellitus and its control were determined and discussed.

Normality test had been done which resulted skewness and kurtosis for knowledge is -0.889 and 1.434, while skewness and kurtosis for attitude is -0.606 and 2.231, and lastly skewness and kurtosis for practice is -0.878 and 0.462. All the variable is in normal range of skewness which from -3 to +3 while normal range for kurtosis is from -10 to +10 (Griffin & Steinbrecher, 2013). Meanwhile, result from Kolmogorov-Smirnov and Shapiro-Wilk test for knowledge, attitude and practice are overall p- values is < 0.001 which significance value should be $p < 0.05$. Thus, parametric test had been used to analyse the data which are Pearson Correlation and one-way independent ANOVA.

4.1 Socio-demographic Characteristics

Table 1: Distribution of respondents by age, gravidity, nation, highest education level, occupation, monthly household income, family history of diabetes, did respondents have any knowledge about GDM, history of GDM in previous pregnancy and how respondents acquire knowledge about GDM, (N=117).

Characteristics	N = 117	%	Mean \pm SD
Age			31.44 \pm 4.18
Gravidity			
Primigravida	28	23.9	
Multipara	72	61.5	
Grand Multipara	17	14.5	
Nation			
Malay	102	87.2	
Chinese	6	5.1	
Indian	7	6.0	
Others	2	1.7	
Highest Education Level			
No Formal Education	0	0	
Primary School	0	0	
Secondary School	42	35.9	
Diploma	34	29.1	
Degree	34	29.1	
Master/PHD	7	6.0	
Occupation			
Housewife	48	41.0	
Professional	32	27.4	
Healthcare Worker	3	2.6	
Laborer	0	0	
Others	34	29.1	
Monthly Household Income			
< 2500 - 4849	70	59.8	
4850 - 10959	46	39.3	
10960 – 15039 >	1	0.9	

Characteristics	N = 117	%	Mean \neq SD
Do you have any familial history of diabetes?			
Yes	94	80.3	
No	23	19.7	
Do you have any knowledge about Gestational Diabetes Mellitus (GDM)?			
Yes	111	94.9	
No	6	5.1	
Do you have history of GDM in previous pregnancy?			
Yes	64	54.7	
No	53	45.3	
How did you acquire the knowledge about Gestational Diabetes Mellitus?			
Family	44	24.6	
Friends	21	11.7	
Medical Professional	107	59.8	
Neighbour	0	0	
Other	7	3.9	

The total number of respondents of this study is 117. The mean and standard deviation for age of the respondents is $31.44 \neq 4.18$ years old with the mode of 29 years old. Out of 117 respondents, more than half respondents are Multipara women (61.5%, n=72), follow by Primigravida (23.9%, n=28) and Grand Multipara (14.5%, n=17). Furthermore, many respondents are Malay (87.2%, n=102) which carried the most respondents in this study, follow by Indian (6.0%, n=7), Chinese (5.1%, n=6) and other (1.7%, n=2) are come from non-Malaysian which Indonesia people. Respondents that have Diploma and Degree both carried same number of participants (29.1%, n=34). The respondents from Master/PHD educational background carried the least number of respondents (6.0%, n=7), and the large number of respondents were from

Secondary school (35.9%, n=42). Many of respondents come from a housewife (41.0%, n=48), follow by women who working other job (29.1%, n=34), women who working as a professional (27.4%, n=32) and lastly from healthcare worker which is nurse (2.6%, n=3). Majority of respondents are come from low monthly income group (B40) which range monthly income < 2500 to 4849 (59.8%, n=70), follow by middle monthly income group (M40) which range of monthly income 4850 to 10959 (39.3%, n=46) and last only one respondent from high monthly income group (T20) which range of monthly income (0.9%, n=1). Around 80.3% (n=94) of respondents stated that they have family history of diabetes and follow by 19.7% (n=23) of respondents stated that they have no family history of diabetes. Out of 117 respondents, more than half of respondents have knowledge about gestational diabetes mellitus (94.9%, n=111), follow by 5.1% (n=6) of respondents have no knowledge about gestational diabetes mellitus. Furthermore, many of respondents stated that they have history of GDM in their previous pregnancy which is 54.7% (n=64) and 45.3% (n=53) of respondents stated they have no history of GDM in previous pregnancy. Majority of respondents acquire knowledge about gestational diabetes mellitus from medical professional (59.8%, n=107), follow by family (24.6%, n=44), friends (11.7%, n=21) and lastly acquire knowledge from other sources (3.9%, n=7).

4.2 Knowledge regarding Gestational Diabetes Mellitus and Its Control

Table 2: Distribution of respondents' answer regarding knowledge of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang, (N=117).

No.	Question	N	%
1.	What are the risk factors of GDM? (can choose more than 1)		
	Family history of diabetes mellitus	96	45.1
	Obesity	42	19.7
	History of GDM in previous pregnancy	69	32.4
	Do not know	6	2.8
	Correct	111	94.9
	Wrong	6	5.1
2.	Do you think that proper nutrition is important throughout pregnancy?		
	Yes	113	96.6
	No	4	3.4
3.	Which modality will help in control of gestational diabetes mellitus? (can choose more than 1)		
	Diet plan	103	45.4
	Medication	45	19.8
	Monitor Blood Glucose	55	24.2
	Exercise	24	10.6
4.	What are the common problems of new born of a GDM mother?		
	Big baby	115	61.2
	Preterm labour	59	31.4
	Birth trauma	11	5.9
	Congenital anomalies	1	0.5
	Respiratory distress syndrome	2	1.1
	Do not know	0	0
5.	How is GDM diagnosed?		
	Urine test	4	3.4
	Blood test after glucose ingestion	114	96.6
	USG	0	0
6.	Do you know insulin controls blood sugar?		
	Yes	93	79.5
	No	24	20.5

7.	Do you know how many hours of fasting are recommended before testing fasting blood sugar?		
	6 hours before test	2	1.7
	8 hours before test	80	68.4
	12 hours before test	32	27.4
	16 hours before test	0	0
	Do not know	3	2.6
	Correct	80	68.4
	Wrong	37	31.6
8.	Who is responsible for your diabetic care? (can choose more than 1)		
	Yourself	86	65.2
	Doctor	10	7.6
	Family	3	2.3
	All of the above	33	25.0
	Correct	32	27.4
	Wrong	85	72.6

The mode score for Section B1 knowledge of gestational diabetes mellitus and its control measure in this study is 7 while the mean and standard deviation score is 6.63 \pm 1.13. Based on the result, more than half of the respondents scored GOOD (59%, n=69) and 48 (41%) respondents scored POOR for questions about knowledge of gestational diabetes mellitus and its control.

For the first question, majority of respondents answered correctly (94.9%, n=111) and only 6 (5.1%) respondents answered the question wrongly. Most of the respondents answered family history of diabetes mellitus (45.1%, n=96) as the risk factor of GDM, follow by history of GDM in previous pregnancy (32.4%, n=69), obesity (19.7%, n=42) and the wrong answer is do not know (2.8%, n=6). Next, for the second question, almost all respondents answered correctly by answering yes

(96.6%, n=113) for “proper nutrition is important throughout pregnancy” and only 4 (3.4%) respondents answered no.

Then, in the third question, respondents can choose more than 1 answer, highest number of respondents answer diet plan (45.4%, n=103) to control gestational diabetes mellitus, follow by monitor blood glucose (24.2%, n=55), medication (19.8%, n=45) and the lowest number of respondents answer exercise (10.6%, n=24). For question number four, majority of respondents answer big baby (61.2%, n=115) for common problems of new born from GDM mother, follow by preterm labour (31.4%, n=59), birth trauma (5.9%, n=11) and respiratory distress syndrome (1.1%, n=2). The least number of respondents answer congenital anomalies which is only 1 (0.5%) respondent.

Next, in question number five, almost all respondents answered correctly which is blood test after glucose ingestion (96.6%, n=114) as answer for “how is GDM diagnosed?” Only 4 (3.4%) respondents answered urine test which is the wrong answer. For the question number six, many of respondents know that insulin controls blood sugar by answering yes (79.5%, n=93) and follow by no (20.5%, n=24). In question number seven, more than half of respondents answered correctly which is 80 (68.4%) respondents with answer option 8 hours before test and 37 (31.6%) respondents answered wrongly with the answer option 12 hours before test (27.4%, n=32), follow by do not know (2.6%, n=3) and 6 hours before test (1.7%, n=2). Next, the last question for section B1, respondents can choose more than 1 answer, the

highest number of respondents answered wrongly which is 85 (72.6%) and only 32 (27.4%) respondents answered correctly. Majority of respondents answered yourself (65.2%, n=86) for responsibility of diabetic care, follow by answer option all of the above (25%, n=33) which the only one correct answer for this question. Only 10 (7.6%) respondents answered doctor and 3 (2.3%) respondents answered family as answer option.



4.3 Attitude regarding Gestational Diabetes Mellitus and Its Control

Table 3: Distribution of respondents' answer regarding attitude of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang, (N=117).

No.	Question	Agree N (%)	Disagree N (%)
1.	Gestational diabetes causes complications in pregnancy?	115 (98.3)	2 (1.7)
2.	Complications of GDM can be prevented?	116 (99.1)	1 (0.9)
3.	Early diagnosis is crucial for preventing complications?	115 (98.3)	2 (1.7)
4.	All pregnancies should be screened routinely for GDM?	115 (98.3)	2 (1.7)
5.	Physical exercise during pregnancy is healthy?	117 (100.0)	0 (0.0)
6.	Should one eat more fresh fruits and vegetables during pregnancy?	114 (97.4)	3 (2.6)
7.	Is concept of eating for two (more food for the baby's growth) always correct?	36 (30.8)	81 (69.2)

The mode score for Section B2 attitude of gestational diabetes mellitus and its control measure in this study is 6 while the mean and standard deviation score is $6.22 \neq 0.59$. Based on the result, almost all of the respondents scored GOOD (94.9%, n=111) and 6 (5.1%) respondents scored BAD for questions about attitude of gestational diabetes mellitus and its control.

All respondents (100%, n=117) answered agree for the question “physical exercise during pregnancy is healthy” follow by question “complications of GDM can be prevented?” (99.1%, n=116) which only 1 (0.9%) respondents answered disagree. Three question carried same number of respondents answered agree (98.35, n=115) which is “gestational diabetes causes complications in pregnancy?”, “early diagnosis is crucial for preventing complications?” and “all pregnancies should be screened routinely for GDM?” meanwhile only 2 (1.7%) respondents answered disagree for those three questions. Next, almost all respondents answered agree for question “should one eat more fresh fruits and vegetables during pregnancy” (97.4%, n=114) and only 3 (2.6%) respondents answered disagree for that question. For the question “is concept of eating for two (more food for the baby’s growth) always correct”, majority of respondents (69.2%, n=81) answered disagree and only 36 (30.8%) respondents answered agree for that question.

4.4 Practice regarding Gestational Diabetes Mellitus and Its Control

Table 4: Distribution of respondents' answer regarding practice of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang, (N=117).

Part 1

No.	Question	Yes N (%)	No N (%)
1.	Do you practice a specific dietary regimen during pregnancy?	98 (83.8)	19 (6.2)
2.	Do you eat three or more meals every day?	104 (88.9)	13 (11.1)
3.	Do you have a control from eating junk foods?	116 (99.1)	1 (0.9)
4.	Do you follow up weight during pregnancy?	115 (98.3)	2 (1.7)
5.	Do you visit the doctor regularly during pregnancy?	112 (95.7)	5 (4.3)
6.	Do you check your blood sugar during pregnancy?	117 (100.0)	0 (0.0)

Part 2

No.	Question	N	%
1.	What practice will you follow to control if you are diagnosed with gestational diabetes mellitus? (can choose more than 1)		
	Balanced diet	91	39.7
	Regular antenatal check-up	53	23.1
	Moderate exercise	28	12.2
	Medications	34	14.8
	All of the above	23	10.0
2.	Do you do self-measurement of blood glucose at home?		
	Yes	114	97.4
	No	3	2.6
3.	Are you following dietary modifications to control GDM?		
	Yes	116	99.1
	No	1	0.9
4.	Do you practice regular physical exercise?		
	Yes	53	45.3
	No	64	54.7
5.	Do you eat more vegetables than meat in order to control blood glucose?		
	Yes	99	84.6
	No	18	15.4
6.	How do you take your meals?		
	3 big meals & 3 small meals	68	57.6
	3 big meals	14	11.9
	Frequent meals	29	24.6
	Eat when hungry	1	5.9
	Correct	96	82.1
	Wrong	21	17.9
7.	How often do you visit hospital for fasting and post meal blood sugar testing?		
	Once every week	5	4.2
	Once every 2 week	105	89.0
	Once a month	5	4.2
	Do not know	3	2.5
	Correct	114	97.4
	Wrong	3	2.6
8.	Where do you store the insulin injection at home? (for GDM patients on insulin)		
	Shelf	17	17.7
	Cupboard	39	40.6
	Refrigerator	40	41.7
	Freezer	0	0
	Correct	78	66.7
	Wrong	39	33.3

The mode score for Section B3 practice of gestational diabetes mellitus and its control measure in this study is 13 while the mean and standard deviation score is $12.38 \neq 1.36$. Based on the result, more than half of the respondents scored GOOD (76.9%, n=90) and 27 (23.1%) respondents scored BAD for questions about attitude of gestational diabetes mellitus and its control.

For Part 1, all respondents (100%, n=117) answered yes for the question “do you check your blood sugar during pregnancy?” follow by question “do you have a control from eating junk foods?” 116 (99.1%) respondents answered yes and only 1 (0.9%) respondents answered no. Almost all of the respondents answer yes for the question “do you follow up weight during pregnancy?” (98.3%, n=115) and only 2 (1.7%) respondents answered no, follow by question “do you visit the doctor regularly during pregnancy?” 112 (95.7%) respondents answered yes and only 5 (4.3%) respondents answered no. Around 88.9% (n=104) of respondents answered yes for the question “do you eat three or more meals every day?” and only 11.1% (n=13) of respondents answered no. Many respondents answered yes (83.8%, n=98) for the question “do you practice dietary regimen during pregnancy?” and 6.2% (n=19) of respondents answer no.

Next for Part 2, for first question respondents can choose more than 1 answer, the highest number of respondents answered balanced diet (39.7%, n=91), follow by

regular antenatal check-up (23.1%, n=53), medications (14.8%, n=34), moderate exercise (12.2%, n=28) and last all of the above (10%, n=23). In second question, majority of respondents answered yes (97.4%, n=114) for self-measurement of blood glucose at home and only 3 (2.6%) respondents answered no. Next for third question, almost all of respondents answered yes (99.1, n=116) for following dietary modifications to control GDM and only one (0.9%) respondents answered no. In question number four, most of respondents answered no (54.7%, n=64) for the question “do you practice regular physical exercise” while for answered yes from 45.3% (n=53) of respondents. Around 84.6% (n=99) of respondents answered yes for the question number five and 15.4% (n=18) of respondents answered no.

Then, for the question number six, the highest number of respondents answered correctly which is 96 (82.1%) and only 21 (17.9%) respondents answered wrongly. Majority of respondents answered 3 big meals and 3 small meals (57.6%, n=68) which is the only correct answer, follow by answer option frequent meals (24.6%, n=29). Only 14 (11.9%) respondents answered 3 big meals and 1 (5.9%) respondents answered eat when hungry as answer option. In the question number seven, almost all of the respondents answered correctly (97.4%, n=114) and only 3 (2.6%) respondents got wrong answer which answer option is do not know. There are three answer option is correct answer which the highest number of respondents is once every 2 week consists of 105 (89%) respondents, follow by once every week and once a month which both carried same number of respondents (4.2%, n=5). The last question for section B3, only for respondents that on insulin, the highest number of respondents

answered correctly which is 78 (66.7%) and 39 (33.3%) respondents answered wrongly. Most of respondents answered refrigerator (41.7%, n=40) and cupboard (40.6%, n=39) which are both of this answer is correct answer. Follow by answer option shelf (17.7%, n=17) and there are none of respondents answered for freezer answer option,



4.5 Level of Knowledge, Attitude and Practice regarding Gestational Diabetes Mellitus and Its Control

Table 5: Distribution of respondents' answer to determine the level of knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

Variable	Good		Poor	
	N	%	N	%
Knowledge	69	59.0	48	41.0
Attitude	111	94.9	6	5.1
Practice	90	76.9	27	23.1

Based on analysis, it had showed that the respondents have good regarding knowledge, attitude and practice regarding gestational diabetes mellitus and its control.

4.6 Relationship between Knowledge and Practice regarding Gestational Diabetes Mellitus and Its Control

Table 6: Distribution of relationship between knowledge regarding gestational diabetes mellitus and its control and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

Variables	Practice	
	r	p- value
Knowledge	0.460	< 0.001

* $p \leq 0.05$

Pearson correlation analysis had showed that there is a significant relationship between knowledge of gestational diabetes mellitus and its control and practice of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

4.7 Relationship between Attitude and Practice regarding Gestational Diabetes Mellitus and Its Control

Table 7: Distribution of relationship between attitude regarding gestational diabetes mellitus and its control and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

Variables	Practice	
	r	p- value
Attitude	0.356	< 0.001

*p ≤ 0.05

Pearson correlation analysis had showed that there is a significant relationship between attitude of gestational diabetes mellitus and its control and practice of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

4.8 Relationship between Socio-demographic Characteristics and Level of Knowledge regarding Gestational Diabetes Mellitus and Its Control

Table 8: Distribution of relationship between socio-demographic characteristics and level of knowledge regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

Characteristics	Knowledge regarding gestational diabetes mellitus and its control				
	Mean (95% CI)	Σx^2	Mean x^2	df	p- value
Gravidity		3.257	1.629	2	0.279
Primigravida	6.39 (0.86 – 1.40)				
Multipara	6.65 (0.92 – 1.40)				
Grand Multipara	6.63 (0.47 – 1.08)				
Highest Education Level		24.204	8.068	3	< 0.001
No Formal Education	0				
Primary School	0				
Secondary School	6.05 (0.78 – 1.44)				
Diploma	6.80 (0.80 – 1.27)				
Degree	7.11 (0.71 – 1.24)				
Master/PHD	7.00 (0.41 – 1.00)				
Occupation		21.589	7.196	3	< 0.001
Housewife	6.17 (0.87 – 1.48)				
Professional	7.00 (0.67 – 1.27)				
Healthcare Worker	8.00 (0.00 – 0.00)				
Laborer	0				
Other	6.82 (0.78 – 1.12)				

* $p \leq 0.05$

* Σx^2 , Mean x^2 , df (between groups)

One-way independent ANOVA is used to determine the relationship between gravidity, high education level and occupation with level of knowledge of gestational diabetes mellitus and its control. The result showed that there is no significant relationship between gravidity and level of knowledge of gestational diabetes mellitus and its control. However, the result also showed that there is significant relationship between high education level and occupation and level of knowledge of gestational diabetes mellitus and its control.



4.9 Relationship between Socio-demographic Characteristics and Level of Attitude regarding Gestational Diabetes Mellitus and Its Control

Table 9: Distribution of relationship between socio-demographic characteristics and level of attitude regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

Variables	Attitude regarding gestational diabetes mellitus and its control	
	r	p- value
Age	- 0.100	0.283

*p ≤ 0.01

Pearson correlation is used to determine the relationship between age and level of attitude of gestational diabetes mellitus and its control. The result showed that there is no significant relationship between age of respondents and attitude of gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang

4.10 Relationship between Socio-demographic Characteristics and Level of Practice regarding Gestational Diabetes Mellitus and Its Control

Table 10: Distribution of relationship between socio-demographic characteristics and level of practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang.

Characteristics	Practice regarding gestational diabetes mellitus and its control				
	Mean (95% CI)	Σx^2	Mean x^2	df	p- value
Gravidity		2.056	1.028	2	0.576
Primigravida	12.32 (0.93 – 1.89)				
Multipara	12.33 (1.18 – 1.61)				
Grand Multipara	12.71 (0.49 – 1.16)				
Occupation		8.548	2.849	3	0.201
Housewife	12.10 (1.12 – 1.62)				
Professional	12.47 (1.05 – 2.00)				
Healthcare Worker	13.33 (0.00 – 0.71)				
Laborer	0				
Other	12.61 (0.68 – 1.17)				

*p ≤ 0.05 * Σx^2 , Mean x^2 , df (between groups)

One-way independent ANOVA is used to determine the relationship between gravidity, high education level and occupation with level of knowledge of gestational diabetes mellitus and its control. The result showed that there is no significant relationship between gravidity, high education level and occupation and level of knowledge of gestational diabetes mellitus and its control.



CHAPTER 5

DISCUSSION AND CONCLUSION

5.0 Introduction

The findings of this study are discussed further in this chapter based on the objectives set. The discussion includes all the results of the descriptive findings of the respondents socio-demographic characterize by age, gravidity, nation, highest education level, occupation and monthly household income. The descriptive result of knowledge, attitude and practice regarding gestational diabetes mellitus and its control will also be discussed. Furthermore, the level of knowledge, the level of attitude and the level of practice regarding gestational diabetes mellitus and its control will be explored in this chapter. The relationship between knowledge and attitude of gestational diabetes mellitus and its control towards practice of gestational diabetes mellitus and its control will be studied. Finally, the relationship between socio-demographic characteristics and level of knowledge, level of attitude and level of practice regarding gestational diabetes mellitus and its control will also be explored in this chapter.

5.1 Characteristics of Socio-demographic

In this study, the age of respondents varies from 21 to 43 years old with the mean and standard deviation for age of the respondents is 31.44 ± 4.18 years old with the mode of respondents is 29 years old. The mean age is similar as the study done by Jazli, Chong, & Shujuan (2021) where they have 31.9 ± 4.88 as their average of the respondents. Another similar study where it took place at maternity clinic of Penang General Hospital, Malaysia done by Zahid Hussain, Zuraidah Mohd Yusoff, & Syed Azhar Sulaiman (2014) showed the mean and standard deviation for the age of their respondents is 32.9 ± 3.57 . All the respondents are antenatal women which is similar to the study done by Shafaiyaz and Rohini (2021) where their respondents also involving antenatal women and this study is conducted in tertiary hospital in Malaysia as well as their study done in tertiary hospital in Chennai.

Furthermore, this study involving women with characterize by gravidity which not consistent with the study done by Yizukanji & Mwanakasale (2018) where there is 36.5% and 63.5% respectively for respondents that characterize with primigravida and multipara in their study whereas in this study there is 23.9%, 61.5% and 14.5% respectively for respondents that characterize with primigravida, multipara and grand multipara. However, there are another study where it took place at Penang Hospital, Malaysia done by Zahid Hussain, Zuraidah Mohd Yusoff, & Syed Azhar Sulaiman (2014) that also been using same types of gravidity which are primigravida, multipara and grand multipara but not consistent with this study where there is 33.3%, 36.7%

and 30% respectively for respondents that characterize with three types of gravidity, primigravida, multipara and grand multipara.

Other than that, majority of the respondents for this study are Malays which is 87.2%, Indian 6.0%, Chinese 5.1% and Others 1.7% where it is quite similar to study done Jazli, Chong, & Shujuan (2021) which is 84.4%, 6.4%, 5.2% and 3.6% respectively for Malay, Indian, Chinese and Others. However, the distribution of the respondents based on educational level is not consistent with the study done by Zahid Hussain, Zuraidah Mohd Yusoff, & Syed Azhar Sulaiman (2014) as in their study the distribution of Secondary, Diploma and Degree is 40.0%, 56.7% and 3.3% while this study the distribution of Secondary School, Diploma, Degree and Master/PHD is 35.9%, 29.1%, 29.1% and 6.0% respectively.

As for the occupation of respondents, the result did not consistent with the other study done by Shafaiyaz and Rohini (2021) where there is 54.2%, 19.5%, 9.5% and 7.4% respectively for housewife, professional, healthcare worker and others in their study whereas in this study there is 41.0%, 27.4%, 2.6% and 29.1% respectively housewife, professional, healthcare worker and others. Other than that, monthly household income in this study is 59.8%, 39.3% and 0.9% for low monthly income (B40), middle monthly income (M40) and high monthly income (T20), respectively while other study stated their distribution of monthly household income for low monthly income (B40), middle monthly income (M40) and high monthly income (T20) is 14.4%, 66.7% and 15.9%, respectively (Yizukanji & Mwanakasale, 2018).

5.2 Knowledge regarding Gestational Diabetes Mellitus and Its Control

For the result in this study regarding level of knowledge, it shows more than half of the respondents have good knowledge which is 59% regarding gestational diabetes mellitus. This result showed that significantly higher knowledge as compared to the similar study done by Shafaiyaz and Rohini (2021) which their finding is around 30% of their respondents show a good knowledge towards gestational diabetes mellitus. This is because our society in Malaysia are more exposed to the source of health that related to their condition and it makes them know better about disease that happen to themselves. There are so many sources to get know any information regarding disease such as they can read from internet, or else they got an information from their parents or family member that experiencing same disease during pregnancy. Society nowadays are always have the feeling of curiosity concerning of their health, this makes them always asking any question related to disease to healthcare provider especially doctors and nurses.

Many of respondents are prone to say that history from family that having diabetes mellitus are the risk factor that lead to gestational diabetes mellitus which is as finding in this study showed that 45.1% of respondents choose that answer when asked regarding risk factors of GDM. However, there is some opposite stand from study by Shafaiyaz and Rohini (2021) stated that family history of diabetes mellitus is the least number of respondents choose an answer for risk factors of GDM which is 13.1% of respondents. As there are contrast between their study and this study, this is due to diabetes mellitus is the most common disease in our country as Malaysia top 3

country with the high prevalence among Southeast Asia country (Kunasegaran et al., 2021). From other perspective, community nowadays are familiar with diabetes because of this disease is inherited and if ask about their parents, majority of them will have either mother or father or their grandparents been through with that disease. Furthermore, based on study showed that gestational diabetes mellitus women are higher significant come from family history of type II diabetes mellitus and probability that type II diabetes mellitus for the next generation is prone higher among diabetic mother than father (Papazafiropoulou, Papanas, Melidonis, & Maltezos, 2017).

5.3 Attitude regarding Gestational Diabetes Mellitus and Its Control

As finding in this study regarding level of attitude, it is shows almost all of the respondents have good attitude which is 94.9% regarding gestational diabetes mellitus. This result shows that significantly higher attitude as compare to the similar study done by Shafaiyaz and Rohini (2021) which their finding is around 54.2% of their respondents show a good attitude towards gestational diabetes mellitus and also other study done in Bangladesh (Islam, Islam, Nyeem, Mannan, & Neaz, 2017) as their study finding is 60.7% of the respondents shows a positive attitude towards gestational diabetes. From the researcher view, a mother once they get to know and aware that they are pregnant women, they have a mentality that they need to do their best to their baby as well for both safety and wellness. As positive thinking of pregnant women could affect to the developing of brain and body of their baby during pregnancy (Wu et al., 2020) hence this can help not only the developmental of the baby, also it can help prevent from complications as mention during interview session with the respondents.

According to the findings of this study, more than half of respondents oppose to the question related to eating for two (more food for the baby's growth) always correct which is 81 out of 117 respondents. To compare with the study similar done in Chennai, India, their finding is contradict from this study which their respondents acknowledge that eating for two always correct from their perspective where around 109 out of 190 respondents gave that answer. In this situation, women might misunderstanding regarding eating for two because there are some myth and fact

regarding this which are the myth is they need to double what they eat meanwhile the fact is they need to add small meals or snacks within a day that nutritious for their body and the baby instead of add more portions of empty calorie food such as soft drinks, fast food and cakes (Madden, 2019). There are also a study done by Robinson, Baird, & Godfrey (2014) stated that maternal nutrition has been shown to change epigenetic processes in the foetus, and these processes may be linked to later body composition in the child, regardless of the size of the child at birth. Because of this, the author stated that need to look at the effects of maternal nutrition on longer-term outcomes as soon as possible.

5.4 Practice regarding Gestational Diabetes Mellitus and Its Control

For the finding in this study regarding level of practice, it shows majority of the respondents have good practice which is 76.9% regarding gestational diabetes mellitus. As this finding shows that significantly higher practice as compare to the similar study done by Shafaiyaz and Rohini (2021) which their finding is around 44.2% of their respondents show a good attitude towards gestational diabetes mellitus. From the researcher perspective, practice or behaviour is the something that might affect health in a long term periods, thus pregnant mother prefer to change their habits which they know can prevent any complications that might occur to their unborn baby or once the baby come out. Based on study by Rockcliffe, Peters, Heazell, & Smith (2021) pregnancy is considered as a time to take the role of a good mother, typically undertaking healthy lifestyle adjustments. This identity change, which involves a redefining of one's self-concept or social function, is a fundamental construct underlying teachable moments. Other than that, an external factor influenced women's behaviour which is social support was shown to be an important influence especially from a partner

5.5 Relationship between Knowledge and Attitude regarding Gestational Diabetes Mellitus and Its Control towards Practice regarding Gestational Diabetes Mellitus and Its Control

Pearson Correlation is used to determine the relationship between knowledge and attitude towards practice regarding gestational diabetes mellitus and its control. As the finding showed that there is significant relationship between knowledge regarding gestational diabetes mellitus and its control with practice regarding gestational diabetes mellitus and its control. The result of this study showed similar finding to the study done by Gesa, T, & Remya (2021) where their finding showed a significant relationship between knowledge and practice of gestational diabetes mellitus with p-value is 0.043. Same to the other others study by Yizukanji & Mwanakasale (2018) as their result showed that there is significant correlation between knowledge and practice of gestational diabetes mellitus which p-value is 0.0003.

The result also showed that there is significant relationship between attitude regarding gestational diabetes mellitus and its control with practice regarding gestational diabetes mellitus and its control. However, when compare to the study done by (Yizukanji & Mwanakasale, 2018) their findings is contradict from this study which there is no significant correlation between practice and attitude with p-value is 0.6220.

5.6 Relationship between Socio-demographic with Knowledge, Attitude and Practice regarding Gestational Diabetes Mellitus and Its Control

One-way independent ANOVA is used to determine the relationship between gravidity, educational level and occupation with level of knowledge regarding gestational diabetes mellitus and its control. The result showed there is no significant relationship between gravidity with level of knowledge regarding gestational diabetes mellitus and its control. However, this findings contradict with the study done by Shafaiyaz and Rohini (2021) where their finding of the study showed that there is significant relationship between gravidity and level of knowledge with p-value is 0.01. When compare to the previous study done in Zambia, Africa where their study's result also showed that there is significant correlation between gravidity and knowledge with p-value is 0.013.

Furthermore, as finding of this study showed that there is significant relationship between educational level with level of knowledge regarding GDM and its control. This finding consistent with the study done in Chennai, India, where their findings stated that there is significant relationship between educational levels with level of knowledge which p-value is 0.002. This may be due to the fact that education has a significant impact on health literacy; pregnant women with a higher education level are able to read health posters, obtain information from health-related articles and literature, and have a better understanding of the health information provided to them during antenatal care. It is also possible that women with higher levels of education have greater access to health-related information through mass media such as

television, radio, and the internet. Studies on the effects of public health education campaigns via mass media have shown that these platforms can induce positive behavioural change; therefore, these media platforms can effectively serve as channels for the public to obtain information on GDM (Byakwaga, Sekikubo, & Nakimuli, 2021) This show that educational level give big impact on how people thinking and implement their knowledge and experience in their daily living. Occupation help them to be more aware about current situation in life.

The findings also showed that there is significant relationship between occupation with level of knowledge regarding gestational diabetes mellitus and its control. The result of this study is consistent with a study done by Shafaiyaz and Rohini (2021) where their finding of the study showed that there is significant relationship between occupation and level of knowledge with p-value is 0.000. As researcher perspectives, people with working life gives them opportunity to explore for education regarding their health well-being especially once they got diagnosed in certain disease such in this situation, gestational diabetes mellitus. Community tends to get variety of health information from their colleague at the working area. Thus, this can help them to have a better knowledge regarding disease related than for those who are not in working area.

This study showed that there is no significant relationship between age and level of attitude regarding gestational diabetes mellitus and its control. However, this findings contradict with study done by Shafaiyaz and Rohin (2021) where their finding

showed there is significant relationship between age and attitude of gestational diabetes mellitus and its control where p-value is 0.026962.

Next, the result in this study also showed that there is no significant relationship between gravidity with level of practice regarding gestational diabetes mellitus and its control which this result is not consistent with previous study done by Shafaiyaz and Rohini (2021). Their study showed that there is significant relationship between gravidity and practice regarding gestational diabetes mellitus and its control where their result of p-value is 0.0017. For relationship between occupation and level of practice, in this study showed that there is no significant relationship with p-value is 0.201 which is greater than 0.05. This findings also not consistent with the study done in Chennai, India where their study showed that there is significant relationship between occupation and practice regarding gestational diabetes mellitus and its control with p-value is 0.018 which is less than 0.05.

5.7 Conclusion

In conclusion, this study provides information regarding the knowledge, attitude and practice of GDM and its control among antenatal women attending antenatal clinic in Hospital Serdang. This study found out that the respondents have a good level of knowledge, good level of attitude and good level of attitude regarding GDM and its control. Furthermore, this study also showed that there is relationship between knowledge towards practice and attitude towards practice of gestational diabetes mellitus and its control as $p\text{-value} < 0.05$. However, the relationship between socio-demographic with knowledge, attitude and practice showed that only few of relationship significantly related. Only relationship between knowledge with educational level and between knowledge with occupation showed that it is significantly related as $p\text{-value} < 0.05$.

There are many things that influence the respondents' way of thinking and practicing good habits in their daily lives while there are some things that need to improvise and take time to adapt with because some things new are not easy to practice and make it as habit. Thus, it is still require to make more awareness and understanding regarding gestational diabetes mellitus especially for pregnant mother at risk to have that disease so they can make a better quality of life during or after pregnancy as the disease are easily lead to complications in a long-term period. Eventually, there will be more enhancement in their practice of lifestyle once they had familiar related to gestational diabetes mellitus and its control.

CHAPTER 6

LIMITATIONS AND RECOMMENDATIONS

6.0 Introduction

This study is a cross-sectional study that had been conducted within a short period of time by using non-probability convenience sampling for the data collection. Thus, there are several limitations identified during research period will be discussed in this chapter.

6.1 Limitations

To begin with, the study had a small sample size, with certain pregnant women with GDM included in this study. This due to their appointment were during the study conducted. As a result, the findings may not apply to all and other pregnant women with GDM that having appointment out from the study duration. Secondly, the study design is a cross-sectional study, which only measure at only one point of time where it could only identify the prevalence and does not allow the identification of causes and the effect of variables. Also, includes only those individuals attended at the time of the study, which known as prevalence-incidence bias.

Next, the respondents might not able to understand fully or not that clear about the questions that been asked in the questionnaire. This due to their focus towards to know turn for their queue number. Also, they want to finish answered it immediately because they worried might interfered their appointment with their doctors even the researchers have explained it's only required 15 to 20 minutes to answer the questionnaire. The period is very short for conduct the survey at the study location since the antenatal clinic operation from 8 am to 12 noon and only on Monday and Thursday for the antenatal check-up or appointment. It is also interfered during practical session and it is limit for researcher to go every week to collect data at the study location.

Last but not least, there is a lack of studies that were comparable or linked to the topic of GDM and its control in Malaysia. These studies might be focused at once or separately on knowledge, attitudes, and practises.

6.2 Implication and Recommendation

A greater degree of education does not ensure that one will have good knowledge, attitude and practice regarding GDM and its control. Even though having high level of knowledge and attitude does not guarantee that one's will have high level of practice and the way of implementing the practice precisely in their daily life. However, it is crucial to have an appropriate knowledge and proper attitude which this can help to amplify an awareness of GDM and its control among pregnant women which not only for those who having GDM. This also can help as precautionary step for those who never been experience diabetes during pregnancy. Furthermore, the data obtained does not represent all the pregnant women with GDM in antenatal clinic Hospital Serdang. The health education related to gestational diabetes mellitus can be done directly such as at the antenatal and postnatal ward, or awareness campaign can be done indirectly as a public education especially for women which this will more effective if include with the information and activities that involve important facts, worldwide statistic and case report from our country or overseas. Hence, this can help to create more awareness regarding GDM and its control to all pregnant women which the disease may come from unhealthy life style can lead to obesity that known as extrinsic factor for the disease happens.

Further studies should be conducted more extensively related predisposing factors to the knowledge and attitude regarding gestational diabetes mellitus and its control, meanwhile positive effect or outcome from practice that been follow during pregnancy for antenatal mother that having gestational diabetes mellitus and its control. This is because factors that being identified can be used as information to the healthcare provider to enhance and put more information regarding gestational diabetes mellitus that might be certain of community did not acknowledge it yet. Otherwise, if the outcome can be identified, this findings can help for antenatal mother to apply the method that clinically approved among others antenatal mothers. Besides, further studies should be using more comprehensive method such as using a large sample size which this can help the data more relevant according to the population at the study area.

The study of relationship between knowledge and attitude regarding gestational diabetes mellitus and its control towards practice regarding gestational diabetes mellitus and its control are found to have significant relationship. This study also found that socio-demographic such educational level and occupation could affect the level of knowledge regarding gestational diabetes mellitus and its control. The findings of this study provides an information regarding the knowledge, attitude and practice of GDM and its control among antenatal women attending antenatal clinic in Hospital Serdang which can serve as future reference for healthcare provider or related health committee to improve more health education and activities related to GDM and its control.

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APPENDICES

Appendix A: Written Permission for Instrument



Appendix B: Participant Information Sheet and Informed Consent Form

Participant Information Sheet And Informed Consent Form

(for adult subjects)

1. Title of study:

Knowledge, Attitude and Practice Regarding Gestational Diabetes Mellitus and Its Control among Antenatal Women Attending Antenatal Clinic in Hospital Serdang

2. Name of investigator and institution:

- a. Nurul Ezzah Binti Mohd Azmi, Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
- b. Hng Siew Hong (Supervisor), Fakulti Perubatan dan Sains Kesihatan,
Universiti Putra Malaysia

3. Name of sponsor: Self-sponsor

4. Introduction:

It is important that you understand why the research is being done and what it will involve. Please take your time to read through and consider this information carefully before you decide if you are willing to participate. Ask the study staff if anything is unclear or if you would like more information. After you are properly satisfied that you understand this study, and that you wish to participate, you must sign this informed consent form.

Your participation in this study is voluntary. You do not have to be in this study if you do not want to. You may also refuse to answer any questions you do not want to answer. If you volunteer to be in this study, you may withdraw from it at any time. If you withdraw, any data collected from you up to your withdrawal will still be used for the study. Your refusal to participate or withdrawal will not affect any medical or health benefits to which you are otherwise entitled.

This study has been approved by the Medical Research and Ethics Committee, Ministry of Health Malaysia.

5. What is the purpose of the study?

The purpose of this study is to study the knowledge, attitude and practice regarding diabetes mellitus and its control among antenatal women attending antenatal clinics in Hospital Serdang.

This research will be conducted for duration of 11 month (March 2022 till January 2023). The expected number of participants is 117 individuals.

6. What are my responsibilities when taking part in this study?

It is important that you answer all of the questions asked by the study staff honestly and completely which will take about 15 - 20 minutes of your time. Study team will also access your medical records for the following information.

a. Gravidity

You will be given a survey form to be answered. This form contains 2 sections which enquire about socio-demographic and knowledge, attitude and practice regarding gestational diabetes mellitus.

7. What are the potential risks and side effects of being in this study?

Participation to this study will not affect your treatment, and the risk is minimal. You are free to decline to answer any of the questions that you feel uncomfortable with.

8. What are the benefits of being in this study?

There may or may not be any benefits to you. Information obtained from this study will help to you as the subject, it will create awareness about the importance of gestational diabetes mellitus among respondents and improve the quality of gestational diabetes mellitus and its control. To the investigator, will allow the researcher to determine the knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women. The researcher able to identify the perception and what is currently lacking on the level of knowledge, attitude and practice about gestational diabetes mellitus and its control among antenatal women. Besides, the findings from the study can suggest for any

improvement to be done for the antenatal women that having gestational diabetes mellitus.

9. Who is funding the research?

This study has no funding as it is a self-sponsor.

10. Will my medical information be kept private?

All your information obtained in this study will be kept and handled in a confidential manner, in accordance with applicable laws and/or regulations. When publishing or presenting the study results, your identity will not be revealed without your expressed consent. Individuals involved in this study, qualified monitors and auditors, and governmental or regulatory authorities may inspect the study data, where appropriate and necessary.

11. Who should I call if I have questions?

If you have any questions about the study or you want information about this study, please do not hesitated to contact one of the people listed below

- i. Researcher**
Nurul Ezzah Binti Mohd Azmi
Contact no.: 017-9731398
Email: 198305@student.upm.edu.my
- ii. Supervisor**
Hng Siew Hong
Contact no.: 016-6861868
Email: hngsiewhong@upm.edu.my

If you have any questions about your rights as a participant in this study, please contact: The Secretary, Medical Research & Ethics Committee, Ministry of Health Malaysia, at telephone number 03-3362 8407/8205/8888.

Informed Consent Form

Title of Study: Knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang

By signing below I confirm the following:

- I have been given oral and written information for the above study and have read and understood the information given.
- I have had sufficient time to consider participation in the study and have had the opportunity to ask questions and all my questions have been answered satisfactorily.
- I understand that my participation is voluntary and I can at anytime free withdraw from the study without giving a reason and this will in no way affect my future treatment. I am not taking part in any other research study at this time. I understand the risks and benefits, and I freely give my informed consent to participate under the conditions stated. I understand that I must follow the study doctor's (investigator's) instructions related to my participation in the study.
- I understand that study staff, qualified monitors and auditors, the sponsor or its affiliates, and governmental or regulatory authorities, have direct access to my medical record in order to make sure that the study is conducted correctly and the data are recorded correctly. All personal details will be treated as **STRICTLY CONFIDENTIAL**
- I will receive a copy of this subject information/informed consent form signed and dated to bring home.
- I agree/disagree* for my family doctor to be informed of my participation in this study. (**delete which is not applicable*)

Subject:

Signature:

I/C number:

Name:

Date:

Investigator conducting informed consent:

Signature:

I/C number:

Name:

Date:

Impartial witness:

Signature:

I/C number:

Name:

Date:



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**Risalah Maklumat Peserta Dan
Borang Persetujuan Atau Keizinan Peserta**

(untuk subjek dewasa)

1. Tajuk penyelidikan:

Pengetahuan, sikap dan amalan mengenai diabetes semasa hamil dan kawalannya dalam kalangan ibu hamil yang menghadiri klinik antenatal di Hospital Serdang

2. Nama Institusi and nama penyelidik:

- a. Nurul Ezzah Binti Mohd Azmi (Principal Investigator), Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia
- b. Hng Siew Hong (Supervisor), Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia

3. Nama penaja: Tiada penaja (Pembiayaan sendiri)

4. Pengenalan:

Risalah ini menjelaskan hal-hal berkenaan penyelidikan tersebut dengan lebih mendalam dan terperinci. Amat penting anda memahami mengapa penyelidikan ini dilakukan dan apa yang dilakukan dalam penyelidikan ini. Sila ambil masa yang secukupnya untuk membaca dan mempertimbangkan dengan teliti penerangan yang diberi sebelum anda bersetuju untuk menyertai penyelidikan ini. Jika ada sebarang kemusykilan ataupun maklumat lanjut yang anda ingin tahu, anda boleh bertanya dengan mana-mana kakitangan yang terlibat dalam penyelidikan ini. Setelah anda berpuas hati bahawa anda memahami penyelidikan ini, dan anda berminat untuk turut serta, anda dikehendaki untuk menandatangani Borang Persetujuan atau Keizinan Peserta, pada muka surat akhir risalah ini.

Penyertaan anda dalam penyelidikan ini adalah secara sukarela. Anda tidak perlu menyertai penyelidikan ini jika anda tidak mahu. Anda juga mempunyai hak untuk tidak menjawab mana-mana soalan yang anda tidak mahu jawab. Anda juga boleh menarik diri daripada penyelidikan ini pada bila-bila masa sahaja. Jika anda menarik diri, segala maklumat yang telah diperolehi sebelum anda menarik diri tetap akan digunakan dalam penyelidikan ini. Jika anda tidak mahu menyertai ataupun menarik diri dari penyelidikan ini, tindakan anda tidak akan menjejaskan segala hak dan keistimewaan perubatan kesihatan yang selayaknya anda terima.

Penyelidikan ini telah mendapat kelulusan Jawatankuasa Etika dan Penyelidikan Perubatan, Kementerian Kesihatan Malaysia.

5. Apakah tujuan penyelidikan ini dilakukan?

Tujuan penyelidikan ini dilakukan adalah untuk mengetahui pengetahuan, sikap dan amalan mengenai diabetes semasa hamil dan kawalannya dalam kalangan ibu hamil yang menghadiri klinik antenatal di Hospital Serdang.

Penyelidikan ini akan berlangsung selama 11 bulan (Mac 2022 hingga Januari 2023). Dijangka bahawa 117 individu akan mengambil bahagian dalam kajian ini.

6. Apakah tanggungjawab saya sewaktu menyertai penyelidikan ini?

Amat penting anda menjawab kesemua soalan yang dikemukakan oleh kakitangan penyelidikan dengan jujur dan lengkap yang akan mengambil masa selama 15 – 20 minit. Penyelidik juga memerlukan maklumat yang berikut daripada rekod perubatan anda:

a. Graviditi

Anda akan diberi borang soal selidik untuk dijawab. Borang ini mempunyai 2 bahagian, yang meliputi topik socio-demografik dan pengetahuan, sikap dan amalan mengenai diabetes semasa hamil.

7. Apakah risiko dan kesan-kesan sampingan menyertai penyelidikan ini?

Risiko untuk penyertaan penyelidikan ini yang adalah minima dan tidak akan menjejaskan rawatan anda. Anda berhak untuk tidak menjawab jika rasa tidak selesa dengan mana-mana soalan kajian.

8. Apakah manfaatnya saya menyertai kajian ini?

Penyelidikan ini mungkin akan mendatangkan manfaat ataupun langsung tiada memberi apa-apa manfaat kepada anda. Segala maklumat yang diperolehi daripada penyelidikan ini akan dapat membantu kepada anda sebagai peserta, kajian ini akan meningkatkan tahap kesedaran terhadap kepentingan diabetes semasa hamil di kalangan responden dan juga meningkatkan kualiti diabetes semasa hamil dan kawalannya. Kepada penyelidik, akan memberi peluang kepada penyelidik untuk menentukan pengetahuan, sikap dan amalan mengenai diabetes semasa hamil dan kawalannya dalam kalangan ibu hamil. Penyelidik dapat untuk mengenalpasti

persepsi dan kekurangan dalam tahap pengetahuan, sikap dan amalan mengenai diabetes semasa hamil dan kawalannya dalam kalangan ibu hamil. Oleh itu, data daripada kajian ini dapat memberikan cadangan penambahbaikan dijalankan untuk wanita hamil yang mengalami diabetes semasa hamil.

9. Siapakah yang membiayai penyelidikan ini?

Kajian ini adalah sara diri dan tiada organisasi yang membiayai kajian ini.

10. Adakah maklumat saya akan dirahsiakan ?

Segala maklumat anda yang diperolehi dalam penyelidikan ini akan disimpan dan dikendalikan secara sulit, bersesuaian dengan peraturan-peraturan dan/ atau undang-undang yang berkenaan. Sekiranya hasil penyelidikan ini diterbitkan atau dibentangkan kepada orang ramai, identiti anda tidak akan didedahkan tanpa kebenaran anda terlebih dahulu.

Pihak-pihak tertentu seperti individu yang terlibat dalam penyelidikan ini, juruaudit dan jurupantau yang terlatih, pihak berkuasa kerajaan atau undang-undang, boleh memeriksa maklumat atau data kajian jika diperlukan.

11. Siapakah yang perlu saya hubungi sekiranya saya mempunyai sebarang pertanyaan?

Sekiranya anda mempunyai sebarang pertanyaan mengenai penyelidikan ini atau anda mahukan maklumat tentang penyelidikan ini, sila hubungi salah seorang daripada orang yang disenaraikan di bawah

i. **Penyelidik**

Nurul Ezzah Binti Mohd Azmi

Contact no.: 017-9731398

Email: 198305@student.upm.edu.my

ii. **Supervisor**

Hng Siew Hong

Contact no.: 016-6861868

Email: hngsiewhong@upm.edu.my

Jika anda mempunyai sebarang pertanyaan berkaitan dengan hak-hak anda sebagai pesakit dalam penyelidikan ini, sila hubungi: Setiausaha, Jawatankuasa Etika & Penyelidikan Perubatan, Kementerian Kesihatan Malaysia, melalui talian telefon 03-3362 8407/8205/8888.

BORANG PERSETUJUAN/ KEIZINAN PESERTA

Tajuk Penyelidikan : Pengetahuan, sikap dan amalan mengenai diabetes semasa hamil dan kawalannya dalam kalangan ibu hamil yang menghadiri klinik antenatal di Hospital Serdang

Dengan menandatangani di bawah, saya mengesahkan bahawa :

- Saya telah diberi maklumat tentang penyelidikan di atas secara lisan dan bertulis and saya telah membaca dan memahami segala maklumat yang diberikan dalam risalah ini.
- Saya telah diberikan masa yang secukupnya untuk mempertimbangkan penyertaan saya dalam penyelidikan ini dan telah diberi peluang untuk bertanyakan soalan dan semua persoalan saya telah dijawab dengan sempurna dan memuaskan.
- Saya juga faham bahawa penyertaan saya adalah secara sukarela dan pada bila-bila masa saya bebas menarik diri daripada penyelidikan ini tanpa harus memberi sebarang alasan dan ianya sama sekali tidak akan menjejaskan rawatan perubatan saya pada masa akan datang. Saya tidak mengambil bahagian dalam mana-mana penyelidikan lain pada masa ini. Saya juga memahami tentang risiko dan manfaat penyelidikan ini dan saya secara sukarela memberi persetujuan untuk menyertai penyelidikan ini di bawah syarat-syarat yang telah dinyatakan di atas. Saya faham saya harus mematuhi nasihat dan arahan yang berkaitan dengan penyertaan saya dalam penyelidikan ini daripada doktor penyelidikan (penyelidik) .
- Saya faham bahawa kakitangan penyelidikan, pemantau dan juruaudit terlatih , pihak penaja atau gabungannya, dan pihak berkuasa kerajaan atau undang-undang, mempunyai akses langsung dan boleh menyemak laporan perubatan saya bagi memastikan penyelidikan ini dijalankan dengan betul dan data direkodkan dengan betul. Segala maklumat dan data peribadi akan dianggap sebagai SULIT.
- Saya akan menerima satu salinan ‘Risalah Maklumat Pesakit dan Borang Persetujuan atau Keizinan Pesakit’ yang telah lengkap dengan tarikh dan tandatangan untuk dibawa pulang ke rumah.

- Saya bersetuju/ tidak bersetuju* untuk doktor yang merawat keluarga saya diberitahu tentang penyertaan saya dalam penyelidikan ini. (*Potong mana yang tidak berkenaan)

Subjek :

Tandatangan:

Nombor

K/P:

Nama:

Tarikh :

Penyelidik yang mengendalikan proses menandatangani borang keizinan:

Tandatangan:

Nombor

K/P:

Nama:

Tarikh :

Saksi tidak-berpihak/adil:

Tandatangan:

Nombor

K/P:

Nama:

Tarikh :

Appendix C: Questionnaire

RESPONDENT CODE:

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UNIVERSITI PUTRA MALAYSIA
FACULTY OF MEDICINE AND HEALTH SCIENCE

DEPARTMENT OF NURSING
BACHELOR OF NURSING

RESEARCH TITLE

***KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING GESTATIONAL
DIABETES MELLITUS AND ITS CONTROL AMONG ANTENATAL WOMEN
ATTENDING ANTENATAL CLINIC IN HOSPITAL SERDANG***

RESEARCHER:

NURUL EZZAH BINTI MOHD AZMI

SUPERVISOR: MADAM HNG SIEW HONG

INSTRUCTION:

This study is conducted for academic purposes. All information will be kept private and confidential. Thank you for your cooperation in answering this questionnaire.

**SECTION A:
PERSONAL INFORMATON**

1.	Age	
2.	Gravidity	<input type="checkbox"/> Primigravida (first time pregnancy) <input type="checkbox"/> Multipara (two until five times pregnancy) <input type="checkbox"/> Grand Multipara (five times and above pregnancy)
3.	Nation	<input type="checkbox"/> Malay <input type="checkbox"/> Chinese <input type="checkbox"/> Indian <input type="checkbox"/> Others
4.	Highest Education Level	<input type="checkbox"/> No formal education <input type="checkbox"/> Primary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Diploma <input type="checkbox"/> Degree <input type="checkbox"/> Master/PHD
5.	Occupation	<input type="checkbox"/> Housewife <input type="checkbox"/> Professional <input type="checkbox"/> Healthcare worker

		<input type="checkbox"/> Laborer <input type="checkbox"/> Other
6.	Monthly Household Income	<input type="checkbox"/> < 2500 – 4849 <input type="checkbox"/> 4850 – 10959 <input type="checkbox"/> 10960 – 15039 >
7.	Do you have any familial history of diabetes?	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.	Do you have any knowledge about Gestational Diabetes Mellitus (GDM)?	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9.	Do you have history of Gestational Diabetes Mellitus in previous pregnancies?	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10.	How did you acquire the knowledge about Gestational Diabetes Mellitus?	
	<input type="checkbox"/> Family <input type="checkbox"/> Friends <input type="checkbox"/> Medical professional <input type="checkbox"/> Neighbour <input type="checkbox"/> Other	

SECTION B:

B1: KNOWLEDGE ON GESTATIONAL DIABETES MELLITUS

1. What are the risk factors of GDM? (can choose more than 1)

- Family history of diabetes mellitus
- Obesity
- History of GDM in previous pregnancy
- Do not know

2. Do you think that proper nutrition is important throughout pregnancy?

- Yes
- No

3. Which modality will help in control of gestational diabetes mellitus?

- Diet plan
- Medication
- Monitor blood glucose
- Exercise

4. What are the common problems of new born of a GDM mother?

- Big baby
- Preterm labour
- Birth trauma
- Congenital anomalies
- Respiratory distress syndrome
- Do not know

5. How is GDM diagnosed?

- Urine test
- Blood test after glucose ingestion
- Ultrasound

6. Do you know insulin controls blood sugar?

- Yes
- No

7. Do you know how many hours of fasting are recommended before testing fasting blood sugar?

- 6 hours before test
- 8 hours before test
- 12 hours before test
- 16 hours before test
- Don't know

8. Who is responsible for your diabetic care?

- Yourself
- Doctor
- Family
- All of the above

B2: ATTITUDE ON GESTATIONAL DIABETES MELLITUS

1. Gestational diabetes causes complications in pregnancy?

- Agree
 Disagree

2. Complications of GDM can be prevented?

- Agree
 Disagree

3. Early diagnosis is crucial for preventing complications?

- Agree
 Disagree

4. All pregnancies should be screened routinely for GDM?

- Agree
 Disagree

5. Physical exercise during pregnancy is healthy?

- Agree
 Disagree

6. Should one eat more fresh fruits and vegetables during pregnancy?

- Agree
 Disagree

7. Is concept of eating for two (more food for the baby's growth) always correct?

- Agree
 Disagree

B3: PRACTICE ON GESTATIONAL DIABETES MELLITUS

Part 1

1. Do you practice a specific dietary regimen during pregnancy?

- Yes
 No

2. Do you eat three or more meals every day?

- Yes
 No

3. Do you have a control from eating junk foods?

- Yes
 No

4. Do you follow up weight during pregnancy?

- Yes
 No

5. Do you visit the doctor regularly during pregnancy?

- Yes
 No

6. Do you check your blood sugar during pregnancy?

- Yes
 No

Part 2

1. What do you practice after you are being diagnosed with gestational diabetes mellitus?

- Balanced diet
- Regular antenatal check-up
- Moderate exercise
- Medications
- All of the above

2. Do you do self-measurement of blood glucose at home?

- Yes
- No

3. Are you following dietary modifications to control GDM?

- Yes
- No

4. Do you practice regular physical exercise?

- Yes
- No

5. Do you eat more vegetables than meat in order to control blood glucose?

- Yes
- No

6. How do you take your meals?

- 3 big meals & 3 small meals
- 3 big meals
- Frequent meals
- Eat when hungry

7. How often do you visit hospital for fasting and post meal blood sugar testing?

- Once every week
- Once every 2 week
- Once a month
- Don't know

8. Where do you store the insulin injection at home? (for GDM patients on insulin)

- Shelf
- Cupboard
- Refrigerator
- Freezer

Thank you for answering this questionnaire.

KOD RESPONDEN:

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UNIVERSITI PUTRA MALAYSIA
FAKULTI PERUBATAN DAN SAINS KESIHATAN

JABATAN KEJURURAWATAN
BACELOR KEJURURAWATAN

TAJUK KAJIAN

***PENGETAHUAN, SIKAP DAN AMALAN MENGENAI DIABETES SEMASA
HAMIL DAN KAWALANNYA DALAM KALANGAN IBU HAMIL YANG
MENGHADIRI KLINIK ANTENATAL DI HOSPITAL SERDANG***

PENYELIDIK:

NURUL EZZAH BINTI MOHD AZMI

SUPERVISOR: MADAM HNG SIEW HONG

ARAHAN:

Kajian ini dijalankan untuk tujuan akademik. Semua maklumat akan dirahsiakan dan sulit. Terima kasih atas kerjasama anda untuk menjawab soal selidik ini.

BAHAGIAN A:
MAKLUMAT PERIBADI

1.	<i>Umur</i>	
2.	<i>Gravidi</i>	<input type="checkbox"/> Primigravida (kali pertama kehamilan) <input type="checkbox"/> Multipara (dua hingga lima kali kehamilan) <input type="checkbox"/> Grand Multipara (kehamilan 5 kali dan ke atas)
3.	<i>Bangsa</i>	<input type="checkbox"/> <i>Melayu</i> <input type="checkbox"/> <i>Cina</i> <input type="checkbox"/> <i>India</i> <input type="checkbox"/> <i>Lain-lain</i>
4.	<i>Tahap Pendidikan Tertinggi</i>	<input type="checkbox"/> <i>Tiada pendidikan formal</i> <input type="checkbox"/> <i>Sekolah rendah</i> <input type="checkbox"/> <i>Sekolah menengah</i> <input type="checkbox"/> <i>Diploma</i> <input type="checkbox"/> <i>Ijazah sarjana muda</i> <input type="checkbox"/> <i>Ijazah sarjana/PHD</i>
5.	<i>Pekerjaan</i>	<input type="checkbox"/> <i>Suri rumahtangga</i> <input type="checkbox"/> <i>Professional</i> <input type="checkbox"/> <i>Pekerja kesihatan</i>

		<input type="checkbox"/> <i>Buruh</i> <input type="checkbox"/> <i>Lain lain</i>
6.	<i>Pendapatan Isi Rumah Bulanan</i>	<input type="checkbox"/> < 2500 – 4849 <input type="checkbox"/> 4850 – 10959 <input type="checkbox"/> 10960 – 15039 >
7.	<i>Adakah anda mempunyai sejarah keluarga yang mengidap diabetes?</i>	
	<input type="checkbox"/> <i>Ya</i> <input type="checkbox"/> <i>Tidak</i>	
8.	<i>Adakah anda mempunyai pengetahuan tentang kencing manis semasa hamil (GDM)?</i>	
	<input type="checkbox"/> <i>Ya</i> <input type="checkbox"/> <i>Tidak</i>	
9.	<i>Adakah anda mempunyai sejarah diabetes semasa hamil (GDM) pada kehamilan sebelumnya?</i>	
	<input type="checkbox"/> <i>Ya</i> <input type="checkbox"/> <i>Tidak</i>	
10.	<i>Bagaimanakah anda memperoleh pengetahuan tentang kencing manis semasa hamil (GDM)?</i>	
	<input type="checkbox"/> <i>Keluarga</i> <input type="checkbox"/> <i>Kawan-kawan</i> <input type="checkbox"/> <i>Pakar perubatan</i> <input type="checkbox"/> <i>Jiran</i> <input type="checkbox"/> <i>Lain-lain</i>	

BAHAGIAN B:

B1: PENGETAHUAN MENGENAI DIABETES SEMASA HAMIL

1. *Apakah faktor risiko GDM?(boleh pilih lebih daripada 1)*

- Sejarah keluarga kencing manis*
- Obesiti*
- Sejarah GDM pada kehamilan sebelumnya*
- Tidak tahu*

2. *Adakah anda tahu pemakanan yang bernutrisi itu penting semasa kehamilan?*

- Ya*
- Tidak*

3. *Modaliti manakah yang akan membantu dalam mengawal kencing manis semasa hamil?*

- Pelan diet*
- Ubat*
- Memantau gula dalam darah*
- Senaman*

4. *Apakah masalah biasa bayi baru lahir ibu GDM?*

- Bayi yang besar*
- Kelahiran pramatang*
- Trauma kelahiran*
- Anomali kongenital*
- Sindrom gangguan pernafasan*
- Tidak tahu*

5. Bagaimanakah GDM didiagnosis?

- Ujian air kencing
- Ujian darah selepas pengambilan glukosa
- Pemeriksaan Ultrasound

6. Adakah anda tahu mengenai insulin yang mengawal gula dalam darah?

- Ya
- Tidak

7. Adakah anda tahu berapa jam berpuasa disyorkan sebelum menguji gula darah puasa?

- 6 jam sebelum ujian
- 8 jam sebelum ujian
- 12 jam sebelum ujian
- 16 jam sebelum ujian
- Tidak tahu

8. Siapa yang bertanggungjawab untuk penjagaan diabetes anda?

- Diri sendiri
- Doktor
- Keluarga
- Semua di atas

B2: SIKAP MENGENAI DIABETES SEMASA HAMIL

1. *Diabetes semasa hamil menyebabkan komplikasi dalam kehamilan?*
 Setuju
 Tidak bersetuju
2. *Komplikasi GDM boleh dicegah?*
 Setuju
 Tidak bersetuju
3. *Diagnosis awal adalah penting untuk mencegah komplikasi?*
 Setuju
 Tidak bersetuju
4. *Semua kehamilan perlu disaring secara rutin untuk GDM?*
 Setuju
 Tidak bersetuju
5. *Senaman semasa hamil adalah sihat?*
 Setuju
 Tidak bersetuju
6. *Seseorang itu perlu makan lebih banyak buah-buahan dan sayur-sayuran segar ketika hamil?*
 Setuju
 Tidak bersetuju
7. *Adakah konsep makan untuk dua orang (lebih banyak makanan untuk tumbesaran bayi) sentiasa betul?*
 Setuju
 Tidak bersetuju

B3: AMALAN MENGENAI DIABETES SEMASA HAMIL

Part 1

1. Adakah anda mengamalkan rejimen pemakanan tertentu semasa mengandung?

- Ya
 Tidak

2. Adakah anda makan tiga kali atau lebih setiap hari?

- Ya
 Tidak

3. Adakah anda mempunyai kawalan daripada makan makanan ringan?

- Ya
 Tidak

4. Adakah anda mengambil berat tentang berat badan anda ketika hamil?

- Ya
 Tidak

5. Adakah anda membuat rawatan berkala ketika hamil?

- Ya
 Tidak

6. Adakah anda membuat pemeriksaan gula dalam darah anda ketika hamil?

- Ya
 Tidak

Part 2

1. *Apakah amalan yang akan anda ikuti untuk mengawal jika anda disahkan menghidap diabetes mellitus semasa hamil?*

- Diet seimbang*
- Pemeriksaan antenatal yang kerap*
- Senaman sederhana*
- Ubat-ubatan*
- Semua di atas*

2. *Adakah anda melakukan pengukuran sendiri glukosa darah di rumah?*

- Ya*
- Tidak*

3. *Adakah anda mengikuti pengubahsuaian diet untuk mengawal GDM?*

- Ya*
- Tidak*

4. *Adakah anda mengamalkan senaman fizikal yang kerap?*

- Ya*
- Tidak*

5. *Adakah anda makan lebih banyak sayur-sayuran daripada daging untuk mengawal glukosa dalam darah?*

- Ya*
- Tidak*

6. *Bagaimana anda mengawal diet anda?*

- 3 hidangan besar & 3 hidangan kecil*
- 3 hidangan besar*
- Kerap makan*
- Makan ketika lapar*

7. Berapa kerap anda ke hospital untuk ujian gula dalam darah ketika berpuasa dan selepas makan?

- Setiap minggu sekali
- 2 minggu sekali
- Sekali sebulan
- Tidak tahu

8. Di manakah anda menyimpan alat suntikan insulin di rumah? (untuk pesakit GDM pada insulin)



- Rak
- Almari
- Peti ais
- Peti sejuk beku

Terima kasih kerana menjawab soal selidik ini.

Appendix D: Gantt Chart

	2021		2022									
	11	12	1	2	3	4	5	6	7	8	9	
Identify the research problem												
Discussion with supervisor regarding research title												
Review of the article for literature review												
Select an appropriate questionnaire												
Proposal presentation												
Submit proposal												
Obtain permission from the relevant party												
Conduct pilot study												
Conduct the research and data collection												
Data analysis and discussion												
Thesis presentation												
Submit the research report												

Appendix E: Approval from Medical Research and Ethics Committee (MREC)

	JAWATANKUASA ETIKA & PENYELIDIKAN PERUBATAN (Medical Research & Ethics Committee) KEMENTERIAN KESIHATAN MALAYSIA d/a Kompleks Institut Kesihatan Negara Blok A, No 1, Jalan Setia Murni U13/52, Seksyen U13, Bandar Setia Alam, 40170 Shah Alam, Selangor.	
		Tel: 03-3362 8888/8205
		Ref : 22-00641-VH7 (2)
		Date: 13-May-2022

NURUL EZZAH BINTI MOHD AZMI
UNIVERSITI PUTRA MALAYSIA (UPM)

Dear Sir/ Mdm,

ETHICS INITIAL APPROVAL: NMRR ID-22-00641-VH7 (IIR)
Knowledge, attitude and practice regarding gestational diabetes mellitus and its control among antenatal women attending antenatal clinic in Hospital Serdang

This letter is made in reference to the above matter.

2. The Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia (MOH) has provided ethical approval for this study. Please take note that all records and data are to be kept strictly **CONFIDENTIAL** and can only be used for the purpose of this study. All precautions are to be taken to maintain data confidentiality. Permission from the District Health Officer / Hospital Administrator / Hospital Director and all relevant heads of departments / units where the study will be carried out must be obtained prior to the study. You are required to follow and comply with their decision and all other relevant regulations.

3. The investigators and study sites involved in this study are:

HOSPITAL SERDANG
Nurul Ezzah Binti Mohd Azmi (Principal Investigator)
Pn. Hng Siew Hong

4. The following study documents have been received and reviewed with reference to the above study:

Documents received and reviewed with reference to the above study:

1. Study Protocol_Version 04, dated 24-Apr-2022
2. Patient Information Sheet & Informed Consent Form (Eng)_Version 01, dated 12-Feb-2022
3. Patient Information Sheet & Informed Consent Form (BM)_Version 01, dated 13-Feb-2022
4. Questionnaire_Version 04, dated 24-Apr-2022
5. Investigator's documents : Declaration of Conflict of Interest (COI), IA-HOD-IA, and CV:
 - a) Nurul Ezzah Binti Mohd Azmi (Principal Investigator)
 - b) Pn. Hng Siew Hong

5. Please note that ethical approval is valid until **12-May-2023**. The following are to be reported upon receiving ethical approval. Required forms can be obtained from the National Medical Research Registry (NMRR) website:

- i. **Continuing Review Form** has to be submitted to MREC within 2 month (60 days) prior to the expiry of ethical approval.
- ii. **Study Final Report** upon study completion to the MREC.

Appendix G: Research Budget

No.	Tools	Quantity x RM/unit	Total Cost
1.	Stationaries		RM30.00
2.	Transportation		
	• Grab	• 2 x RM16.00	RM32.00
		• 1 x RM19.00	RM19.00
3.	Data Internet		RM30.00
4.	Printing		
	• Questionnaires	• 160 x RM0.40	RM64.00
	• Softbound	• 2 x RM10.00	RM20.00
	• Hardbound	• 4 x RM20.00	RM80.00
5.	Binding		RM60.00
		TOTAL	RM335.00

Appendix H: Turnitin Summary

198305_Turnitin Report

ORIGINALITY REPORT

18%	13%	8%	8%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.journaljpri.com Internet Source	5%
2	publichealthmy.org Internet Source	1%
3	ebpj.e-iph.co.uk Internet Source	1%
4	irep.iium.edu.my Internet Source	1%
5	www.jcdronline.org Internet Source	1%
6	B. Bhowmik, F. Afsana, T. Ahmed, T. Siddiquee, T. Ahmed, F. Pathan, H. Mahtab, A.K.A. Khan. "Evaluation of knowledge regarding gestational diabetes mellitus: a Bangladeshi study", Public Health, 2018 Publication	1%
7	Submitted to Universiti Teknologi MARA Student Paper	<1%
8	Submitted to Universiti Kebangsaan Malaysia Student Paper	