

**Women and Healthcare Professionals' Experience, Knowledge
and Understanding of Gestational Diabetes Mellitus in Indonesia:
A Single Exploratory Case Study**

Ririn Wulandari

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Abstract

Background: gestational diabetes mellitus (GDM), a common hyperglycaemia first diagnosed in pregnancy, is associated with short- and long-term negative impact for women and babies. There is evidence that maintaining glucose levels may reduce the risk of adverse outcomes caused by GDM; and women, with assistance from healthcare professionals, can maintain it independently in their daily lives. However, there is limited evidence on the experience and understanding of GDM among women and healthcare professionals.

Aim: to explore the experiences, knowledge and understanding of GDM among women with GDM and healthcare professionals within a health centre in Indonesia.

Methods: this study involved two phases.

Phase 1: a qualitative systematic review was conducted to find existing evidence about the experience of women with GDM in low-and middle-income countries, employing Joanna Briggs Institute (JBI) approach. The findings derived from this phase served as cornerstone for the subsequent phase.

Phase 2: a single exploratory case study design was employed to answer the objectives, while the case was a health centre in Indonesia. In-depth interviews, non-participant observation, and study documentation were conducted. The data were analysed using thematic analysis.

Findings: The findings indicate that GDM was not sufficiently managed in the health centre. Women and healthcare professionals lacked knowledge and understanding about GDM, contributing to negative experiences among women with GDM. Lack of effective communication created a suboptimal relationship between women and healthcare professionals. Additionally, barriers in healthcare professionals' unclear roles, long waiting times in the health centre, and the absence of GDM guidelines have influenced the quality of services provided.

Conclusion: This study provides an in-depth understanding of women and healthcare professionals experiences with GDM, which eventually may contribute to the development of GDM patient-centred care within a health centre. The new knowledge uncovered from this study has the potential to function as evidence for future research.

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Glossary

Birth trauma	The occurrence of dysfunction or damage to the newborn's body function or structure resulting from a negative incident during childbirth.
Foetal macrosomia	Condition of a baby with birth weight above 4,000 g, irrespective of their gestational age
Neonatal hypoglycaemia	Condition of a newborn with blood glucose <2.6 mmol/L
Neonatal jaundice	The presence of yellowish discolorations on the skin, sclera, and mucous membranes in a neonate
Shoulder dystocia	The condition when the infant's head has been delivered, but one of the shoulders becomes obstructed by the mother's pubic bone, resulting in a delay in the delivery of the baby's body
Stillbirth	When a foetus dies either after the 24 weeks of gestation or during delivery (definition according to NHS).

List of abbreviations

ACOG	American College of Obstetricians and Gynaecologists
ANC	Antenatal Care
ADA	American Diabetes Association
BMI	Body Mass Index
BPJS-K	<i>Badan Penyelenggara Jaminan Sosial Kesehatan/</i> Social Security Agency for Health
CAQDAS	Computer-assisted qualitative data analysis software
CHWs	Community Health Workers/ cadres
DIP	Diabetes Mellitus in Pregnancy
ES	Endocrine Society
FIGO	The International Federation of Gynaecology and Obstetrics
FPG	Fasting Plasma Glucose
GCT	Glucose Challenge Test
GDM	Gestational Diabetes Mellitus
HAPO	Hyperglycaemia and Adverse Pregnancy Outcome
HCP	Healthcare Professionals
HICs	High Income Countries
IADPSG	The International Association of Diabetes and Pregnancy Study Groups
IGT	Impaired Glucose Tolerance
JBI	Joanna Briggs Institute
LMICs	Low-Income and Middle-Income Countries
MNT	Medical Nutrition Therapy
NHS	National Health Service
NICE	The National Institute for Health and Care Excellence
OGTT	Oral Glucose Tolerance Test
PERKENI	<i>Perkumpulan Endokrinologi Indonesia/</i> Indonesian Society of Endocrinology
Puskesmas	<i>Pusat Kesehatan Masyarakat/</i> community health centre
Pustu	<i>Puskesmas Pembantu/</i> auxiliary health centres
Risikesdas	<i>Riset Kesehatan Dasar/</i> basic health research

SOGC	Society of Obstetricians and Gynaecologists of Canada
UKBM	<i>Upaya Kesehatan Bersumberdaya Masyarakat/</i> Community-Based Health Efforts
USPSTF	The United States Preventive Services Task Force
WHO	World Health Organisation

Chapter 1 Introduction

This thesis serves as a comprehensive report presenting the findings of a study conducted as part of a doctoral programme within the School of Healthcare at the University of Leeds. The study aimed to explore the experiences, knowledge, and understanding of women and healthcare professionals regarding gestational diabetes mellitus (GDM) in the context of Indonesia. It explored the perspectives of women with GDM and the healthcare professionals involved in providing the care. In addition, it seeks to identify the current routine practices of GDM management within a health centre setting.

This chapter begins with an overview of GDM, followed by its classification, screening and diagnosis, pathophysiology, risk factors, impacts, and management. Subsequently, the chapter elaborates on the background of the study setting, providing a concise section on the Indonesian health system and the epidemiological situation related to GDM. Finally, this chapter outlines the research aim, objectives, research questions, as well as the structure of the thesis.

1.1 GDM overview

As a serious pregnancy complication affecting approximately 14% of pregnant women globally, GDM is characterised by the spontaneous development of hyperglycaemia during pregnancy (Plows et al., 2018). This medical condition is typically diagnosed in the second or third trimester (around 24-28 weeks of pregnancy) and is not present as overt diabetes before gestation (Li et al., 2018). GDM may or may not resolve after pregnancy (Egan et al., 2021) with recurrence rates up to 70% (Bottalico, 2007). While GDM often resolves after childbirth, its long-term consequences remain a cause for concern (McIntyre and Moses, 2020). Timely and accurate diagnosis of GDM, along with effective interventions and management, are crucial not only for the long-term health of both the mother and child but also for reducing the financial burden on healthcare systems (Dall et al., 2019).

1.2 Classification of GDM

The definition of GDM has been the subject of ongoing debate, with the commonly employed one being the identification of any level of glucose intolerance that is initially detected during pregnancy (Metzger et al., 1998). In 1999, the WHO also provided a definition that aligns with the aforementioned concept, where GDM includes women with diabetes mellitus or impaired glucose tolerance (IGT). While this definition has enabled the development of a standardised approach for classification strategy, it also presents certain challenges. The inclusion of women with pre-existing diabetes not identified before pregnancy in this definition leads to a lack of clarity between the morbidities associated with diabetes in pregnancy and gestational diabetes (Hod et al., 2015b; American Diabetes Association, 2023). Ideally, individuals with risk factors or those belonging to high-risk populations should be identified for undiagnosed diabetes during the preconception period. However, the available evidence indicates that numerous cases of GDM stem from pre-existing hyperglycaemia, which is identified through routine screening during pregnancy (American Diabetes Association, 2023). It is worth noting that routine screening is not commonly conducted in non-pregnant individuals within the reproductive age range. Regarding the classification of hyperglycaemia, according to WHO (2013), it is stated that women who develop hyperglycaemia at any point during pregnancy should be designated as either diabetes mellitus in pregnancy (DIP) or GDM. DIP is a condition in which a woman either has pre-existing diabetes (type 1 or type 2) predating pregnancy or when her first diagnosed glucose level during pregnancy meets the WHO criteria for diabetes mellitus in the non-pregnant state. GDM is defined when hyperglycaemia that does not fulfil the diagnostic criteria of DIP occurs, typically identified between 24 and 28 weeks of pregnancy (World Health Organisation, 2013). In the context of pregnancy, it is advisable to consider hyperglycaemia as a continuous risk factor, similar to maternal weight and blood pressure measurements, rather than categorising it as either normal or abnormal using arbitrary diagnostic thresholds (Lefkovits et al., 2022).

1.2.1 Risk factors

The underlying processes behind GDM occurrence in pregnant women have not been fully illuminated. However, studies have identified risk factors associated with GDM. These studies have demonstrated that the factors requiring attention include not only those that occur during pregnancy, but also those that manifest during the pre-conception period (Harville et al., 2011; Hedderson et al., 2011)

1) Non-modifiable factors

According to studies, advanced maternal age has been associated with an increased risk of GDM. The prevalence of GDM in women aged over 40 years was found to be higher than in younger women (Solomon et al., 1997; Anna et al., 2008). Pregnant women carrying male fetuses have also been observed to be at an elevated risk of developing GDM (Retnakaran et al., 2015). Additionally, a family history of diabetes mellitus among women increases the risk of GDM (Solomon et al., 1997). Based on a review, it has been noted that several factors contribute to a greater likelihood of GDM. These factors include a history of GDM, experiencing multiple pregnancies, having genetic predispositions, and higher parity (McIntyre et al., 2019). The historical occurrence of stillbirth and the presence of hypertension are also factors that contribute to GDM risk (Natamba et al., 2019). Moreover, the risk of GDM is relatively higher among women of non-white ethnic backgrounds. A review conducted in the UK reveals that Asian women have the highest rates of GDM (Diane et al., 2016). Studies conducted in Australia show that GDM prevalence is higher among women of South Asian descent compared to women of Australian origin (Anna et al., 2008). A study conducted in Canada involving multiple ethnic groups also indicated that the highest GDM prevalence occurred among Asian women (Hedderson et al., 2012). The potential causes for these ethnic disparities are expected to be multifaceted, encompassing various factors, but not limited to variations in body fat distribution, lifestyle choices such as diet and physical activity, and genetic predisposition (McIntyre et al., 2019).

2) Modifiable factors

A review has indicated that the presence of excessive body adiposity prior to pregnancy, as indicated by a body mass index (BMI) exceeding 25kg m^{-2} , is correlated with an increased risk of GDM (Zhang and Ning, 2011).

Research also shows a correlation between women who adhere to a recommended diet and a decreased likelihood of developing GDM (Tobias et al., 2012). While existing data suggests a moderate correlation between GDM and maternal smoking prior to and during pregnancy (Zhang and Ning, 2011), women who smoke more than 25 cigarettes per day reportedly have a higher risk of developing GDM (Bao et al., 2016). Engaging in a higher level of physical exercise prior to or during pregnancy has been found to be associated with a decreased risk of GDM (Tobias et al., 2011). A large cohort study conducted in the USA demonstrated that the aforementioned four risk factors, including overweight or obesity, smoking, unhealthy diets, and physical inactivity, are linked to an increased risk of GDM in women (Zhang et al., 2014).

1.2.2 Prevalence

The prevalence of GDM exhibits significant variability depending on the populations being studied and the specific testing approach utilised (Akgöl et al., 2017). The ideal approach for GDM testing, threshold values for diagnosis, and interventions are subjects for discussions with no consensus achieved at the international level. Despite the significance of understanding GDM prevalence in a global scope, it is noteworthy that the comparisons of GDM prevalence across countries is a challenge (Zhu and Zhang, 2016).

Globally, in 2019 there were approximately 20.4 million pregnancies associated with some degree of hyperglycaemia, with the majority (83.6%) attributed to GDM (International Diabetes Federation, 2019). GDM prevalence has been on the rise in recent years and is estimated to affect around 6 to 25% of pregnancies (Lefkovits et al., 2022). The prevalence of GDM varies among low, middle, and high-income countries (Jiwani et al., 2012). To maintain consistency within this report, the

categorisation of countries is based on the World Bank classification (The World Bank, 2019).

In high-income countries such as the US and the UK, the reported prevalence of GDM ranges from 2% to 10% and 2% to 3% respectively (Jiwani et al., 2012). In low and middle-income countries (LMICs), a wider range of prevalence is observed, accounting for 0.4 to 24.3%, including countries such as Brazil, Bangladesh and Ethiopia (Kanguru et al., 2014). Discrepancies also exist between regions. For instance, in Africa, it was reported to range from 1.6% to 17.8%, while in Asia, the prevalence was from 11.5% (Lee et al., 2018). Malaysia (18.3 %) and India (13.6%) reported the highest prevalence in Southeast and South Asia (Zhu and Zhang, 2016). Nevertheless, it is important to note that there are still many LMICs in Southeast Asia where the data on the prevalence of GDM remains limited (Nguyen et al., 2018), and countries such as Vietnam, Thailand, the Philippines, and Indonesia only have hospital-based data (Amarra et al., 2021).

1.3 Impact of GDM

GDM can have negative impact on pregnancy in both the short and long term. In the short term, GDM can lead to maternal complications, including an increased risk of preeclampsia, gestational hypertension, assisted delivery, and postpartum haemorrhage (Metzger et al., 2008). In addition to these physiological consequences, the diagnosis of GDM has been found to be associated with an increased prevalence of anxiety and depression among pregnant women (OuYang et al., 2021). It may also increase the risk for newborns, leading to conditions such as foetal macrosomia, stillbirth, birth trauma, shoulder dystocia, neonatal jaundice and neonatal hypoglycaemia (Carr et al., 2006; Allcroft et al., 2013). GDM has also been linked to the delayed maturation of the baby's brain, compromised intrauterine growth, and reduced cognitive abilities when compared to babies born to non-GDM mothers (Perna et al., 2015). In the long term, GDM is associated with an increased risk of developing type 2 diabetes for women (Maresh, 2005). Women with GDM have a nearly 10-fold higher risk of developing type 2 diabetes compared to normoglycemic pregnant women (Adam et al., 2023). Babies born to mothers with GDM may also have a higher risk of becoming overweight (OR=1.42)

and obese (OR=1.18) (Bloom et al., 2019). Indeed, some have described GDM as a major public health issue (Lewandowska, 2021).

GDM can also have a negative impact on the economy as it poses a significant financial challenge for women. It has been reported that the financial burden caused by GDM is substantial (Xu et al., 2017; Meregaglia et al., 2018). Studies have revealed that the cost of pregnancy with GDM is higher than without GDM, with mean differences of \$462.02 as reported by a study from Australia (Moss et al., 2007), \$1,438 in a study from Finland (Kolu et al., 2012), \$15,593 in a study from the USA (Lenoir-Wijnkoop et al., 2015) and \$1,929.87 in a study from China (Xu et al., 2017)

1.3.1 Experiences of women with GDM

There have been fewer studies conducted on women's experiences of living with GDM in Low- and Middle-Income Countries (LMICs) compared to High-Income Countries (HICs). It has been reported that women in LMICs face barriers such as time constraints and financial limitations when managing GDM (Sundarapperuma et al., 2018). Women in LMICs often may also perceive that their own health as less important and prefer to allocate available resources towards their baby's health. Additionally, they may not have sufficient time to take care of their own health (Suraiya et al., 2015).

Studies from HICs reveal that women often find it difficult to accept the diagnosis of GDM for the first time. Some women have reported feeling shocked, panicked, overwhelmed, scared, and tearful in response to the diagnosis (Draffin et al., 2016; Martis et al., 2018; Parsons et al., 2018). They not only feel monitored by their families and healthcare professionals but also face challenges in changing their daily lifestyles (Evans and O'Brien, 2005). Women acknowledge the importance of lifestyle interventions such as exercise and weight control (Bandyopadhyay et al., 2011b) and demonstrate varying degrees of awareness about risk factors, complications, and the future risk of type 2 diabetes (Zulfiqar et al., 2017; Wah et al., 2019). This evidence is supported by a qualitative review of 16 primary studies (15 studies from HICs and one study from Tonga, an LMIC) conducted between 1994 and 2011, which further suggests that the primary motivation for adhering to

GDM management is the health of their babies (Parsons et al., 2014). GDM can also impact women's psychosocial wellbeing (Gilbert et al., 2019). One study reported that one-third of women with GDM exhibit symptoms of postpartum depression symptoms (Nicklas et al., 2013).

1.4 Management of GDM

Improved outcomes of GDM rely on its comprehensive management, which includes testing, timely diagnosis, and targeted interventions (Mpondo et al., 2015). The implementation of GDM treatment has shown a statistically significant reduction in the relative risks of macrosomia, shoulder dystocia, and birth trauma (World Health Organisation, 2013). Numerous guidelines for managing GDM are available, including the Canadian clinical practice guidelines in diabetes and pregnancy, New Zealand clinical practice guidelines, and guidelines for the management of gestational diabetes mellitus in India (Zhang et al., 2019). A review conducted by Li-Zhen et al. (2019) identified nine GDM guidelines that are strongly recommended for screening and diagnosis. These guidelines include those from the World Health Organisation (WHO-2013), the UK National Institute for Health and Care Excellence (NICE-2015), the American Diabetes Association (ADA-2018), the Society of Obstetricians and Gynaecologists of Canada (SOGC-2016), the Endocrine Society (ES-2013), the International Federation of Gynaecology and Obstetrics (FIGO-2015), the United States Preventive Services Task Force (USPSTF-2014), the International Association of Diabetes and Pregnancy Study Groups (IADPSG-2015) and the American College of Obstetricians and Gynaecologists (ACOG-2018).

The highest-ranked guidelines were produced by the WHO, NICE, and ADA, respectively. In another study, the NICE guideline in the UK, which provides recommendations from preconception to the postnatal period, is regarded as the most coherent GDM guideline (Zhang et al., 2019). It is beyond the scope of this study to cover all management guidelines. Therefore, this report discusses the management of GDM using the three highest ranked-guidelines aforementioned above.

1.4.1 Screening, testing, and diagnosis

The terms screening and testing are sometimes used interchangeably in studies. The term 'screening' is frequently employed within the context of the two-step approach (further elaborated in section 1.4.2). Generally, 'screening' pertains to the process of assessing asymptomatic women for GDM using a 50-gram oral glucose challenge test, as commonly practised in the United States. The screening process is then followed by diagnostic test using a 75g or 100g oral glucose tolerance test if the result shows an exceeding value(s) (US Preventive Services Task Force et al., 2021). Meanwhile, in the United Kingdom, a one-step approach is implemented for the identification of women with GDM. Under this strategy, women who identify as being at high risk of GDM are directly tested without undergoing the aforementioned 'screening' process. Two-step and one-step approaches will be discussed in the section below, along with the thresholds for GDM diagnosis recommended by several international guidelines.

1.4.2 Two-step versus one-step method

Testing and diagnosis are important measures of GDM management (Hod et al., 2015a). The two-step method of the oral glucose tolerance test (OGTT) was developed by O'Sullivan and Mahan in the 1960s. This screening method consists of a first-step glucose challenge test (GCT), involving the oral administration of a 50g glucose solution followed by a venous glucose examination after 1 hour. Subsequently, for those who passed the screening criteria, a second-step OGTT is performed, which may consist of either a 100g, 3-hour test or a 75g, 2-hour diagnostic test (Li-Zhen et al., 2019). In this approach, the diagnosis of GDM is established when a woman exhibits two or more abnormal test results. This O'Sullivan and Mahan method has been widely employed by numerous organisations over an extended period of time.

In 2008, a one-step OGTT testing method was introduced by the International Association of Diabetes and Pregnancy Study Groups (IADPSG). This method recommends the administration of a 75g glucose solution and lowers the OGTT diagnostic threshold. In this approach, a GDM diagnosis is made when an individual exhibits one abnormal value (Metzger et al., 2008). There is an ongoing

debate about this method, as it results in a significant increase of GDM diagnoses. Concerns have been raised regarding the potential of the medicalisation of pregnancies and the substantial increase in the cost of managing GDM (Li-Zhen et al., 2019). However, it is worth noting that this approach is endorsed by the WHO and other international organisations.

1) WHO

The WHO (2013) guideline refers to the IADPSG, which considers the criteria for screening based on the adverse outcome profiles. The screening procedure involves the intake of a 75-gram glucose solution, followed by examinations of plasma glucose at one and two hours afterwards. The cut-off points for glucose levels are 5.1-6.9 mmol/L for fasting plasma glucose, ≥ 10.0 mmol/L for 1-hour plasma glucose, and 8.5-11.0 mmol/L for 2-hour plasma glucose respectively (see Table 1). If an individual reaches or exceeds one or more of these criteria, a GDM diagnosis should be established (World Health Organisation, 2013). The WHO tends to recommend universal screening rather than selective screening based on the presence of risk factors. This might explain the absence of risk factors in the guidelines provided by the WHO (Li-Zhen et al., 2019).

2) NICE

The NICE guideline recommends using the 2-hour 75g oral glucose tolerance test (OGTT). Women with a history of GDM in a previous pregnancy should undergo testing either in the first or second trimester. If the result is normal, further testing should be conducted between 24-28 weeks of pregnancy. OGTT should also be offered to women with other risk factors during the same 24-28 weeks of pregnancy. A diagnosis of GDM is made if a woman has either a fasting plasma glucose level of ≥ 5.6 mmol/L or a 2-hour plasma glucose level of ≥ 7.8 mmol/L. Additionally, measuring HbA1c may be performed for women diagnosed with GDM at the time of diagnosis to identify any undetected pre-existing diabetes (National Institute for Health and Care Excellence, 2015).

The NICE guideline also recommends assessing specific risk factors before conducting the test. These risk factors include a body mass index greater

than 30 kg/m²; a history of delivering a baby weighing 4.5 kg or more; previous gestational diabetes in a previous pregnancy, having a first-degree relative with diabetes (family history of diabetes), and having an ethnicity with a family origin that has a high prevalence of diabetes. Healthcare professionals should offer a GDM test to individuals who have one or more of these risk factors. Additionally, for women who have two or more events of glycosuria with a value of 1+ or above, or one event with a value of 2+ or above during routine antenatal care, offering a GDM test is also recommended (National Institute for Health and Care Excellence, 2015).

3) ADA

To diagnose GDM, two approaches can be utilised, either the one-step or two-step method (American Diabetes Association, 2023). The one-step approach is based on IADPSG criteria, involving the use of 75 grams glucose solution with measurements taken at one and two hours after administrations. In contrast, the two-step approach begins with a 50 grams glucose load test for non-fasting individuals, followed by measurements after one hour. If the individual's glucose level is ≥ 7.2 mmol/L, they should proceed to a 100 grams OGTT, which should be conducted in a fasting state. The thresholds for the 100 grams OGTT are based on the Carpenter-Coustan criteria, as seen in Table 1. A diagnosis of GDM can be made if the individual shows at least two values that meet or exceed the criteria. The different approaches for screening and diagnosing GDM result in variations in the degree of hyperglycaemia in pregnant women, leading to an ongoing debate about the best strategy for diagnosing GDM.

Table 1 Diagnostic criteria for GDM according to international guidelines recommendation

Criteria	Positive diagnosis	Glucose (g)	FPG Mmol/L	1-hour Mmol/L	2-hour Mmol/L	3-hour Mmol/L
WHO-2013	≥1	75	5.1-6.9	≥10.0	8.5 – 11.0	n/a
NICE-2015	≥1	75	≥ 5.6	n/a	≥ 7.8	n/a
ADA-2023						
One step	≥1	75	≥5.1	≥10.0	≥8.5	n/a
Two steps	≥2	100	≥5.3	≥10.0	≥8.6	≥7.8

1.4.3 Interventions

The focus of the interventions, as crucial measures in GDM management, is to maintain glucose levels (Lapolla et al., 2009). NICE’s recommendations on preconception care are primarily intended for women with pre-existing diabetes who are planning to become pregnant. These women are advised to achieve fasting blood glucose levels of 5–7 mmol/L upon waking and 4–7 mmol/L before meals at other times during the day (National Institute for Health and Care Excellence, 2015). In contrast, the ADA guideline does not specifically provide glucose targets for those particular population. However, it recommends that individuals should receive care from multidisciplinary healthcare professionals before becoming pregnant (American Diabetes Association, 2023).

During pregnancy, women should be educated about the self-monitoring of their glucose levels. For any form of diabetes, including GDM, the recommended targets are 5.3 mmol/L (fasting) and either 7.8 mmol/L (1 hour after meals) or 6.4 mmol/L (2 hours after meals). This glucose control should be achieved without causing hypoglycaemia (National Institute for Health and Care Excellence, 2015). The glucose targets outlined in NICE align with ADA’s recommendations, except for the 2-hour target. ADA recommends a slightly higher 2-hour target of 6.7 mmol/L (American Diabetes Association, 2023).

There are two primary ways to control glucose levels in GDM, lifestyle and pharmacological management (Hod et al., 2015a). In the first instance, all women with GDM should receive dietary counselling and clear guidance on physical activities from healthcare professionals as part of lifestyle management (National Institute for Health and Care Excellence, 2015). Studies have reported that lifestyle management has helped to reduce the incidence of GDM (Sun and Zhao, 2016) and lower the number of excessive gestational weight gain (Chan et al., 2018). More than 70% of GDM cases can be managed by simply making lifestyle changes (American Diabetes Association, 2023). If lifestyle management proves inadequate within 1-2 weeks, pharmacological management involving medications such as metformin, glyburide, or insulin may be necessary (National Institute for Health and Care Excellence, 2015).

Over the years, insulin has been widely regarded as the preferred pharmacological management for GDM. However, there has been a growing trend in the utilisation of metformin and glyburide as substitutes for insulin (Ryu et al., 2014). Glyburide has been recognised for its ability to increase insulin secretion, while metformin works by suppressing hepatic glucose synthesis, decreasing glucose absorption, and enhancing peripheral glucose uptake (Shuster et al., 2020). These oral medicines are considered favourable due to their convenience of administration and reduced cost as compared to insulin (Langer et al., 2010).

A systematic review suggests that both lifestyle and pharmacological management are reasonable and effective measures for GDM women, with metformin appearing to be the most effective treatment compared to insulin or glyburide (Farrar et al., 2017). However, it is worth noting that according to ADA (2023), metformin and glyburide are not recommended as the first line of medicine for GDM. Concerns arise due to the lack of evidence regarding the long-term safety for the baby, as these agents are known to cross the placenta (American Diabetes Association, 2023).

As part of interventions, NICE also recommends that women with GDM give birth no later than 40⁺⁶ weeks. For those who have not given birth by that time, it is advisable to induce the labour or offer a caesarean section if indicated. Elective

labour may be considered before 40⁺⁶ weeks for women with maternal or foetal complications. After delivery, postpartum women should be tested to exclude persisting hyperglycaemia. If the woman show a normal glucose level, a test is still needed to exclude diabetes in the 6-13 weeks after birth. Women should also be reminded to continue a healthy lifestyle and to do an annual HbA1c test (National Institute for Health and Care Excellence, 2015). In addition, the recommendation from ADA for postpartum women is to conduct the 75 grams OGTT between 4 -12 weeks after delivery and then annually in the 1-3 years thereafter (American Diabetes Association, 2023).

1.5 Study context

This section presents an overview of maternal health in Indonesia, with a particular focus on the research site pertaining to gestational diabetes. It also discusses the healthcare system in Indonesia, with a specific emphasis on government policies implemented to enhance maternal health outcomes. Additionally, this section provides an overview of the available evidence regarding the prevalence of GDM in Indonesia and research conducted on GDM within Indonesia.

1.5.1 General information on Indonesia

The Republic of Indonesia, situated in Southeast Asia, is the largest archipelago country (USAID, 2022). Indonesia ranks as the fourth most populous country globally, with a population exceeding 270 million individuals (Badan Pusat Statistik, 2022). The Indonesian population is characterised by a significant degree of ethnic, cultural, and economic diversity distributed across over 17,000 islands. According to Berglee (Berglee, 2016), Indonesia has the highest population of individuals who self-identify as Muslim, with more than 80% of its populace adhering to this religious affiliation.

In 2019, Indonesia ranked seventh in terms of the largest number of diabetic patients (International Diabetes Federation, 2019). In 2018, the government conducted basic health research (*Riskesdas*), a national survey conducted every five years, involving 300,000 household samples from all provinces in Indonesia. The data revealed the prevalence of diabetes in the country was 10.9%, affecting

approximately 20.4 million people (MoH, 2020). Among women aged over 18 years, the prevalence of being overweight (BMI between 25 – 26) was 15.1%. while obesity (BMI more than 27) was 29.3%. Additionally, the prevalence of central obesity (abdominal circumference > 80 cm) among women over 15 years old was 46.7%. Out of approximately 5 million annual deliveries, 3.7% of babies were born weighing ≥ 4 kg (MoH, 2019a). Data also revealed that women faced challenges in accessing healthcare, including financial constraints (15.1%), long distances to health facilities (10.9%), and the need for approval from a family member before seeking care (5.7%) (Balitbangkes, 2019).

1.5.2 The health system in Indonesia

Primary healthcare services in Indonesia are provided by community health centres known as *Puskesmas (Pusat Kesehatan Masyarakat)*. These health centres serve as the foundational healthcare facilities, ensuring access to care for all Indonesians (National Research Council, 2013).

The majority of the health centres in Indonesia are located at the sub-district level and are tasked with promoting public health within their designated working area (MoH, 2019b). These health centres maintain a network within rural communities and operate under the authority of the local health department. To fulfil their objectives, the health centres receive support from its networks, including auxiliary health facilities (*Puskesmas pembantu*), mobile health centres (*Puskesmas keliling*), and village midwives (MoH, 2019b). Members of these networks are required to report the services they provide to the health centre. To improve the accessibility of healthcare, health centres are further assisted by Community-Based Health Efforts (UKBM), which ensure the delivery of healthcare services to the local community on a daily basis. One of UKBM is called Village Health Posts (*Pos Kesehatan Desa*), where health workers, primarily midwives, actively engage with health cadres to carry out these activities (MoH, 2012).

Health centres in Indonesia can be classified based on their geographical location, distinguishing between urban, rural, and remote areas, as well as by the presence or absence of inpatient services (MoH, 2019b). There are variations in the minimum number of healthcare personnel required between facilities that offer

inpatient services and those that do not. In health centres that do not provide inpatient services, it is recommended to have a minimum staffing composition consisting of one medical doctor, one dentist, five nurses, and four midwives. Meanwhile, health centres offering inpatient services should have a minimum staffing composition consisting of two medical doctors, one dentist, eight nurses, and seven midwives (MoH, 2014b). The majority of healthcare personnel in a health centre are typically midwives and nurses. Midwives play a significant role in delivering various services within health centres, especially in maternal and child healthcare provisions (Widyawati et al., 2015). According to regulations, midwives have the authority to provide maternal health services such as counselling in the pre-pregnancy period, services for antenatal, delivery and postpartum of non-high-risk pregnancies, as well as breastfeeding care (MoH, 2017).

The Indonesian government implements accreditation measures in order to enhance the quality of healthcare services and clinical performance. Health centres are required to undergo periodic accreditation, with a minimum frequency of once every five years. Accreditation results in one of five distinct statuses for the health centre, ranging from the highest level of achievement known as "*paripurna*" (excellent) to the lowest grade of non-accreditation. This classification is based on the evaluation of the quality of health facilities conducted by external parties (MoH, 2022).

Patients who cannot be treated at the health centre due to either limited available resources or need specialist services are subsequently referred to a hospital. Hospitals primarily prioritise the provision of curative and rehabilitative services, including inpatient, outpatient, and emergency care. Hospitals are classified based on the extent of services they provide, ranging from Class A to D, as well as their ownership, either public or private (MoH, 2014a). According to MoH (2010), hospitals categorised as Class A are the largest healthcare facilities primarily designated for national referrals. Subsequently, hospitals falling under Class B, Class C, and Class D follow in descending order of size and scope. Public hospitals are under the management of governmental entities, while private hospitals are overseen by entities that operate with the primary objective of generating profit. Hospitals exhibit significantly lower levels of accessibility

compared to health centres. The distribution of healthcare facilities exhibits regional disparities, with urban areas generally possessing more advanced facilities compared to their rural counterparts (Agustina et al., 2019).

The Indonesian government has implemented a health insurance programme to achieve universal health coverage. The national health insurance system underwent a process of development until the year 2014 when the Indonesian government implemented a new national health insurance programme. This programme is administered by BPJS-K (*Badan Penyelenggara Jaminan Sosial-Kesehatan*), a governmental public health institution (Mundiharno and Thabrany, 2012). The objective of BPJS-K is to achieve universal health coverage by the year 2019. However, as of 2022, the number of participants in BPJS is recorded to be approximately 90% of the total population of Indonesia. According to Fuady (2013), the health insurance programme implemented a vertical referral system for patients, directing them from primary healthcare facilities (such as health centres) to secondary or tertiary healthcare facilities.

1.5.3 GDM prevalence in Indonesia

Recent data on GDM is lacking and the available GDM prevalence data, which is based on a study using O'Sullivan-Mahan criteria from a decade ago, ranged from 1.9 to 3.6% (Purnamasari et al., 2013). A study with a small sample size conducted in Ujung Pandang, Indonesia, found that 56% of 46 women with GDM experienced either diabetes or glucose intolerance six years after giving birth (Indonesian Society of Endocrinology (PERKENI), 1997). Other evidence regarding GDM is scarce due to the limited number of published studies in Indonesia.

1.5.4 Guidelines

The first clinical guideline in Indonesia concerning GDM was published in 1997 by the Indonesian Society of Endocrinology (PERKENI). This consensus-based guideline provided recommendations for the diagnosis and management of GDM. The recommendations were derived from both local and international evidence and were adapted from WHO (1980) guidelines. In 2013, the Indonesian Task Force on Reproductive Health developed a clinical guideline specifically for diabetes in

pregnancy, covering both pregestational diabetes and GDM. It is worth noting that the recommendations in this guideline refer back to PERKENI's 1997 guideline. Despite studies demonstrating that clinical guidelines can enhance the quality of care (Oh et al., 2011; So and Wright, 2011), the Indonesian clinical guideline on GDM has not been periodically updated. In 2020, the government introduced a national guideline for the management of type 2 diabetes in adults, which includes a section on the management of GDM (MoH, 2020).

This national guideline appears to reference the WHO-2013 guideline, which recommends the classification of hyperglycaemia in pregnancy into either DIP or GDM. GDM refers to diabetes mellitus that is diagnosed during the second or third trimester of pregnancy and was not recognized before pregnancy. The guideline recommends that GDM testing should be conducted for all pregnant women by employing OGTT after fasting for 8-14 hours, using 75 grams of glucose dissolved in 250-300 mL of water. Pregnant women who have risk factors for diabetes should be screened at their first prenatal visit. These risk factors include being overweight or obese, having a sedentary lifestyle, a family history of diabetes, a history of giving birth to a baby weighing ≥ 4000 grams, a history of GDM, and hypertension ($\geq 149/90$ mmHg). Additionally, women with diabetes mellitus, polycystic ovaries and individuals with a history of cerebrovascular disease are also at an increased risk. If the test result is negative at the first visit, a re-examination is recommended between 24-28 weeks of pregnancy. In addition, women with no high risk of diabetes also should be tested at 24-28 weeks of gestation.

According to the guidelines, the ideal diagnostic procedure for GDM involves performing a venous blood glucose test. Women are diagnosed with GDM if their fasting blood glucose is ≥ 92 mg/dL, or if it is ≥ 180 mg/dL after 1 hour, or ≥ 153 mg/dL after 2 hours. In cases where conducting a venous blood glucose test is not feasible, it can be replaced by conducting a capillary blood glucose test. It is important to note that the accuracy of capillary blood glucose testing may be compromised due to the examination procedure and equipment employed. If a pregnant woman is unable to do the fasting, she should still be tested by administering 75 g of glucose solution. GDM can be established if the venous

blood glucose value after 1 hour is ≥ 180 mg/dL or after 2 hours is ≥ 153 mg/dL. For capillary blood tests, the thresholds are 1-hour ≥ 191 mg/dL or 2-hour ≥ 162 mg/dL. To improve pregnancy outcomes, the guideline recommends that women maintain their blood glucose levels within specific targets. These targets include fasting blood glucose levels < 95 mg/dL, and blood glucose levels of less than 140 mg/dL one hour after a meal or less than 120 mg/dL two hours after a meal. Regular education on appropriate weight gain and lifestyle interventions should be provided throughout pregnancy. Nutritional counselling, conducted by a nutritionist, is essential to help women achieve their target body weight and blood glucose levels. However, it is worth noting that the guideline does not emphasise the importance of exercise. For cases of uncontrolled GDM after the implementation of lifestyle modifications, the guideline recommends insulin administration. Metformin is identified as an alternative to insulin, though it is important to note that metformin has the ability to cross the placental barrier.

The guideline encourages women with GDM to start breastfeeding immediately after childbirth to minimise the risk of neonatal hypoglycaemia and continue breastfeeding for 6 months postpartum. This practice helps reduce the likelihood of obesity and diabetes in the child, while also lowering the risk of type 2 diabetes and hypertension in the mother. Women are advised to undergo a re-examination with a TTGO 75 grams between 4-12 weeks postpartum to eliminate the possibility of developing diabetes after childbirth. If the results are normal, they should continue to undergo re-examinations every 1-3 years (MoH, 2020).

However, anecdotal evidence suggests that GDM testing is not commonly practised in public healthcare facilities in Indonesia. Urine glucose testing is generally used to detect the presence of glucose (Morris et al., 1981), and it is not recommended for identifying GDM. This practice is due to the fact that the urine glucose test is considered to have insufficient sensitivity (Chen, J. et al., 2019), and it presents after a substantial increase in blood glucose levels. Therefore, the utilisation of a urine test may not detect GDM until it has reached an advanced stage, which could potentially result in a delay in diagnosing and treating the

condition. In 2018, only 34% of women received a urine glucose-protein test during pregnancy in 2018.

1.5.5 Research on GDM in the context of Indonesia

There are three quantitative studies identified during the process of background reading (Amiruddin et al., 2016; Sunjaya, A.P. and Sunjaya, 2018; Sunjaya, A.F. and Sunjaya, 2019). The first quantitative study employed observational analytics with a retrospective design. The study recruited 135 women, of which 45 women had prediabetes or GDM (case group) and 90 women did not have prediabetes or GDM (control group). It revealed that women who consume less fibre and coffee have a higher risk of diabetes and GDM (Amiruddin et al., 2016). The second and third studies were identical (same population, authors, data source, and data collection timeframe). These studies employed a small sample size of 45 pregnant women with gestational and pregestational diabetes. The second study reported that women with poor glycaemic control have a higher risk of infant mortality, while the third study showed that adequate Medical Nutrition Therapy (MNT), a treatment based on nutrition, provides the same outcomes as insulin therapy. Moreover, three qualitative research studies were identified (Mufdlilah et al., 2020a; Mufdlilah et al., 2020b; Subarto et al., 2022). All studies were conducted in the city of Yogyakarta, which mainly focused on exploring the difficulties of GDM management from women's perspectives. These three studies will be discussed further in Chapter 2 (qualitative systematic review). These relatively new studies show the growing attention towards GDM in Indonesia.

The limited research about GDM in Indonesia contributes to the lack of available evidence on GDM, which leaves issues such as the true prevalence, the magnitude of the problem, and the current management practices and care pathways of GDM unexplored. Given the complexity of the issue of GDM in Indonesia, there is a need for contextual information and an in-depth understanding of the problem. Moreover, the risk factors of GDM in Indonesia, such as overweight, obesity, and a high number of pregnancies experienced by women, could mean that there is a potentially high number of unidentified GDM

cases within the population. These factors increase the necessity to further explore GDM in the context of Indonesia.

The limited number of qualitative research studies in Indonesia has resulted in a lack of exploration into the experiences of women and healthcare professionals. The collaboration between women and healthcare professionals in managing glucose levels determines the outcomes of pregnancy (Ge et al., 2017). Successful collaboration may enhance women's ability to receive optimal health education from healthcare professionals. This is important because women with GDM need to adhere to a strict routine of management, including maintaining their glucose levels and making lifestyle changes (Ge et al., 2017). Qualitative research that explores 'how women and healthcare professionals in Indonesia experience, understand, and have knowledge about GDM in real-life contexts is considered essential. Such research can provide rich evidence about GDM, which may inform research-based interventions in the future. Therefore, this study aims to explore the experiences, knowledge, and understanding of GDM among women and healthcare professionals in the Indonesian context.

1.6 Aim and objectives of the study

Aim: To explore the experiences, knowledge, and understanding of gestational diabetes mellitus (GDM) among women diagnosed with GDM and the healthcare professionals responsible for their care in the context of Indonesia.

Objectives:

1. To gain an understanding of the experiences of pregnant and postpartum women with GDM by reviewing and synthesising the existing studies within the context of Low- and Middle-Income Countries (LMICs).
2. To explore experiences, knowledge, and understanding of women diagnosed with GDM in Indonesia.
3. To explore experiences, knowledge and understanding of GDM among healthcare professionals with varying roles within maternity care services.
4. To explore how GDM is identified and managed in routine practice delivered by healthcare professionals at a public health centre.

5. To identify the presence of national/local guidelines for GDM and assess the extent to which they are utilised to guide practices at a public health centre.

1.7 Structure of the study

Two phases of the study are proposed to achieve the objectives. The first phase will be a qualitative systematic review to address objective 1, while the second phase will be a single exploratory case study to address objectives 2 to 5. An illustrative figure of the phases can be seen in Figure 1.

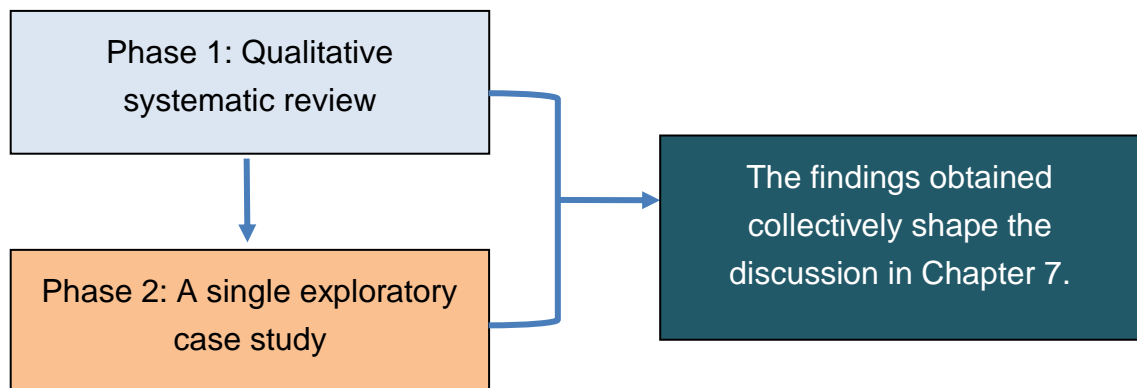


Figure 1 The illustration of the phases of this doctoral research project

1.8 Summary box

- GDM is an increasingly significant public health issue
- There is a lack of consensus at the global level pertaining to testing, diagnostic thresholds, and management for GDM
- Determining the precise scope of the worldwide GDM issue and comparing its prevalence across countries poses challenges due to the absence of consensus
- Generally, there is a lack of information about GDM in LMICs
- In the context of Indonesia, only limited studies have been done on GDM, resulting in a scarcity of information regarding this condition

Chapter 2 Literature Review

2.1 Introduction

In this chapter, a comprehensive qualitative systematic review is presented employing the esteemed Joanna Briggs Institute (JBI) methodology. The purpose of this review is to analyse and synthesise the subjective experiences of women living with GDM in the context of low and middle-income countries (LMICs), as found in existing qualitative research. The objective of this systematic review is to identify and address areas of limited knowledge and provide a comprehensive understanding to inform future qualitative research, policy formulation, and practical applications around GDM issues. Details of the review process are also provided, covering the aim of the review, methods, data synthesis, and findings. Subsequently, a discussion to identify the gaps in the evidence base is presented, followed by the strengths and limitations of this review.

2.2 A qualitative systematic review of experiences of pregnant and postpartum women with GDM in LMICs

The current situation regarding GDM in LMICs is relatively unknown (Macaulay et al., 2014; Nguyen et al., 2018; Nguyen et al., 2019). Despite the uncertainty related to its prevalence, it is crucial to understand the experiences of women living with GDM in LMICs. By understanding these women's experiences, the complexities of the phenomenon of GDM management from the women's perspective can be pictured. This understanding may inform healthcare professionals on how to improve the quality of care based on evidence-based practice, pay attention to women's needs, and inform future research.

The experience of women with GDM is a multifaceted phenomenon, shaped by a myriad of personal, cultural, and societal factors (Hjelm et al., 2021). Reviews focusing on qualitative research regarding women's experiences with GDM in LMICs have not been identified to date. To unpack this phenomenon, a qualitative systematic review approach is necessary. This approach provides the ability to dive into details, including views, perspectives, and beliefs, and to capture women's subjective experience and understanding (Seers, 2015), aspects often

overlooked in quantitative reviews. In this review, a qualitative systematic review is employed to synthesise primary qualitative studies that have reported the experiences of women with GDM, aiming to develop an overarching understanding of the phenomenon.

There are numerous methods for conducting a qualitative systematic review, and there is no explicit guidance on how to determine the most suitable method for a review objective (Hannes and Lockwood, 2012). When selecting an appropriate method, various factors such as expertise, available resources, and timeframe must be taken into account. Given the comprehensive nature of all qualitative synthesis methods, it is beyond the scope of this study to examine them all in detail. However, in this chapter, three commonly employed methods will be explored: meta-ethnography, thematic synthesis, and the aggregative method (Hannes and Lockwood, 2012). This exploration will help inform the decision regarding the ultimate approach for this review.

a) Meta-Ethnography

Meta-Ethnography provides the ability to translate metaphors, themes, and concepts from original research into the framework of other studies, leading to a rich and comprehensive interpretive synthesis (Hannes and Lockwood, 2012). This method facilitates the development of higher-order theoretical frameworks that can incorporate both qualitative and quantitative evidence. It is particularly suitable for gaining a deep understanding of complex phenomena and is widely esteemed for its conceptual depth (Noblit and Hare, 1988). However, there is a lack of clear guidance on sampling, which can potentially lead a novice researcher to encounter ambiguity or bias (Noblit and Hare, 1988). Meta-Ethnography might also require a significant amount of time due to its comprehensive and interpretive nature (Booth et al., 2016). Moreover, it demands a substantial level of expertise in qualitative research, which could be challenging for an inexperienced researcher.

b) Thematic Synthesis

Thematic synthesis allows for the inductive grouping of themes into overarching categories that capture similarities, differences, and relationships, aiming to generate hypotheses about the studied phenomenon (Lipworth et al., 2009).

Thematic Synthesis is designed to offer guidance for practitioners and is flexible enough to accommodate various methods in primary research. It involves a balance between description and theory development, making it beneficial for a deeper understanding of complex phenomena. One limitation of this method is its lack of structure, and it requires substantial iteration, which might be challenging for a novice researcher (Hannes and Lockwood, 2012).

c) Aggregative Method

The aggregative method combines research findings to produce a summary or overall description of the studied phenomenon. Concepts must be identified in advance, and it requires comparability among primary research studies in terms of research method and question (Hannes and Lockwood, 2012). This method is practical for developing policy recommendations and is supported by the available approach from Joanna Briggs Institute (JBI). Its systematic and pragmatic nature makes it approachable for novice researchers, contributing to efficient project management and saving resources in terms of theoretical and methodological training (Lockwood et al., 2020).

Considering the constraints of being a novice researcher with limited time and resources, the Aggregative Method by JBI appears to be the most suitable approach for conducting the qualitative systematic review. The JBI approach to conducting a qualitative systematic review is structured and systematic, offering a more manageable and efficient timeframe for beginners (Booth et al., 2016). While each method has its unique strengths and weaknesses, Meta-Aggregation emerges as the most pragmatic and efficient choice, given the specific circumstances and constraints (Lockwood et al., 2020). Once the researcher, in consultation with the supervisory team, decided on the review method, comprehensive training was undertaken through the JBI comprehensive systematic review training programme.

JBI approach provides robust guidance throughout its process, starting from how to develop an informative and clear title to interpreting the 'confidence' of the established evidence. The approach offers a critical appraisal tool (see Appendix A) and a template for presenting results (refer to Table 4). The approach also

provides a data extraction tool (refer to Appendix B) that enables the researcher to extract similar data across all included studies. Additionally, a template for an overview flowchart is available to assist the researcher in structurally presenting review findings (see Figure 3). In addition, the JBI approach has developed a ranking system called ConQual, allowing the researcher to assign the 'confidence' level of the result (Lockwood et al., 2020).

This chapter presents the findings from the qualitative systematic review conducted to explore the experiences of pregnant and postpartum women with GDM in LMICs. The systematic review includes 24 qualitative studies that describe the women's experiences when being diagnosed for the first time, explore their concerns, challenges, and efforts in managing GDM, and their experience with healthcare services. These studies vary in their focus, approach, and time period. Therefore, it is useful to synthesise the evidence regarding the experience of women with GDM on a global scale as they deal with their condition.

2.2.1 Aim

The aim of this review is to understand and synthesise the current evidence of the experience of GDM among pregnant and postpartum women diagnosed with GDM in LMICs.

2.2.2 Methods

In this review, four components of the JBI qualitative systematic review approach were utilised. These components include the search strategy to identify potential studies, critical appraisal of the methodological rigour of the primary studies, extraction of the data from the selected studies, and synthesis of the collected data (Lockwood et al., 2020).

2.2.3 Review question

The review question is as follows: What are the experiences of pregnant and postpartum women diagnosed with GDM within the context of LMICs?

2.2.4 Search strategy

A systematic search was conducted to locate all relevant published studies. The search terms were determined using the PICO framework, which considers population, phenomena of interest, and context were used (see Table 2). An initial limited search of database such as MEDLINE, CINAHL, EMBASE, PsycINFO, and Social Science Citation Index was carried out in October 2019 to identify articles related to the topic. Comprehensive keywords, text words contained in the titles and abstracts of relevant articles, and the index terms were used to develop a complete search strategy, with assistance from an information specialist (see Appendix C). Additionally, the reference lists of all studies selected for quality appraisal were screened to identify any additional relevant studies.

Table 2 Overview of search terms used in the search strategy

PICO component	Terms overview in this review
P – population	Women diagnosed with GDM in pregnancy or postpartum period
I – Phenomena of interest	Experiences, views, perceptions, beliefs, perspectives, meanings and understandings of GDM
Co – Context	Low and Middle-Income Countries (LMICs), regardless of the location of data collection (e.g. hospital, community)

2.2.5 Eligibility criteria

Below is the table of the inclusion criteria used for searching and reviewing the studies.

Table 3 Inclusion criteria

	Inclusion criteria
1	Peer-reviewed empirical qualitative studies or qualitative data from mixed methods studies
2	Primary studies conducted in the LMICs setting
3	Studies reporting qualitative data collected from pregnant and/or postpartum women with GDM as participants
4	Papers written in English
5	Studies conducted from 2010 to the present

This review considered qualitative studies from peer-reviewed journals to enhance the credibility and validity of the review. Studies published in journals typically undergo expert review before dissemination. These studies aimed to explore the experiences of women with GDM in LMICs, a group classified by the World Bank based on the income classification of economies for the fiscal year (The World Bank, 2019). The research consists of various designs and methods such as phenomenology, grounded theory, ethnography, qualitative description, qualitative content analysis, and thematic analysis. Qualitative data from mixed methods studies were also included. For the purpose of this review, only studies published in English were considered, due to a lack of translation resources. Studies published from 2010 onwards were considered, as background reading indicates that the first study focusing on the experience of women with GDM in LMICs was conducted in 2010 (Doran and Davis, 2010). This study was later featured in a qualitative systematic review by Parson et al. in 2014, which examined the experience of women with GDM on a global perspective setting, encompassing both high-income and low-middle-income countries (Parsons et al., 2014).

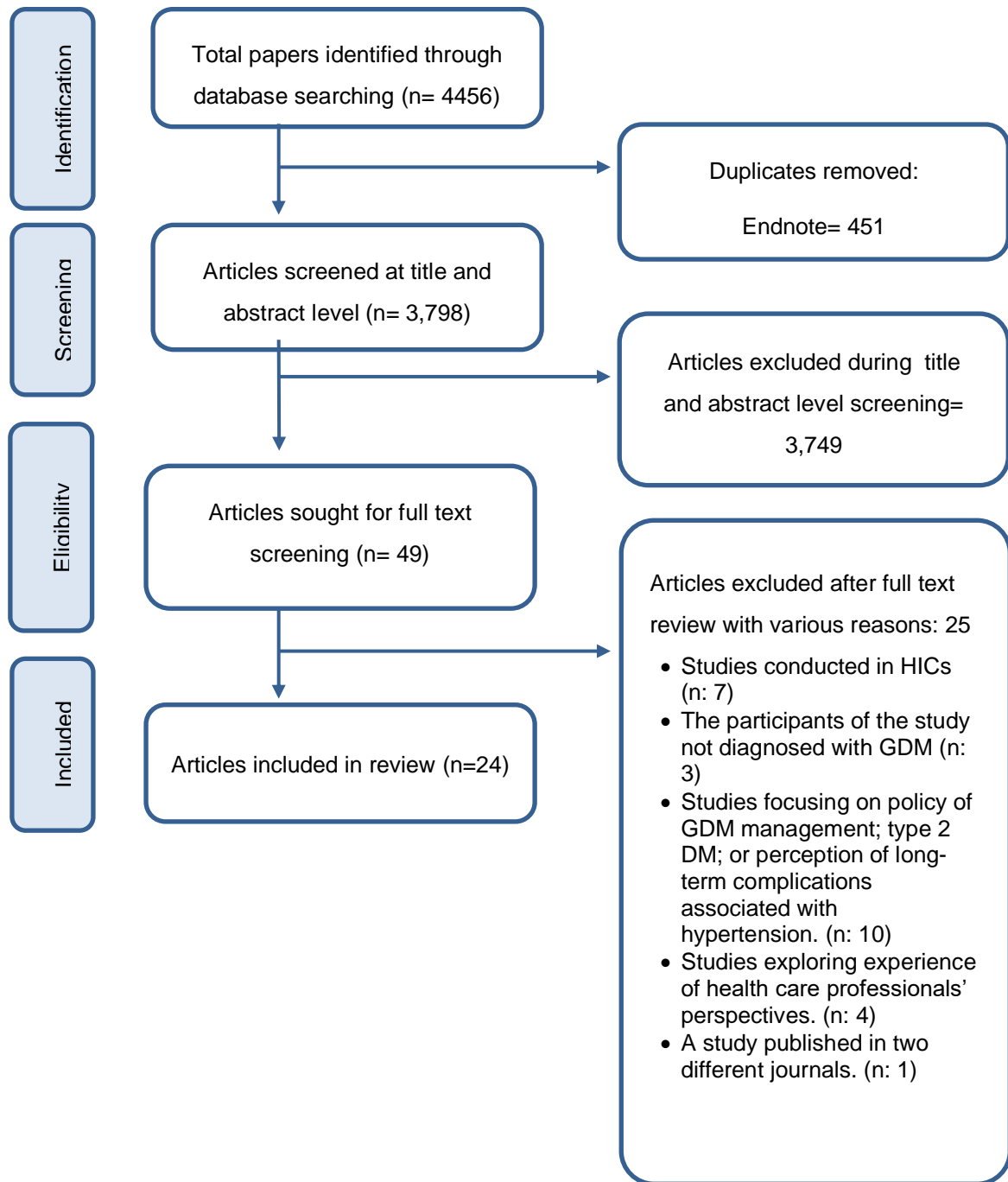
It is important to note that women from high-income countries are expected to have different experiences with GDM compared to women residing in low- and middle-income countries. These differences include not only the availability and quality of

healthcare resources and services but also the cultural dynamics within their respective communities. Therefore, it is essential to conduct a review that specifically focuses on LMICs to gain a comprehensive understanding of the experiences encountered by women in those regions.

2.2.6 Study selection

The process of searching that ultimately led to selecting studies for inclusion is outlined in the adapted PRISMA flowchart (Moher et al., 2009). A total of 4,456 studies were initially identified (see Figure 2). These studies were organised using Endnote, and duplicates were removed. The remaining results were then imported and managed in Rayyan, a web-based tool designed for evaluating references in systematic reviews and extensive literature reviews at no cost. This tool was employed for re-identifying duplicates and conducting manual screening, which involved reviewing titles and abstracts. During the manual screening process, 3,749 studies that did not meet the criteria for qualitative studies were excluded. Potentially relevant studies were retrieved in full (n=49). The full text of selected studies was thoroughly assessed. Consultation with the supervisory team was carried out to ensure the accuracy of the assessment results. This rigorous process resulted in a total of 24 studies that met the eligibility criteria for inclusion.

Figure 2 PRISMA flow diagram for selection of studies



2.2.7 Assessment of methodological quality

The purpose of conducting a quality appraisal of the included studies was to evaluate the validity of the methodology and to assess any potential biases in its design and analysis (Lockwood et al., 2020). All studies were subjected to rigorous assessment using the ten questions (Q) of the JBI critical appraisal checklist for qualitative research, with responses marked as a “yes (Y)”, “no (N)” or “unclear (U)”. It was decided not to exclude studies regardless of the result of the quality appraisal, as even low-quality studies might reveal valuable findings (Pawson, 2006). Furthermore, including low-quality studies may be necessary to provide a broader picture of the available evidence in LMICs, helping the identification of areas for further exploration. Table 4 below presents the quality assessment results of the included studies.

The majority of the included papers (n= 24) were qualitative studies, with only one paper reporting a mixed-method study. The following section provides a summary of the methodological quality of the included studies based on the JBI quality appraisal questions (Q1 to Q10) for qualitative research.

1. Congruity between the stated paradigm and research methodology (Q1).
One study explicitly mentioned the underlying paradigm of its study, which was an interpretive study (S15). However, all other studies did not explicitly mention their paradigm. Most of these studies stated that they employed a qualitative design, but this statement did not define the underlying philosophy of the study, making the congruity unclear.
2. Congruity between research methodology and research objectives (Q2).
All included studies clearly mention their methodology and the objectives; and there was congruity between them.
3. Congruity between research methodology and methods to collect data (Q3)
All included studies clearly stated the specific method(s) used in data collection, and the congruity between the method(s) and the methodology can be ascertained.
4. Congruity between research methodology and representation and analysis of data (Q4).

The majority of the studies provided clear steps on the data analysis process, while one study (S7) had limited information on how its data were analysed. The congruity between the research methodology and the representation and analysis of the data was confirmed as the studies' data presented the phenomena of interest.

5. Congruence between research methodology and interpretation of result (Q5).

All studies had a result section that reflected the authors' interpretation of the data, and its congruence with the methodology was identified.

6. Locating the researcher culturally or theoretically (Q6).

Six studies showed the authors' awareness of locating themselves theoretically in the study (S4, S12, S13, S15, S20, S21). This suggested that their previous experience may influence the interpretation of findings. Other studies were lacking information regarding this issue.

7. Influence of the researcher on the research and vice-versa (Q7).

Eight studies mentioned the possible influence of the researcher on their studies (S1, S2, S4, S12, S13, S15, S20, and S21), while other studies did not provide information in this regard.

8. Representation of participants' voices (Q8).

All studies' results section were supported by participants' quotations, indicating that the representation of participants' voices was considered.

9. Ethical approval (Q9).

The majority of the studies have gained ethical approval from ethical committees, while two studies (S1 and S5) did not include information regarding ethical approval. Sufficient details on how ethical issues such as informed consent, the right to withdraw, and anonymity were maintained and provided in the studies. However, two papers merely mentioned the approval from an ethical committee (S10, S11).

10. Relationship of conclusions to analysis or interpretation of data (Q10).

The conclusions in the studies were based on their reported findings, ensuring a clear link between the data presented in the finding sections and the discussion or conclusion.

Table 4 Methodological quality of included studies (n=24)

Citation	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Rafii et al., 2017	U	Y	Y	Y	Y	N	Y	Y	N	Y
Khooshehchin et al.,2016	U	Y	Y	Y	Y	N	Y	Y	Y	Y
Kolivand et al., 2018	U	Y	Y	Y	Y	N	N	Y	Y	Y
Nielsen et al., 2020	U	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sundarapperuma et al., 2018	U	Y	Y	Y	Y	U	N	Y	N	Y
Hirst et al., 2012	U	Y	Y	Y	Y	U	N	Y	Y	Y
Suraiya AHS et al., 2015	U	Y	Y	Y	Y	N	N	Y	Y	Y
Youngwanichsetha et al., 2016	U	Y	Y	Y	Y	N	N	Y	Y	Y
Subarto et al., 2022	U	Y	Y	Y	Y	N	N	Y	Y	Y
Mufdilah et al., 2020	U	Y	Y	Y	Y	N	N	Y	U	Y
Mufdilah et al., 2020	U	Y	Y	Y	Y	N	N	Y	U	Y
Ge et al., 2015	U	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ge et al., 2016	U	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ge et al., 2016	U	Y	Y	Y	Y	N	N	Y	Y	Y
Ge et al., 2017	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Shang et al., 2021	U	Y	Y	Y	Y	U	U	Y	Y	Y
Doran et al., 2010	U	Y	Y	Y	Y	U	N	Y	Y	Y
Mensah et al., 2019	U	Y	Y	Y	Y	U	N	Y	Y	Y
Zalwango et al., 2021	U	Y	Y	Y	Y	N	N	Y	Y	Y
Muhwava et al., 2020	U	Y	Y	Y	Y	Y	Y	Y	Y	Y
Muhwava et al., 2020	U	Y	Y	Y	Y	Y	Y	Y	Y	Y
Dickson et al., 2020	U	Y	Y	Y	Y	U	U	Y	Y	Y
Mukona et al., 2017	U	Y	Y	Y	Y	N	N	Y	Y	Y

Utz et al., 2016	U	Y	Y	Y	Y	N	U	Y	Y	Y
% Yes	4,1	100	100	100	100	25	33.3	100	83.3	100

Q: Question; Y: Yes; N: No; U: Unclear

2.2.8 Data extraction

During the data extraction process, the standardised format from JBI was utilised. The process involves extracting key characteristics as well as the findings and illustrations from the selected studies. Key study characteristics such as participant information, context, methods for data collection, and analysis, were extracted from the primary studies.

2.2.8.1 Characteristics of the reviewed studies

All included studies (n=24) were published between 2010 and 2022. They were conducted in 14 countries. These studies are five studies from China (S12, S13, S14, S15, S16), three studies from Iran (S1, S2, S3), three studies from South Africa (S20, S21, S22), three studies from Indonesia (S9, S10, S11), and one study for each of the following countries: Ghana (S18), Malaysia (S7), Zimbabwe (S23), Thailand (S8), Sri Lanka (S5), Morocco (S24) Tonga (S17), Vietnam (S6), Uganda (S19), and India (S4). Out of these studies, fourteen studies were conducted in hospital or clinic settings (S2, S6, S8, S12, S13, S14, S15, S16, S18, S19, S20, S21, S22, S23), four studies were situated in health centre settings (S7, S9, S10, S11), and one study was conducted both in a hospital and health centres (S3). In addition, there were five studies carried out in community settings (S1, S4, S5, S17, S24). The studies involved pregnant participants ranging from 20 to 38 weeks of pregnancy or postpartum women. The majority of the studies (n=17) utilised interviews as the data collection method, three studies used focus group discussion (FGD) (S5, S6, S22), and four studies employed both FGD and interviews (S19, S20, S21, S23). Sample sizes ranged from 6 to 62 participants, with a total of 430 participants included in this review. The journey of dealing with GDM for women typically started with screening, diagnosis, blood glucose monitoring during pregnancy, and postpartum follow-up care. For the majority of the studies, the primary focus was on issues related to glucose monitoring. However, two studies placed more emphasis on the experience of women with

GDM screening and diagnosis (S24, S22), while three studies explored GDM management during the postpartum period (S1, S5 and S16). For the details of characteristics of the studies, refer to Appendix D.

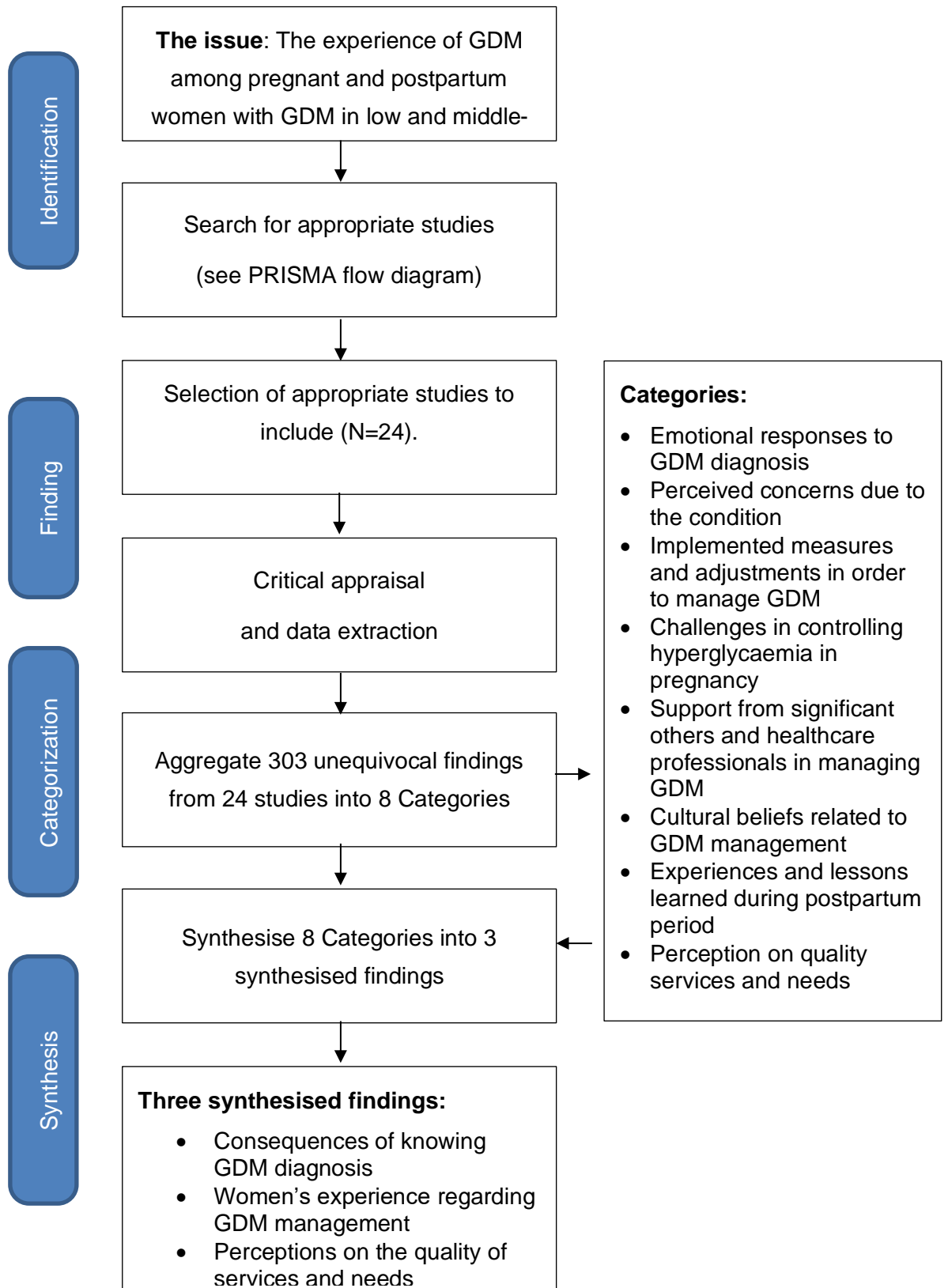
2.2.8.2 Extracting findings and illustrations

The next step is the extraction of findings and illustrations. In this review, a **finding** refers to an extracted verbatim of the results presented in the included primary studies, which reflect the interpretation of the author. Meanwhile, an **illustration** can be either a direct quotation or other data that corroborates a finding. During the extraction of findings, consistency was maintained at the sub-theme or theme level, depending on the availability in each study (for an example of data extraction, refer to Appendix E). Findings were assigned a level of credibility including “unequivocal” (if a finding is well-illustrated), “credible” (if it contains an illustration but lacks a clear association), or “unsupported” (if a finding is not supported by data), as per the recommendations in the JBI reviewer’s manual (Lockwood et al., 2020). Findings that were assigned “unsupported” were excluded from the review.

2.2.9 Data synthesis

This review adhered to three steps of the JBI approach on data synthesis. It began with data extraction from primary studies (as indicated in the data extraction section). Then, categories were built based on findings with similar meaning, and synthesised findings were developed (see Appendix F for the category development). Following that, the focus moved from the primary studies to the gathered findings in order to develop categories by identifying two or more similar findings that described concepts based on the perspective of the reviewer. Once the categories were created, the synthesis process was performed by developing an overarching statement that reflected a group of categories to produce a comprehensive set of synthesised findings (see Figure 3) (Lockwood et al., 2020).

Figure 3 Qualitative review overview flowchart (JBI format)



2.2.9.1 Synthesised finding 1: consequences of knowing GDM diagnosis

The included studies have illustrated that knowing the diagnosis of GDM has significant consequences for women. Women who were initially informed about their GDM diagnosis expressed shock and confusion, indicating their disbelief. In the midst of this information gap, fear of the condition started to take hold, leading to various concerns. These concerns included apprehensions about whether GDM would negatively affect their pregnancy outcomes and the potential of adverse impact on their own short- and long-term health.

Category 1: Emotional responses to GDM diagnosis

Eleven previous studies highlighted women's emotional reactions when learning that they were diagnosed with GDM (S6, S9, S11, S13, S15, S16, S18, S19, S20, S21, S22). Initial responses to the diagnosis were mainly characterised by negative emotional reactions. Women reported feelings of shock and surprise upon receiving the diagnosis for the first time. They also described being anxious, confused, scared, and frightened of the impact of GDM, such as premature birth and intrauterine growth restriction. The studies revealed a lack of knowledge and understanding about GDM, which often led to denial and doubt regarding the diagnosis. The condition was perceived as a burden, resulting in distress and sadness among women. The feelings of guilt and self-blame were mentioned due to their perception of an insufficient attempt to protect their health.

Category 2: Perceived concerns due to the condition

Upon receiving a diagnosis of GDM, women often grapple with a range of concerns as highlighted in several studies (S4, S6, S8, S9, S12, S15, S16, S17, S20, S21, S22). Upon being informed about the presence of hyperglycaemia, the women were in constant fear of rising blood glucose levels. An ANC visit can serve as an anxiety-inducing moment for some women, as it involves blood glucose checking, which evokes fear and worries. Various descriptions of the emotion of worry were revealed, encompassing worry for the baby's well-being, inability to meet societal expectations, and the requirement of daily treatments. Several women were concerned about performing glucose self-test, injections, and consuming glucose-lowering medication on a daily basis. Despite needle-related

fears, concerns around potential effects on the baby caused by glucose-lowering agents result in a preference for insulin. Insulin was considered safer, more 'natural,' and harmless for the baby, regardless of the challenges in its accessibility highlighted in one study.

The fear of caesarean sections and the desire to experience a 'normal delivery' were expressed. Concerns about the longer time in scar healing following the caesarean section were evident. Moreover, apprehensions were stated regarding the complexity of glucose management in the postpartum period, such as financial difficulties, time constraints, and limited resources following childbirth. Disease transmission through breast milk led the women to worry about breastfeeding. Several women were reportedly abstaining from breastfeeding because of this particular reason. Long-term impacts that may occur, such as type 2 diabetes (T2DM) in women and the potential risk of disease for their offspring, were also of concern for some women.

2.2.9.2 Synthesised finding 2: women's experience regarding GDM management

This theme elaborated on women's experiences managing GDM, encompassing its barriers and facilitators. Lack of knowledge and understanding of the condition is one of the main barriers, while family support is an important facilitator. The efforts of women engaging in glucose level management after GDM diagnosis will also be explored.

Category 1: Challenges in controlling hyperglycaemia in pregnancy

This theme explored the challenges faced by women with GDM in controlling glucose levels, which were described in studies S1, S2, S4, S5, S6, S7, S9, S11, S12, S13, S14, S15, S16, S17, S18, S20, S21, S22, S23. Pregnancy-related difficulties, such as fatigue, physical discomfort, and lack of motivation, were reported as challenges in managing GDM. The constant monitoring and the excessive scrutiny of healthcare professionals contributed to feeling overwhelmed and helpless. The challenges in adhering to the dietary recommendations from healthcare professionals were manifold, including cravings, difficulty in calculating the appropriate amount of food, and societal food norms. Some women openly

spoke about occasionally deviating from the recommended diet as a coping mechanism. Financial constraints in obtaining healthier food further enhanced the complexity of regulating a healthy diet. Moreover, women frequently overlooked physical activity as an essential component of GDM management. The lack of knowledge about suitable exercises and the safety concerns are contributing factors to their limited engagement. Physical activity was not a regular recommendation from healthcare professionals when developing a management plan.

Several studies in this review have demonstrated a significant lack of knowledge about GDM among women and healthcare professionals. This lack of awareness often leads to the view that GDM is a less severe condition. Additionally, this view is reinforced by the influence of others who also consider GDM as insignificant. Moreover, the absence of physical symptoms can create a perception of good health despite GDM diagnosis. These attitudes may contribute to irregular monitoring of blood glucose levels.

Category 2: Implemented measures and adjustments in order to manage GDM

Despite the challenges involved, some measures to manage GDM were reported in various studies (S1, S2, S4, S6, S8, S9, S10, S11, S15, S16, S17, S20, S21, S22). These measures included performing glucose self-check and actively pursuing GDM-related information from a variety of sources such as magazines, healthcare provider and online resources. To improve their condition, women made lifestyle changes. Adopting healthy diets, food craving controls, and the consumption of unpalatable foods were the adjustments to manage GDM. With limited knowledge, some women experimented with various dietary sources to determine which options were suitable for them. The frustration associated with dietary control proved challenging for pregnant women, and some continued to experience disappointment on this issue even after childbirth. Another lifestyle modification was the women's engagement in physical activity. While exercise was often overlooked, a few women reported activities such as walking or doing household chores as forms of physical activity. In addition, the utilisation of

pharmacological interventions such as metformin, glyburide, or insulin was mentioned in a few studies.

Category 3: Support from significant others and healthcare professionals in managing GDM

This theme discussed the support women received to manage GDM (S2, S3, S4, S7, S9, S15, S16, S18, S21, S22). Inadequate family support was identified as a significant challenge in managing GDM. Several women viewed their family as a challenge and expressed a desire for more support. However, others frequently cited the family as the main source of support and experienced significant encouragement from them. Societal support from peers, community, and elderly relatives was expected to be improved. The presence of a supportive social environment was important for making lifestyle adjustments, and community support was considered essential. Joining groups, such as social media conversations for pregnant women with GDM, provided moral support and courage to manage the condition. In addition, only a few women mentioned obtaining informational support from healthcare professionals.

Category 4: Cultural beliefs related to GDM management

This theme explored the wider cultural and religious beliefs in society related to gestational diabetes mellitus (GDM) (S3, S4, S5, S6, S9, S12, S16). Findings revealed that women frequently engaged in religious practises to attain health and to seek psychological comfort, such as worshipping Buddha or praying to God (Allah). They believed that positive thinking and connection to a higher power could provide the inner peace necessary to confront any challenge, including GDM. Some women also sought solace by consulting fortune-tellers or traditional healers.

The findings showed certain beliefs related to traditional dietary choices aimed at improving the glucose levels of postpartum women, such as *thambunhodi* (a traditional food in Sri Lanka is prepared with garlic, *karapincha* (curry leaves), and pepper). However, certain foods were restricted due to the belief that they may attract supernatural disturbances, such as fried meat and fish, while eggs were believed to cause retained placenta. In addition, women reported that the dietary

recommendations provided by healthcare professionals frequently contradicted their local and individual perceptions of what constituted appropriate and healthy eating. For instance, advice to avoid consuming juice was considered as counterintuitive based on their cultural and personal beliefs, as women perceived that juices contained sugar and vitamins, which were considered healthy.

Category 5: Experiences and lessons learned during the postpartum period

This theme discussed women's experience during the postpartum period and lessons learned from the pregnancies impacted by GDM, as seen from women's perspectives (S1, S2, S6, S9, S11, S15, S20). The studies revealed that supporting factors for undergoing postpartum testing included awareness of the importance of the test, the perceived severity of potential adverse outcomes in the future, and the consideration of potential harm if they neglected the test. This awareness and motivation often stemmed from receiving information from healthcare professionals, receiving encouragement from family members, or sharing information with significant others who have diabetes.

On the other hand, the findings highlighted a number of factors that discouraged women from undergoing postpartum glucose testing. Disbelief in the potential impact, the perception of being healthy, and the belief that breastfeeding normalizes glucose levels increased the reluctance of postpartum women to undergo testing. Additionally, numerous domestic responsibilities, procrastination, and unsupportive circumstances at health centres led women to forego glucose testing.

A few women considered knowing the GDM diagnosis to be a "learning moment." They believed that being aware of the diagnosis and the possibility of developing 'real' diabetes in the future led individuals to start altering their lifestyles. However, for some others, they perceived that there were no longer any restrictions on carbohydrate consumption after childbirth. Women who were unaware of the long-term consequences of GDM were more likely to lack adherence to healthy diets after delivery.

2.2.9.3 Synthesised finding 3: perception on quality services and needs

This review revealed dissatisfaction among women with the GDM-related services (S2, S3, S4, S6, S7, S10, S11, S14, S15, S17, S18, S20, S21, S22, S24). The health services around GDM management were experienced differently by rural and urban women, particularly in terms of dietary management. Findings suggested that urban women found it easier to adhere to dietary recommendations due to their familiarity with recommended healthy diets.

Women discussed the challenges they faced in accessing adequate services at healthcare facilities, including long-distance travel, difficulties in making appointments, and overcrowding at the health facility due to high patient volume. The findings revealed a scarcity of medical supplies, such as a limited number of glucose test strips, as well as a lack of staff. As a result, healthcare professionals had limited time to engage with each patient, leading to inadequate client-provider interaction. Thus, women expressed the desire for one-on-one counselling sessions, especially regarding healthy diets. In addition, women had concerns about the lack of comfort and privacy in healthcare facilities due to the large number of patients.

The attitudes of healthcare professionals during service provision were highlighted. The healthcare professionals were perceived as displaying a lack of empathy, especially towards women who had poor understanding of GDM. Expression of anger towards healthcare professionals was evident in one study, as they were considered judgmental and inclined to blame the women. The practice of restricting women from being accompanied by family members during glucose testing was perceived as unfriendly.

Concerns were expressed regarding the quality of services provided and the inconsistent GDM-related health information provided by different healthcare professionals or different health facilities. It was believed that healthcare professionals needed more knowledge and skills to manage GDM and to play a more active role in educating women about GDM, starting from early pregnancy or even before marriage. There was a lack of tailored and continuous care for

women, especially during the postpartum period. The need for clearer information was emphasised, beyond merely distributing a leaflet.

2.3 Discussion

Within this qualitative systematic review, three main synthesised findings emerged from the analysis of the 24 included studies. The experience of living with GDM in LMICs from women's perspective is discussed below.

2.3.1 Synthesised finding 1: consequences of knowing GDM diagnosis

The synthesised finding 1 exploring the consequences of knowing GDM diagnosis delves into the initial reactions and concerns arising from the lack of knowledge among individuals upon receiving such a diagnosis. Understanding the emotional and cognitive responses to the diagnosis is crucial in comprehending the broader impact on individuals' lives, as inadequate awareness contributes to heightened concerns about the disease and its implications.

1) Initial reactions towards diagnosis

The first synthesised finding on the consequences of knowing GDM diagnosis emphasised how women undergo emotional reactions toward the diagnosis. Research evidence in this review shows that learning about a GDM diagnosis elicits shock and creates negative emotional responses, such as anxiety, guilt, and fear. These emotions experienced by women in the LMICs context are echoed in studies conducted in high-income countries (HICs) where women experienced similar feelings (Persson et al., 2010; Bandyopadhyay et al., 2011a; Carolan, 2013; Carolan-Olah et al., 2017). Generally, women were surprised and 'not ready' to learn about the diagnosis for the first time.

2) Lack of knowledge about GDM

Furthermore, this review highlights the lack of knowledge and understanding among the majority of women diagnosed with GDM in LMICs. This lack of awareness might be one of the main factors that potentially create a diverse array of concerns among women. Learning about the diagnosis without being armed with sufficient knowledge about GDM can result in purported harms (He et al., 2021). In

this study, counterproductive fears are included, such as worry about attending antenatal visits, breastfeeding, and using insulin. However, a GDM diagnosis could be a "learning moment" for those who are aware of the possible negative outcomes in the future. A study showed that women who possess knowledge can encounter the diagnosis better compared to those who have a limited understanding of GDM (Craig et al., 2020). It is essential to ensure that healthcare professionals provide sufficient knowledge about GDM while informing the diagnosis.

2.3.2 Synthesised finding 2: women's experience regarding GDM management

Within the realm of women's experiences concerning GDM management, this finding shows the intricate dynamics surrounding perceptions of managing GDM. It explores the challenges posed by their cultural and religious beliefs in the context of GDM management, shedding light on the multifaceted aspects that influence their decision-making and coping strategies.

1) Perceptions about GDM management

The perception that GDM management is a difficult task was evident in this review. Women reported the feeling of stress when implementing dietary adjustments. They experienced difficulties in modifying their dietary intake by experimenting with alternative food options. This problem was a challenge, especially for South Asian women, who heavily depend on carbohydrate-rich foods, such as rice (Yuen and Wong, 2015). Moreover, the views that healthier food was often more costly compared to their daily options, imposing an additional financial burden. This perception contradicts a study that has indicated there is no significant disparity in the cost of food items recommended by healthcare professionals and the food choices made by women (McManus et al., 2013). However, it is noteworthy that this perception might rely on women's knowledge about healthy diets, food culture (what constitutes as 'daily food'), as well as their financial situation. In addition, this review shows limited studies pertaining to women engagement in physical activities. Exercise tends to be overlooked by the women and under-emphasized by the healthcare professionals. A study shows that South Asian women are often

discouraged from exercising during pregnancy and postpartum because of the perception that exercise entails rigorous and strenuous activities which could affect the pregnancy. Within that study context, walking is not regarded as exercise, whereas engaging in household chores is commonly recognised as a physical activity (Bandyopadhyay et al., 2011a).

2) Culture and religious beliefs

The studies included in this review involved participants representing diverse cultures and religious backgrounds. One of the approaches to overcome psychological issues caused by GDM involves praying towards a supernatural entity. The studies have demonstrated the importance of having a religious belief for a certain group of people, as a coping mechanism in managing anxiety resulting from GDM (Hjelm et al., 2018; Hjelm et al., 2021). In these instances, culture and religious beliefs serve as a facilitator for GDM management. However, this review also unveiled unfavourable behaviours influenced by cultural dietary habits. Some cultures have restrictions on food options during pregnancy and postpartum. Sometimes, the dietary beliefs were disadvantageous for women, for example, restricting fish, eggs, and meat (Sundarapperuma et al., 2018). A review on the experience of women with GDM from culturally and linguistically diverse backgrounds (CALD) was conducted (Haigh et al., 2023), considering that this group has a higher risk of GDM (Yuen and Wong, 2015). The review demonstrated a discrepancy between the dietary recommendations provided by healthcare professionals and the dietary practices rooted in these women's cultural backgrounds. The recommendations are mostly related to Western diets, leading the women to think that their traditional diet is unhealthy (Haigh et al., 2023).

2.3.3 Synthesised finding 3: perception on quality services and needs

The finding focusing on perceptions of quality services and needs addresses the broader context of GDM management, particularly in low- and middle-income countries (LMICs) where resources are limited. This finding unravels the impact of constrained resources on the perceived quality of services, shedding light on the challenges individuals face in accessing adequate healthcare and support for GDM.

1) Limited resources in the LMICs setting

Limited resources were evident in the findings of studies conducted in LMICs. The lack of physical resources, including a limited number of healthcare professionals, and the lack of medical supplies, were revealed. Few studies indicating the need for women to travel long distances in order to access services suggest a scarcity of easily accessible healthcare facilities. These shortages, combined with a large number of patients, create overcrowding and a lack of time for interaction. Eventually, these issues compromised the quality of consultation, resulting in negative experiences with healthcare professionals. Studies conducted in Australia and Ireland showed that the majority of women expressed satisfaction with the quality of services they received, indicating the convenience for women to contact healthcare professionals when they encounter a problem (Carolan, 2013; Tierney et al., 2015; Hjelm et al., 2021). In addition, the unfulfilled need for tailored and sustainable care is highlighted in this review. This finding suggests that women require holistic care considering their unique personal needs (Craig et al., 2020).

2.4 The ConQual: building confidence in the results of qualitative systematic review

In the JBI approach, the process to establish the confidence of synthesised findings (ConQual) is by assessing the dependability and credibility of the included studies. Initially, the primary studies are ranked, ranging from 'high', 'moderate', 'low', to 'very low'. According to this approach, qualitative studies should be assigned a ranking of 'high'. Therefore, all included studies in this review were graded as 'high' (Munn et al., 2014).

The following step is assessing dependability. Five questions from the critical appraisal tool are employed to assign dependability, including:

1. Does the research methodology align with the study questions or objectives?
2. Does the research methodology align with the methods employed for data collection?

3. Does the research methodology align with the way the data is represented and analysed?
4. Does the researcher's cultural or theoretical positionality have a stated statement?
5. Is the reciprocal relationship between the researcher and the research, in terms of influence, adequately considered?

If there are 4 to 5 'yes' responses, the initial grade remains unchanged. If there are 2-3 'yes' responses, it transitions to one lower level. If there are only 0 or 1 'yes' response, the score moves down by two levels. With regards to this review, the studies moved one level down because most of the studies obtained 'no' for questions 4 and 5.

Furthermore, to assign credibility, it is necessary to thoroughly examine the number of findings that have been categorised as either Unequivocal (U), Credible (C), or Not Supported. If all findings are unequivocal, the score remains unchanged. If studies present a combination of unequivocal and credible findings, they will be assigned a downgrade of one level. However, if the study presents a mixture of credible and unsupported findings, it will be assigned a downgrade of three levels (Munn et al., 2014). In this review, all the findings are unequivocal, resulting in an unchanged score for its credibility. The summary table containing the ConQual scores for this review can be found in Appendix G.

2.5 Strengths and limitations

This qualitative systematic review includes studies from various geographic locations and multicultural backgrounds within the LMICs context. This diversity enhances the external transferability of this review. The participants in the primary studies were pregnant and postpartum women diagnosed with GDM, contributing to a comprehensiveness understanding of women's experience with GDM during these periods. The discussions with the supervisory team during the processes of this review were a robust and iterative procedure, which increases the internal credibility of the review findings. The utilisation of well-established approach (JBI qualitative systematic review) enhances the review's rigour and transparency. The similarity of the context (LMIC countries) resulted in a focus findings that pictured

women's experience in a specific regions. To the best of my knowledge, this is the first review focusing on women's experience with GDM in LMICs settings.

However, there were several potential limitations in this review. No study was excluded based on the quality assessment result, resulting in the inclusion of low-quality results of studies in the review. While the majority of the studies were of good quality, out of the 24 included, only one study clearly mentioned its research paradigm, six studies identified the researchers culturally or theoretically, and seven studies highlighted the researchers' influence on their studies. The absence of the two later elements could contribute to researcher bias and potentially compromise external transferability. Additionally, only studies published in English were included in this review, which may have caused non-English research to be missed. Unfortunately, this review did not cover the perspectives of health professional regarding GDM. Their perceptions might have been valuable in explaining the reasons or backgrounds for their low performance in delivering GDM services, which is a common concern among women.

2.6 Conclusion

This qualitative systematic review highlights challenges faced by women diagnosed with GDM in LMICs when managing the condition. The lack of knowledge about GDM contributes to the perception that GDM management is complicated. The insights gained from exploring women's experiences of living with GDM in this review can contribute to a better understanding of the issue, which can enhance the development of care based on personal needs. In the specific context of Indonesia, there is a notable gap in our understanding of women's experience with GDM, as this topic has not been thoroughly explored. The findings of this review contribute to the justification for undertaking the present study, exploring the experience, knowledge, and understanding of GDM among women as well as healthcare professionals in Indonesia.

The insights garnered from Phase 1 played a pivotal role in shaping the trajectory of Phase 2 of this study. They facilitated the development of informed propositions for the subsequent phase and guided the formulation of a comprehensive interview guide tailored to elicit nuanced responses and gather in-depth perspectives during

interviews conducted in Phase 2. Ultimately, the seamless integration of knowledge from Phase 1 into the subsequent phase culminated in a robust foundation for the final discussion, ensuring a cohesive and well-informed synthesis of study outcomes.

2.7 Summary box

- GDM imposes significant stress on various aspects of women lives due to its considerable health risks.
- The lack of knowledge and understanding about GDM contributes to the development of negative emotions upon learning the diagnosis.
- Culture and religion play a crucial role in GDM management.
- Women perceived the need for education about GDM, indicating the pivotal role of healthcare professionals.
- The obstacles of GDM management in LMICs include overcrowded health facilities, long-distance travel, limited resources, and the absence of continuous personalized care.

Chapter 3 Methodology and Methods

3.1 Introduction

This chapter offers an overview of the methodology and methods utilised in phase two of this study, presenting an outline of the research design, procedures, and techniques. It discusses the philosophical underpinnings that underlie the inquiry and elaborates on the qualitative methodology employed. Furthermore, it provides a comprehensive account of the specific methods used for data collection and analysis, including interviews, observation, and study documentation. Finally, the chapter explains the measures taken to ensure the robustness and validity of the research outcomes.

3.2 Philosophical and theoretical underpinning research

There are numerous ways to approach a social inquiry, and researchers must decide among the myriad of available approaches. Although the decisions researchers make when choosing between these various approaches often involve practical considerations, it is essential for them to comprehend the theoretical and philosophical foundations that underlie their research (Holloway and Wheeler, 2010). Research paradigms shape scientific discoveries by providing a framework of assumptions and principles (Bourgeault et al., 2010), making them pivotal in this context.

Paradigms encompass three fundamental aspects: ontology, epistemology, and methodology (Guba and Lincoln, 1985). Ontology pertains to the understanding of the nature of reality within a paradigm. Some researchers may believe in a single, objective reality independent of human perception, a view known as realism. Meanwhile, others may contend that reality depends on individual perspectives, an approach known as relativism (Guba and Lincoln, 1985). Epistemology consists of the fundamental beliefs about what constitutes knowledge and the process of acquiring it. Methodology concerns the way data is gathered and analysed to develop knowledge. Understanding the specific assumptions inherent in a paradigm aids in clarifying the validity and reliability of findings that support scientific studies. It helps identify gaps and limitations in generating robust and

credible evidence (Park et al., 2020). The chosen paradigm thus offers a roadmap for research, ensuring consistency in approach and facilitating the communication of methods and findings. Therefore, the research paradigm functions as the foundation of any study, profoundly influencing the entire research process (Creswell, 2013).

3.3 Research paradigm

A research paradigm functions as a set of fundamental beliefs that inform and guide the research process. It significantly influences how researchers perceive the world, shaping their perspectives and comprehension of interconnections (Guba and Lincoln, 1985). Three primary paradigms serve as the bedrock for comprehending this research: positivism, interpretivism, and critical theory. An explanation of each paradigm will be provided to facilitate understanding of their potential applications.

1) Positivism

The positivism paradigm assumes that reality is comprehensible and governed by unchanging laws or principles. In this paradigm, the reality is context-independent and can be generalised, some of which explain causal relationships (Denzin and Lincoln, 2018). Logical positivists generally believe that obtaining objective measurements about phenomena and events is achievable. They hold that unbiased perception is the cornerstone of science, not only in natural sciences like biology and physics but also in social sciences such as psychology and anthropology (Flick, 2022). Several principles serve as the foundation of positivism. These include the idea that the goal of sciences should be centred on identifying laws to explain and predict phenomena under investigation. The hypothetico-deductive model should be employed in studying inquiries. Additionally, the presence of a single, identifiable, and absolute reality is established through the replication and integration of scientific findings and theories (Park et al., 2020). Guided by these principles, positivism aims to uncover the laws of nature and translate them into theories to explain and predict phenomena, in alignment with the hypothetico-deductive approach (Park et al., 2020). However, the primary concerns in using the positivism paradigm lie in the challenges of exploring

perceptions, thoughts, and views. These concepts cannot be objectively measured. Additionally, there's the potential for overlooking truths about reality that arise from individual perspectives, as positivism's focus is on generalising results (Pham, 2018).

2) Interpretivism

The interpretivism paradigm highlights that knowledge is socially constructed (Miles and Huberman, 2014; Denzin and Lincoln, 2018). To comprehend a social inquiry, interpretivists must elucidate the process of meaning development and understand both the verbal and non-verbal actions of social actors. Drawing from a relativist ontology, a single phenomenon may have multiple interpretations because each individual perceives the world differently and subsequently acts accordingly (Pham, 2018). In essence, the goal of interpretivism is to explore the intricate lived experiences in the real world and comprehend phenomena from the perspective of the people themselves (Denzin and Lincoln, 2005). Interpretivists tend to seek rich explanations about events and phenomena within their unique contexts, rather than aiming to generalise their insights to a larger population (Pham, 2018). Interpretivism serves as a theoretical foundation that informs and shapes the perspectives of qualitative researchers (Denzin and Lincoln, 1994). It offers research advantages, including the capability to provide more authentic information in real settings and the ability to investigate views, values, feelings, thoughts, and perspectives that cannot be directly observed (Pham, 2018). Despite its strengths, interpretivism has faced criticism for potentially compromising the principles of validity and objectivity due to the presence of various biases (Pham, 2018). Reflexive awareness is an important aspect that enhances the rigour and trustworthiness of a study (Miles and Huberman, 2014).

3) Critical theory

Critical theory constitutes a theoretical framework that asserts the influence of social, political, cultural, gender, and economic factors on reality, continuously shaping what is commonly accepted as truth (Weaver and Olson, 2006). Within the realm of critical theory, there exist various approaches, including post-modernism and feminism, each offering distinctive perspectives on power dynamics, language, and gender (Paynton and Hahn, 2023). Unlike merely explaining the existence of

social systems, this paradigm prioritises active efforts to transform these systems towards more desirable directions (Weaver and Olson, 2006). At the core of this theory lies the emphasis on 'praxis,' the fusion of theory and action. Engaging critically with these concepts becomes imperative to facilitate social change and justice (Paynton and Hahn, 2023).

3.3.1 Underlying paradigm for current research

Choosing a philosophical assumption that underlies methodological choices can greatly enhance researchers' clarity about their study (Weaver and Olson, 2006). In terms of the nature of reality (ontology), the researcher's belief rests on the understanding that social reality is produced through intricate social interactions, inseparable from the context and the actors involved. Epistemologically, it is held that reality is constructed and can accommodate multiple interpretations. In the context of this study, the goal is to elucidate the experiences of women diagnosed with gestational diabetes mellitus (GDM), as well as the healthcare professionals responsible for their care within a specific setting. Consequently, from both an ontological and epistemological perspective, the researcher deems the interpretivism paradigm to be the most fitting for this study. Interpretivism underscores that knowledge revolves around how individuals attribute meaning to their experiences. It becomes crucial for the researcher to grasp these interpretations from the participants' personal viewpoints (Creswell, 2013). This guiding principle steers the researcher towards a qualitative study, which is expounded upon in the subsequent section.

3.4 Methodology: qualitative research

Qualitative research, with its origins rooted in anthropology, sociology, humanities, and evaluation, employs empirical materials such as interview transcripts and written notes to comprehend individuals' experiences of social or human phenomena (Creswell, 2009; Guest et al., 2013). Unlike quantitative research, which offers cause-and-effect relationships, qualitative research delves into patients' behaviours and emotions, yielding nuanced insights, particularly suitable for healthcare research (Bowling, 2009). This approach is closely linked to a

constructivist worldview, emphasising that diverse experiences shape varied perspectives and behaviours (Creswell and Creswell, 2023).

Qualitative research adopts a holistic approach, aiming to comprehend various dimensions of participants' reality, including their thought processes and actions. This methodology necessitates that researchers empathise with subjects, adopting an insider's perspective (Christensen and Johnson, 2000). The process of data collection typically involves conducting observations and in-depth interviews, complemented by field notes that provide insights aiding in subsequent data interpretation and theory generation. Through this approach, qualitative research uncovers intricate aspects of human experiences that might otherwise remain unexplored. A qualitative approach is thus selected to guide the overall study, as it facilitates the exploration of complex and detailed information within a real-life context (Creswell, 2013).

3.5 Research design

The aim and objectives of this study demand an in-depth understanding of the diverse experiences surrounding GDM within authentic settings. Experiencing GDM is a multifaceted phenomenon that intertwines women's physical and mental well-being, encompassing the involvement of diverse healthcare professionals in managing interventions both during pregnancy and the postpartum period (Horsch et al., 2018). This research aims to explore the experiences, knowledge, and understanding of both women and healthcare professionals within the real-life context. In this scenario, the researcher's control over situations is inherently limited. To accomplish this, common qualitative approaches, as identified by Creswell (2013), will be elaborated upon in the subsequent section, exploring their potential application in this study.

1) Ethnography

Ethnography is primarily utilised by researchers interested in comprehending human perspectives and cultural studies (Spradley, 1980). In this research approach, attention is focused on examining collective behavioural patterns, linguistic systems, social structures, and activities displayed by a specific cultural group over extended periods (Creswell, 2013). The central goal of this method is to

provide comprehensive insights into people's perspectives and actions, alongside contextual features. In ethnography, fieldwork stands as the primary data collection technique, centred around gathering data within its 'natural' environment (Hammersley and Atkinson, 2007). Researchers aim to attain a profound understanding of the social group by 'immersing' themselves in these settings, aiming to grasp the participants' reality – known as the 'emic perspective' (Creswell, 2013). This researcher-participant interaction necessitates a direct and sustained connection for a substantial period, often involving data collection through observations and interviews.

The primary data collection method in ethnography is observation (Ritchie et al., 2014). This method enables the recording of people's behaviours, which can supplement self-reported data collected through interviews. The goal of this process is to uncover participants' 'tacit knowledge' (Taylor and Francis, 2013) – the cultural and behavioural aspects so deeply ingrained that participants take them for granted. Analysis in ethnographic research can be intricate and time-consuming, often requiring extensive note-taking to capture the intricate nature of participants' social lives. However, for this study, the aim is not to unveil social dynamics or cultural norms within a society; therefore, ethnography was considered unsuitable.

2) Phenomenology

Phenomenology is a research approach aimed at exploring the lived experiences of individuals regarding a specific phenomenon, thereby highlighting their individual views and perspectives (Creswell, 2013). The data collection process in phenomenology primarily involves interviews, as its central focus lies in investigating participants' understanding of their own experiences. When employing this approach, researchers are required to engage in a 'bracketing' process. This entails the separation of their pre-existing knowledge and understanding of the research inquiry, ensuring the absence of researcher bias in the study (Tufford and Newman, 2010). The researcher must meticulously examine all notes and transcripts from interviews during the data analysis, as the phenomenological approach can generate a concise overview suitable for further investigation (Lester, 1999).

According to Creswell (2013), phenomenology aims to shed light on the collective understanding of individuals regarding a singular concept or idea. However, this might pose limitations when this method endeavours to explore intricate social interactions involving multiple parties. Additionally, the process of 'bracketing,' as carried out by researchers, could seem impractical to implement, especially when involving individuals well-versed in the specific area being studied (Taylor and Francis, 2013). Given these considerations, this design is unsuitable to fulfil the overarching objective of the current study. Here, the researcher seeks to delve into the experiences, knowledge, and understanding of women and healthcare professionals concerning GDM within a specific setting.

3) Grounded theory

Grounded theory is an approach aimed at developing a theory from data, often seeking a profound understanding of social phenomena (Charmaz, 2014). The primary objective of grounded theory is to generate a theory rooted in the perspectives of individuals or groups (Creswell, 2013). In terms of data collection, this approach predominantly relies on interviews. For data analysis, it may construct a hierarchical classification system, encompassing a set of interconnected codes as proposed by Glaser and Strauss. (1967). Alternatively, it can adopt Charmaz's approach, which embraces a constructivist methodology.

A notable feature within the grounded theory approach is constant comparative analysis, where data collection and analysis occur simultaneously (DePoy and Gitlin, 2015). This ongoing process serves as a means to integrate newly acquired data with existing data, resulting in a more comprehensive understanding of a specific phenomenon (Charmaz, 2014). However, despite the merits associated with this approach, grounded theory is not well-suited for the current study, as the primary objective here is not to generate theory but to explore in detail the experiences of GDM within a specific context in a real-life setting.

4) Narrative study

The narrative approach is a research methodology where the researcher's focus lies in understanding people's stories, which are usually presented in chronological or sequential order (Creswell, 2013). This approach offers an insightful analysis of

perceptions, interpretations, and experiences, providing a valuable understanding of participants' narratives (DePoy and Gitlin, 2015). A distinctive characteristic of this method is its ability to incorporate the researcher's perspectives into individuals' narratives. Within this approach, the researcher takes on the role of a collaborator or co-constructor in the study. This dynamic leads to increased interaction, collaboration, and engagement throughout the research (Moen, 2006). For data collection, interviews are employed, designed with the intention of eliciting personal stories. Additionally, data collection tools often include other materials that provide insight into personal documents, such as autobiographies, diaries, and letters (Connelly and Clandinin, 1990).

Narrative research has the ability to provide a comprehensive understanding of individual stories. However, it encounters limitations in effectively capturing intricate social interactions and complex environmental dynamics (Gerrish and Lacey, 2010). Due to these limitations, this approach is not appropriate for the current study, where the researcher seeks to comprehend the experiences related to GDM involving various parties within a specific context.

5) Case study

A case study is a qualitative research design commonly employed to investigate current phenomena within real-life settings. In the realm of health science research, the use of this design has grown, serving as a valuable methodology for evaluating specific programmes and interventions. It encompasses various data collection methods, including interviews, observation, and study documentation (Baxter and Jack, 2008). Each source is considered a discrete element within a larger 'puzzle.' To acquire a comprehensive understanding of the entire phenomenon, it is crucial to systematically gather and scrutinise all these components. Regarding data analysis, case study experts follow various approaches. Stake (1995) favours categorical aggregation and direct interpretation as primary methods, while Yin (2009) develops multiple analytical techniques, such as pattern matching, linking data to propositions, building explanations, time-series analysis, logic models, and cross-case synthesis.

A case study is characterised as a comprehensive investigation into a particular phenomenon, often termed the 'case,' within its genuine and practical context (Yin, 2018). This research approach encompasses several key traits that are also shared with ethnography, including the use of diverse data collection methods (Creswell, 2013).

Described as a thorough exploration of a phenomenon (referred to as the 'case') within its authentic real-world context (Yin, 2018), a case study shares defining features with ethnography, including the utilisation of various data collection approaches (Creswell, 2013). This methodology proves especially advantageous for health researchers who possess an extensive comprehension of their research environments. Their prior knowledge and understanding of the topics they intend to investigate, termed as 'pre-understanding' (Gerrish and Lacey, 2010), aid in shaping research inquiries. A case study serves to investigate deeply into a complex phenomenon (Lapan et al., 2012). It is particularly suited to address 'how' or 'why' inquiries related to contemporary phenomena where the boundaries between the phenomenon and its context are blurred (Yin, 2009).

The current study potentially involves multiple components to comprehensively understand women's and healthcare professionals' experiences, knowledge, and understanding of GDM. Addressing this issue can potentially inform the development of future interventions, guide future research, and raise awareness among women and healthcare professionals about GDM. The case study approach permits exploration of diverse sources of evidence to grasp the complexity of the phenomenon (Yin, 2009). Furthermore, the case study approach is well-suited for applied research where the generated knowledge could enhance policy and practice (Yin, 2009). Hence, the case study design is employed as the most appropriate approach for this research.

As previously mentioned, Yin (2009) and Stake (1995), two prominent methodologists, have developed distinct approaches to case studies. Stake's approach offers flexibility and does not require detailed design preparation, but it might lead a novice researcher to feel lost or stuck in the process. In contrast, Yin presents a comprehensive and logical sequence for forming a case study design

(Yazan, 2015). According to Yin (2009), a case study is a research strategy that provides a structured action plan to guide the study. A case study comprises five characteristics: an empirical inquiry; a contemporary phenomenon; conducted within a real-life context; unclear boundaries between the phenomena being studied and the context; utilisation of multiple sources of evidence. This research adopts Yin's case study approach due to its clear guidance in conducting a case study, from formulating questions to drawing conclusions.

3.5.1 Type of case study

A case study can be categorised as exploratory, descriptive, or explanatory, depending on the study's purpose and the nature of the questions being posed. Additionally, case studies can be classified as single or multiple (Yin, 2009). Initially, the aim of this study was to investigate the experience, knowledge and understanding of GDM among women and healthcare professionals at two distinct levels of healthcare facilities, specifically primary and tertiary levels. Nevertheless, the collection of data at the tertiary facility level was rendered unfeasible because to the circumstances of the Covid-19 pandemic. Hence, the objective of this study was afterwards adjusted to deeply explore the experiences, knowledge, and understanding of women and healthcare professionals regarding GDM within a specific site, a public health centre and the associated outreach. The goal is to comprehend how this phenomenon unfolds within a real-life context. As a result, a single exploratory case study aligns well with the purpose (exploration), the form of the research questions ('how' questions), and the study's context (focusing on a single site).

3.5.2 Defining the 'case' and unit of analysis

One of the challenging aspects of the case study approach lies in defining the 'case' itself. Delineating the 'case' holds significance as it helps maintain the study's focus (Yin, 2009). To aid in this definition, considering whether the study aims to explore an individual, a program, or an interactive process within a given context can be beneficial (Baxter and Jack, 2008). Achieving clarity on what constitutes the 'case' ensures relevance in sourcing information.

The scope of this case study is confined to the boundaries of a public health centre. The selection of the public health centre as the research site arises from its role as a primary-level health service (gatekeeper) within the community. Specifically, this study centres on the Katon public health centre situated in Lampung Province, Indonesia. The rationale behind choosing this study location will be elaborated further in Section 3.7.1.

Consequently, the defined 'case' is the Katon public health centre, encapsulated within a system (public health centre management), a place (the health centre's operational area – Katon sub-district), and a time frame (four months for data collection) (Creswell, 2013). Furthermore, for a comprehensive understanding of the phenomenon under scrutiny, the study incorporates three units of analysis: the experiences, knowledge, and understanding of women; the corresponding perspectives of healthcare professionals; and relevant documents pertaining to GDM management in the context of the public health centre.

3.6 Theoretical propositions

Propositions play a vital role in ensuring the research remains focused (Yin., 2018). These propositions can stem from professional experience, existing literature, established theories, or empirical data. In cases of exploratory case studies, propositions might be absent due to a dearth of experience, knowledge, evidence, or relevant information from the literature to formulate such propositions (Baxter and Jack, 2008). Based on a broad literature search, a focussed systematic qualitative review, professional experience as a midwife, as well as discussions with supervisors, there were three initial propositions proposed in this study which aimed to ascertain:

1. Healthcare professionals' levels of knowledge and their attitudes significantly influence care management and the experiences of women who use health services.
2. A lack of understanding of GDM among women can potentially impact their health outcomes and their utilisation of healthcare services.

3. The inadequacy of resources, encompassing knowledge, skills, materials, and staff among healthcare professionals, contributes to the deficiency in patient support and care.

3.7 Methods

This section describes the chosen methods. It starts with an explanation of the study site selection and the process of obtaining ethical approvals. The subsequent processes of participant recruitment, data collection, and data analysis will then be outlined.

3.7.1 Study site selection

There are 10,269 public health centres spread across 34 provinces in Indonesia as of 2021 (Badan Pusat Statistik, 2021). In order to achieve the research objectives, certain factors need consideration, including the researcher's access to data within the site and the site's willingness to participate in the study. Taking into account factors such as time availability, network accessibility, and other resources, especially during the pandemic period, this study was conducted in Lampung province, where the researcher worked as a lecturer with existing collaborations at Malahayati University in Bandar Lampung.

Lampung province houses 303 public health centres, out of which three have been accredited as 'paripurna' (the highest grade for primary health services accreditation). From anecdotal knowledge, it is evident that GDM management is not typically integrated into routine services for pregnant women in Indonesia. Consequently, the selection of the most suitable site becomes crucial, operating on the assumption that public health centres with the highest grade provide more comprehensive services than others. Among these three centres, Katon public health centre emerged as the prospective study site due to the following reasons: 1) the centre sees a substantial number of pregnant women annually (approximately 1500 visits); 2) it offers regular glucose testing services to pregnant women; 3) the researcher possesses a network of clinical colleagues at this site, facilitating access to potential data that aligns with the research objectives.

3.7.2 Pre-engagement activity

With the location selected, the subsequent focus is on securing access for the research. The profound impact of the COVID-19 pandemic on Indonesia, evident through one of the highest global death rates, introduces additional complexities when seeking authorization for research studies. Before seeking verbal and written permission from the site, the researcher pursued dual ethics approvals from the School of Healthcare Research Ethics Committee (SHREC) at the University of Leeds and the Health Polytechnic of Bandar Lampung Ethics Committee in Indonesia. These obtained approvals were subsequently presented to the Lampung district authority to secure permission for conducting data collection within Lampung province, where the Katon public health centre is situated.

The researcher initiated a meeting with the Head of Katon public health centre, who serves as the primary gateway to the site. This informal meeting served as an introduction to the researcher herself, her background, and a broad overview of the study's purpose. This occasion provided an opportunity to foster trust and address any queries that the head of the Katon health centre might have about the study. During the meeting, the researcher emphasized that the study's activities, which include participant recruitment, observation of routine consultation sessions, and interviews and that this study would not disrupt clinical operations.

Moreover, the researcher reached out to colleagues working within the health centre to gain a deeper insight into the work environment and culture. These colleagues expressed their commitment to supporting the research and offered assistance as needed. However, it was conveyed by these healthcare professionals that the researcher must secure formal authorization from the Health Department of Bandar Lampung before commencing the study. They stressed that the research could only commence after obtaining this approval, as the Health Department functions as the governing body for the health centre.

To substantiate the researcher's initial contact with the site, a letter of support was sought from the public health centre. This letter, accompanied by a formal request letter, was submitted to the Health Department of Bandar Lampung. Together with the health centre, they jointly responded to the letter, affirming their support for the

study's execution at the site. This support letter played a pivotal role in substantiating the application to the Research Ethics Committee at the School of Healthcare, University of Leeds (please refer to Appendix H for the support letter).

3.7.3 Ethical principles

This research adhered to key ethical principles such as justice and autonomy; privacy and confidentiality; and beneficence and non-maleficence. Considering the principle of justice and autonomy, all participants received participant's information sheet (PIS) and a thorough explanation of the study. Both women and healthcare professionals were given an opportunity to discuss any doubt or to ask questions related to the research and they were given time (minimum 24 hours) before deciding their participation and giving their consent. They were also informed that they were free to withdraw at any time during the data collections to ensure that participation in the research was voluntary.

If during the data collection the participants feel uncomfortable because of sharing their experiences, the researcher will inform the participants that they may not answer the questions, have a break or withdraw from the study. The interview will be discontinued if necessary when participants indicate distress. A distress protocol guided by Draucker et al. (2009) was prepared to help the participants (see Appendix I). Interviews were undertaken in the most available convenient venue where participants feel comfortable to tell their experiences to ensure privacy and confidentiality.

The gathered data were handled in accordance with University of Leeds guidance. The participants were informed that confidentiality of their data will be assured. All participants were provided a pseudonym that only the researcher able to identify them. This pseudonym was used when the researcher needs to quote their words in the report of findings. The healthcare professionals were informed that they may be identified due to their specific profession. All hard file data were temporary secured and stored in a locked cabinet where no one has access except the researcher. Then the hard file data were scanned and saved in M Drive of the University desktop and Microsoft One Drive provided by the University of Leeds together with soft file data (from interviews) which only can be accessed by the

researcher. Hard files were discarded once they have been scanned and saved. With regards to beneficence and non-maleficence principle, this research may potentially deliver benefit to women and healthcare professionals as well as the researcher. A summary of projects' result will be provided to the healthcare professionals, which can be used to enhance the services related to GDM management.

3.7.4 Ethical approval

When conducting research, it is crucial for researchers to anticipate and address potential ethical concerns that may arise throughout their study. Safeguarding the dignity, rights, safety, and wellbeing of all participants is paramount (Guillemin and Gillam, 2016). These ethical considerations are relevant at all stages of research, spanning from obtaining formal permissions and using participant-friendly language in study materials during the initial steps to maintaining transparency during data collection and ensuring participants' privacy and anonymity.

For the present study, the process of obtaining ethical approval commenced with the submission of an application to the Ethics Committee of Health Polytechnic Bandar Lampung, Indonesia, through an online platform. Following the receipt of ethical approval from this local committee, the process proceeded with an application to the Research Ethics Committee at the School of Healthcare, University of Leeds. This involved completing and submitting an ethics application form along with several supporting documents. These documents included a study protocol, recruitment advertisement (Appendix J), informational leaflet (Appendix K), participant information sheets (Appendix L-O), consent forms (Appendix P-S), interview guides for healthcare professionals (Appendix T), interview guides for women (Appendix U), a protocol for handling distress (Appendix I), and a consent contact form (Appendix V)

After review, the committee issued a preliminary favourable approval, contingent upon minor revisions to the consent form and additional clarity on safety measures during data collection amidst the ongoing COVID-19 pandemic. All recommended changes were incorporated, and the documentation was resubmitted.

Subsequently, the committee granted full ethical approval (HREC 20-018) (Appendix W).

3.7.5 Requesting access/formal approach to the site

Upon receiving ethics approval, the researcher arranged a meeting with the head of the public health centre. The purpose of this meeting was to seek official permission from the site for the researcher to conduct data collection. As part of the process, the ethics approval along with a request letter were provided to the head of the public health centre. Following this, a formal letter of permission was issued by the health centre, authorizing the study to be conducted.

During the meeting, the data collection methods to be employed in this study were discussed. These methods include interviews, observations, and study documentation. The researcher and the head of Katon public health centre also engaged in a thorough discussion about the procedure for recruiting participants. Seeking recommendations from the head of the public health centre, the researcher inquired about potential participants from the healthcare professionals' group. The head of the public health centre suggested beginning the data collection by interviewing senior midwives at the site due to their direct involvement in maternal health. Given their proximity to gestational diabetes cases within both the site and the community, these midwives were considered well-suited for identifying potential women participants and providing valuable insights to the researcher.

3.7.6 Data collection methods

Utilizing multiple sources of evidence will enhance the study's rigour (Creswell, 2013) and contribute to the validity of the research (Pannucci and Wilkins, 2010). This case study incorporates three distinct data collection methods: semi-structured in-depth interviews, non-participant observation, and document analysis. The rationale for selecting each method is expounded upon below:

1) Interviews

Interviews are widely acknowledged as a prevalent method of data collection in qualitative studies (Jamshed, 2014). They are loosely

categorised into structured, unstructured, and semi-structured formats (Dicicco-Bloom and Crabtree, 2006). These interview methods form a continuum, with structured interviews tightly adhering to a list of questions on one end and unstructured interviews, where participants have more autonomy in directing the conversation, on the other end. Semi-structured interviews occupy the middle ground of this continuum. Structured interviews are commonly used in quantitative research, involving a standardized set of questions posed by the interviewer (Wright et al., 1989). This rigid format limits the interviewer's ability to delve deeper into responses, potentially yielding superficial data. Given that this research aims to explore individual experiences, structured interviews were deemed unsuitable.

Another interview method, known as unstructured interviews, is frequently used in ethnography and anthropology studies. In this approach, the interviewer selects key informants believed to provide valuable insights into the research inquiries. The interviewer engages in ongoing observation and continuous questioning to gather information. Despite offering great flexibility, this technique demands a significant time investment in thorough research and requires a skilled interviewer with relevant experience. Considering these factors, unstructured interviews were not chosen for implementation in this study.

Semi-structured interviews find widespread use in health research (Jamshed, 2014). This approach involves predetermined questions but allows interviewees the opportunity to explore issues in depth as they see fit, with the questions not rigidly constrained (Longhurst, 2010). Semi-structured interviews are considered the most suitable method due to their flexibility in eliciting participants' viewpoints (Charmaz, 2014). For this study, the data collection method of semi-structured in-depth interviews was selected to investigate the research objectives concerning the exploration of a complex phenomenon.

2) Observation

Observation is an enduringly utilised data collection approach in research, foundational in nature, focusing on the researcher's visual and auditory observations to gain insight into a specific phenomenon of interest (McKechnie, 2008). Participant observation, a method that enables researchers to immerse themselves and actively engage in a given context, facilitates meticulous observation and integration into the studied phenomenon (Spradley, 1980). This approach can involve direct interaction, including posing inquiries during the actual occurrence of the event under investigation. Participant observation can be overt, where participants are aware of being observed, or covert, where participants remain unaware (McKechnie, 2008). While covert observation is believed to enhance study trustworthiness, it may also be perceived as compromising participants' privacy.

Non-participant observation stands in contrast to participant observation, characterised by the absence of interaction between the researcher and participants (Sreeram et al., 2023). This method is less likely to interfere with the studied phenomenon (Williams, 2008). It can be conducted overtly or covertly, in public or private settings (Sreeram et al., 2023). Covert non-participant observation might be hindered by ethical considerations, while open observation could lead participants to alter their behaviour to hide their true attitudes due to awareness of being observed (Williams, 2008).

The observational aspect of this study aimed to scrutinise the GDM counselling process delivered by healthcare professionals to women during routine ANC visits. To minimise disruption during consultations, the non-participant observation method was chosen. Field notes were taken in short phrases to capture key events after observation (Mulhall, 2003).

Additionally, six stages were employed to mitigate the Hawthorne effect, allowing participants to behave as naturally as possible (Oswald et al., 2014).

3) Document analysis

Document analysis can be defined as a systematic process of examining and evaluating documents to extract meaning, gain comprehension, and generating empirical knowledge (Bowen, 2009). Documents, when used as data sources in qualitative research, can complement and enrich evidence gathered from interviews and observations (Merriam, 2009). They have the potential to provide a broader perspective on the phenomena under investigation (Mason, 2002) and can serve as a means of triangulation (Denzin, 1978), promoting convergence and corroboration. Qualitative researchers are encouraged to utilise multiple sources of evidence to enhance the credibility and robustness of their findings (Bowen, 2009). In the case study approach, additional sources of evidence include interviews, observations, and documents (Yin, 2009).

3.7.7 Identifying the data sources

Before embarking on the fieldwork, it is essential to identify the data sources. This ensures that each research question and objective is supported by relevant data and that the collected information is closely aligned with the research inquiries.

Table 5 presents the planned data collection framework for this study.

Table 5 Data collection plan

Research objectives	Source(s)	Method(s)
To explore experience, knowledge and understanding of GDM among women with identified GDM	Women who are identified with GDM by healthcare professionals in current or previous pregnancy.	In-depth semi-structured interviews with women who are considered as GDM by healthcare professionals
To explore experience, knowledge and understanding of GDM among healthcare professionals with different roles involved in maternal services	Healthcare professionals	In-depth semi-structured interviews with healthcare professionals involved in maternal services within the case study site.
To explore how GDM is managed in routine practice	GDM consultation session	Non-participant observation during clinical consultation sessions

Research objectives	Source(s)	Method(s)
delivered by healthcare professionals		between women with GDM and healthcare professionals.
To identify national/local guideline(s) of GDM in place and explore to what extent they are used to guide practice in a public health centre	<ul style="list-style-type: none"> • Government policy • Clinical practice guidelines • Standard operational procedure • other documents related to GDM management 	Analysis of documents relevant to the identification/ treatment and management of GDM.

3.7.8 Sampling and recruitment of participants

The sampling methods for this study include purposive and snowball sampling. Purposive sampling involves the researcher selecting participants (women and healthcare professionals) based on predetermined characteristics that align with the study's objectives (Marshall, 1996). This approach was implemented at the outset of data collection. Purposive sampling was chosen due to its practicality in selecting participants who are assumed to hold key insights into the phenomena under investigation (Ritchie and Spencer, 2002). Additionally, snowball sampling was utilised to identify potential participants who might not have been initially captured through purposive sampling. In snowball sampling, eligible participants are recommended by other healthcare professionals (Streeton et al., 2004).

The women and healthcare professionals responsible for conducting GDM consultation sessions were invited to participate in both interviews and observations. However, they had the option to choose whether to take part in both data collection procedures or engage in either of the activities.

3.7.8.1 Sampling and recruitment of healthcare professionals

Purposive sampling was utilised during the initial recruitment of healthcare professionals. The inclusion criteria for this group encompassed any healthcare professionals who were directly or indirectly involved in providing care for GDM at Katon public health centre. The head of the public health centre, a healthcare

professional with a dental background, who played a role in maternal health management, was the first potential participant to be invited to participate in the study. Anecdotal knowledge indicated that there were four distinct healthcare professional backgrounds directly involved in maternal health services within Indonesian health centres, including doctors, midwives, nutritionists, and laboratory staff. Moreover, through discussions with clinical colleagues, it was suggested to include pharmacists in the study due to their expertise and understanding of glucose-lowering medications available at the site. The pharmacist's awareness of the population that might require these medications was considered valuable.

- **Identifying healthcare professionals**

The identification of eligible healthcare professionals commenced during the meeting with the head of the public health centre (see section 3.7.6). The eligibility criteria to be involved in this study is having experience either direct or indirect in providing services to women with hyperglycaemia in pregnancy. The recommendations provided by the head of the public health centre were utilised in identifying potential participants. According to the head of the health centre, two senior midwives were the key figures in maternal health. Additionally, the head of the health centre highlighted midwives working in auxiliary health centres, health posts, and those in private practice, particularly in a specific urban village within the health centre's working area. The auxiliary health centres and health posts operate under the health centre's supervision, with midwives from these sites regularly submitting health reports for women within their designated areas. Private practice midwives provide independent services but maintain coordination with the health centre by sharing data with the health post, which is subsequently forwarded to the health centre. Doctors, who serve as consultants for midwives when dealing with high-risk pregnant women, and a nutritionist responsible for conducting dietary consultations, were also recommended by the head of the health centre to participate in this study. Eligible healthcare professionals were also identified through multiple visits to the health centre, during which the researcher built rapport and trust with the staff on site. During this period, laboratory staff and pharmacists were recognized as potential participants.

Additionally, reviewing the organisational chart was conducted to identify potential participants, serving as a supportive approach for the steps outlined above.

- **Approaching healthcare professionals**

Following the identification process, the researcher invited potential participants to a meeting. The original plan was for the researcher to offer either a short presentation or a handout about the study to the healthcare professionals. However, due to the intensive scheduling associated with the COVID-19 immunisation initiative and the substantial influx of patients visiting the community health centre at that time, conducting the meeting became infeasible. The demanding workload prevented healthcare professionals from finding simultaneous availability, which hindered the organisation of collective gatherings.

In response, the researcher approached healthcare professionals on an individual basis to explain the data collection procedures and describe what might be required from them if they were willing to participate in the study. A Participant Information Sheet (PIS) was provided along with a letter of invitation to participate in the study. They were assured that participation was voluntary, and they had the right to withdraw from the study without needing to provide any reasons. An opportunity for discussion was provided in case they had questions, and sufficient time was granted to read the PIS and consider their participation. Additionally, healthcare professionals were encouraged to recommend other potential participants who could be invited to the study through snowball sampling.

- **Recruiting healthcare professionals**

After the meeting, the healthcare professionals were informed that they were given at least 24 hours to consider their participation. They were also encouraged to ask questions or seek further explanations about the study (the researcher's contact number is available in the PIS). Once the healthcare professionals agreed to participate, the researcher provided the consent form, which was directly distributed to them. The written consent was then sought by asking them to read and sign the consent form. A flow diagram related to the recruitment of healthcare professionals can be seen in Figure 4.

3.7.8.2 Sampling and recruitment of women participants

Purposive and snowball sampling were employed in the recruitment of women participants. The inclusion criteria for women participants included the following: 1) being at least 18 years old; 2) being identified as having GDM by healthcare professionals (either in the current or previous pregnancy); 3) having the ability to communicate in Bahasa Indonesia. In order to raise awareness among women about the study, a standing banner was printed and placed at the entry point of the site as well as in the waiting room.

- **Identifying the women participants**

After receiving recommendations from the head of the public health centre regarding key personnel involved in maternal services, the researcher approached the healthcare professionals engaged in these services to discuss the recruitment of women. The researcher raised awareness and provided them with accurate information about eligible participants for this study. Subsequently, healthcare professionals were asked to identify women who met the inclusion criteria developed by the researcher.

The identification process encountered challenges in ascertaining women with GDM, primarily stemming from the non-routine administration of GDM tests within the health centre and its outreach areas. The advent of the pandemic era further exacerbated the challenge, as the restricted access to healthcare facilities led to a diminished number of pregnant women seeking antenatal care (ANC) at the health centre. Consequently, the combination of these factors culminated in a diminished pool of women diagnosed with GDM, thereby impeding the effectiveness of the identification process.

- **Approaching the women participants**

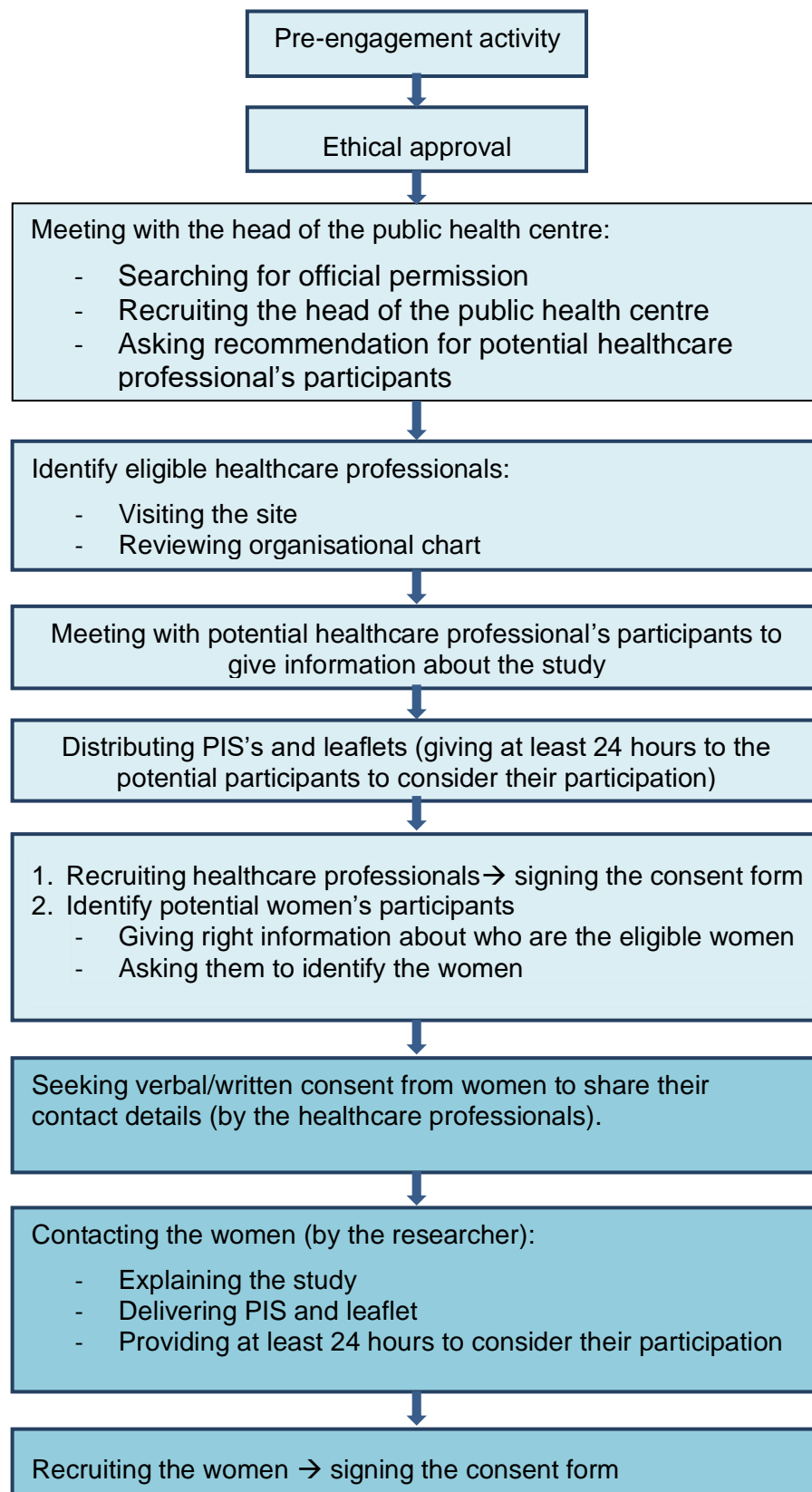
The initial approach to eligible women for study participation was carried out by healthcare professionals as part of the identification process. The healthcare professionals provided a brief explanation of the study and offered a leaflet to capture the women's interest. Afterwards, the healthcare professionals sought written consent from the women, which allowed them to share the women's contact details with the researcher. Women who consented to be contacted by the

researcher were then directly contacted, either in person or over the phone, to further discuss the study, address any questions or concerns they might have, and provide additional information. During this contact, the women were reassured of their right to withdraw from the study, and they were offered a Participant Information Sheet (PIS). The PIS was distributed in person to those who met face-to-face or via mail for those contacted by phone. The researcher's contact information was provided at the end of the PIS.

- **Recruiting the women participants**

The women were given at least 24 hours to decide whether they wanted to participate in the study. Once again, the researcher offered them the opportunity to ask any questions related to the study. If the women agreed to participate, the consent form was provided either in person or by mail with a return envelope. Their written informed consent was obtained before the interview and/or observation. They were required to carefully read and sign the consent form. A flow diagram depicting the recruitment of women can be found in Figure 4.

Figure 4 Flow chart of women and healthcare professionals' recruitment



3.7.9 The interview topic guide

To maintain the focus of the interviews with women participants and healthcare professionals, interview topic guides were created. These guides did not consist of a list of specific questions but rather included suggested topic areas for exploration. The development of these topic guides drew from the broader literature, systematic review (Chapter 2), and discussions with supervisors. Additionally, demographic data were collected as part of the interview to provide contextual background, aiding the researcher in understanding the participants' responses. This demographic information helped create a clear description of the participants, which in turn assisted anyone examining the study, thus enhancing engagement with the study findings.

The interview topics with the women participants included:

1. The women's experiences with GDM, starting from their awareness of the diagnosis, their encounters with GDM management, and the support they received during this period.
2. The women's knowledge and understanding of GDM, encompassing the risk factors, impact on both mother and baby, and the necessary interventions for managing their condition.
3. Perceived needs in managing GDM from the women's perspective.
4. Factors that enable or hinder their adherence to GDM management.

The interview topics with healthcare professionals focused on:

1. Healthcare professionals' experiences in managing women identified as having GDM, along with the current care practices to support these women.
2. Healthcare professionals' knowledge and understanding of GDM, covering aspects such as its definition, testing and diagnosis methods, impacts, and intervention strategies.
3. Perceived needs for managing GDM cases within the site.
4. Factors that enable or hinder GDM management in the site, as perceived by healthcare professionals.

Furthermore, additional questions were directed to the head of the public health centre – a key figure in this context. These questions pertained to her indirect involvement in GDM management, encompassing:

1. Experience in managing the site, particularly in relation to services provided to pregnant women with GDM.
2. Policies or guidelines regarding GDM that are employed at the site and the extent to which they have been implemented.

Subtopics and questions have been further developed to explore the main topic areas in detail. The development of the questions is based on extensive literature, the researcher's personal knowledge and experience, and input from the supervisory team.

3.8 Data collection

Before the interviews, the researcher reassured the participants that they had the right to not answer questions that made them feel uncomfortable due to sharing their experiences. Participants were also informed that they could take a break or withdraw from the study if they wished. If necessary, the interview could be discontinued if participants expressed distress, and a distress protocol guided by Draucker et al. (2009) was ready to support the participants.

3.8.1 Interviews with the women

Interviews were conducted at the most convenient time and place available to ensure that women felt comfortable sharing their experiences while maintaining privacy and confidentiality. Out of the women interviewed (n=6), four preferred to have the interview at their homes, one chose her workplace (a health post), and another opted for a public location. When conducting interviews at the women's homes, a healthcare professional accompanied the researcher to the location. In cases where the interview took place at a health post, the researcher reserved a private room with minimal distractions prior to the interview. Chairs were arranged so that the participant could sit facing the researcher. Refreshments were offered, and the women were informed that they could take breaks (to drink or eat) during the interview.

The interview began by collecting demographic information from the women participants before delving into questions about their experiences, knowledge, and understanding of GDM. With their permission, the interviews were audio-recorded, and detailed field notes were compiled after the interviews to capture non-verbal cues, the situation, and the researcher's thoughts during the interactions (Appendix X). Each interview lasted approximately between 50 to 65 minutes.

3.8.2 Interviews with healthcare professionals

The researcher met with healthcare professionals at the date, time, and location that had been agreed. All healthcare professionals (n=21) preferred to conduct the interviews in their workplaces. For those based in the health centre, the researcher reserved a room prior to the interview. Chairs were arranged in a manner that allowed both parties to have a face-to-face interaction. Refreshments were provided, and healthcare professionals were informed that they could have drinks and snacks during the interview.

Before delving into the main questions, the researcher collected demographic information. The interviews with healthcare professionals aimed to gain insight into their experience in managing GDM cases, their knowledge and understanding of GDM, and their regular practices in providing care to women. Each interview took between 25 minutes to one hour.

3.8.3 Non-participant observation

During the data collection timeframe, only one observation was conducted during a consultation session as part of the routine practice of GDM management at the public health centre. This partly due to the decreased number of pregnant women who attended the health centre during Covid-19 pandemic. Prior to conducting the observation, the researcher made regular visits to the site to familiarise herself with various aspects such as the layout, working hours, services offered, and interactions among healthcare professionals. These visits aided in building rapport and relationships with the healthcare professionals (HCPs) and other staff members. This approach aimed to minimise any potential intrusion or disturbance during the observations and was also one of the measures taken to mitigate the

Hawthorne effect. During these visits, the researcher took notes to gather information about the environment.

Given that observation involved women and healthcare professionals, the process could only proceed once a mutual agreement was reached. The researcher ensured that both parties had a clear understanding of the observation procedure. Prior to the observation, a brief explanation of the upcoming activity was delivered. It was emphasized that the researcher would not participate in any activities during the consultation session but would act solely as an observer. The researcher positioned herself in a distant corner of the room to minimise any distractions to the consultation session and refrained from making eye contact with the participants.

This study employed descriptive observation guided by Spradley's (1980) framework. The observation process utilised a question matrix that included elements such as space, act, object, activity, event, time, actor, goal, and feeling (for the observation schedule, refer to Appendix Y). Although some areas required more attention than others, the researcher initially observed all areas at the beginning of the observation (grand tour observation) to establish the context. Subsequently, the researcher delved into a more focused phase where questions became more specific (mini tour observation) (Spradley, 1980).

The observed aspects encompassed communication between women and healthcare professionals regarding the management of GDM, the care and support provided to the women, and the women's reactions to these interactions. Verbal and non-verbal responses of the participants, including physical interactions, facial expressions, and body language, were closely observed. The duration of the observation session was approximately 15 minutes.

In addition, concerning the issue of withdrawal from either the observation or interviews, participants were granted the option to withdraw at any point during the data collection process and up to two weeks following its completion, without the requirement to provide a reason. If a participant chose to withdraw within this specified timeframe, any collected data could be deleted. However, if the decision to withdraw occurred beyond this two-week period, it would not be feasible to discard the data. In the case of 'non-participant observation', if either party

(healthcare professionals or women) opted to withdraw, the collected data could not be deleted unless both parties agreed to exit the study.

3.8.4 Document analysis

The researcher collected documents pertaining to the management of GDM. These documents encompassed policies, regulations, national guidelines concerning GDM, standard operational procedures within the site, and a blank pregnancy book.

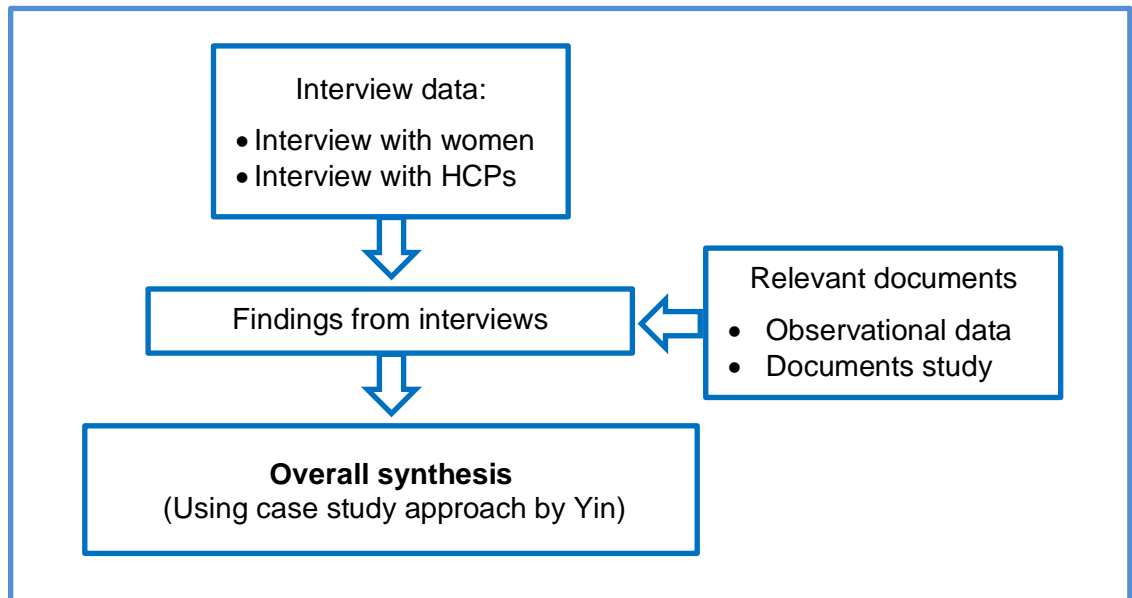
3.9 Data analysis

This research is an exploratory single case study aimed at delving into the experiences, knowledge, and understanding of GDM among women and healthcare professionals. The goal is to comprehend how this phenomenon unfolds within real-life contexts. The data for this study were collected through in-depth semi-structured interviews, non-participant observation, and the analysis of documents related to GDM management. These methods were chosen to ensure the richness and depth of the data collected.

3.9.1 Type of analysis

The three datasets were processed sequentially, starting with the analysis of data from interviews with women, followed by the analysis of data from interviews with healthcare professionals. After consultation with the supervisory team, it was determined that the interview data was rich, comprising a total of 27 interviews (6 with women and 21 with healthcare professionals), which lent itself to a more in-depth thematic analysis. This approach is considered appropriate as it corresponds with an interpretive paradigm which can facilitate the exploration of underlying meanings. Both interview datasets were subjected to the thematic analysis approach outlined by (Braun and Clarke, 2022), resulting in a summarized representation of the interview data. However, the observational data, stemming from a single observation, and the document data, which consists of 7 documents, constitute a relatively limited set of data. The researcher extracted information from this dataset to strengthen the findings from the interviews.

Figure 5 Data analysis process

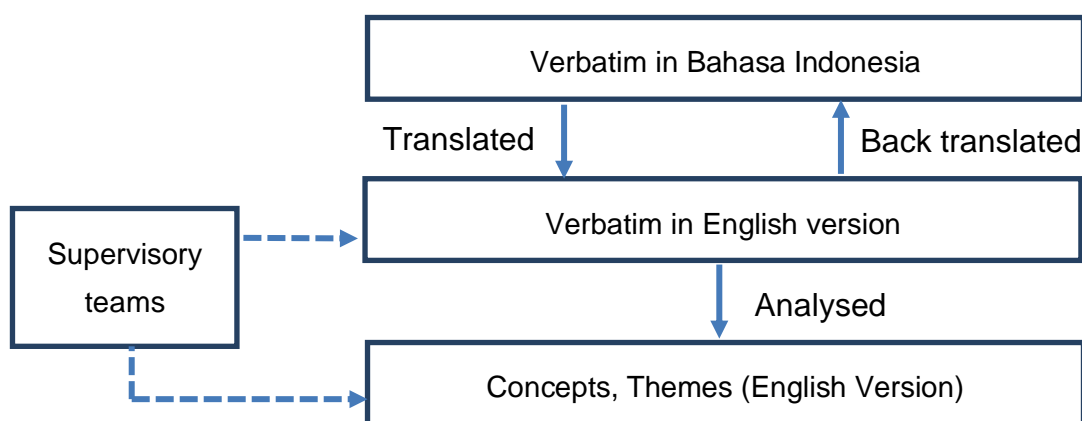


3.9.2 Transcription and translation

The data from the interviews were transcribed and then translated from Bahasa Indonesia into English by the researcher. To minimise the risk of losing meaning due to cultural differences, the transcription and translation process followed the four-stage translation procedures in qualitative nursing research proposed by Chen and Boore (2010). In the first stage, the researcher transcribed the interviews verbatim in the original language while paying close attention to the content. This ensured that the interviews were accurately represented as intended by the participants. During the second stage, the researcher translated from the source language to the target language (English). All translations were carried out by the researcher, who is proficient in both Indonesian and English and has a comprehensive understanding of the research context. This process was done immediately after each interview was completed. The third stage involved back translation, where a professional translator translated the English version back to Bahasa Indonesia. Back-translation techniques were utilised in order to attain semantic equivalency. The researcher engaged a qualified translator who was aware of the confidentiality of the data and had signed a confidentiality agreement not to disclose any information related to the study to unauthorized individuals. Any misunderstandings were resolved through discussions between the researcher and

the translator, comparing the original transcript with the translated version. The fourth stage included the involvement of supervisors. The translated transcripts were shared with the supervisory team, composed of native English speakers who understood the study context. They provided a different perspective and additional insights to the translation process. All collected data from observations and documents were also transcribed (e.g., from photos) and translated from Bahasa Indonesia into English before the data analysis process. The translation was performed by the researcher herself. The stages of the translation process are illustrated in Figure 6.

Figure 6 Translation and back translation



3.9.3 Managing data

The data were stored and managed using NVivo12 (QSR International Pty Ltd, 2018), a computer-assisted qualitative data analysis software (CAQDAS). NVivo12 was utilised for various tasks such as organizing and sorting large volumes of qualitative data, annotating and retrieving text, locating specific words, phrases, and data segments, as well as enhancing the effectiveness and efficiency of the data analysis process. It ensured that access to the source data and their respective contexts was maintained throughout the analysis, thereby upholding rigor in the analysis process (Jackson and Bazeley, 2013). In the following section, the process of generating initial codes, which constitutes the second stage of thematic analysis, will be detailed with the use of NVivo.

3.9.4 Data analysis process

3.9.4.1 Interview data

The interview data from both groups, women participants and healthcare professionals, were analysed using the thematic analysis approach developed by Braun and Clarke (2022). This approach comprises six phases: familiarizing with the dataset, coding, generating initial themes, developing and reviewing themes, refining, defining, and naming themes, and writing up. The following sections provide a detailed explanation of each phase.

a. Familiarising with the dataset

Once the interview data were transcribed and translated, the next step was to familiarise with the dataset. This involved three approaches: building a deep understanding of the data by reading and re-reading the transcripts (immersion), developing critical questions about the data to comprehend it from various perspectives rather than as mere information (critical engagement), and creating notes of ideas related to the data. Through these three steps, the researcher both became 'close' to the data through immersion and gained 'distance' through critical analysis. The third step involved developing notes of ideas related to the data, using various forms of text such as short memos or reflections that emerged while reading the transcripts, based on what worked best for the researcher (Braun and Clarke, 2022).

b. Coding

The next phase is 'coding,' which involves developing codes that capture specific meanings from the dataset. These codes, which are the smallest elements in the analysis process, are used to generate themes. This process results in codes and their corresponding labels as outcomes (Braun and Clarke, 2022). To begin, the researcher took a transcript and read it. Whenever the researcher encountered relevant ideas, concepts, or meanings that could address the research objectives, she developed a code. During this process, the researcher paused reading when interesting content was identified and determined whether a new code was needed or if it could be applied to existing codes. The codes captured both explicit and

implicit meanings from the data. This systematic process occurred over multiple rounds to ensure rigour and allow the codes to evolve from the existing dataset.

Coding can be conducted both manually and using software programs. Manual coding on hard-copy printouts allows the researcher to work meticulously with the transcript, offering greater control over the data (Saldana, 2013). A software can assist with the labour-intensive analysis and provide easier data retrieval options (Pope et al., 2000). For novice researchers conducting qualitative analysis for the first time, the recommendation is to start with manual coding and then transfer the codes to software (Saldana, 2013). In this study, the data were initially coded manually. The process began with the transcripts from women, where code labels were written directly on the printed text. Interesting ideas or meanings were highlighted, underlined, or circled before being assigned a code label. Once this initial process was completed, the researcher moved on to the second round of manual coding, developing a two-column table in a 'word file' format. Code labels were typed beside the corresponding data sources. This process started from the middle of the data set (interviews numbered 4 to 6) and progressed to the end, then reversed back to interviews numbered 1 to 3 (Braun and Clarke, 2022).

The third round of coding in this study was facilitated using NVivo 12. The dataset was imported into NVivo 12, and the researcher coded the data while considering the codes from the previous two rounds and re-evaluating the code labels developed. This process was repeated until the researcher was satisfied with the consistency and comprehensiveness of the codes, allowing progression to the next phase (Braun and Clarke, 2022).

c. Generating initial themes

In this phase, the task involves exploring codes with similar meanings or patterns that can be organized into initial themes (Braun and Clarke, 2022). The focus of this phase shifts from individual codes (smaller meaning units) to identifying larger patterns or themes. Relevant codes were grouped together to form networks that could potentially give rise to themes. The researcher created 'thematic maps' to organize the codes, aiming to identify patterns, meanings, and possible connections between the codes. Lines were used to illustrate connections,

disconnections, or interactions among the codes (such as dotted lines, straight lines, or lines with arrows). During this stage, relationships were developed not only between individual codes but also between themes and across different levels of themes.

d. Developing and reviewing themes

During this phase, the initial themes developed in the previous phase were revisited by reconnecting them to all the codes and the entire dataset. This process aimed to validate the potential themes and ensure that they encompassed the richness and diversity required to address the research questions. Additionally, new themes could emerge during this review.

The process began by juxtaposing the tentatively developed themes with the codes that had been associated with each theme. The researcher then posed reflective questions, such as: Does the pattern exemplify or reveal a concept relevant to the research question? Are the boundaries of the theme well-defined? Is there sufficient data to support the theme? Is the data supporting the theme consistent? Do the themes contain substantial information? During this stage, themes underwent revision, refinement, and clarification.

Once a set of themes had been linked to the codes in the data extracts, the next step involved extending the process of development and review to the entire dataset. This broader perspective allowed the themes to encompass the full scope of the dataset, reducing the potential for misinterpretation of the data's content and contributing to a coherent narrative. To aid in visualizing the overall story, the connections and boundaries between themes, and the complete analysis, a thematic map was created.

This phase entailed a flexible yet robust approach. Themes that did not effectively capture the essence of the data were discarded, and the process might be revisited at Phase Three or even Phase Two if necessary. The iterative process continued until the researcher was confident that the themes adequately encapsulated the key meanings within the dataset.

e. Refining, defining and naming themes

During this phase, the refinement of themes was conducted to establish the structure and flow of the analysis. Theme definitions were developed to elucidate the essence of each theme. This process offered an opportunity to assess whether a theme met the criteria to be recognized as a genuine 'theme'. A well-constructed theme should encompass a core meaning that can be succinctly explained in a few sentences. According to Braun and Clarke (2022), there are four aspects to consider when defining a theme: the central concept the theme represents, the boundaries of the theme, the distinctiveness of the theme, and the role of the theme within the overall narrative. If the researcher encounters challenges in addressing these aspects and struggles to formulate a definition, it might be necessary to revisit the previous phases of analysis. In this study, three main themes were developed during this phase.

Subsequently, the next step in this phase involves naming the themes. A concise, informative, and engaging name can help captivate readers' attention. While there are no strict rules for naming themes, the researcher should ensure that the chosen name is not misleading in conveying the essence of the theme, even if an eye-catching name is preferred. All the aforementioned processes, starting from the developing codes to the naming of themes, were shared with the supervisory team to gain insights. This iterative strategy was conducted to ensure the robustness of the data analysis process.

f. Writing up

In this phase, the process and results of the analysis are documented through writing. This writing process outlines how the data were processed to generate codes, initial themes, and ultimately, the developed themes. This narrative offers a comprehensive account of the theme development process and provides a detailed description of the experiences, knowledge, and understanding of women and healthcare professionals regarding GDM.

3.9.4.2 Observation data

A thin set of data was gathered from the observation of one GDM consultation session. The data were read multiple times to establish an overall understanding and general impression. The researcher immersed herself in the data to uncover new insights (Kondracki et al., 2002), a process also referred to as inductive approach. Due to the limited data, a descriptive summary was generated based on the observation data.

3.9.4.3 Document data

The cohort of documents identified as relevant to the study includes materials related to the management of glucose for pregnant women, which are accessible to healthcare professionals working in the health centre. The researcher also consulted guidelines issued by government bodies (Ministry of Health) and professional associations (Indonesian Society of Endocrinology; and Indonesian Society of Obstetrics & Gynaecology). The researcher compared and contrasted the collected guidelines with the available documents that were utilised in the daily practices of the health centre. Subsequently, descriptive summary from the document analysis were generated (Flick, 2022).

3.9.4.4 Analysis of the exploratory single case study

Once the data from each dataset were analysed, the summaries from each dataset were synthesised. The points, meanings, or interesting findings drawn from each dataset were combined and integrated (Schick-Makaroff et al., 2016). In this research, pattern-matching technique is employed to analyse the case study (Almutairi et al., 2014). This decision is primarily informed by the nature of the research questions and the propositions that guide this study. This offers a structured approach for validating the theoretical propositions that underpin the study. If the observed evidence aligns with the predicted patterns, this will support the validity of the study. Pattern-matching also enables a robust demonstration of how and why certain phenomenon occurs. This careful and systematic comparison of proposition and evidence is crucial to producing reliable, meaningful insights in case study research. Hence, the use of pattern-matching aligns perfectly with the research objectives.

3.10 Data management plan

This research generated data in the form of audio recordings resulting from in-depth semi-structured interviews. The audio files were stored in MP3 or WAV format (these formats are not available for data sharing). These recordings were fully transcribed using Microsoft Office Word 2007/2010, and the data was anonymised before being analysed and shared with the supervisory team. The study also generated field notes from observations and documents related to GDM management. These latter data were kept in Microsoft Office Word 2007/2010 format and anonymised.

For the purpose of sharing data with the supervisory team, the researcher took responsibility for coordinating and ensuring data storage and access. A dedicated folder for this research project was created in Microsoft OneDrive provided by the University of Leeds. A consistent system of file naming and an organized folder structure were developed to ensure easy retrieval. Then the folder was managed so that the supervisors could read and write the stored files. At the end of the project, the Word documents will be converted to both plain text and PDF formats for long-term preservation. The results of this study are planned to be shared with the research community to support good research practices. Therefore, the data will be deposited in the Research Data Leeds Repository at the University of Leeds.

3.11 Lone working policy

Data collection took place during the operating hours of the health centre, specifically between 7:30 am and 2:30 pm. This ensured the presence of healthcare professionals and staff members at the public health centre to provide a secure environment for the researcher. In cases where women opted to conduct interviews at their homes, a midwife accompanied the researcher to the designated location. These visits to women's homes were scheduled outside the health centre's working hours, factoring in the midwife's availability.

At times, situations arose where the midwife could not accompany the researcher during home visits. To address such scenarios, an additional precautionary measure known as the liaison system was implemented. The researcher was

partnered with a designated liaison in Indonesia who remained informed about the researcher's whereabouts. Prior to and following each interview, the liaison was contacted to verify the researcher's safety status. If, for any reason, communication with the researcher could not be established, a senior colleague from an Indonesian university was entrusted with the responsibility of establishing contact. In the event that contact remained unestablished for an extended period of six hours, the matter would be escalated to Professor Linda McGowan, the lead supervisor. She would then provide guidance on the necessary steps to be taken. Additionally, if the researcher encountered situations where safety in a particular area was a concern, these concerns were communicated to the supervisory team before proceeding. The researcher sought their advice to ensure a cautious and well-informed approach in such circumstances.

3.12 Trustworthiness and rigor

Trustworthiness and rigour are essential in qualitative research to uphold the credibility and validity of findings (Denzin and Lincoln, 2018). The discussion concerning the measures implemented to establish trustworthiness and rigour in this study is presented in the following section, encompassing the methods employed to address credibility, transferability, dependability, and confirmability aspects of the research (Guba and Lincoln, 1985).

1) Credibility

Credibility pertains to the extent to which the findings accurately depict the perspectives and experiences of the participants (Flick, 2022). To ensure the credibility of this research, multiple data sources were utilised, including interviews, observations, and study documents. Employing a diverse range of data sources enables the researcher to gain a comprehensive understanding of the GDM phenomenon within the health centre, thus enhancing credibility. Significantly, a considerable amount of time was dedicated to fostering a familiarity with the context. The aim was to cultivate an environment of mutual trust that encourages participants to openly and transparently share their experiences. Another strategy involves engaging in discussions with supervisors to gather valuable insights.

Additionally, the researcher maintained a journal of reflections, which served as both a recollection aid and a precaution against potential researcher bias.

2) Transferability

Transferability refers to the ability of research findings to be effectively applied and adapted in various contexts or settings (Padgett, 2017). To enhance transferability, this study offers detailed and comprehensive explanations of the phenomena under investigation. These explanations encompass not only the research context but also the characteristics and involvement of the study participants. The intention is to provide readers with a thorough understanding and an assessment of the potential applicability of conducting similar research in their contexts. The research process is meticulously outlined, beginning with the selection of research sites, the acquisition of necessary research permits, and subsequent stages of data collection and analysis. This comprehensive account aids readers in grasping the research design and facilitates their consideration of applying similar designs in different contexts.

3) Dependability

Dependability, analogous to reliability in quantitative research, concerns the consistency and stability of research findings (Jensen, 2008). To ensure dependability, maintaining a well-organized storage system for all information gathered in the study and its processes is crucial. The objective is to establish an audit trail that allows other parties to track modifications and changes made by the researcher over time, ensuring transparency in the study's evolution. Moreover, the incorporation of data from various sources facilitates the practice of data triangulation. For instance, the data collected through interviews aligns with information obtained from documents, thereby reinforcing the study's dependability.

4) Confirmability

Confirmability refers to the extent to which research results can be compared with the findings of other studies, ensuring that they remain unaffected by the researcher's judgments (Jensen, 2008). To uphold confirmability, the researcher consistently considered their own biases throughout the research process.

Emerging thoughts, ideas, and reflections were recorded in a journal to mitigate the potential for researcher bias during data collection, analysis, and interpretation. Ongoing reflections were employed to critically assess biases and disentangle them from the research outcomes. Multiple data sources and regular supervisory meetings also contributed to ensuring the confirmability of this study.

In summary, the application of various measures, including prolonged engagement, peer debriefing, thick descriptions, comprehensive documentation, and reflexivity, can establish the trustworthiness and rigour of this study.

Enhancing the credibility, transferability, dependability, and confirmability of the study can potentially improve the validity and trustworthiness of the findings of this qualitative exploratory single case study.

3.13 Reflexivity

As a midwife who is currently immersed in academia rather than actively practising in a clinical setting, I approach this qualitative research with a distinctive perspective shaped by my combined professional backgrounds. The study site is a public health centre located in Bandar Lampung city, a place I am personally familiar with. Having a few colleagues working at the site enriches the research process, although it also introduces complexities that require a cautious strategy in order to navigate them carefully.

Although I am no longer actively practising in clinical settings, my current understanding of maternal health is still influenced by the experiences and insights I gained during that time. As a mother who underwent a 'difficult pregnancy' due to hyperemesis gravidarum, I shared the challenges with numerous women. These shared experiences inform my perception and interpretation of the research data. However, I am aware of the potential to assume that I fully understand participants' experiences solely based on my professional background. It is crucial to maintain openness and remain conscious of these influences throughout the research process.

Furthermore, the potential impact of my roles on researcher-participant relationships is significant, especially as a doctoral student from an overseas university. Recognisable within the community, my presence may influence

participant behaviour or responses due to pre-existing perceptions or expectations based on their knowledge of me. It is essential to communicate clearly to participants that their involvement is voluntary, their responses are confidential, and their decision to participate or not will not affect any services they might receive.

In conclusion, my unique roles as a former midwife and current academic within a familiar community emphasize the need for a commitment to reflexivity. By implementing self-awareness and practising reflexivity throughout the process, I aim to effectively navigate these complexities to conduct an ethically sound and intellectually meaningful study.

3.14 Summary

There is a notable absence of studies focusing on the perspective of women and healthcare professionals regarding GDM within the context of Indonesia. The outcomes of this study are poised to contribute novel insights into the first-hand experiences of women dealing with GDM. Concurrently, healthcare professionals, who play a pivotal role in providing care, stand to benefit by gaining a deeper comprehension of the challenges inherent to GDM, as well as the specific requirements of women undergoing GDM care. The results of this study hold promise in various dimensions. They have the potential to inform the development of targeted services that cater to the unique needs of individuals dealing with GDM. Additionally, these findings can serve as a foundational resource in shaping the design of future interventions related to GDM. Furthermore, the study's evidence-based outcomes can lay a substantial groundwork for forthcoming research endeavours centred around GDM in the Indonesian context. Ultimately, the culmination of these efforts may collectively drive enhancements in policies, practices, and the overall quality of GDM management within Indonesia.

3.15 Summary box

- This is the first study in Indonesia exploring the experience, knowledge, and understanding about GDM among women and healthcare professionals who provide services.
- An exploratory single case study was chosen as the method to understand the phenomenon in the real life context.
- To gain comprehensive insight about the case, multiple data collection methods were utilised, including interview, non-participant observation, and document analysis.
- The selection of the research location was based on its accreditation status, which is regarded as the excellent. This decision was made in order to maximise the potential for gathering a wide range of comprehensive data.
- Data analysis was conducted by employing thematic analysis for interview data, and the themes were bolstered by observational data and documents.

Chapter 4 Findings based on interviews with women

4.1 Introduction

This chapter presents the results of the data analysis, which is based on in-depth interviews with women. The primary aim was to explore women's experiences, knowledge, and understanding of hyperglycaemia diagnosed during their pregnancy. The chapter begins with a description of the characteristics of the women. This is followed by the structure of themes and subthemes that emerged from the thematic data analysis. A detailed explanation of each theme and its associated subthemes are provided, drawing from how women described and reflected on their experiences of living with hyperglycaemia during pregnancy. To provide a thorough understanding of each theme and subtheme, anonymous quotes from the women are included.

4.2 Study sample

As described in Chapter 3, women were selected purposively based on information provided by healthcare professionals regarding which women had experience of living with hyperglycaemia in pregnancy. This initial process was supplemented by using a snowballing sampling technique based on women's information during the interviews to identify potential participants. From that process, seven women with hyperglycaemia detected in pregnancy were identified and invited to take part in the interviews. One woman declined to participate, although she did not provide a reason for her decision. According to information from the midwife who had identified her, this particular woman is a doctor herself. She had undergone a caesarean section, and her baby had passed away shortly after birth. The midwife expressed concerns that the women might feel the interview too sorrowful or shameful to engage in. Therefore, six women were interviewed in this study.

The majority of the interviews were conducted in the women's house, while one woman chose to be interviewed in her office and another woman preferred a public place (café). The interviews lasted from 50 to 65 minutes. The ages of the women ranged from 24 to 41 years old, and all of them had been informed by the healthcare professional that their blood glucose levels were elevated. At the time of

the interviews, three women were still pregnant, while the other three had given birth in 2016, 2020 and 2021. The women were recruited through healthcare professionals practising within the health centre's working area. Three women were identified by the healthcare professionals from *Puskesmas Induk* (the main health centre) and health posts, two women were referred by a private midwife, and one woman was introduced to the researcher by a woman she had previously interviewed. Two women had conducted a blood glucose test at the health centre, three women had it done at a private laboratory, and one woman had the test performed at a public hospital. All women participants in the study were assigned a pseudonym to ensure the protection of their identities and preserve confidentiality. The characteristics of these women are summarised in Table 6.

Table 6 Characteristics of women interviewed in the study (N=6)

Women (pseudonym)	Age (years)	Timing of interview	Family history of diabetes	Description
Isah	35	Postpartum 2016	NA	• First time tested at a public health centre
Nung	24	The 6 th month of pregnancy	Father	• First time tested at a private laboratory
Hera	41	Postpartum 2020	Mother, Aunt	• First time tested at private practice of a specialist doctor
Pipit	31	The 7 th month of pregnancy	Mother	• First time tested at a health centre
Dwi	37	10 days after delivery	Grandfather	• First time tested at a public hospital
Lina	37	The 8 th month of pregnancy	Mother, Father	• First time tested at a private hospital

4.3 Structure of the findings

Thematic data analysis yielded six key themes, each with several subthemes. They are: experience with testing, reflections, and views of hyperglycaemia in pregnancy; physical and psychological consequences of living with hyperglycaemia detected during pregnancy; lack of communication and compromised service quality leading to dissatisfaction among women; internal and external barriers that women struggle to manage their glucose levels during pregnancy; self-management developed and utilised by women; perceived supports and healthcare professionals' advice, and women's needs and expectations. Each theme is further broken down into several subthemes, which can be seen in Table 7.

Table 7 Structure of themes and subthemes

Sub-theme	Theme
<ul style="list-style-type: none"> • Women’s experience of opportunistic testing • Women’s reflection on living with elevated blood glucose • Views about causes of hyperglycaemia • Views about treatment for hyperglycaemia • Views about medication • Views of risk and perceived impact of hyperglycaemia 	<p>Experience of tests, reflections and views of hyperglycaemia detected in pregnancy</p>
<ul style="list-style-type: none"> • Reported physical symptoms attributed to hyperglycaemia in pregnancy • Being anxious about pregnancy 	<p>Physical and psychological consequences of living with hyperglycaemia in pregnancy</p>
<ul style="list-style-type: none"> • Views on the interaction with healthcare professionals • Experiences with the health services 	<p>Lack of communication and compromised service quality leading to dissatisfaction among women</p>
<ul style="list-style-type: none"> • Being proactive • Pursuing spiritual tranquillity • Self-made lifestyle modifications 	<p>Self-management developed and utilised by women</p>
<ul style="list-style-type: none"> • Perceived support • Lifestyle advice from healthcare professionals 	<p>Perceived supports and healthcare professionals’ advice</p>

4.4 Theme 1: Experience of testing, reflections and views of hyperglycaemia detected in pregnancy

This theme depicts women's perspectives regarding their condition and explores their past experience with blood glucose testing. Many women did not anticipate the test results, and were hesitant to accept them because they believed they were healthy. The glucose tests that the women underwent can be described as rather 'opportunistic', implying that they took advantage of the opportunity for testing. More detailed explanation will be provided in the following section.

4.4.1 Subtheme 1: Women's experience of opportunistic testing

All women in this study experienced an opportunistic test to detect hyperglycaemia in pregnancy. The opportunistic test, in this context, refers to sugar tests that were not intended primarily to screen for GDM and did not follow the recommended timing and methods for GDM screening. The majority of the women experienced only one sugar test during their pregnancy by the time of the interview was conducted. The test revealed that they had high sugar levels for the first time during their pregnancy.

The majority of women initially discovered their hyperglycaemia during pregnancy through a laboratory blood test, which was not specifically intended for screening for gestational diabetes nor was it part of routine care for pregnant women. In this study, most women reported having consistently high blood pressure during several antenatal visits. Due to their hypertension, they were requested by healthcare professionals to undergo a laboratory blood test. Blood glucose was one of the conditions that is frequently checked among other indicators, such as hepatitis B, human immunodeficiency virus (HIV), and syphilis. This opportunistic testing allowed the women to learn about their hyperglycaemia in pregnancy.

"...I haven't checked (my) blood sugar because my blood pressure was too high. The doctor said I needed to check the blood first at the laboratory... If my blood pressure does not go down, he asked me to check the blood (sugar). From there, my blood sugar (level) was about 300..."(Hera, had the condition in 2020, 41-years-old)

Similar to what Hera mentioned above, Pipit had the opportunity to undergo testing for hyperglycaemia in pregnancy due to developing hypertension. Apart from having hypertension, she was offered the opportunity to get tested after she reported the discomforts she suffered that made her daily tasks challenging. Then, she was advised by the healthcare professional to undergo the laboratory tests, including a blood glucose test.

“...At that time, almost every part of my body was swollen; my hands were swollen. I couldn’t hold (anything), I couldn’t do anything, I couldn’t... Well, finally, I went there (to the midwife’s practice), that was the second time. For the third time, the midwife asked me to do a lab test, and she said, ”okay, you go to the health centre... this... this and this are things that should be tested”. Well, the next day, I performed the test at the health centre.” (Pipit, 34-weeks-pregnant, 31-years-old)

Isah, who was a nurse by profession, was offered the opportunity to do the test during a routine general check-up for healthcare professionals at her workplace. She was in her third trimester and she did not have the test offered as part of her standard pregnancy care.

“I was pregnant with my second child. We (healthcare professionals) used to have a check-up programme held by the health centre. There was a programme, ma’am. Coincidentally, at that time, I was pregnant.” (Isah, had the condition in 2016, 35-years-old)

The experiences of these three women described above indicated that their glucose levels were only tested incidentally due to other reasons. It showed that testing for hyperglycaemia in pregnancy was not considered routine practice at the site.

Furthermore, the women also highlighted the test procedure. As previously mentioned around the opportunistic test, the majority of women in this study underwent the sugar test procedure which was not based on the international GDM testing standard. The findings in this study show that these women experienced

different test procedures, including random blood glucose (RBG) and fasting blood glucose (FBG).

“I think I was not fasting.” (Hera, had the condition in 2020, 41 years old)

“That was fasting (blood sugar), because we were (asked) to fast, right?” (Isah, had the condition in 2016, 35-years-old)

However, there were three women, Nung, Lina and Dwi, who received an oral glucose tolerance test (OGTT) performed.

*“I was told to do fasting for 8 hours. I did the fasting, and I checked. My blood sugar was high, still at 200 and above. By the way, when I was checked, I could eat after the blood was drawn, after two hours. I ate, I went back there after two hours, my blood was taken.”
(Nung, 26-weeks-pregnant, 24-years-old)*

The OGTT was not conducted at the public health centre, but it was done at a private laboratory for Nung, at a private hospital for Lina, and at a public hospital for Dwi. They intentionally accessed private clinics of specialist doctors, as they believed the services to be of higher quality (explored more in section 4.6.2). Nung and Lina were suggested by the specialist doctor to conduct OGTT, while Dwi was referred to the hospital due to high blood pressure and subsequently underwent OGTT at the hospital.

In addition to various methods of the sugar test, the women also reported different timing for sugar tests during pregnancy. Some women stated that they were tested in a late phase of pregnancy. Meanwhile, some women had been tested in the second trimester. The variation in the timing of the test portrayed the sense of the absence of guidance on when the test should ideally be performed.

“That's already at the end of the pregnancy I checked. Already at times...in the third trimester.” (Isah, had the condition in 2016, 35-years-old)

“How old was it? 5 months (or) 6 months, I guess.” (Hera, had the condition in 2020, 41-years-old)

4.4.2 Subtheme 2: women’s reflection on living with hyperglycaemia during pregnancy

The majority of women had not received a formal diagnosis of GDM from healthcare professionals but were only informed about the test result, which stated that they had hyperglycaemia. This condition was perceived as having a ‘disease’, causing the women to think about the problem continuously. Expressions of shock, sadness and confusion were found when the condition was reported, as it was not anticipated by any of the women. Feelings of anxiety were mentioned by those who have learned of diabetes-related deaths in the general population.

“...If I look at my neighbours who got diabetes, they died, right?...Really surprised. It actually made me drop. Think about it every night. Sometimes, every night I cry. I wonder why. (I) cannot eat well. (I) really have to take care of that. It’s sad, sis.” (Nung, 26-weeks-pregnant, 24-years-old)

According to Nung, being aware of the actual condition led to uncomfortable feelings. The women could not believe the test result, and some wondered why they got hyperglycaemia in pregnancy when there was no history of diabetes in the family.

“...From that moment, I finally found out that my sugar was high. It was like, I was shocked, thinking about it. How come? While my sisters have no history like that... neither does my little sister. Even my sister, who had been pregnant for 5 times, and her sugar wasn’t high. Their sugar all are normal. I thought, why, why only me?...” (Pipit, pregnant in second trimester, 31 years old)

The emotional responses upon discovering the condition may be attributed to women’s healthy self-image. The women never thought that they might have hyperglycaemia in pregnancy. Some women were aware of some indicators that

need to be checked during pregnancy, such as blood pressure and haemoglobin. However, blood glucose levels during pregnancy were never considered.

"...Because of high blood pressure history, diabetes, protein, liver, cholesterol, everything is good. All negative. But I don't think I checked of it (sugar) because I was confident that I didn't have it then." (Dwi, postpartum, 33-years-old)

Furthermore, the feeling of surprise when the condition was identified may be due to a lack of awareness of the possibility of developing hyperglycaemia in pregnancy. The women reflected on being shocked at having the condition in themselves, while what they knew was that this condition mostly affects the elderly. They believed that hyperglycaemia in pregnancy was a rare incident.

"I just found out that it's only me. In my neighbourhood, maybe there are some, maybe. But maybe they didn't check, maybe there are, ma'am. I'm the only one whom I know (laughing)." (Nung, 26-weeks-pregnant, 24-years-old)

Only one woman who worked as a nurse had heard about such a condition, but she never encountered a patient or any of her friends or relatives who had experienced a similar condition.

"If it's a friend, it's not yet. There are no close ones yet. I do not know. I've only heard of pregnant women. But if it's from close (circle), close friends or from this family, not yet. Just err...(I've) ever heard of it. For example, the pregnant women from somewhere, I had (heard)." (Isah, had the condition in 2016, 35-years-old)

With regards to women's reflection on the situation, they held the notion that the baby's wellbeing was the significant priority. They believed they had to make sacrifices for the sake of the unborn baby, and their health came second. One woman considered eating as a form of sacrifice for the unborn baby's wellbeing, and restricting the food intake was equivalent to limiting nutrition for her infant. She decided to keep eating despite suffering from hyperglycaemia to nourish their babies. She explained:

“Because I was not taking vitamins from the doctor, I didn't drink milk either. I just eat from any food for the child's nutrition. Even though it had a high impact on my sugar, I think what's important is the child, even if the mother will be affected.” (Pipit, 34-weeks-pregnant, 31-years-old)

4.4.3 Subtheme 3: views about the causes of hyperglycaemia in pregnancy

Women believed that there might be several causes of hyperglycaemia in pregnancy, including the view that poor diet and lack of exercise were contributing factors. The contributing causes that were mentioned by Isah include excessive food intake and inadequate physical activities. Isah believed that pregnancy was associated with fatigue and laziness, both discouraging exercise.

“...maybe first from diet. Namely, diet. Lack of exercise or lack of activities. Maybe from... because you eat a lot so the carbohydrates are not burned, so they stay. Yes, maybe pregnant women are usually... lazy to exercise, tired, snacking, eating. Yes, maybe from there, because it doesn't burn enough, it stays, so the blood sugar can go up.” (Isah, had the condition in 2016, 35-years-old)

Some women were aware of how their lack of exercise impacted their glucose levels and believed the unused sugar would stay in the blood and increase the sugar level. However, they were still unable to overcome their laziness. In addition to lifestyle factors, some women also believed that pregnancy itself was a potential cause of hyperglycaemia. This might be rooted from a common belief among Indonesians that pregnancy can cause changes in women, often referred to as *‘bawaan bayi’*, an Indonesian term meaning “common and normal changes due to the presence of the baby in pregnancy”. Mostly, people associate any changes, discomfort and even diseases that occur during pregnancy to *‘bawaan bayi’*. Therefore, some women attributed the increase in their sugar levels to the pregnancy, as expressed by Pipit and Lina:

“...but I am thinking maybe it's because of the baby, maybe it's because I am pregnant with my first child. That is how pregnant

women are, right? It has different symptoms, I just think like that, sis.” (Pipit, 34-weeks-pregnant, 31-years-old)

“Maybe it’s their diet. Because they eat sweet food, maybe also because of the hormonal influence, because the hormones change, right? it could also be due to the influence of ‘bawaan bayi’ (common and normal changes due to pregnancy).” (Lina, 36-weeks-pregnant, 32-years-old)

It was worth noting that some hold the opinion that having hyperglycaemia during pregnancy was normal, as pregnant women typically go through several changes in the body. Isah mentioned that it is normal to have a rise in numerous substances within certain limits in pregnancy, including the sugar level.

“Everything was high. People say as I was still pregnant, it’s okay, they say it’s still at its (normal) limit. Cholesterol, sugar and high uric acid, at that time were also quite high at 7 if I’m not mistaken...” (Isah, had the condition in 2016, 35-years-old)

Another cause of hyperglycaemia in pregnancy, based on women’s belief, was hypertension. Five women reported having high blood pressure in the pregnancy. They believed that pregnancy-related hypertension was a critical issue, even more so than hyperglycaemia. They felt that high blood pressure could cause glucose levels to rise. Dwi and Lina even contend that high blood pressure was the root of the problem:

“Anything can go up (due to hypertension). Let alone diabetes, all diseases can rise, people said. All will go up.” (Dwi, postpartum, 33-years-old)

“the blood pressure, it must be from the blood pressure, I thought.” (Lina, 36-weeks-pregnant, 32-years-old)

It was also believed that the hyperglycaemia in pregnancy was caused by lack of rest. Having a heavy physical task during pregnancy might prevent one from getting enough rest, eventually leading to raised blood glucose levels.

“in fact, that... it could be that this sugar is because lack of rest. It causes it to rise”. (Lina, 36-weeks-pregnant, 32-years-old)

In addition to a lack of physical rest, emotional exhaustion was also described as a possible cause of hyperglycaemia in pregnancy. One woman held the view that the mind had a role in controlling the glucose level. According to the woman, stress may trigger the rise of blood glucose levels. Therefore, pregnant women with hyperglycaemia should avoid excessive stress to prevent psychological exhaustion.

“I think it really has an impact. If it's you have high blood sugar, you can't really think much. It's really affects (you).” (Nung, 26-weeks-pregnant, 24-years-old)

4.4.4 Subtheme 4: views about treatment for hyperglycaemia in pregnancy

As mentioned in the section above, women perceived hyperglycaemia in pregnancy as a ‘disease’, and some women believed that the condition can be cured. Two different views regarding the cure of this condition were identified. Some women believed that the condition would spontaneously be resolved after childbirth, while others considered that it could be treated with interventions. One woman anticipated that the birth would lead to the cure of the ‘disease’, stating:

“...as far as I know, it's like diabetes during pregnancy, but diabetes appears when we are pregnant but it can end right after the pregnancy...”(Dwi, postpartum, 33-years-old)

For some other women, this condition was considered similar to other diseases that could be managed with proper treatments.

“Anyway, “yes it can be cured for sure. It's still at 300”, they said. The important thing is to take care of the food, don't eat sweet foods. Yes, I also eat and still eat brown rice, I don't even use white sugar at all...” (Nung, 26-weeks-pregnant, 24-years-old)

Although women believed that hyperglycaemia in pregnancy can be cured with diet modifications, in reality, women struggled to control their blood glucose. it was

commonly reported that controlling blood glucose was not a simple task for women.

“Well, it's very difficult to regulate blood sugar. Well, the food has been taken care of, but when we check, it is still high.” (Nung, 26-weeks-pregnant, 24-years-old)

Women found it challenging to maintain healthy blood glucose levels. Based on their experiences, some women can only follow a low-sugar diet for a short period of time. The adherence was reported when the women experienced physical problems such as numbness or drowsiness (these symptoms will be discussed in section 4.5.1). However, they quickly resumed their regular diet when they no longer had any physical complaints. Women noted that their greatest temptation was in the form of their favourite foods or drinks, despite the fact that they were aware that these foods and drinks were high in sugar and should to be avoided.

“Yesterday it was hurt, right? Now, it's like it's a little swollen sis (she sees her hands). Usually if it's not swollen it's a bit shrivelled up. There must be something wrong with what I ate. If I feel like I've eaten something wrong, I've stopped what it was. It's like ice, and maybe it's because of the ice. I stopped it (sweet ice). But it doesn't take long, only for how many days. if it (hands) doesn't hurt anymore, that's it.” (Pipit, 34-weeks-pregnant, 31-years-old)

The belief that hyperglycaemia in pregnancy can be cured sometimes serves as a counterbalance to women's fear. On the one hand, women were terrified of this condition, but because of the belief that hyperglycaemia can be cured, some women became careless. Lack of concern about food was reported, because there were medicines that they believed would take care of the 'disease'.

“Even though it's still a worry. But sometimes I'm like, “ah, there's the drug.” (Hera, had the condition in 2020, 41-years-old)

4.4.5 Subtheme 5: views about medication

With regards to medication for hyperglycaemia in pregnancy, despite the belief that the condition can be cured with medicines, none of the women in this study were

using oral glucose-lowering medications. In Indonesia, there is a widespread belief that pregnant women should not use medicines during pregnancy, as they might influence the foetus's growth and development. This belief made women become more conscious of what they consumed. This awareness can be advantageous when it comes to chemicals that have not been clinically proven, such as herbal remedies. However, an excessive fear of oral drugs also made women reluctant to take them, even when they might be necessary.

“Nothing, because I'm pregnant, right? So, the doctor didn't recommend taking medicine. As the doctor asked what medicine I usually take, I said “I don't usually take medicine, Doc”, I said. I don't take sugar-lowering drugs.”
(Lina, 36-weeks-pregnant, 32-years-old)

Another common belief related to medicines in Indonesian society is the fear of so-called 'chemical drugs'. The notion that modern medicines contain chemicals was still firmly in women's minds, especially when it comes to drugs taken orally. These chemical drugs were believed to have a harmful impact on the body, especially on the kidneys.

“Yes, it's scary, ma'am. (Medicines) from the doctor are like chemical drugs, I am afraid that there will be side effects, like to kidney.” (Nung, 26-weeks-pregnant, 24-years-old)

It is noteworthy that Nung perceived oral medications as chemical substances that potentially deliver adverse side effects, but this perception did not apply to insulin.

“What drugs can pregnant women can take when they have blood sugar? It turns out that the only way is insulin. No other (way).” (Nung, 26-weeks-pregnant, 24-years-old)

In the management of hyperglycaemia, insulin may be necessary if oral medications are inadequate to lower blood glucose level to a certain target. It was revealed that the majority of women were aware that insulin could lower blood glucose levels. Some women used insulin per healthcare professionals' advice. They believed insulin was the safest sugar-lowering medicine for pregnant women. However, one woman, Pipit, was afraid to use insulin. She believed that the insulin is used by severe diabetes patients. This perception gave the woman the

impression that she had a serious health condition if she needed insulin therapy. She preferred not to use insulin because she was unable to psychologically to accept that her blood glucose was high.

“I've been thinking, sis, imagine injecting insulin. It's like the disease is really bad, right? So that I have to be injected with insulin. Because as far as I know, if you used insulin, it's already... this is it... I've been imagining bad things.” (Pipit, 34-weeks-pregnant, 31-years-old)

Interestingly, there was an assumption that traditional medicines were not ‘chemical drugs’ and were relatively safer for the human body. Herbal remedies in this context refer to a fluid made from bitter-tasting leaves, believed to be the traditional substances that can help someone manage their blood glucose. Some women stated the concern about consuming herbal remedies during pregnancy due to the assumption that it could deliver adverse effects to the foetus. Nevertheless, they planned to use herbal remedies as a treatment to manage hyperglycaemia after pregnancy.

“From my family, they give me encouragement. “There's no need to worry. It can be cured. Later, when you have delivered a baby, we will take this medicine, which is traditional (the woman imitating her mother's words). Like herbal medicine. Eat bitter leaves, like that.” (Nung, 26-weeks-pregnant, 24-years-old)

4.4.6 Subtheme 6: views of risk and perceived impact of hyperglycaemia in pregnancy

Hyperglycaemia in pregnancy was believed to affect the health of both the woman and the baby. Some women mentioned poor health incidents that may occur in women living with hyperglycaemia during pregnancy. These incidents are perceived as the result of living with hyperglycaemia.

“Can...can be...what...sudden shock, what...heart (problems), suddenly fainted and others...I'm afraid that suddenly, yes, suddenly fainting, suddenly having a seizure, right?” (Isah, had the condition in 2016, 35-years-old)

Another perceived negative impact of hyperglycaemia was the slow healing of scars. The difficulty in wound healing was an impact that was most frequently mentioned by women. Women believed that if one's blood glucose level was high, wound healing would be complicated and would take longer to complete. This was thought to pose a risk to the women, particularly if they had a caesarean section. High sugar levels were thought to impede the healing of surgical scars.

“Moreover, at this time, I have high blood sugar, right? Like a caesarean, the wound won't heal. People said it is so difficult when someone with blood sugar to heal their wounds. I want it to be normal, yes. I just don't know God's plan.” (Nung, 26-weeks-pregnant, 24-years-old)

“...if I have diabetes, I'm high (sugar), maybe after caesarean, it will be a long healing, it can even get ulcers.” (Dwi, postpartum, 33-years-old)

In addition, some women also reported complications as a long-term impact that could occur to them. In the Indonesian context, people are generally afraid of the 'complication'. This word refers to the complex damage caused by a single incident. They perceived that hyperglycaemia could affect other organs and caused complications. The term 'complication' was considered another risk of hyperglycaemia in pregnancy.

“I'm afraid of other complications because they say other complications are scary. Can be heart, kidney; everything can get complicated. Complications to eyes, so those are what I am afraid of.” (Lina, 36-weeks-pregnant, 32-years-old)

Besides 'complications', another long-term effect that women mentioned was developing diabetes after childbirth. Dwi explained her worry that diabetes would arise after childbirth as another long-term effect. She expressed concern about the possibility of getting the 'real' diabetes after delivery, which frightened her and prompted to start managing her diet.

“I'm afraid if it continues, I'm afraid it continues that's why I'm from now on, I manage my intake. I'm afraid something happens. I'm afraid that if I don't take care, it's not only when I'm pregnant, (but) after I'm pregnant, I'm afraid I'll get

real diabetes. The doctor also said that if we don't take care, it usually continues like that.” (Dwi, postpartum, 33-years-old)

According to women's responses above, hyperglycaemia during pregnancy was believed to adversely affect their health. They addressed a few possible consequences for a woman who had hyperglycaemia during pregnancy, both in the short and long term. They also believed that negative consequences could also affect babies and themselves. Babies may gain up to 5 kilograms in weight due to hyperglycaemia in pregnancy. The adverse impact on the baby's organ development was also mentioned as a risk. The organ may not develop normally or the baby may be malformed.

“the foetus is big but not healthy, right, people said... baby has a good size but his organs aren't okay. He can grow up to 5 kg because of the effects of diabetes but the organs that exist are not perfect. The heart and all organs are not perfect, just the body.” (Dwi, postpartum, 33-years-old)

“Amit amit jabang bayi (a phrase used in Indonesia to show fear and a wish that the bad thing is not going to happen) sis, the doctor said, I read on Google, I had read (people) sharing on Google that it can cause very big baby when it is born. Then, Amit amit jabang bayi, the baby could be deformed, it is said that the baby could get sugar as well later.” (Nung, 26-weeks-pregnant, 24-years-old)

Another perceived impact that some women raised was about the risk of the baby's death. Women reported that after finding out that they had a 'disease', their anxiety increased, and their worries focussed on the baby's health. They searched information about the impact of hyperglycaemia on the baby mostly from social media. The vast and unfiltered information on social media led the women even more anxious about the safety of their baby.

“It is because I play social media, IG (Instagram). Seeing a pregnant person, just like yesterday I saw someone who was 6 months pregnant, she was just like me, right, 6 months pregnant, her child died in the womb. That's what I'm afraid of. That's why sometimes "do you move, do you move?" that's what I am afraid of.” (Nung, 26-weeks-pregnant, 24-years-old)

While other women reported adverse impacts that could potentially occur to the baby, Hera, however, stated that she did not anticipate the risk to be serious. During her pregnancy, she did not believe that having hyperglycaemia was a significant condition. The condition was inadequately addressed, which eventually contributed to the death of the baby. Despite the evidence, she continued to harbour scepticisms about the claim that hyperglycaemia was a contributing factor of the baby's death.

“But I just thought, is it true that my child has diabetes?” (Hera, had the condition in 2020, 41-years-old)

4.5 Theme 2: physical and psychological consequences of living with hyperglycaemia

Living with hyperglycaemia during pregnancy was often described as inconvenient by the women, interfering with their physical and psychological well-being. This theme epitomised physical symptoms that women perceived to be related to hyperglycaemia as well as its psychological consequences, providing the experience of women on their struggle to bear the sense of guilt associated with the condition.

4.5.1 Subtheme 1: reported physical symptoms attributed to hyperglycaemia in pregnancy

Women reported several physical discomforts attributed to hyperglycaemia in pregnancy. Some of the symptoms were similar to complaints that commonly occur to pregnant women, but the women in this study believed that the symptoms have a causal link to their condition. The most frequently reported symptoms were drowsiness and feeling weak. Drowsiness was experienced by almost all women interviewed. They recounted that the desire to sleep comes all day, and it was difficult to overcome. Nung specifically mentioned that she often felt sleepy and weak in the morning around 8 a.m.

“Then, what I felt was, before I knew I had this blood sugar, what I felt I was always weak in the morning at 8 o'clock. Already sleepy. Easy... to get tired.

Why I feel tired in the morning?. Sleepy, sleep..." (Nung, 26-weeks-pregnant, 24-years-old)

Similarly, Hera also reported the symptom of drowsiness in the morning. She was unable to control her craving to sleep, even though her husband warned her against sleeping in the morning. According to Hera, there was a belief circulated in the neighbourhood that sleeping in the morning time could cause white blood cells to rise to the upper part of the body, and if it reached the eyes, it caused blindness.

"...My husband said, "wake up, people who are pregnant (not allowed to) sleep in the early morning". I only wake up when it's time to pray... I've never really heard people's advice. Get up in the morning, don't sleep early, what will happen later, white blood rises to the top and hits the eye. (I) never obeyed..." (Hera, had the condition in 2020, 41-years-old)

Hera recounted that despite the threat of blindness, most of the time she was unable to stay awake in morning time. She also reported feeling weak as another symptom of hyperglycaemia in pregnancy. Hera observed her condition and came to the conclusion that the 'feeling weak' meant her blood glucose was high.

"It feels like if for example, my blood sugar goes up, I can feel it. I feel so weak." (Hera, had the condition in 2020, 41-years-old)

Other physical discomforts that affected the women were feeling thirsty and frequent urination. Most of them were not bothered by the thirst because it could easily be overcome by drinking water, but some women found frequent urination created an obstacle. The need to use the toilet at night disrupts their sleeping hours, which may compromise their sleep quality. Moreover, these symptoms created curiosity for the women about what was happening in their bodies.

"Why is it so easy to be thirsty? I want to drink ice all the time. That's it, you can pee in the middle of the night for 10 times..." (Nung, 26-weeks-pregnant, 24-years-old)

The women were unaware about the possible causes of these symptoms, except for Isah who was a nurse. She guessed that those symptoms were related to hyperglycaemia.

“Always thirsty, urinating a lot, constantly urinating at night, lack of sleep, getting tired quickly, a little activity makes tired. Usually, we can just guess in that direction (sugar problem). (Isah, had the condition in 2016, 35-years-old)

Moreover, some women in this study reported that they experienced swelling in their hands or legs. For some women, this symptom repeatedly occurred during their pregnancy. Initially the women did not understand why their hands or legs were swollen. After knowing their blood glucose levels, the women started to perceive that the symptoms were related to the high sugar level.

“Six or seven (months of pregnancy), it's already swollen. The swelling seems to be the symptom, I think. Because people say it's swollen at 9 months. I've also had swelling like that. I think it's really a sign. There must be sugar in it, swelling in the legs. Swollen feet.” (Dwi, postpartum, 33-years-old)

In addition, the reported symptom includes feeling numb in the hands. One woman, Pipit, experienced the numbness, but she tended to disregard the discomfort until it started to affect her daily routine. She recounted that she expressed the numbness to the healthcare professional during the antenatal visit. The healthcare professional suspected that the numbness was caused by a lack of calcium.

“I said, why are my hands numb, cramping? I can't do anything, what's wrong with me, huh? “oh, maybe lack of calcium”, she said. Then, I was given medicine. Then I went there again, I checked again why there was no change (effect) from the medicine. I was given another medicine...”. (Pipit, 34-weeks-pregnant, 31-years-old)

Lina provided a distinct viewpoint about numbness. She reported that she felt this symptom, but assumed that the numbness was caused by high blood pressure instead of hyperglycaemia. Therefore, maintaining blood pressure was considered more important, which is believed to be the source of all the uncomfortable feelings.

"It's numb, yes, often. But they say it's because of high blood pressure. Numbness is the effect of high blood pressure, people said." (Lina, 36-weeks-pregnant, 32-years-old)

4.5.2 Subtheme 2: being anxious about pregnancy

The women expressed concerns after knowing that they had hyperglycaemia in pregnancy, particularly on how to successfully maintain a healthy diet. The most common advice related to diet that they received was to reduce rice consumption. This could be a result of dietary habits in the context of Indonesia, where rice is the main staple food. Generally, people consumed rice three times a day, at breakfast, lunch, and dinner. Rice is the primary source of carbohydrates for most Indonesian people, and therefore, it has become the main food item that must be reduced. Rice is very important for the Indonesian people that without having rice in the menu one is considered not having eaten yet. At the same time, women with hyperglycaemia were advised to decrease their consumption of rice. A woman reported that after knowing that they have hyperglycaemia, she developed a fear of rice.

"And when it comes to rice, I'm afraid of it." (Dwi, postpartum, 33-years-old)

The rice, which was so familiar in everyday life, suddenly became something to be avoided. This posed a challenge for women, which partly contribute to their perception that controlling blood glucose was a difficult task. Women were aware that they did not fully comply with the advice related to diet and acknowledged that they did not frequently monitor their blood glucose. The common explanation was that they were terrified to know the real situation.

"...Even though I take it easy. I keep thinking about it. Has it gone down or not? that's why until now I haven't checked the lab because I'm afraid that if it goes down, thank God, but if it's high, yes, I'm afraid it will get higher..." (Pipit, 34-weeks-pregnant, 31-years-old)

"So I initially had the intention to visit (health centre), yes, it's pretty good, sis, it's free, to check for free, but how come it's like, in my heart, it's not very pleasing. When I want to go there, it is like so hard to step my feet.

Then what I'm also afraid of is the sugar check err... the lab check is the fear, yes, that's the fear, the sugar, if the blood sugar is still high and it doesn't go down and down. I'm afraid, oh my, I'm afraid..." (Nung, 26-weeks-pregnant, 24-years-old)

According to the experiences of some women above, the lack of monitoring of blood glucose levels was due to the fear of confronting the reality. They recounted feeling solace when they did not know their glucose level, expecting that it would return to normal.

Furthermore, it was reported that having a chronic disease that needs daily management exhausted the women. Women stated feeling uneasy upon knowing their raised blood glucose levels. Some women experienced anxiety and persistent thoughts about the condition, even though the healthcare professionals have advised them to remain calm. The uncertainty about what could happen to the women and the baby was reported as a contributing factor.

"I was just told not to think too much, sis, just take it easy, I should not have to take it too much. But I am sick; how can I not think about it, sis? (Pipit, 34-weeks-pregnant, 31-years-old)

"That's it sis. Maybe my thoughts can have an influence. Maybe this blood sugar. Every night, sometimes, I cry. "Oh my God, when will I be free of thoughts like this, oh my God?" When is it. Sometimes it's sad." (Nung, 26-weeks-pregnant, 24-years-old)

Besides being agitated, women reported being confused about living with hyperglycaemia during pregnancy. They received advice from the community to reduce their food consumption, without clearly explaining what type of food they should limit and how much they were allowed to take. On the other hand, women were advised to pay attention to the nutrients for the baby. They were expected to be able to fulfil the necessary nutrients for the unborn baby. This situation made them confused about where to stand in maintaining a balance between limiting food intake and ensuring adequate nutrition for the baby.

"...Eating is wrong, and while not eating is also wrong. Awry." (Hera, had the condition in 2020, 41-years-old)

As previously mentioned, some women reported being afraid of knowing their sugar levels. They chose not to do anything, neither monitoring nor maintaining their blood glucose. A woman described that she was blamed by her community when an unwanted result happened due to her absence in managing the condition.

“They've already said, “Atu (a term for older women in Lampung language), don't you understand, pregnant women can't take ice”. I always drink the liquid ‘beng-beng’, every day. There are suggestions from the family. That's why I was blamed. Blamed. “We've been told you that pregnant mother...”, they know I have high blood pressure, “don't eat' salty food”. I reduced the salt. But they still “don't eat that salty one”. Yes, like that, they support me. I'm just stubborn. Don't hear what people say. Brother, sister, husband.”
(Hera, had the condition in 2020, 41-years-old)

As reported in her quote above, she was blamed for not taking sufficient measures to manage hyperglycaemia during pregnancy, leading to the death of her baby. She also reported feeling guilty for not being able to protect her baby.

“...Maybe he (the baby) still wants to survive, I think. It's just that God wills otherwise. He really doesn't want to live with me (crying).” (Hera, had the condition in 2020, 41-years-old)

Moreover, undergoing pregnancy with hyperglycaemia could lead to traumatic experiences for women, including a pathological fear of pregnancy (tokophobia). In this study, women reported that pregnancies complicated by hyperglycaemia were not only unpleasant, but also sometimes can be a scary experience. This led to the avoidance of another pregnancy in the future. Hera reported that she fell into a coma for nearly two months after she gave birth, and her baby died one week after birth. She felt traumatised and decided to get female sterilisation.

“It's really dangerous. Very dangerous. Yes. The proof is that I went into a coma. If it's not dangerous, maybe I'm not like that. Right? Terrifying. I don't want to be pregnant anymoreI said, “I want to be sterile”...I don't care. A man always wants many children. What about us? I'm the one who carries (pregnant).” (Hera, had the condition in 2020, 41-years-old)

Besides being anxious about pregnancy, some women acknowledged concerns about giving birth, considering the possibility of complications during delivery. The women were afraid of unknown emergencies that could arise, even though they could not explain what difficulties might happen during delivery. The intriguing thing was that most pregnant women were aware of the significance of haemoglobin and hypertension issues. The women were aware that regular blood pressure and haemoglobin checks were necessary. They mentioned haemoglobin issues, such as the concern that their haemoglobin may drop as delivery approaches and the potential dangers of high blood pressure during delivery. Women became increasingly anxious as the due date approached.

“I am worried. I worry when I give birth. People said it is really dangerous, sis. My sugar is above normal and my blood pressure is high. It's something we shouldn't have.” (Pipit, 34-weeks-pregnant, 31-years-old)

Some women were also concerned about potential future impacts in addition to the immediate effects. Most women were unaware that they could develop type 2 diabetes in the future. However, they were concerned that their current situation might have consequences in the future. Women are worried that hyperglycaemia might recur in future pregnancies.

“I'm afraid it will happen again.” (Lina, 36-weeks-pregnant, 32-years-old)

4.6 Theme 3: lack of communication and compromised service quality leading to dissatisfaction among women

All women had experienced consultations with healthcare professionals in various settings regarding hyperglycaemia during pregnancy. They reported ineffective communication from healthcare professionals, which eroded trust and created a gap between them. Given their perception of inadequate services provided by public health facilities, women preferred to access private health services for better management. Generally, this theme described two main views: the difficulties of communicating with healthcare professionals and the unsatisfactory experiences with health services.

4.6.1 Subtheme 1: views on the interaction with healthcare professionals

Some women commented that they were not satisfied with the information provided by healthcare professionals due to the use of 'language' and they felt it was too complicated for them. The women failed to understand the 'language', which referred to the complex way of delivering information as well as the medical terms that was used by the healthcare professionals. They were reluctant to ask questions or clarify the information and were more comfortable finding out through other parties apart from healthcare professionals.

"the language is difficult for us to understand. So, we are more afraid. If we look at or read the information in the group, it's a bit lighter, sis. We understand better. "Oh, like this like that". I think it is like that, sis." (Pipit, 34-weeks-pregnant, 31-years-old)

"I searched on Google. How about diabetes. what was that?... what should I do. What should I avoid. I searched." (Dwi, postpartum, 33-years-old)

The lack of clear information from healthcare professionals created confusion for the women which potentially caused misunderstandings between women and healthcare professionals. In this study, unclear information from healthcare professionals created misinterpretations and decreased trust. Nung recounted that she became suspicious and questioned the healthcare professionals' genuine concern, as they were eager to ask her to conduct a laboratory test at the health centre.

"Why are they excitedly asking me to check the lab there, you know?...It turned out that they (health centre personnel) got data from the health post, that there was a pregnant woman err... her blood sugar was very high, her address is this, her phone number is this (she imitating the health post personnel). They gave my data." (Nung, 26-weeks-pregnant, 24-years-old)

From her explanation above, Nung considered that the healthcare professionals were pursuing her through the home visit programme. She was also displeased because despite the fact she had not provided her contact information, she was visited twice by the healthcare professionals, who subsequently requested her

immediate presence at the health centre. The suspicion of the true intention and the dissatisfaction about data sharing without her consent negatively impact the relationship between the woman and healthcare professionals.

Furthermore, Nung mentioned about fear-inducing communication. She recalled that communication by healthcare professionals was rather 'scary' and could be interpreted as intimidating. The manner in which healthcare professionals communicated the potential impacts on women and babies was perceived as harrowing. Rather than providing support, the information from healthcare professionals induced fear in the women. Nung described that upon receiving the information, she became anxious. It led to the reluctance to interact and to access care from the healthcare professionals.

"If that's the case...err...don't scare people. Make people happy. Don't speak like, we've only met once, then scare us. That's the point... people are not the same, aren't they? Maybe yes, maybe. Human is different from one to another. My character is so sensitive. When they treat me like that, I will feel cranky. It's just that they shouldn't be too intimidating... (Nung, 26-weeks-pregnant, 24-years-old)

Dwi had a similar unpleasant experience regarding communication with healthcare professionals where discouragement was reported. Healthcare professionals were considered unhelpful in the management of hyperglycaemia, and instead made the women feel anxious and fearful.

"Something like that makes you down, isn't it? Not supportive, I mean. "this is DM (diabetes mellitus), ma'am, the child will be like this". Well, I already know, you don't have to tell me, I'm already scared, and you add it by saying it again? oh my!" (Dwi, postpartum, 33-years-old)

As a result of not getting clear information, some women assumed that healthcare professionals did not have expertise about hyperglycaemia in pregnant women. This assumption arose because women only received information about the negative impact that can occur in pregnant women with hyperglycaemia, without getting clear information about how to manage such a condition.

“So basically, it's diabetes, but pregnant, just like that. But they don't know what the condition is, what's the medicine. That's why they scare me. (Laugh) Because they don't know, that's why they just scare people.” (Dwi, postpartum, 33-years-old)

The dissatisfaction among women with regards to communication potentially creates interpersonal conflicts between women and healthcare professionals. The trust and understanding between the two could be negatively impacted due to communication issues.

4.6.2 Subtheme 2: experiencing the health services

As previously mentioned in section 4.2, women accessed care from different health facilities within the working area of Katon health centre. The experience of health services that they reported varied depending on the setting. Those who accessed services from public health facilities reported dissatisfaction partly due to limited care and lack of continuity of services provided by healthcare professionals. Pipit expressed her disappointment with how the healthcare professionals handled her condition during her visit to the site. The scepticism on the test result was reported, as Pipit perceived that the healthcare professionals were not providing services with dedication and a sense of responsibility.

“A service for pregnant women should be comprehensive, sis. We can, like at the health centre (for example), we can do an ultrasound. We can see the heartbeat. But last time, I didn't even have a blood pressure check. We were asked to register, and being asked what the purpose of the lab test was. We want to know what's going on, right?...There was sugar, so I was surprised at that time, that it reached 201. Where did that number come from? I'm afraid if the health professional is wrong, sis....” (Pipit, 34-weeks-pregnant, 31-years-old)

Furthermore, women perceived that healthcare professionals were reluctant to be actively involved in managing hyperglycaemia during pregnancy and often preferred to transfer the responsibility onto other parties, such as a specialist doctor or a higher-level health facility. The health centre, as a primary-level health service, had a large number of patients daily. This condition required healthcare

professionals to work fast, which sometimes compromises the quality of care. They immediately wanted to refer high-risk patients to higher-level services such as hospitals or specialist doctors.

“From the health centre, she immediately said to the doctor. They called, made a call to dr Dibu. “Ma’am, go straight to Doctor Dibu, and see what the doctor will say later”.... The health centre was busy. They wanted to quickly refer (me) to the doctor, to the hospital.” (Hera, had the condition in 2020, 41-years-old)

As mentioned above, the healthcare professionals tended to refer women with hyperglycaemia during pregnancy. Whereas, it was revealed that the referral system was quite confusing for the women. In the interview, some women reported experiencing referrals from various health facilities, such as going from private midwife practices to health centres or from health centres to specialist doctor’s clinics or hospitals. The absence of comprehensive pathways leads to uncertainty of where to go for a referral. Confusion was expressed by some women because of the complexity of tiered referral in the Indonesian health system, where people may choose private or public healthcare facilities. People could access private health facilities as long as they were willing and able to afford the service. However, to access services from the public health facility, they must follow the rules in the health system, including tiered referral. It is allowed to change the path during the process, either from private to public or one way around. These two pathways are sometimes not comprehensively understood by the women, causing confusion.

“Can you imagine, sis, on that day I went from the health centre to the midwife and then to the doctor. How can I not stress?”... going here and there. Oh my God, I said. That's why I was down that time, I fell. Because I thought about it.” (Pipit, 34-weeks-pregnant, 31-years-old)

The absence of clear referral pathways made women think that the referral system was confusing and tiring. They had to go back and forth to arrange documents needed for referrals from a primary health service to a higher-level facility. A woman stated that administrative-related matters take up a lot of time and effort.

She also complained about the long waiting time for medical care and the inadequacy of services received due to the high number of people who benefit from the government's free healthcare system.

“Tired of going back and forth. Tiring, not practical. Exhausting. It was the third day, and I was in a hurry (to be discharged). “already healthy”. Already healthy? Healthy from Hong Kong! (this is a phrase commonly used by Indonesian to indicate something that is impossible). ...That's it, I'd better pay. It's not arrogance or anything. It's complicated. If I took care of it (administrative work), I would be sick first. The medicine was really standard (low quality). I'm just tired. The caesarean hasn't healed, it's better if I go to a private (facility). Better for me to just pay, and not thinking about referral.” (Dwi, postpartum, 33-years-old)

The administrative-related work in the referral system made women reluctant to access public health facilities. Some women looked for a fast track to get quality services through private health facilities. The women can access health services easily without having to fuss with administrative issues and long queues unlike at public health facilities. They decided to pay for the convenience of accessing care.

“Well, if using my own money, it still takes a long time, but we don't go back and forth here and there, that's it.” (Nung, 26-weeks-pregnant, 24-years-old)

In general, women who accessed care from private health facilities expressed satisfaction with the services, especially from private practice of medical specialists. Some women decided to access private health facilities because they had an unpleasant experience dealing with health services from public health facilities in the past. Based on various experiences regarding health services, women concluded that the quality of health services depended on how much one's willingness to pay.

“...you know what it's like. In a way, if we want something good, we look for a good one. The point is, in our place in Indonesia, if you want standard (low) services, then you get standard services...I really dare to pay. Yes, we are not like this (arrogant). Yes, the situation is like that. I don't keep badmouthing, because, I'm sorry, I just keep paying.” (Dwi, postpartum, 33-years-old)

4.7 Theme 4: self-management developed and utilised by women

The women remarked how their lives were negatively affected by hyperglycaemia during pregnancy. Although they initially struggled to accept their condition upon first detection, they eventually went through some measures of self-management, including being proactive and seeking help from God. Some women also described some lifestyle-related modifications that they practised to lower their blood sugar as part of self-management.

4.7.1 Subtheme 1: being proactive

Some women believed that undetected hyperglycaemia in pregnancy was a dangerous condition. To be able to manage the condition, it has to be screened and diagnosed. Lina mentioned the importance of taking the initiative to inform the healthcare professionals about her health. Being proactive to ensure that the healthcare professionals were aware of all her symptoms and history was perceived as an effort to receive proper tests and other services.

“Sometimes someone knows this but she doesn’t want to inform (healthcare professional). That’s wrong. So, we have to inform this... “I have this history, Doc. I want a complete check”. Everything must be complete, we should request.” (Lina, 36-weeks-pregnant, 32-years-old)

Being proactive for some women was mainly driven by the motivation of ensuring the wellbeing of unborn babies. For Nung, the encouragement also came from her desire to fulfil her husband’s wishes to have a baby. The evidence of her enthusiasm was demonstrated in her statement below:

“Oh God, can I heal or not, I have to be motivated, I don’t have children yet, I have to recover, I have to be able to, just have to make my husband happy because we’ve been married for more than a year, (and it) will be two years. Anyway, I have to be motivated, I definitely can.” (Nung, 26-weeks-pregnant, 24-years-old)

Some women perceived that the management of hyperglycaemia was a personal responsibility. The quantity of food consumption depends on personal preferences,

and the adherence to lifestyle modification cannot be imposed on a woman. Support from other parties can play supplementary roles at best, while the women must ultimately determine the decisions with regard to managing their condition.

“Yes, self-awareness that there is no cure for diabetes unless we hold ourselves back, right?” (Dwi, postpartum, 33-years-old)

“That’s it, it is up to us, do you want to change or not. If the doctor and the midwife gave you strong advice, forbade you not to do this and that, and if you are still stubborn, it’s useless, right? It’s from ourselves. Because it’s good or not, we are the ones who experience it by ourselves.” (Pipit, 34-weeks-pregnant, 31-years-old)

4.7.2 Subtheme 2: the pursuit of spiritual tranquillity

Women were shocked when they learned about the high blood glucose level, but eventually, they started to accept the situation. This circumstance is related to the predominant Muslim belief system in Indonesian society. Most of people believe in Allah as the only God. Allah is believed to be all-knowing what is the best for each individual, and everything occurs according to his will. Some women considered the condition to occur according to Allah's will, with the purpose of necessitating their acceptance. Therefore, some women perceived that hyperglycaemia in pregnancy was more manageable if the women think positively. Promoting blood glucose stability includes having a relaxed attitude and not worrying excessively about their circumstances.

“the point is... if we have something, we think positive, think positively, think positively about Allah. Just surrender. At that time I did that because I was in shock at that time. So yeah... just accepted it, this is the test, that's it. So yeah...let us have a calm heart, plong (feeling of relieved and no burden), that's it.” (Isah, had the condition in 2016, 35-years-old)

For Isah and Hera, God had a specific reason for giving them the ‘disease’, which in this case the hyperglycaemia in pregnancy. Women must be ready and willing to accept God's will. Therefore, making an effort to find peace from God was perceived as necessary.

I thought that God had shown me (the way), so I prayed. Istikharoh (prayers for asking guidance from God). Asking for directions. (Hera, had the condition in 2020, 41-years-old)

According to Isah's response, she believed that her condition was a test from God. The 'disease' was perceived as a sign from God bringing people closer to God spiritually. Practicing the prayers more frequently, particularly the *tahajjud* prayer (the mid/late night prayer, typically between 3 to 4 a.m), was regarded as an attempt to beseech God for salvation from the disease and develop close relationships with God.

"Maybe God, maybe this is a warning that we have to get closer. Yes, basically being self-aware (laughs). Making myself aware to become calmer." (Isah, had the condition in 2016, 35-years-old)

4.7.3 Subtheme 3: self-made lifestyle modification

Some women reported feeling healthier after making lifestyle changes, one of which was reducing the rice and sticky rice. As previously indicated, given that rice was a staple food for the majority of Indonesians, all women tried to manage their intake of rice. It was reported to be challenging for women to eliminate rice from their diet. Women strive in different ways so they can still consume rice without experiencing a significant increase in sugar. Some women described that they took leftover rice (the rice cooked the day before), under the assumption that it had lower sugar content compared to freshly cooked rice. In addition, cold rice was also believed to contain less sugar compared to warm rice.

"I ate leftover rice. The rice that was left over from yesterday, did not finish, the cold one." (Nung, 26-weeks-pregnant, 24-years-old)

"I really like eating when the rice is hot. The midwife said it wasn't good. She said if it could be chilled. That's why I know when I want to eat, I wait for the rice to be very cold and then eat, so that the sugar content is a bit low." (Pipit, 34-weeks-pregnant, 31-years-old)

The women reported that glutinous rice was also avoided since it was thought to have high sugar content. In Indonesia, sticky rice was prepared to provide a range

of treats. *Tape*, a fermented food made from sticky rice, was believed to be able to surge blood glucose.

“There is food, this is really what I was told to do, sticky rice.. my parents told me to reduce sticky rice.. because it can increase blood sugar, especially the Tape (sweet food made from sticky rice) is very fast (to increase blood sugar),...” (Lina, 36-weeks-pregnant, 32-years-old)

Another self-management strategy developed by some women was minimising sugar use in cooking. They also tried lowering their salt intake due to high blood pressure. Women stated that eating tasteless food is a method to manage their condition. These attempts were described as efforts to ensure the baby's health during pregnancy.

“The food’s taste is like...although it is tasteless, it is for the sake of my child.” (Pipit, 34-weeks-pregnant, 31-years-old)

“..., so only tasteless food, stir-fried vegetables, pepes (fish that wrapped in a banana leaf, roasted)...” (Lina, 36-weeks-pregnant, 32-years-old)

Apart from dietary changes, women were informed that exercises were beneficial to manage hyperglycaemia. However, as previously described, most women in this study refrained from exercising for several reasons. To compensate for the lack of exercise, some women stated that they do household chores as their "exercise". They perceived sweeping, moping the floor, and other household chores that induce perspiration as an alternative to physical exercises.

“It is sometimes like this, ma'am... The women, sometimes when they...what... clean the house, sweep, they already feel like it's sweaty enough. Even though it's actually not yet, it's not optimal. It's just that sometimes we sweep, we mop, we clean up the house, we... sweat, it seems like that's already... that's enough.” (Isah, had the condition in 2016, 35-years-old)

4.8 Theme 5: perceived support and healthcare professionals' advice

When faced with challenges in seeking solutions for their condition, women perceived getting support from various sources, including friends, family members, neighbours, and the internet, while healthcare professionals were seen as the party who provided advice. One interesting phenomenon was how women preferred to seek support from their personal network. The experience in management of hyperglycaemia may play a role in influencing women's perceptions and behaviour on their condition. In this theme, women's perception on support that they received was elaborated, which includes getting encouragement from friends, reminders from mothers, assistance with household chores from husbands, and information from seniors in the community. They also stated that the internet was a useful source of information that was easily accessible. Discussion of women's experiences on how they were supported by health professionals by getting advice on diet and exercises also informed the women's perceptions on the management of hyperglycaemia. Health professionals' advice on hyperglycaemia management was extensively discussed across all the women. However, it was reported that the advice regarding diet and exercise was neither clear nor tailored made for each individual.

4.8.1 Subtheme 1: perceived support

Women reported that they received support from significant others in managing hyperglycaemia in pregnancy. One significant source of support for women was their friends. It was mentioned that friends encouraged the women to overcome their current situation by maintaining a healthy diet and following the doctor's recommendations. For women, friends were the place to share stories and experiences and to gain greater empathy for their condition.

"Friend. Friends are always very supportive, cheering me up..." (Nung, 26-weeks-pregnant, 24-years-old)

Indonesian society has a strong religious tradition. The topics that dealt with finding God's peace were inspiring to women. Isah mentioned specifically about friends

from a religious group that assisted her in managing her mind. They were regarded as wise friends who offered comforting advice.

I just have friends. Friends who are...what is it... friends in pengajian (a community who learn about religion), right? They are people who understand more, right... we're just sharing (thought). (Isah, had the condition in 2016, 35-years-old)

Support for women also comes from family members, especially from their mothers. It was described that their mothers were their greatest ally, and the ones who constantly reminded them to be aware of what they eat, to be cautious in preserving their health, and use insulin as prescribed by their doctors for some cases.

"Definitely my mother. Mom supports me the most. Yes, support, always warn. "Be careful", that's it. Then sometimes, "let's check" like that. Mom reminds (me)." (Isah, had the condition in 2016, 35-years-old)

Yesterday my mother-in-law asked me to get insulin injection. "go to Puri Betik Hati Hospital for an injection". (Pipit, 34-weeks-pregnant, 31-years-old)

Another important source of support for women was their husbands. While being 'unhealthy,' women required assistance to do household chores. Some women reported that their husbands took over some of their responsibilities for everyday housework. The husband taking over the household chores were acknowledged as a significant form of support for women.

"In these 9 months, I don't iron, everything is done by my husband, he sweeps and mops the floor, everything, I just turn on the laundry machine, make the bed, but the rest are done by my husband. (Lina, 36-weeks-pregnant, 32-years-old)

Seniors were another source of support. Some women received advice on managing hyperglycaemia in pregnancy from seniors in their neighbourhood. Since people with blood glucose issues were typically elderly, seniors were the individuals to turn to for advice and support when problems emerged as they were viewed as having more life experience. However, information from seniors

sometimes comes from their experiences rather than scientific evidence. The suggestions made were also more influenced by the prevailing culture in society.

“That's what they said. You can't eat anything, like giblets, you know, like intestines, that's how it is. Then it is said that you can't eat a lot of grilled meatballs, which are burnt, like that. It is said that it could harm the baby...”
(Nung, 26-weeks-pregnant, 24-years-old)

Women also sought support from those in their immediate vicinity, such as neighbours. The majority of women expressed interest in seeking more information about hyperglycaemia during pregnancy. It was intriguing that some women prefer their neighbours over the healthcare professionals as the information source. The lack of understanding between women and healthcare professionals, as mentioned in Theme 3, was likely to be why women were ambivalent to visit the health facility to seek information about their condition.

“There is (source of information). Not from the doctor Dibu, nor from the health centre, it was from my neighbour...” (Hera, had the condition in 2020, 41-years-old)

Some women searched for information online on social media platforms, including Facebook and Instagram. Pregnant women's Facebook groups provided a welcoming environment for women to share and seek information. Colleagues who were also suffer from the same condition became go-to sources for information on pregnancy-related hyperglycaemia. Compared to information provided by health professionals, this group provided information that was simpler to comprehend. Women also watched videos on YouTube and Instagram for information.

“Finding out on Google. Sometimes when you're not doing something else, your brain doesn't have any thoughts, sis. It is calmed down. I'll find out what could be the cause. What I'm focusing on is the foetus, not to me. To the foetus. What is the impact? I searched on YouTube for pregnant women with high blood sugar, you see. I watched. (Nung, 26-weeks-pregnant, 24-years-old)

“...But if I watched on YouTube, there are pregnant women who are safe. She didn't know that she had blood sugar. I used to see that. (Hera, had the condition in 2020, 41-years-old)

4.8.2 Subtheme 2: lifestyle advice from healthcare professionals

Women reported that the healthcare professionals advised them to adjust their lifestyles. The women mentioned dietary changes as the common suggestion, including reducing the consumption of sweet-tasting foods and consuming less carbohydrate sources.

“... then the doctor said “regulate the diet, ma’am” she said like that. “Adjust your diet, reduce flour, reduce rice, eat more vegetables”, like that” (Lina, 36-weeks-pregnant, 32-years-old)

However, there was no detailed information from healthcare professionals on what food that is beneficial and what food should be avoided, as well as how much the calorie intake is to ensure a healthy and balanced diet. The women merely mentioned that the healthcare professionals had advised them to change their diet, which was understood as reducing food intake.

“The midwife only suggested that to reduce sugar, don't drink sweet and sweet cakes like that. It is allowed, but reduce it. Don't do it too often. Like what my midwife said yesterday, especially the rice, it has to be reduced because the sugar content of the rice is really high, she said, especially if it's just cooked. It needs to be reduced, she said. (Pipit, 34-weeks-pregnant, 31-years-old)

In the quotation above, Pipit and other women described the advice of reducing rice. Healthcare professionals emphasised that the reduction of rice consumption was crucial to lower women's blood glucose. In addition to reducing rice intake, healthcare professionals also suggested switching from rice to brown rice. White rice was believed to have a higher sugar content compared to brown rice. Eating brown rice instead of white rice was considered as part of a healthy diet.

“...if possible, replace the white rice with brown rice, she said, or oat... don't take white rice.” (Lina, 36-weeks-pregnant, 32-years-old)

Unfortunately, health professionals did not provide additional information regarding the recommended number of servings of brown rice for women. Another dietary suggestion was to replace white sugar to palm. It was considered beneficial for people with hyperglycaemia to switch to palm sugar from white sugar.

“But the doctor said that the original palm sugar is okay. If you cook, just put a little. That’s what the doctor said. Not too much.” (Nung, 26-weeks-pregnant, 24-years-old)

In addition, women were advised to consume ample quantities of vegetables and fruit, which were regarded as beneficial and healthy food for women with hyperglycaemia in pregnancy. However, similar to brown rice, there was no information on the recommended daily intake of fruits and vegetables. Women believed that there were no restriction on the amount of fruits and vegetables they could consume.

“I should eat lots of vegetables. It’s even good. There are no restrictions for blood sugar. If you eat spinach like this, a little, no. I was even told to add more vegetables...” (Nung, 26-weeks-pregnant, 24-years-old)

“I ate a lot of fruits like mango, guava...Grapes, apple seeds, mango, err, kiwi. what else? Orange, it’s like that...No, just as much as I want. Just for the sake of filling me up.” (Dwi, postpartum, 33-years-old)

Most women recounted how they had altered their diets, but only a few mentioned how they exercised during pregnancy. Some women stated that they were advised to exercise. There were different exercises recommended, such as morning walks and sunbathing. Some women were instructed to take a short stroll daily.

“He (doctor) said “go for a walk, if not 5 minutes (to) 10 minutes regularly”, he said.” (Hera, had the condition in 2020, 41-years-old)

In the context of Indonesia, sunbathing in the morning is a common practice as a way to receive sunlight for improved health. Interestingly, some women perceived sunbathing as a form of exercise, although they were simply enjoying the warmth of the sun without engaging in physical activities.

“...like sunbathing, or walking, things like that. Go for a walk, don't go far, just walk around.” (Lina, 36-weeks-pregnant, 32-years-old)

The majority of women, however, stated they refrain from exercise due to various personal factors; these factors were covered in greater detail in section 4.4.3. Some women were suggested by the health professionals to avoid engaging in physically demanding activities. Engaging in heavy activity might affect the baby's health.

“The midwife said yesterday, don't be tired, don't work overload.” (Nung, 26-weeks-pregnant, 24-years-old)

This advice sometimes served as a justification for some women to refrain from exercising while they are pregnant. This view is related to cultural beliefs in some Indonesian communities, viewing pregnant women as vulnerable and weak individuals who are not supposed to engage in physical movement in order to protect them and the babies.

Despite the mentioned forms of supports, some women expressed dissatisfaction and desired more comprehensive and effective services. They also demanded more patient-centred care that focuses on women's needs and provide empathetic experiences.

“Err... it should be...specialized, that's what I mean... More often, more focused if there are things that needs to be monitored.” (Isah, had the condition in 2016, 35-years-old)

“...It's just that they shouldn't be too intimidating. It's really nice to be visited, it's really nice to be noticed. Just don't be like that, the way they talk to patients, that's it.” (Nung, 26-weeks-pregnant, 24-years-old)

Women stated that they desired non-threatening services. In Indonesia, there is a common perception that healthcare services are hostile and unwelcoming . This image in the society affects the interactions between women and healthcare professionals, resulting in a less cohesive and harmonious health service experiences.

4.9 Summary box

- Screening for hyperglycaemia in pregnancy is not a routine practice at the Katon health centre.
- Hyperglycaemia in pregnancy is a condition that tends to be overlooked by women until it is recognised.
- Concerns about the impact of hyperglycaemia in pregnancy lead to anxiety among women.
- Managing glucose levels poses a significant challenge for women.
- The provision of healthcare services related to the management of hyperglycaemia in pregnancy was perceived as inadequate and lacking in empathy.
- Women strive to manage hyperglycaemia throughout pregnancy by implementing their own lifestyle modifications and seeking comfort through spiritual means.
- In addition to their immediate social circles (family and friends), women also obtained support through peer groups established on social media platforms.

Chapter 5 Findings based on interviews with healthcare professionals

5.1 Introduction

This chapter summarises the findings of the data analysis conducted on the basis of in-depth interviews with healthcare professionals. The purpose is to assess healthcare professionals' knowledge and understanding of hyperglycaemia during pregnancy and their experience in managing this condition. The structure of themes and subthemes that developed from the thematic analysis is presented after describing the characteristics of healthcare professionals. Based on how healthcare professionals expressed and commented on their experiences, a thorough explanation is provided for each theme and its related subthemes. Anonymous quotations are supplied to provide comprehensive insight into each theme and subtheme.

5.2 Study sample

Healthcare professionals were selected purposively based on the recommendation of the head of the health centre. The healthcare professionals with experience in providing care for women with hyperglycaemia in pregnancy were invited. The majority of them are midwives, as they are considered to be the foremost actors in maternal health in the context of Indonesia. Seventeen healthcare professionals were identified and approached. All of them agreed to participate in the study. One doctor and two midwives were recommended by healthcare professionals who were interviewed. Therefore, twenty-one participants were interviewed in this study. All interviews were conducted in the working place and lasted between 25 to 60 minutes. The healthcare professional's ages ranged from 27 to 65 years old. They have been working as health providers for between 4 and 30 years. The characteristics of the healthcare professionals are summarised in Table 8.

Table 8 Characteristics of healthcare professionals (N=21)

Healthcare professionals (Code)	Age (years)	Job Experience (years)	Gender	Professional Qualification
Ana	52	25	Female	Dentist
Beta	49	29	Female	Midwife
Cinta	51	30	Female	Midwife
Dahlia	36	12	Female	Midwife
Emilia	36	12	Female	Midwife
Firda	39	18	Female	Midwife
Galuh	32	11	Female	Midwife
Hilda	48	24	Female	Midwife
Indira	30	9	Female	Midwife
Junita	28	4	Female	Midwife
Kanti	41	15	Female	Doctor
Laksmono	46	15	Male	Doctor
Mardi	29	4	Male	Doctor
Nadia	27	6	Female	Laboratory staff
Oliv	45	26	Female	Laboratory staff
Putri	35	12	Female	Nutritionist
Qila	51	25	Female	Pharmacist
Rosi	55	34	Female	Nurse
Sumiati	43	23	Female	Midwife
Tyas	49	29	Female	Midwife
Umi	65	29	Female	Midwife

5.3 Structure of the findings

Three themes were developed based on interviews with healthcare professionals.

- Healthcare professionals' views, knowledge, and understanding related to hyperglycaemia in pregnancy (section 5.4)
- The management of women with hyperglycaemia in pregnancy (section 5.5)
- Needs and resources required by healthcare professionals (section 5.6)

Section 5.4 discusses in more detail how healthcare professionals view hyperglycaemia in pregnancy as a high-risk factor for women and baby. Section 5.5 explores their experience in managing this condition. In addition, section 5.6 analyses the perceived needs of healthcare professionals to provide services for women with hyperglycaemia during pregnancy.

Table 9 Structure of themes and subthemes of HCP's interview

Sub-theme	Theme
<ul style="list-style-type: none">• Healthcare professionals' views about hyperglycaemia in pregnancy in general• Healthcare professional's knowledge about risk factors, symptoms and impact of hyperglycaemia in pregnancy on mother and baby• Healthcare professionals perceive that women have little knowledge and awareness about hyperglycaemia in pregnancy	Healthcare professionals' views, knowledge and understanding related to hyperglycaemia in pregnancy

Sub-theme	Theme
<ul style="list-style-type: none"> Healthcare professional's views about barriers for women in accessing care 	
<ul style="list-style-type: none"> Healthcare professional's experience in glucose testing Healthcare professional's experience in managing hyperglycaemia in pregnancy Healthcare professionals experience in referring women for further support Lack of policy and guidance on the management of hyperglycaemia in pregnancy 	<p>The management of women with hyperglycaemia in pregnancy</p>
<ul style="list-style-type: none"> Needs and resources required by healthcare professionals 	<p>Needs and resources required by healthcare professionals</p>

5.4 Theme 1: healthcare professionals' views, knowledge, and understanding related to hyperglycaemia in pregnancy

This section will address how healthcare professionals perceive hyperglycaemia in pregnancy. Their understanding of the risk factors and effects that may result from this condition was explored and presented alongside their perspectives on women living with hyperglycaemia. The healthcare professionals also reported some barriers they noticed which could discourage women from managing their condition.

5.4.1 Subtheme 1: healthcare professionals' views about hyperglycaemia in pregnancy in general

Healthcare professionals reported that at the health centre women who are five months pregnant (20 weeks) or more typically undergo laboratory tests to identify a variety of markers, including but not limited to protein urine levels, hepatitis B, human immunodeficiency virus (HIV), syphilis, and blood glucose. The laboratory test for glucose level was taken at least once during pregnancy, regardless of the presence of known risk factors. Some pregnant women might have follow-up glucose tests if it is considered necessary by healthcare professionals. Health professionals claimed that they had checked blood glucose levels in all pregnant women during antenatal visits to the health centre. However, they infrequently discovered excessive glucose levels in pregnant women. The majority of healthcare professionals viewed hyperglycaemia in pregnancy as a rare event.

“...as long as I'm on duty at the Katon health centre, I found one (case) yesterday, yes, that's the only one I met face to face.” (Cinta, midwife at the health centre)

“Ah, it's not that often. It's rare. There is one case. Here (in the health centre), it's not many.” (Beta, midwife at the health centre)

Beta and Cinta are senior midwives who have worked for over 15 years. They stated that they had only encountered a few cases during their work. In the last year, they said that they had only seen one case. Meanwhile, Qila, a pharmacist who has worked for more than 20 years at the health centre, said that she had never encountered a pregnant woman with hyperglycaemia.

“But it's rare, you know, very rare, so almost every month, it's almost never. I've never found one myself.” (Qila, pharmacist at the health centre)

Furthermore, the healthcare professionals working at the health posts also mentioned that they rarely encounter pregnant women with hyperglycaemia in their area. Some midwives believed that there was not any case in their area.

“So, thank god there is no case. Yes, as long as I work here, I haven’t met a pregnant woman with a DM yet.” (Firda, midwife at the health post)

Some healthcare professionals believed there was a very small likelihood of pregnant women presenting with hyperglycaemia levels. This condition was suggested as one explanation for the infrequent occurrence of the condition in the community.

“The chances are small, sis. It’s not as big as err... if you’re a pregnant woman with hypertension, that’s how it is. It seems like a small chance. You see, err... during my time in the Katon, I’ve never heard of a pregnant woman with gestational diabetes. It seems that the possibility is small.” (Emilia, midwife at health post)

Based on the assumption that the number of pregnant women with hyperglycaemia was low, some healthcare professionals perceived the issue as insignificant. They believed that other health problems among pregnant women were more prevalent and/or dangerous, for example hypertension, HIV or hepatitis.

“...The issue is not ‘wow’ (laugh)... Maybe there is, but not many. Every time there are meetings, seminars, the problem of diabetes is never discussed. Because maybe (pregnancy) with diabetes it’s not very risky. Like HIV and hepatitis are risky, or hypertension can be convulsive, people say. If you have diabetes, the risk may not be so (big). Only the baby weighs less.” (Kanti, doctor at the health centre)

According to Kanti, hyperglycaemia in pregnancy does not pose serious health risks to the women and babies compared to other diseases. Moreover, its prevalence is lower compared to conditions such as anaemia and pregnancy-related hypertension.

“...that’s because cases of pregnant women with diabetes are rarely found. It’s not like an everyday case like anaemia. Anaemia is, out of 10 pregnant women, 7 can get anaemia, and 3 don’t. Well, that is the difference between

DM (and anaemia). DM is rarely found in pregnant women. So, we often discuss pregnant women with DM, how we manage, we talk about it, but finding such patients is rare. What often is anaemia, high blood pressure, those are more commonly found in pregnant women.” (Indira, midwife at the health post)

Despite the notion that the number of cases was small and relatively harmless, the majority of healthcare professionals lacked a clear understanding of the classification of hyperglycaemia that is detected for the first time in pregnancy, such as GDM and diabetes mellitus in pregnancy. They considered all pregnant women with hyperglycaemia as having diabetes mellitus (DM) during pregnancy. As seen in Indira’s statement above, she identified pregnant women with hyperglycaemia as ‘women with DM’. In addition, the confusion in terminology of GDM and diabetes mellitus in pregnancy is evident in quotes from Emilia and Dahlia below:

“Maybe it’s the same, right? same (laughs). Maybe it is the same, pregnant women with diabetes.” (Emilia, midwife at the health post)

“I think they both are the same, (pregnant) with diabetes, but how come the cases are different? One already had it before pregnancy. One of them had it when she was pregnant?” (Dahlia, midwife at the health post)

Some health professionals were entirely unfamiliar with the term gestational diabetes or GDM. They were unsure when a condition was classified as GDM. They mistakenly assumed that GDM was identical to type 2 diabetes in pregnant women, and some health professionals appeared bewildered when discussing the distinction between GDM and diabetes in pregnancy.

“Will DM in a pregnant woman disappear after giving birth?” (Beta, midwife at the health centre)

“I think it’s different... is that a pregnant woman is indeed has DM from the start? So, if after pregnancy, then DM, are there other factors from the

pregnancy that made her DM? I don't know too (laugh)". (Hilda, midwife at the health post)

Other healthcare professionals were aware of GDM but were uncertain whether or not their knowledge was accurate. It is worth noting that few healthcare professionals could differentiate between GDM and existing diabetes.

"The only thing I know is like this, later when she gives birth, maybe her blood glucose will return to normal. Well, maybe it's not GDM, isn't it? Eh, that's what GDM is when she returns to normal, that's what (GDM). If she doesn't return to normal, it could be that she's a DM, that's how it is. But yeah, that's just my knowledge (laughs). I still don't understand how to determine anything, I don't understand." (Oliv, laboratory staff at the health centre)

5.4.2 Subtheme 2: healthcare professional's knowledge about risk factors, symptoms and impact of hyperglycaemia in pregnancy on mother and baby

Healthcare professionals commonly assumed that hyperglycaemia during pregnancy was associated with a variety of risk factors, including a family history of diabetes and an unhealthy diet. The majority of healthcare professionals highlighted having a family history of diabetes as a significant risk factor. It was suggested that pregnant women with hyperglycaemia may have inherited a genetic susceptibility to the condition.

"...Actually, the so-called diabetes can be from heredity, a factor from...what is it, heredity (inherited from a family member), right? Can be heredity, can also be due to diet. So, err...many things related to this (GDM). Maybe she has 'the seeds'...we never know." (Ana, the head of the health centre)

Moreover, some healthcare professionals mentioned an unhealthy diet as another potential risk factor. It was believed that excessive food consumption might

exacerbate the pre-existing genetic factor, increasing the likelihood of developing hyperglycaemia during pregnancy.

“Yes, as far as I know, there used to be genes. Yes, there were hereditary. But what percentage was that, but it was triggered again with that diet, ma'am, an excessive carbohydrate diet is an unhealthy lifestyle.” (Cinta, midwife at health centre)

Apart from heredity and unhealthy diet, one healthcare professional, Galuh, also mentioned a lack of exercise and a women's weight as risk factors. She highlighted the factors that were rarely mentioned by others, which showed a good understanding of risk factors. Galuh and other healthcare professionals emphasised the importance of family history in determining the condition, commonly referred to as the "heredity factor" in Indonesia.

“Yes, one is food. Second is the body weight. Third, she rarely exercises, right? Fourth, I said... heredity, I said earlier, heredity seems to be bigger than lifestyle, in my opinion. It's because it's 50%-50%. For example, if she has heredity, there's a certainty. We don't want to pre-empt God's will, but she will get it, whether she gets it from her mother or her father. Yes, her weight was not maintained, right? It's a careless eating style, and she's never exercises. That's what I think.” (Galuh, midwife at the health post)

Nadia expressed a different perspective, suggesting that the risk factor for GDM might originate from both inside and outside a woman's body. She suggested that the ability to tolerate the level of glucose in the blood was partly determined by an individual's metabolism. Rather than being solely influenced by food intake, the women's blood glucose levels were more affected by their metabolic function.

“Err...in my opinion, apart from the lifestyle, it is the readiness of her body, such as her metabolism. For instance, if she eats a lot, but the respond of her body is good, then there will be no problem. But if she eats irregularly and her body is not ready, it can cause it (elevated blood glucose). So, there

are two, I think, apart from the outside also from the inside.” (Nadia, laboratory staff at the health centre)

Apart from knowledge of risk factors, some healthcare professionals indicated several signs that a woman might have hyperglycaemia in pregnancy. One such sign was when she experienced a significant weight increase. They reported that this sign was not always indicative of diabetes but could result from overeating. However, healthcare professionals typically became cautious about hyperglycaemia if this sign was accompanied by other symptoms, such as dizziness and fatigue.

“Because from the growth of pregnancy, not necessarily determine that there is (glucose). There are those who are pregnant, they eat freely, they come (to ANC) and gain weight for 4 kg. Well, that usually affects the blood pressure, right? Not necessarily diabetes. To the blood pressure. But if you have symptoms, there must be other complaints. Weakness, especially weakness. You have eaten but still feel weak. If we don't understand, we feel dizzy and weary, (we) try to drink something sweet, right? Turns out it wasn't, so we became suspicious because the patient kept coming.” (Umi, private midwife)

“Uncontrolled weight gain. She has gained a lot of weight and her baby, big baby. Macrosomia, it turns out that the mother has DM.” (Beta, midwife at the health centre)

Interestingly, Beta considered a large baby or macrosomia a sign of hyperglycaemia in pregnancy rather than its impact. She stated that a mother who gives birth to a big baby may have increased blood glucose levels. This understanding may lead to undetected hyperglycaemia in pregnant women, and it can potentially result in missed opportunities to manage the condition and provide suitable interventions, leading to various negative outcomes.

1) Negative impacts on the babies

Healthcare professionals reported the potential adverse outcomes for babies born to mothers with hyperglycaemia, from early to the end of pregnancy and after the delivery.

*“It can...what is...can deliver a premature baby. What else? (ask herself).”
(Indira, midwife at the health post)*

“Many (impacts). If her pregnancy is still in the early trimester, she could have miscarriage, it could be BO (blighted ovum), the foetus doesn't develop. Then, if she is pregnant (in last trimester), she can have a giant baby, and then she can be born prematurely. Many (impacts), for pregnant with DM.” (Firda, midwife at the health post)

The majority of healthcare professionals mentioned women having ‘big babies’ as the impact of hyperglycaemia in pregnancy. They used this knowledge as a basis for suspecting that the mother might have hyperglycaemia. When they noticed that the foetus has grown large during pregnancy and interpret this as a sign that the mother may have hyperglycaemia, this indicates the delay in healthcare professionals recognising hyperglycaemia in pregnant women.

“...That's macrosomia. That is the most common impact. That seems to be what we all afraid of from diabetes, sis.” (Emilia, midwife at health post)

“...pregnant women with diabetes mellitus usually have big babies. So, if there is a new pregnant woman who come to check with me, I think the baby is big, I tell them to check their blood glucose immediately. What worries me is that the mother has high blood glucose.” (Tyas, private midwife)

While using a large baby as a proxy for identifying a mother with hyperglycaemia may be considered too late for the management of the condition, according to Tyas, it can be helpful in minimising potential difficulties during and after childbirth. She recounted that a large baby might complicate the delivery process and increase the likelihood of a caesarean section for the mother. Furthermore, according to Oliv, the newborn has a more difficult time adjusting to the environment outside the womb since it has been accustomed to the high glucose

levels in the mother's blood. Oliv emphasised the increased likelihood of hypoglycaemia and the possibility of developing diabetes in the future.

“As far as I know, the baby can be big, right? With a large baby, if the baby is delivered normally, (I am) sorry for the mother. The risk is also greater. After all, even if the child is born, there will be genes, right? Err, the baby will get a DM too. And, for sure, it's dangerous for the baby too, that's what it is. The adjustment for newborns, so a baby with DM is always thirsty. It means that he wants to drink milk all the time. Even though his (milk intake) should have been moderated, it actually got to the baby. It was also DM.”
(Oliv, laboratory staff at the health centre)

Some healthcare professionals had a contrasting view to the majority, suggesting that babies of mothers who suffer from hyperglycaemia might have a lower birth weight. They suggested that this might be related to dietary modifications requiring pregnant women to reduce carbohydrate intake. As a result of intrauterine glucose deficiency, the babies were born with a low birth weight.

“I don't understand... diabetics have to go on a diet. Maybe the baby is underweight? Because people with diabetes should not consume foods that contain excessive glucose, right? Maybe if she was pregnant and during her pregnancy, she had diabetes, she was on a diet, eating less, her child could have a low baby weight.” (Dahlia, midwife at the health post)

In addition to low birth weight, it was reported that the babies might experience breathing difficulty. Some healthcare professionals mentioned the risks of breathing difficulties and a weakened immune system in newborns.

“... The child could be affected, err... the weight is low. We don't just focus on the baby, in my opinion. That's when she gave birth, right? We have to pay attention to her child, right? Her child was underweight and had shortness of breath. It's easy to get sick because of low insulin glucose.”
(Galuh, midwife at the health post)

According to Galuh's quote above, becoming more vulnerable to disease was one of the long-term impacts on babies that may occur. Another long-term impact was the risk of developing type 1 diabetes. Some healthcare professionals believed that

the intrauterine condition of the baby with large glucose intake from the mother formed a particular environment, which was considered as the contributing factor to the occurrence of type 1 diabetes in babies.

“Usually after birth, children get hungry more easily, vulnerable to have long-term effects. Sometimes type 1 DM is there (as a risk), right? So, it could be a heredity. So those who are used to it become type 1 DM.”
(Mardi, doctor at the health centre)

Umi mentioned the possibility of cognitive impairment in the future for infants as another possible long-term impact.

“Yes... with a mother's condition like that, blood glucose is unstable. It must be to the baby (the impact), what will happen immediately, not just how big the baby is. If the others (impacts) don't show up ... whether later on he will be stupid, or what, we do not understand. What I do know is that babies are definitely at great risk.” (Umi, private midwife)

A more fatal impact was mentioned by Kanti, where a baby could die in the womb as a result of hyperglycaemia in pregnancy.

“For the baby, if the mother has metabolic disorders, the baby is also at risk. Can be the death of the foetus in the womb. Foetal death.” (Kanti, doctor at health centre)

2) Negative impacts to the women

Healthcare professionals have also highlighted the negative consequences of hyperglycaemia in pregnant women. Women may be affected both during and after pregnancy. One of the unfavourable effects of hyperglycaemia in pregnancy was the likelihood of developing hypertension. It was believed that if a woman developed hypertension during pregnancy, other unfavourable results would follow, signalling that the health of women would require attention. Several health professionals saw hypertension as an indication that a laboratory test, such as a blood glucose test, should be conducted.

“...if for the mother, it is usually hypertension, that is. Then what's the name, it's like pre-eclampsia, swelling, swelling of the cheeks, of the hands and feet, usually like that. If it's like that, I usually ask for a check (laugh).”
(Emilia, midwife at the health post)

“For the mother, maybe BP (blood pressure) can arise, or if it can't be handled, it can be a pre-eclampsia. Maybe, there must be something like this.” (Laksmono, doctor at the health centre)

Another reported consequence caused by hyperglycaemia in pregnancy was the risk of complications. In the context of Indonesia, the word ‘complications’ could mean any conditions that aggravate an existing health problem. It was believed that the complication of hyperglycaemia could negatively impact various organs in women’s bodies. They believed that the complications might be severe, leading to significant health issues for the women.

“In my opinion, err... DM can cause complications, right? It can go anywhere (the body), for the mother, right? Surely the complications can be many. It can lead to complications. Although it does not occur to everyone. But most of what we see is DM (diabetes mellitus) in non-pregnant women, err... can have many effects. It could be on the kidneys, it could be on the heart, finally on other organs could...could be...affected, you know. The condition could be worse, especially in gestational period, right? I think so.” (Beta, midwife at the health centre)

“...The effect may be that the blood glucose can stay high, or if it's too high, it can lead to complications. We know for example, if a non-pregnant patient has high blood glucose, a coma can occur, ketoacidosis and other kind of complications can occur, so the effect is quite serious.” (Laksmono, doctor at the health centre)

As previously mentioned, hyperglycaemia in pregnancy may increase the risk of macrosomia, resulting in an increased likelihood of a caesarean section. Some

healthcare professionals also stated concern about the healing process of the caesarean wound, which may take longer due to the condition.

"...If the blood glucose is high, the baby will be big... if the baby is big, it can't be delivered normally, usually by caesarean. If the mother has high glucose, it will take a long time for a caesarean to heal. I'm afraid that if it is DM, you should take care of the food, ma'am... that's it." (Junita, midwife at the health post)

Although most healthcare professionals focused on the negative physical impact of hyperglycaemia, one midwife acknowledged that the condition might also cause psychological impact. Firda mentioned that the burden of dealing with daily management and the potential consequences led to emotional distress for the women.

"The mother can have bleeding, prolonged (delivery), fatigue when she is pregnant, right? Because, for DM err...you often feel thirsty, feel hungry and pee back and forth, right? Psychologically, it's already (drained)." (Firda, midwife at health post)

Out of twenty-one interviews with healthcare professionals, only Firda mentioned the potential risk of psychological distress associated with hyperglycaemia levels in pregnancy. This suggested that the majority of healthcare professionals focused more on the physical impact of this condition. In addition, most healthcare professionals appeared to be more aware of short-term over long-term impacts. It was worth noting that several healthcare professionals admitted to being unaware of the potential long-term effects of hyperglycaemia in pregnancy.

"I don't think so, I rarely see. If the DM is due to pregnancy, I don't think there's any." (Firda, midwife at health post)

"I guess I haven't heard of it." (Umi, private midwife)

5.4.3 Subtheme 3: healthcare professionals perceive that women have little knowledge and awareness about hyperglycaemia in pregnancy

Some healthcare professionals believed that blood glucose was a severe condition that necessitates appropriate management due to its adverse impact on both the mother and baby's health. As emphasised by Ana: "...*(it) can't be underestimated*". Healthcare professionals claimed that they had attempted to assist women in managing the disease, and they felt that they had offered a good clinical service. Nevertheless, they faced challenges with some women who disregarded their advice. Health professionals perceived that women generally lack awareness of the risk of hyperglycaemia during pregnancy.

"Up to today, no (hindrance). In terms of quantity, our health professionals are enough. The lab staff, we have three so that's ok, right? See for yourself, Mrs. Y is very capable. I think inshaallah (God willing) there should be no hindrance. For doctors to become consultants, we have many doctors. From those aspects, there is no (hindrance). It's just that sometimes the problem is the pregnant women who have err...lack of awareness." (Ana, the head of the health centre)

"I think they don't understand blood glucose (issue)." (Tyas, private midwife)

Despite healthcare professionals offering advice on laboratory testing and information about the potential consequences of hyperglycaemia, they perceived that some women did not comply with their recommendations for personal reasons. According to Junita, a lack of understanding among women on the importance of laboratory tests may lead to undetected hyperglycaemia during pregnancy. As a midwife in a health post, Junita expressed concern about the reluctance of some pregnant women in her area to undergo laboratory tests at the health centre. Meanwhile, she mentioned her inability to perform the glucose test at the health post due to a lack of equipment and supplies (this issue will be further discussed in section 5.6).

“Now the problem is that some people want it, some don't. Yes, ma'am, if you are asked to... "Ma'am, check the lab tomorrow. I'm afraid there is hepatitis if hepatitis is transmitted to your child". Basically, everything has been told... I've said about the bad impacts... next month when I check the pink book, it's not there yet... “Yes, ma'am, yesterday my husband couldn't escort me”, there must have been something like this (reason), but some have checked the lab, and some haven't.” (Junita, midwife at the health post)

Similar to Junita, Galuh stated that only few women in her working area followed the healthcare professionals' advice. She noted that women did not make sufficient efforts to maintain their health despite receiving information and guidance from healthcare professionals. Galuh reported difficulties monitoring women's blood glucose due to her inability to observe the women's daily activities.

“...It's hard, Rin (author name), sometimes we already inform that, yes, we can't. It's rare to find pregnant women who immediately obey. I know that they have a lot to think, right? We are not able to monitor their feet for 24 hours too, what to drink, we already told them too, sometimes there are also those who don't take calcium, don't take err... blood supplement tablets. I've informed them the effect. There's still a pink book, for example, it's useful to read, (they) do not read. From the book, it looks like you're bla bla bla. They've been told'. We'll definitely let them know.” (Galuh, midwife at the health post)

Moreover, despite the lack of health awareness, some healthcare professionals perceived that some women actively resisted their suggestions. Several healthcare professionals had tried various approaches to encourage women to seek care, including providing counselling and involving the community health workers (CHWs/ cadres). However, women's adherence to the healthcare professional's advice remained inadequate.

“It seems that from our side, we have done our best, it's just that this community sometimes lacks of awareness. We are already at the

Posyandu; we give counselling sometimes during pregnancy exercise meetings, and sometimes cadres have refresher training once a month for the cadres to pass it on to their families. It's just that the stubborn ones are stubborn, there are also those who are obedient, ma'am. The stubborn ones don't come at all...I think it's important, but the people's awareness is poor. We're already announced, but they did not want to obey.” (Rosi, nurse at auxiliary health centre)

From healthcare professionals' perspective, women were perceived as not following advice on maintaining a healthy diet and regular exercise due to laziness. They believed that women were not sufficiently managing their blood glucose through exercise because they were unwilling to engage in physical activities. Women often disregarded a healthy diet, not considering for the nutritional value of the food they consumed.

“...Just have a mindset. Eat so that you're full, and then maybe you don't want to exercise because you are pregnant, you feel too lazy to do things. Pregnancy exercise (antenatal class) also seems to be lacking. Not many people are participating. If not encouraged by the cadres, I don't think (they will join). (Kanti, doctor at the health centre)

“...It's just a normal day-to-day eating pattern. But for us, if I see, sometimes they don't follow a healthy lifestyle, right...as long as they can eat. Sometimes they do not yet... it's enough to eat carbs. If it's carbs, they definitely take them, but not the others (nutrients). Sometimes they eat rice and noodles, that's it. The important thing (in women's view) is 'eat'.” (Hilda, midwife at the health post)

Furthermore, from healthcare professionals' point of view, women were considered to show limited concern for health issues. They tended to avoid complicated procedures, such as lab tests, because they had many other responsibilities, including domestic tasks. This responsibility consumed a lot of women's time, making them unable to prioritize their health.

"I don't know either. I also get confused sometimes. Yes, they often underestimate their health, and they didn't seem to care about their health, careless with their pregnancy. Yes, they do care about the foetus, but about the things that support the health of the baby, sometimes they don't pay much attention to them. The important thing is that the baby moves, it means healthy, and there are no problems, that's all. Later, the birth is safe, that's all without anything like that. I think they don't like it (lab checks), I think they just want something simple. They don't want a complicated one. Sometimes the reason is that they are busy with household matters, you know... children, household matters. That's why sometimes when they are told to examine (themselves) at the health centre, "still can't do it, ma'am, not yet, later if I have time". (Hilda, midwife at the health post)

Some healthcare professionals believed that the availability of medications was another contributing factor that made women less interested in the recommendation of lifestyle changes. Firda stated that some women overlooked the importance of healthy lifestyle and preferred to rely solely on medications to manage blood glucose levels. The women believed that medicines were the easiest way to manage any blood glucose issues. Hence, there was no cause to be concerned.

"It's like they already know. It's just that people are different, yes. it's different'. It's different. Some have different thoughts. Some are "ah, just ignore it, the important thing is that if you can still cooperate with the drug, it won't spike too". Different people are different (with their views)." (Firda, midwife at the health post)

In terms of a lack of awareness, some women typically sought medical services only when they experience physical issues. Rosi stated that in order to increase women's awareness, healthcare professionals may need to use fear-based messaging to encourage women to prioritise their health. By emphasising the potential adverse impact of the condition, Rosi believed that women might be more likely to obey healthcare professionals' advice.

“The public's awareness is still lacking, so they have to be frightened, and then they will want to go. Yes, they must be frightened, then she will have a go (doing the advice).” (Rosi, nurse at the auxiliary health centre)

In addition, according to Kanti, generally, the women felt overwhelmed and disengaged from managing hyperglycaemia, regardless of the advice and information that healthcare professionals provided. They were considered to lack the willingness to comprehend the complexity of their condition and were unmotivated to take action. They tend to feel powerless to deal with their health problems.

“Instead of understanding, usually they just give up (laugh). “Yeah, what can I do”, usually like that.” (Kanti, doctor at the health centre)

5.4.4 Subtheme 4: healthcare professional’s views on barriers for women in accessing care

Pregnant women with hyperglycaemia were rarely identified in the health centre. Some healthcare professionals assumed that women with high-risk pregnancies obtained care from specialist doctors or hospitals, resulting in fewer pregnant women being identified with hyperglycaemia in the health centre's working area. It was also believed that pregnant women from middle- to upper-income socioeconomic backgrounds preferred private health facilities. Services provided by private facilities were considered more user-friendly, provided quicker service, and were perceived to offer excellent quality. Beta reported that some women chose private health facilities, even though the health centre offered more comprehensive laboratory test services.

“I'm actually err...the pregnant woman still feels that when she goes to see doctors, everything is safe. So, there's no need to go to the health centre (for tests). In fact, we have a more complete lab examination at the health centre for now. The last few years, for almost about seven or eight years, our health centre does complete laboratory examinations. We have done that. It is mandatory for pregnant women to do the lab check. So,

sometimes pregnant women are asked why (not going to the health centre), "I've already checked with the doctor, ma'am, so why do I still need to go to the health centre?" (imitating what a woman said) ..." (Beta, midwife at the health centre)

Apart from socioeconomic status, according to Kanti, women with high educational backgrounds were reluctant to visit the health centre.

"Because pregnant women who are highly educated, most of them go to obstetricians. Not here (at the health centre)." (Kanti doctor at the health centre)

Healthcare professionals working at health posts and at the auxiliary health centre reported a similar phenomenon that women with higher socioeconomic status tend to avoid using public health facilities. Some women were unaware of the need to visit the health post or auxiliary health centre. They opted for a private provider due to the unavailability of physicians and the lack of equipment at these health facilities.

"Pregnant women whose families over there (pointing house location) are rich. So, they prefer going to Prodia (a private laboratory provider) or seeing a private doctor..." (Firda, midwife at the health post)

Meanwhile, women from financially disadvantaged families could not access care at the health centre because of financial constraints. Healthcare professionals believed that these women lacked concern for their health because they prioritized their immediate needs, such as obtaining food, over their health.

"They think "yes, to survive is difficult" maybe like that, yes. For err...for example, I just said "Mom, this is later, err... please eat this later, okay?" "Yes, I'll eat whatever food I can get". Well, we're also confused when they say that (laughs). That's why I said "alright, ma'am, the important thing is that there are no taboos. If you can, it doesn't have to be expensive. Tempeh, tofu, eggs are also good. It doesn't matter what kind of fish you eat," for example, it's like that. So, it's hard. For going to the health centre, "I

don't have BPJS (health insurance), do I have to pay, sis?". That's it (the problem)" (Emilia, midwife at the health post)

Emilia expressed her confusion about how to give a solution for women with economic difficulties to access health care. She noticed that certain groups of women had to pay for health services from the health centre. Interestingly, there was conflicting information among healthcare professionals regarding the cost of laboratory tests at the health centre. According to some, pregnant women can avail of free laboratory tests by showing a health insurance card or identity card. However, others stated that the service was only partially free. Although the cost was minimal, some health professionals believed that many pregnant women struggled to afford it. Emilia revealed that the lack of resources often led the women to be unable to undergo laboratory tests during pregnancy. These women had more significant daily living needs, and paid health services such as laboratory tests were almost impossible to afford. Some women sought free services so that they no longer had to consider the cost. Providing advice or recommendations without direct financial assistance for women would be meaningless, as Galuh said:

"To get tested you have to pay, now it's back again, where most people don't have money. (They) want (something) free, Rin. It is difficult. That's why I said mostly the problem is about the cost... Well, I'm telling you, unless you said this "this is your money for treatment."..." (Galuh, midwife at the health post)

Another barrier hindering women from having laboratory testing was the need to have someone to accompany them to the health centre. According to several health professionals, women were reluctant to attend the health centre independently and typically waited for their husbands to escort them. This practice frequently causes delays in accessing care and may lead to untreated health conditions, as Tyas put it:

"The reason is that there is no one to escort them (to go to the health centre), all kinds of things, like that. There are those who come once we

ordered them to check the lab, checking it right away. There are also people who comes again (to the clinic), there is no lab result from the health centre. Yes, the reason is no one came with her (to health centre), all sorts of things (laughs). (Tyas, private midwife)

According to Indira, in addition to requiring the spouse to join them, another obstacle for women to conduct laboratory tests was securing approval from the husband. Indira identified some women who delayed testing because they were required to be accompanied by their spouses and acquire permission to attend the health centre.

“Yes, sometimes “Ma'am, wait a minute, my husband can take me or not... can I get permission or not”. It's definitely like that.” (Indira, midwife at the health post)

In addition, it was revealed that women lacked time to care for their health. Hilda identified time as a barrier to conducting laboratory tests for women in her working area. She noticed that the proximity between the house and the health post did not positively influence the women to access care, particularly during pregnancy when laboratory tests are required.

“I don't know either... because sometimes they say they don't have time, even though they're actually close (to the health post). Sometimes that's the problem. I also can't do anything about it “I haven't had time, ma'am”, or sometimes “I am not at home”. (imitating a woman's responses)” (Hilda, midwife at the health post)

5.5 Theme 2: the management of women with hyperglycaemia in pregnancy

This theme explores healthcare professionals' experiences in providing services to pregnant women with hyperglycaemia in pregnancy. The theme covers the management process, including blood sugar testing, offering health advice, and referring women to higher-level facilities. Healthcare professionals believed they had done everything in their power to assist these women in managing the

condition. However, these health professionals also stated the difficulties in providing treatments for elevated blood sugar in pregnancy due to the absence of guidelines.

5.5.1 Subtheme 1: healthcare professional's experience in glucose testing

It was revealed that there were variances in the experience of providing screening among healthcare professionals, depending on the context of their workplace (health centres, auxiliary health centres, health posts or private midwife practices). The laboratory facilities are unavailable in the auxiliary health centres, health posts, and most of the private midwives' practices. Only the laboratory staff members at the health centre can perform the glucose tests. They stated that testing blood glucose levels was a routine practice for all pregnant women. They confidently stated that they had implemented the appropriate measures to identify high-risk pregnancies, including women with hyperglycaemia.

“Err...at that time, we screen every pregnant woman.” (Nadia, laboratory staff at the health centre)

Meanwhile, the healthcare professionals stationed at the auxiliary health centre and the health posts, as well as the private midwife reported that they encouraged all women to undergo laboratory tests at the health centre at least once during their pregnancy. Although government policy (*Permenkes No. 25 tahun 2015*) allows midwives or nurses to perform laboratory tests at health facilities, they considered themselves as lacking skills to conduct glucose tests.

“In this auxiliary health centre, the problem is that there is no blood glucose test. So, we can't (find).” (Sumiati, midwife at the auxiliary health centre)

“... because I've never checked the lab. For the lab, they went to the health centre. If there were one (suspected), I'd send her straight to the lab, the patient. “Let's check everything.” In here (her practice), I rarely do.” (Umi, private midwife)

With regard to testing, it was revealed that there was a lack of clear guidance on the timing of blood glucose testing. Ideally, according to healthcare professionals, pregnant women should have at least four prenatal visits, with one visit in each of the first and second trimesters and two visits in the third trimester. However, pregnant women did not always adhere to this recommendation. Commonly, the women had antenatal visits at their convenience. According to Tyas, healthcare professionals had to adapt to the situation and use the visit as an opportunity to perform blood glucose tests.

“Usually, at the beginning, sometimes patients come to us, not from the first trimester. There are those who are already in the 3rd trimester, even before delivery, like that. So, let's see if there is no blood test in the history book, we immediately check the lab.” (Tyas, private midwife)

Given this circumstance, the majority of healthcare professionals decided to conduct RBG test. They believed that the RBG test is the most convenient procedure, and it could be used to determine whether or not a woman suffered from "diabetes in pregnancy". The screening began with an RBG test performed on all pregnant women, and a result below 200mg/dl was considered normal. If the result was above that value, the woman should undergo a further blood glucose test.

“RBG. Because women don't plan, they usually don't know that they will check the lab. Usually, the midwife says, "we'll check the lab, okay?". Because they haven't (checked during pregnancy). Well, usually, if it's high without additional symptoms, I'll tell them to come back to check again for fasting blood glucose. Tell them to fast first.” (Kanti, doctor at the health centre)

“Usually random (blood glucose). When it is high, we will direct the patient to try fasting and take fasting blood glucose and 2 hours post prandial...” (Oliv, laboratory staff at the health centre)

As mentioned by Kanti and Oliv above, the majority of women visited the health centre without preparing for a blood test. Consequently, most healthcare

professionals decided to conduct RBG tests over alternatives such as FBG and OGTT. Another reason for opting RBG was the perception that women were likely to refuse the testing if they were required to remain at the health centre for an extended period of time (two hours for OGTT). Therefore, healthcare professionals chose the RBG test for the convenience of women.

“Yes. For the practicality. If they have to wait for another 2 hours, maybe a lot of people will object (to the lab test).” (Hilda, midwife at the health post)

“Yes, troublesome. They don’t want to wait.” (Tyas, private midwife)

5.5.2 Subtheme 2: healthcare professional’s experience in managing hyperglycaemia in pregnancy

There were challenges in addressing hyperglycaemia during pregnancy as reported by the healthcare professionals, resulting diverse experiences. The first step in managing hyperglycaemia in pregnancy is identifying women with this condition. Midwives working at health posts reported that they were required to submit a monthly report to the main health centre regarding the health of mothers and children in their area, including the report of any high-risk pregnant women in their neighbourhood. To fulfil this responsibility, the assistance of community health workers, which commonly called as *cadres*, in identifying pregnant women at risk is crucial. As previously explained in Chapter 1, *cadres* are individuals from the community who are trained to enhance community empowerment in the health sector. By working with *cadres*, the healthcare professionals can monitor the health of women and babies in their area.

“I have to find. That’s why the extension of my hand, yes, that’s the cadres, where I ask for help. You see, because I can’t possibly spread it anywhere myself. At least that’s it, cadre.” (Emilia, midwife at the health post)

In the context of Indonesia, midwives play an important role in women's and child's health. They are responsible for the majority of maternal and infant health services. They are also responsible for providing information, advice, and counselling.

“Yes, for us (midwife), I do the counselling.” (Beta, midwife at the health centre)

According to some healthcare professionals, they provided advice and information regarding a healthy diet. They suggested the importance of reducing carbohydrate consumption and increasing fruit and vegetable intake.

“(I said) “Take care of your diet, don't let it be uncontrolled because I am afraid that the glucose will not only reach 300 (mg/dl), it could go up to 500 (mg/dl), which is not only dangerous for the baby, but also for you” (imitating what she said to a pregnant woman). That's the example (of the advice).” (Beta, midwife at the health centre)

Some healthcare professionals recommended that women consume fruits. Sumiati mentioned that all types of fruits could be consumed in moderation, and she emphasised the importance of satisfying a pregnant woman's food cravings.

“All fruits are not forbidden. It's just the one that's too sweet, not to take too much. Sometimes pregnant women have a bad taste in their mouth, they crave something sweet, right? So, it's really not possible to ban it. It's okay, for example, if it's a slice or one piece, that's it. Let her wish come true, that's it. if it's too restricted, it's a pity.” (Sumiati, midwife at the auxiliary health centre)

The healthcare professionals did not discuss the need to carefully consider the quantity and type of fruits they should promote. Some midwives admitted feeling uncomfortable when discussing nutrition as they perceived they lacked the knowledge and understanding. They advised women to consult a nutritionist, who is regarded as the most qualified healthcare professional to offer advice on a healthy diet.

“Yes, the management is better if she already (knows) that she has high blood glucose, one, we involve nutritionist to regulate the diet of pregnant women themselves. So that she knows what can't be eaten, and how much should a pregnant woman eat. Because blood glucose is also influenced by diet.” (Tyas, private midwife)

However, Putri, a nutritionist at the health centre, stated that throughout her years at the health centre, she had no experience providing dietary advice for pregnant

women with hyperglycaemia. She assumed that her counselling would be similar to that of a non-pregnant individual with diabetes, as she never provided care for pregnant women with this condition.

“Because it's still new for me regarding pregnant women with high blood glucose (issue), depending on what the doctor's diagnosis looks like. Maybe it's (the management) still the same as other patients with high blood glucose... So far, it never happened, I've never experienced the case of pregnant women with high blood glucose, so there's no experience.” (Putri, nutritionist at the health centre)

In addition, the majority of healthcare professionals believed that monitoring blood glucose levels required routine laboratory tests. Without such tests, it would be difficult to determine the most suitable management strategies.

“...Even though it's been done but we don't check the blood glucose, it's hard. (I) checked again every 2 weeks, what are the results. "I have followed this healthy lifestyle, ma'am, how do I know that I am healthy?" Yes, (I) checked. That was the point, if we don't check, then we don't know. (We) can't guess.” (Galuh, midwife at the health post)

Some healthcare professionals reported challenges in monitoring blood glucose levels in pregnant women. The majority of women tend to check their blood glucose levels irregularly, and even some had never done it during pregnancy.

“...I think it's complicated... the problem is that for 9 months, 3 times, some once, 2 times, some not at all.” (Junita, midwife at the health post)

Regarding the management of hyperglycaemia in pregnancy, it is interesting to note that a few healthcare professionals reported that some woman in the community believed in herbal remedies derived from plants, often made from bitter-tasting plants, which they thought could lower blood glucose.

“There are. They drink binahong leaves or something like that.” (Umi, private midwife)

“Noni fruits. This is the medicine for diabetes.” (Sumiati, midwife at the auxiliary health centre)

5.5.3 Subtheme 3: healthcare professionals' experience in referring women for further support

In this subtheme, the Indonesian tiered referral system will be explained. It will start from the health post as the community's most minor and local health service. Healthcare professionals described that health posts lacked the power or authorization to make referrals to hospitals. They were solely responsible for referring their patients to the health centre if they encountered pregnant women with hyperglycaemia.

“When we have patients, for example, if there are patients who are high risk with anything, they are immediately referred to the health centre, later the health centre will make a referral or transfer to the hospital.” (Emilia, midwife at the health post)

Similar to health posts, auxiliary health centres and private midwives' practices also lacked the authority and mandate to refer their patients. Akin to their counterparts at health posts, health professionals at these health facilities were responsible for recommending pregnant women at high risk to visit the health centre. However, there is an exception for women who wish to access a higher level of private health facility. They can directly access it without needing a referral letter from the health centre, but this comes with the consequences of having to pay for the services, as private facilities are generally not covered by the national health insurance.

“Yes, if it's from the midwife, you can't (refer). Except for being independent, independent care costs may be possible. Of course, you can if you want to pay independently (laughs).” (Tyas, private midwife)

The health centre serves as the cornerstone of primary health services and has the authority to make referrals to higher-level health facilities. According to health professionals, the tiered referral system required them to refer patients to type C institutions. If a case cannot be managed at the type C level, the patient is then referred to type B hospitals, followed by type A hospitals as the highest-level facility.

“The referral system is tiered, right? Tiered from (referral to) the level of a type C hospital, then if type C can't handle it, then (the patient will) go to type B, like that, or then move on to type A, like that. So, err... from here, the referral system is tiered, ma'am, so later we will advise her in choosing to which hospital the patient want to go. We give err... full rights to the patient to choose which hospital. The important thing is the hospital is a type C hospital” (Cinta, midwife at the health centre)

According to the Cinta's explanation above, the referral procedure at the site seems relatively clear and straightforward. Nonetheless, it has been noticed that there were different views regarding the threshold or the point at which a case should be referred. Mardi believed that a health centre could manage women with blood glucose levels below 300.

“(It) can be managed here, but, yes, it depends too. If it's managed here, it's probably under 300. Yes. If it's above that, then we'll go to the hospital. Like that, right? (Mardi, doctor at the health centre)

Nadia used a different criterion to determine whether a woman should be referred. Based on her experience, Nadia recommended that a woman consult with a specialist doctor rather than being treated at the health centre.

“Err...it (the blood glucose) was over two hundred. And the urine glucose was +3. So, we did not recommend err...visiting the health centre. So, directly (we recommended her) to a specialist (doctor). Because that's how it is (the value).” (Nadia, laboratory staff at the health centre)

5.5.4 Subtheme 4: lack of policy and guidance on the management of hyperglycaemia in pregnancy

Based on the results of interviews with healthcare professionals, many of them described the absence of a national guideline on managing hyperglycaemia during pregnancy in Indonesia. Hyperglycaemia in pregnancy was an overlooked condition due to the absence of guidelines. Healthcare professionals did not feel compelled to conduct screenings or tests because it was not a mandatory requirement.

“Honestly, (based on) experience, because of the lack of... there is no clear set of procedures, (on how) we have to check the glucose, of course, logically there is no real difficulty. Because there is no clear procedure, there is no standard err... yes. A clear SOP (is the issue), so especially in Indonesia, yes, there is no "must check, check blood glucose for pregnant women" like that because it's not something that is (a primary focused). But if there is a clear screening policy, maybe we can use it, like that.” (Mardi, doctor at the health centre)

Tyas highlighted the absence of national guidelines for managing blood glucose in pregnancy, noting that she had not encountered such guidelines from the local health department. According to her experience, the local health department usually disseminates any new regulations or programmes related to healthcare services on behalf of the central government.

“Oh, not yet. There isn't any yet, (specifically for) management of pregnant women. Not yet, or I don't know. But it looks like it's not there yet. Because I...if it is there, it must be from the health agency, (but) It doesn't exist.” (Tyas, private midwife)

In addition to the absence of national and local health department guidelines, the health centre also lacks standards for managing hyperglycaemia in pregnancy.

“I (have to) admit that until now there hasn't been any, because of us, we didn't make the SOP, sis. For those who specifically treat diabetes, we use clinical practice guidelines for doctors. Diabetes is common, but for pregnant women, it is not yet, because it is actually almost rare to see it really” (Laksmono, doctor at the health centre)

The absence of guidelines resulted in unclear roles among healthcare professionals. Different views exist on who plays a significant role and takes responsibility for managing hyperglycaemia in pregnancy. According to nurses and general practitioners, midwives have the most significant role in managing this condition. This is consistent with the widespread belief in Indonesia that midwives play an important role in women's and children's health.

“That’s the job of the midwife to answer (this question). It’s the midwife who has the responsibility, right?” (Rosi, nurse at the auxiliary health centre)

“Pregnant women are served by midwives, but the consultation for complications is with doctor, while screening is more of midwives (responsibility).” (Kanti, doctor at the health centre)

However, according to midwives, their responsibilities are primarily focused on normal, low-risk pregnant women. They believed pregnant women with hyperglycaemia were beyond their scope of practice and that they should consult with physicians. Midwives often recommend these women to give birth in hospitals or at doctor's clinics.

“We think that our scope of work is where our main duties and functions are; our authority ends there. For the rest, I’ll leave it to someone who is more skilled. (laugh)” (Tyas, private midwife)

“I recommend not giving birth at the health post level, for example, at a health centre or for example, at a private practice midwife, because this is a high-risk patient. This is indeed later err... the delivery must be under the authority of err... a specialist doctor at the hospital.” (Cinta, midwife at the health centre)

In addition to the uncertainty regarding healthcare professionals’ roles, the absence of clear management guidelines has contributed to a lack of communication channels for effective information sharing among healthcare professionals. Emilia revealed that there is no established protocol for disseminating women's health information, including glucose testing results. This information is often communicated verbally, informally, and without prior scheduling among the healthcare professionals.

“Or if later there is an increase in blood glucose or she is included as high-risk pregnant woman, the health centre usually immediately contacts me. Like sister Beta, “this is your patient, here it is “. We directly monitor the house. We call it ‘home visit’. We said so.” (Emilia, midwife at the health post)

According to Rosi, another informal platform used to share information was exchanging messages on WhatsApp. This platform is commonly used in the Indonesian setting for both personal and work-related matters.

“Basically, now we can do by WA. Easy.” (Rosi, nurse at auxiliary health centre)

Furthermore, most healthcare professionals expressed the need for guidelines on managing hyperglycaemia in pregnancy. They believed that having clear guidelines would make managing the condition more effective. They anticipated that by implementing a standard of care, they could focus on controlling the blood glucose levels and potentially mitigate adverse effects.

“I just want this; I mean the procedure (should be) available. So, we can learn from the SOP, what are the standards (measure to be conducted). If for example there is a pregnant woman with this DM, we have this guidance, right?” (Hilda, midwife at the health post)

5.6 Theme 3: needs and resources required by healthcare professionals

The majority of healthcare professionals acknowledged that they lacked understanding regarding hyperglycaemia in pregnancy and expressed the need for additional knowledge on the topic. They were interested in learning more about the condition to provide appropriate management services in the future.

“Still not enough. Maybe that's the only answer. Still lacking, not (enough) yet...err...err...not yet developed. So, it's just... you know...it's just like that.” (Putri, nutritionist at the health centre)

“Mmm...maybe eh...so that it seems like we, medical staff, needs to understand more, maybe yes, we can learn more. Then I will know more about the term, understand the patient's condition better. Because all this time we are blind (laughs).” (Emilia, midwife at the health post)

In addition to the need for increased knowledge, some healthcare professionals expressed a desire to acquire new skills. Dahlia, a midwife working at the health post, expressed the need for training on managing cases of excessive blood

glucose during pregnancy. She hoped that gaining these skills would grant healthcare professionals working in health posts the authority to manage pregnant women with the condition.

“(I hope) we are given some kind of training on the science of diabetes, or how to detect if the mother has diabetes. That is first. Second, we are given assistance, given the authority or the right to examine pregnant women, for lab checks. Perhaps that’s it (the hope).” (Dahlia, midwife at the health post)

Midwives at health posts had limited authority to intervene in women's health, as previously mentioned in section 5.5.3. They believed that the community's reluctance to utilise health posts services was partially due to the lack of comprehensive services provided. Some reported that when they need to intervene with a high-risk pregnant woman, midwives at the health posts must seek guidance from the health centre, which could potentially lead to longer decision-making times.

“What do I need? (asking herself) Maybe we need a doctor (laughs). Yes, it seems. It's because we at the health post do not have any authority. So, if you say what do you need, what do you need for diagnoses of all kinds, we have to consult with the health centre staff. We can't make our own diagnoses; we can't make your own decisions. (We) must consult with the coordinator of midwives.” (Emilia, midwife at the health post)

Emilia's desire to have a doctor working at the health post was not only about the authority issue, but it was also about the need for more healthcare professionals at the health posts. Midwives working at health posts were expressed concerns about the lack of personnel to help them fulfil their responsibilities.

“Actually, it's not enough. I am alone. The nurses, they do their own work, yes, such as environmental health or something, yes, their own services. I'm a midwife, so I'm alone. I am covering one village. Meanwhile, this Kedaton (village) is wide. I'm here, the population is 3000...For health professionals, the number may need to be increased, so that it (case) can be monitored, given that the area is large.” (Dahlia, midwife at the health post)

Another issue emphasised by all midwives at the health post was the unavailability of glucose monitoring equipment (glucometer) for pregnant women. They expressed the need for the equipment that could be used to screen blood glucose at their workplace. According to them, it would be challenging to encourage pregnant women to check their glucose levels at the health post without available equipment. They believed that the absence of the glucometers for screening blood glucose prevents them from providing effective maternal health care. In addition, if they were provided with the equipment, they could bring glucose testing services closer to pregnant women by visiting them in their homes as part of the home visit programme, ultimately resulting in more pregnant women receiving blood glucose testing.

“Maybe what I want is a tool. So, what I want is that we have a home visit programme every month. If, for example, the pregnant woman can't come here, I can visit her house to check it (blood glucose). If the tool is available.” (Hilda, midwife at the health post)

“Maybe for the health post, if indeed the DM examination is for screening, early detection, I think at the health post it's okay to put a tool to check DM? whether using urine or blood, that's okay. For pregnant women. So that we can detect it early. Then later if it turns out to be actual DM, for further management, she will go to the health centre. Like that.” (Firda, midwife at the health post)

5.7 Summary box

- Healthcare professionals perceived hyperglycaemia in pregnancy as a rare and insignificant condition, with a low likelihood of occurrence.
- While some adverse outcomes and risk factors of hyperglycaemia in pregnancy were familiar to healthcare professionals, there was a lack of discussion about its long-term impact on women.
- Healthcare professionals believed that financial constraints and a lack of awareness among women about hyperglycaemia in pregnancy were significant barriers to its management.
- There was an absence of clear guidelines for managing women with hyperglycaemia during pregnancy.
- Random blood glucose testing was considered the most convenient method to identify women with hyperglycaemia in pregnancy.
- Healthcare professionals require adequate training and resources to provide high-quality services for women with hyperglycaemia in pregnancy.

Chapter 6 Validation of the observational and documentary data

6.1 Introduction

To attain an in-depth understanding of a phenomenon in a case study, it is typically important to gather data from multiple sources (Crowe et al., 2011). It is advisable to employ various data sources in case studies to enhance the internal credibility of the research. The underlying assumption is that conclusions derived from multiple perspectives will provide a comprehensive picture of the situation (Stake, 1995). The initial intention of this research was to gather a diverse range of data sources, including interviews, observations, and documents. The collected data consist of 27 interviews (six with women and 21 with health professionals), one non-participant observation during a GDM consultation session, and seven documents pertaining to the management of hyperglycaemia. In the subsequent sections, non-participant observation data (section 6.2) and the document analysis (section 6.3) will be discussed. Additionally, a section regarding synthesis of the case will be elaborated in this chapter.

6.2 Non-participant observation

At the onset of the pandemic when data collection was commenced, only one opportunity was permitted for conducting a non-participant observation of a routine consultation regarding GDM between a pregnant woman and a midwife. In this specific consultation, Pipit, a pregnant woman with hyperglycaemia, was interviewed for this study fortnightly prior to the observation. She had given her consent to participate in the observational activities. Pipit arrived at the health centre in the morning and met with midwife Beta at the maternal and child health room. The preliminary administrative assessment included the verification of personal identification and health insurance documentation. Following this, Midwife Beta instructed Pipit to proceed to a separate room for a laboratory examination, which was a blood test. The midwife provided her with a document that she needed to present to the laboratory staff. After receiving the laboratory results, Pipit returned to the maternal and child health room, where she shared the findings with the midwife. The consultation regarding gestational GDM then began, as

outlined in the following summary.

Observation: Consultation session of Pipit, 31 years old, 7th month of pregnancy, and Midwife Beta, with 29 years of experience in maternal health care

Date: 2nd November 2021

The observation was conducted in a maternal and child health room at the health centre. The room hosted a total of nine individuals, including a midwife, a married couple, a researcher, and five nursing students pursuing their bachelor's degree who were engaged in internship activities.

Upon Pipit's arrival in the room, she presented the blood glucose test result obtained from the laboratory. In response, the midwife promptly commenced the sharing of information related to blood glucose levels. Despite the laboratory results indicating normal values, the midwife recommended that Pipit reduce her intake of sugar. After a brief discussion, the midwife remembered her need to perform an abdominal palpation (Leopold's manoeuvre) as part of antenatal care. Subsequently, she requested that Pipit recline on the bed.

The midwife displayed a lack of enthusiasm towards Pipit's laboratory results and refrained from offering positive feedback. She presented details related to dietary advice, encompassing both the types of foods that should be included to Pipit's diet as well as those that should be avoided (without providing specific guidance on the quantity of food intake). There was no mention of recommended physical activities. The midwife engaged in one-way communication without exploring Pipit's viewpoints or her individual needs. Occasionally, the midwife sought agreement from the researcher regarding the information she provided. She said "yes, ma'am?" or "right, ma'am?." The researcher maintained a friendly demeanour, often with a smile and head nod, but she consciously avoided making direct eye contact with the participants involved.

Furthermore, Pipit was not provided with any visual aids or supplementary materials to illustrate the dietary regimen.

Pipit exhibited a sense of contentment upon receiving confirmation that the laboratory test yielded normal results. She felt a sense of amazement upon discovering that her laboratory results were within the expected range, despite deviating from the dietary recommendations provided by people in her social circle. On multiple occasions, Pipit proactively shared information regarding her dietary practices with the midwife, even in the absence of any explicit inquiry. This midwife displayed a slight sense of annoyance due to the Pipit's actions, and remarked, "this woman has a wrong mindset", while directing her gaze towards the researcher. Pipit did not exhibit any signs of being offended; instead, she responded with laughter.

6.3 Document analysis

The utilisation of document analysis serves to enhance the validity and robustness of the interview findings. The compiled documents consist of a collection of supplementary data sources providing information pertaining to the management of GDM. Limited documents regarding the matter in this study were discovered. A national guideline, developed by the Ministry of Health of Indonesia in 2020, was discovered, outlining the management of type 2 diabetes mellitus in adult patients. The document includes a section dedicated to the management of hyperglycaemia in pregnancy. Two other guidelines on diagnosis and management of hyperglycaemia in pregnancy, established by professional organisations in Indonesia, were identified. These guidelines are from the Indonesian Society of Endocrinology (PERKENI) in 2021 and from the Indonesian Society of Obstetricians and Gynaecologists (POGI) in 2010. Moreover, other gathered documents include a maternal and child health book, a leaflet on healthy diets for pregnant women, a nursing care guideline for diabetes, and a clinical practice guideline for doctors in managing type 2 diabetes in the health centre.

All three guidelines (national, PERKENI, and POGI guidelines) recommend universal GDM testing in pregnant women. Testing should be conducted during the

initial antenatal care visit and repeated between 24 and 28 weeks of pregnancy in cases where negative findings are obtained, indicating a value below the established threshold. All guidelines suggest conducting an OGTT after an 8-14 hour fasting period and the collection of a venous blood sample as the ideal procedure of testing. Nevertheless, both the national and PERKENI guidelines permit testing among women who have not fasted and endorse the utilisation of capillary blood as a viable option. This flexibility is intended to provide assistance to women who are unable to fast or due to inadequate equipment at health facilities in rural areas.

Differences among the three guidelines include the threshold for diagnosing GDM, as well as the recommended daily target for blood glucose levels in pregnant women. The POGI guideline does not recommend the administration of anti-diabetic medications, while the other two guidelines advocate for the use of insulin (as the primary option) and metformin. Furthermore, it is advised to conduct retesting during the postpartum period to confirm the absence of diabetes following childbirth. Table 10 displays the similarities and discrepancies identified within the specified guidelines.

Additionally, it was noticed that three documents discovered within the health centre (nursing care guideline for diabetes; clinical practice guideline for doctors in managing type 2 diabetes; the leaflet) lack any guidance or instructions related to the management of hyperglycaemia in pregnancy. The maternal and child health book, which is provided to all pregnant women on the site, does not contain information regarding the condition. The book highlights the importance of four fundamental laboratory tests, including blood type analysis, haemoglobin evaluation, urine examination, and screening for HIV, syphilis, and malaria. However, the book does not emphasise the need for a blood glucose test.

Table 10 Comparison between GDM management guidelines

	National guideline	PERKENI guideline	POGI guideline
Targeted population	All women	All women	All women
Timing for screening	<ul style="list-style-type: none"> - At the first antenatal booking for women at risk of diabetes - At 24-28 weeks for non-high risk 	<ul style="list-style-type: none"> - At the first antenatal booking for women at risk of diabetes - At 24-28 weeks for non-high risk individuals 	<ul style="list-style-type: none"> - At the first antenatal booking for all women, - Repeated at 24-28 weeks if the initial result is negative
Procedure	75g OGTT (fasting or non-fasting) <ul style="list-style-type: none"> - using a venous blood sample - a capillary blood sample (as an alternative) 	<ul style="list-style-type: none"> - Ideal OGTT (using fasting venous blood glucose) - Alternative OGTT 1 (using fasting capillary blood glucose) - Alternative OGTT 2 (If a woman is unable to fast) 	75g OGTT after fasting
Diagnosis	OGTT upon fasting: <ul style="list-style-type: none"> - FBG ≥ 92 mg/dL - 1-hour ≥ 180 mg/dL - 2-hour ≥ 153 mg/dL. OGTT non-fasting Venous blood: <ul style="list-style-type: none"> - 1-hour ≥ 180 mg/dL - 2-hour ≥ 153 mg/dL Capillary blood:	Ideal OGTT <ul style="list-style-type: none"> - FBG ≥ 92 mg/dL, or - 1-hour blood glucose ≥ 180 mg/dL, or - 2-hour blood glucose ≥ 153 mg/dL Alternative OGTT 1 <ul style="list-style-type: none"> - FBG ≥ 95 mg/dL, or - 1-hour blood glucose ≥ 191 mg/dL, or 	<ul style="list-style-type: none"> - FBG ≥ 126 mg/dL - 2-hour ≥ 200 mg/dL

	National guideline	PERKENI guideline	POGI guideline
	<ul style="list-style-type: none"> - 1-hour 191mg/dL - 2-hour ≥ 162 mg/dL 	<ul style="list-style-type: none"> - 2-hour blood glucose ≥ 162 mg/dL <p>Alternative OGTT 2</p> <ul style="list-style-type: none"> - Using venous blood: 1 hour ≥ 180 mg/dL; or 2-hour ≥ 153 mg/dL - Using capillary blood: 1 hour ≥ 191 mg/dL; or 2-hour GD ≥ 162 mg/dL 	
Management of GDM	<p>Recommended glucose level targets:</p> <ul style="list-style-type: none"> - FBG < 95 mg/dL - 1 hour after a meal < 140 mg/dL, - 2 hours after a meal < 120 mg/dL <p>Pharmacological therapy: Insulin or metformin</p> <p>Education on weight gain and nutrition during pregnancy</p>	<p>Recommended glucose level targets:</p> <ul style="list-style-type: none"> - FBG < 95 mg/dL - 1 hour after meal < 140 mg/dL, - 2 hours after meal < 120 mg/dL <p>Medical nutritional therapy</p> <p>Physical activity (150 minutes/week)</p> <p>Pharmacological therapy: Insulin or metformin</p> <p>Independent monitoring of blood glucose levels</p>	<p>Recommended glucose level targets:</p> <ul style="list-style-type: none"> - FBG < 100 mg/dL - 2 hours after meal < 140 mg/dL <p>Anti-diabetic medications are not advised</p> <p>Routine ANC</p>

	National guideline	PERKENI guideline	POGI guideline
Postpartum follow up	<ul style="list-style-type: none"> - OGTT on 4 to 12 weeks after childbirth - Annual testing for up to 3 years 	<ul style="list-style-type: none"> - OGTT or HbA1c on 6 weeks to 6 months - Annual test up to 3 years 	OGTT at 6 weeks after childbirth

6.4 Synthesis of the case study

This section focuses on the reconciliation of various data sets. A commonly used approach in case-study research for consolidating diverse data involves the utilisation of a pattern-matching technique, as proposed by (Yin, 2009). This particular technique is implemented in the present study. While the exact definition of a 'pattern' remains somewhat elusive, in case-study methodologies, it is typically understood as a configuration of events, incidents, behavioural actions, or intervention effects that are evident within the data (Mills et al., 2009). In this study, the procedure outlined by (Almutairi et al., 2014) for pattern-matching is adhered to in order to generate the synthesis result. The technique of pattern matching is typically delineated into three distinct practical processes or phases. The process has three main steps: (i) Stating the propositions of the case study; (ii) comparing the observed patterns obtained from different methods with the expected patterns; and (iii) offering theoretical interpretations and generating research findings. The explanation for each of these steps is presented below.

1) Stating the propositions of case study

The initial propositions for this study (as detailed in Section 3.6) were derived through an extensive literature reading, a targeted systematic qualitative review, professional expertise as a midwife, and consultations with supervisors. These sources collectively informed the selection of propositions, including:

1. Healthcare professionals' levels of knowledge and their attitudes significantly influence the management of care and the experiences of women who use health services.
2. A lack of understanding of GDM among women can potentially impact their health outcomes and their utilisation of healthcare services.
3. The inadequacy of resources, encompassing knowledge, skills, materials, and staff among healthcare professionals, contributes to the deficiency in patient support and care.

2) Comparison of the observed patterns with the propositions

The objective of this stage is to evaluate empirically derived patterns identified in the case study in relation to the propositions. It is important to highlight that the objective is not to affirm or challenge the propositions themselves; instead, it is focused on constructing explanations regarding the presence or absence of observed patterns (Yin, 2003). This process ultimately enhances the validity of the study and contributes to either supporting or modifying the underlying conceptual framework (Yin, 2003).

To proceed with the subsequent phase, patterns within the three collected datasets must initially be identified. The findings from interviews, observations, and documents were organised into a table (Table 11) to facilitate subsequent data analysis. The juxtaposition of findings from each dataset facilitated the identification of patterns, while also ensuring a comprehensive examination of all available information. The utilisation of tabulation facilitated the researcher in formulating her conceptual orientation, enabling her to observe the initial patterns throughout the findings and comprehend the similarities and differences within and across the datasets. Subsequently, the data across datasets were compared and contrasted based on dimensions where similarities and differences were observed. The three dimensions were selected as follows: management of GDM, knowledge and understanding of GDM, and the relationships between women and healthcare professionals. After thoroughly perusing the data to have a comprehensive grasp of general facts and comprehension, an initial synthesis of the amalgamated findings was established. The first synthesis version was subsequently refined and deliberated upon in consultation with the supervisory team. The synthesis conducted effectively developed clear empirical patterns that are relevant to the study objectives and align with the underlying theoretical framework. In total, three patterns were identified: (i) The management of GDM in the health centre exhibits inadequacies (ii) Lack of knowledge and understanding about GDM among women and healthcare professionals providing services may lead to the negative experiences for women with the condition; (iii) The potential underlying factor contributing to the suboptimal rapport between

women and healthcare professionals can be attributed to the lack of effective communication. The empirically-found patterns were further explored against the prepositions.

Table 11 Key similarities and differences in the findings of the case study

Dimension	Women findings	Healthcare professional findings	Supplementary data (documents and an observation)
Management of GDM	<ul style="list-style-type: none"> • Opportunistic test (RBG, FBG, OGTT) • Being proactive • Pursue spiritual tranquillity • Self-made lifestyle modification • Limited lifestyle advice from healthcare professionals 	<ul style="list-style-type: none"> • Experience in conducting glucose testing (RBG) • Managing hyperglycaemia in pregnancy (provide advice on diets) • Experience in referring women to higher level health facilities for further support 	<ul style="list-style-type: none"> • Guidelines recommend to test all women using OGTT • Glucose level targets are available in the guidelines • The guidelines recommend medical nutritional therapy, physical activity, and pharmacological intervention
<i>The management of GDM in the health centre exhibits inadequacies</i>			
Knowledge and understanding about GDM	<ul style="list-style-type: none"> • Views about causes of hyperglycaemia • Views about treatment for hyperglycaemia • Views about medication • Views of risk and perceived impact of hyperglycaemia • Reported physical symptoms attributed to hyperglycaemia in pregnancy • Perceived psychological consequences 	<ul style="list-style-type: none"> • Views about hyperglycaemia in pregnancy in general • Knowledge about risk factors, symptoms and impact of hyperglycaemia in pregnancy on mother and baby 	<ul style="list-style-type: none"> • Limited information provided during GDM consultation session • The absence of information about exercise

	<ul style="list-style-type: none"> • Women reflection over living with elevated blood glucose 		
<p><i>Lack of knowledge and understanding about GDM among the women and healthcare professionals who provide the services may lead to a negative experience for women living with the condition</i></p>			
Women-healthcare professional's relationships	<ul style="list-style-type: none"> • Views on the interaction with healthcare professionals • Experiencing the health services 	<ul style="list-style-type: none"> • Healthcare professionals perceive that women have little knowledge and awareness about hyperglycaemia in pregnancy • Healthcare professional's views about barriers for women in accessing care 	<ul style="list-style-type: none"> • Midwife does not provide positive reinforcement during the consultation session • One-way communication in the consultation • The comment '<i>this woman has a wrong mindset</i>' during the consultation has the potential to strain interpersonal rapport
<p><i>The potential underlying factor contributing to the suboptimal rapport between women and healthcare professionals can be attributed to the lack of effective communication</i></p>			

3) Theoretical explanations

The following section describes the synthesis explanation from the findings across the dataset compared to propositions.

Synthesis 1:

The empirically-based pattern: The management of GDM in the health centre exhibits inadequacies.

The proposition: Healthcare professionals' levels of knowledge and their attitudes significantly influence the management of care and the experiences of women who use health services.

The inadequacy of resources, encompassing knowledge, skills, materials, and staff among healthcare professionals, contributes to the deficiency in patient support and care.

Explanation: The provision of services for women with GDM at the health centre falls short of meeting optimal standards. One of the identified factors is the lack of established guidelines for the management of hyperglycaemia in pregnancy at the site. This absence contributes to healthcare professionals' lack of awareness regarding the appropriate timing, procedures, and criteria for diagnosing and managing GDM. Eventually, this compromises the quality of service provided.

Synthesis 2:

The empirically-based pattern: Lack of knowledge and understanding of GDM among the women and healthcare professionals who provide the services may lead to a negative experience for women living with the condition.

The propositions: Healthcare professionals' levels of knowledge and their attitudes significantly influence the management of care and the experiences of women who use health services.

A lack of understanding of GDM among women can potentially impact their health outcomes and their utilisation of healthcare services.

Explanation: Health professionals' insufficient knowledge and understanding of GDM significantly impacts the quality of services provided to pregnant women, resulting in inadequate care. The understanding of women also plays a significant role in shaping their lived experience with GDM. These two factors

mutually reinforce each other, contributing to the development of a negative experience of GDM.

Synthesis 3:

The empirically-based pattern: The potential underlying factor contributing to the suboptimal rapport between women and healthcare professionals can be attributed to the lack of effective communication

The proposition: Healthcare professionals' levels of knowledge and their attitudes significantly influence the management of care and the experiences of women who use health services.

Explanation: The absence of effective communication between women and healthcare professionals creates a sense of disconnect between these two parties. One-way communication and healthcare professionals' belief that women lack awareness of their well-being may lead to women perceiving a lack of empathy from health professionals for their conditions. The lack of effective communication plays a significant role in exacerbating the difficulties encountered by these women in obtaining proper care management.

Final synthesis

The knowledge and understanding of GDM among women and healthcare professionals significantly shaped their interactions, perceptions, and beliefs regarding GDM, ultimately impacting the effectiveness of GDM management.

6.5 Summary box

- A non-participant observation was undertaken during a consultation session between a pregnant woman experiencing hyperglycaemia and a midwife.
- Although the midwife offered guidance on maintaining a healthy diet, there was an omission in addressing the importance of incorporating exercise as a component of GDM management.
- The midwife refrained from actively encouraging or providing positive reinforcement to the woman.
- Three guidelines for the management of GDM were identified. They were compared and contrasted to elucidate the similarities and differences among them.
- The synthesis of the case revealed that the interactions, perceptions, and beliefs concerning GDM were notably influenced by the knowledge and understanding of GDM among both women and healthcare professionals, which eventually it had a consequential impact on the overall GDM management.

Chapter 7 Discussion

7.1 Introduction

The overarching aim of this study was to explore experiences, knowledge, and understanding of gestational diabetes mellitus (GDM) among women and healthcare professionals in the context of Indonesia. A research study employing a single exploratory case study approach and a qualitative systematic review were conducted to accomplish this overarching aim. The data was acquired through interviews, non-participant observation, and documents. This chapter begins by discussing the original contributions of the thesis to knowledge, followed by an overview of the study. The subsequent section elaborates on the key findings from a broader standpoint and their potential to enhance the implementation of GDM management. Additionally, conclusions are drawn to offer recommendations for policy, practice, and future research.

7.2 The original contribution to knowledge

This study represents the first exploratory case study specifically focused on GDM in Indonesia. It reveals complex issues surrounding the management of GDM within a health centre that has not been previously documented in GDM-related studies in Indonesia. A lack of knowledge and understanding about GDM significantly contributes to the substandard management. Previous studies have found that women with GDM in Indonesia struggle to maintain their glucose levels (Mufdlilah et al., 2020a; Subarto et al., 2022), but these studies did not explore the contributing and underlying factors behind this finding. This current study identifies that women encounter difficulties in understanding the complexities of GDM, which is seen as a knowledge gap. This lack of understanding leads the women to avoid undergoing necessary tests for monitoring their glucose levels. Although women were eager to acquire more information from healthcare professionals, but this need remains unfulfilled due to most healthcare professionals' inability to provide comprehensive knowledge and information. Furthermore, ineffective communication during a GDM consultation and a lack of empathy towards women was noticed, exacerbating the complexities of the issue. Further dissatisfaction among women with the GDM services was related to the extended waiting times and the practice of sharing patients' personal

information among healthcare professionals. This combination of factors led to hesitations among women to utilising GDM services from the health centre.

This study also identified equally concerning issues related to limited knowledge and understanding among healthcare professionals responsible for providing services, jeopardising the well-being of both women and their babies. The healthcare professionals' belief that GDM is rare can be attributed to the underestimation and neglect of GDM within the context of Indonesia. This issue extends to the health centre as an organisation, where there is an absence of clear roles and responsibilities in delivering GDM care. In addition, healthcare professionals perceived that GDM should be managed at higher-level healthcare facilities. The study also highlights policy issues, including a lack of local and national guidelines for GDM, limited in-service training, and insufficient government programmes for GDM. Ultimately, this study found that GDM, as a public health problem, has been overlooked and received little attention from the Indonesian government.

7.3 Overview of the study

This study was driven by a set of objectives:

1. To explore experience, knowledge, and understanding of women with identified GDM in Indonesia.
2. To explore experience, knowledge, and understanding of GDM among healthcare professionals with different roles within maternity care services.
3. To explore how GDM is identified and managed in routine practice delivered by healthcare professionals at a public health centre.
4. To identify if there are national/local guideline(s) of GDM in place and explore to what extent they are used to guide practice in a public health centre.

Various data sources (see Chapter 3) were gathered in this exploratory case study approach to generate rich and comprehensive datasets that allow the researcher to understand a phenomenon from multiple perspectives. In understanding the data through a broader sociocultural lens, this study was

guided by propositions in line with the case study approach, as outlined in Table 12.

Table 12 Theoretical propositions

Theoretical propositions	Proposition supported?
1. Healthcare professionals' levels of knowledge and their attitudes significantly influence care management and the experiences of women who use health services.	Supported
2. A lack of understanding of GDM among women can potentially impact their health outcomes and their utilisation of healthcare services.	Supported
3. The inadequacy of resources, encompassing knowledge, skills, materials, and staff among healthcare professionals, contributes to the deficiency in patient support and care.	Supported

These propositions offer the researcher insight into the challenges that women and healthcare professionals encounter in managing GDM at the health centre, including personal, interpersonal, organisational, and policy environment factors. The set of original propositions were supported by the findings from this study. The multiple levels of interrelated factors contribute to complex relationships that impact women's experiences, which will be elaborated in the following section.

7.4 Discussion of the findings

Following a thorough examination and interpretation of the findings, three discussion points were identified: a) Bridging the gap between needs of women with GDM and the services provided; b) Understanding organisational culture as a barrier to GDM identification and management; c) Exploring the influence of policy environment on the understanding and management of GDM.

7.4.1 Bridging the gap between needs of women with GDM and the services provided

The findings of this study shed light on important issues concerning unmet needs among women, including the unmet need for information related to GDM, comprehensive care, and empathetic services. There is no one-size-fits-all approach to addressing these needs. It is crucial to deconstruct the problem to facilitate a comprehensive understanding of the intricate nature of the GDM issue.

- *The unmet need for information*

This study revealed that one consequence of woman having limited knowledge and understanding of GDM was a rise in fear and concern for their well-being and the well-being of their newborns. These negative emotions drove them to seek clear and specific information and knowledge about GDM from healthcare professionals. However, the lack of knowledge among health professionals often meant that these women's needs could not be adequately met, leading to disappointment and dissatisfaction with the services and a tendency to underestimate the significance of managing GDM. These findings align with the studies conducted in LMICs, which highlighted a lack of knowledge among women about GDM (Hirst et al., 2012; Suraiya et al., 2015; Rafii et al., 2017; Sundarapperuma et al., 2018) and women's dissatisfaction with GDM-related service provision (Ge, L. et al., 2016; Mensah et al., 2019). These studies were conducted across several healthcare settings, including hospitals, communities, and clinics, with varying patient visits, suggesting that the lack of satisfaction with GDM management was prevalent across research settings. In addition, these contextual variations may hinder the establishment of universal recommendations and underscore the need for tailored strategies in different situations, including in Indonesia.

- *The unmet need for comprehensive care*

This study revealed disparities between the viewpoints of healthcare professionals and women with GDM regarding their healthcare-seeking behaviour. Healthcare professionals believed that they had provided the best care possible and that women were unaware and careless about their health. In contrast, the women stated that they received limited care and that healthcare professionals exacerbated the problem by presenting negative GDM scenarios. These conflicting views led the women to explore alternate methods and employ trial-and-error strategies to manage their condition without oversight and monitoring by healthcare professionals. The findings also uncovered other needs, such as sufficient time for consultation, supportive communication without excessive medical terms, and clear information regarding GDM. These needs resonate with a review by Karavasileiadou et al. (2022). While most studies in this review were mainly conducted in high-income countries (nine out

of ten), they yielded similar findings, indicating that women's desire for effective GDM management is a global concern.

In the current study, the women's desire for comprehensive and feasible care that aligns with their needs has not been fulfilled. In the context of LMICs, such as Indonesia, to meet the expectation of the women on comprehensive GDM care becomes more challenging due to the prevailing socioeconomic situations. Women from lower socioeconomic backgrounds encounter formidable obstacles, including financial constraints and reduced access to healthcare facilities (Mensah et al., 2019). Studies highlighted that individuals from lower socioeconomic backgrounds often experience higher rates of complications and poorer health outcomes (Delanerolle et al., 2021). The financial constraints faced by these individuals may lead to delayed medical consultations and adherence issues (Al Nadhiri et al., 2023), exacerbating the unmet need of comprehensive care.

The scarcity of resources further compounds the issue, hindering healthcare professionals in delivering comprehensive services. This study revealed that insufficient funding and limited infrastructure impede the establishment of comprehensive GDM management, leading to compromised quality in essential aspects such as early detection, education, and ongoing care. The lack of funding also perpetuates a cycle of insufficient healthcare coverage. This inadequacy is felt most acutely in preventive measures, where limited resources may result in a greater emphasis on reactionary rather than proactive healthcare (Adam et al., 2023). Furthermore, the absence of a robust infrastructure can lead to missed opportunities for timely intervention and improved patient outcomes (Morampudi et al., 2017). Consequently, the constrained resources exacerbate the challenges faced by healthcare professionals, making it imperative to address the systemic issues of healthcare funding and infrastructure to enhance the overall effectiveness of GDM management programs in resource-limited environments.

The circumstance mentioned above indicates the gap between women's needs and the support provided. A review conducted by (Devsam et al., 2013) aligns with this finding, emphasising the importance of understanding individuals' needs as the fundamental basis for managing GDM. Other studies have shown that modifying GDM management by providing personalised services and

enhancing women's involvement in GDM care is necessary (Jones et al., 2009; Craig et al., 2020). Therefore, it is imperative for healthcare professionals in Indonesia to understand women's needs and expectations to effectively manage GDM.

- *The unmet need for empathetic services*

Another contrasting view pertained to communication. Women commonly expressed their dissatisfaction, perceiving the communication style of healthcare professionals as intimidating. In contrast, healthcare professionals frequently claimed that women lacked awareness and tended to disregard their recommendations, leading them to employ fear-inducing communication, which they believed could motivate women to act on their condition. The observation data further strengthened the findings on communication issues, where a paternalistic communication style and the healthcare professionals' power dynamics within the consultation session were evident. The paternalistic model can be characterised as a communication style or strategy wherein healthcare professionals, as the authority figures in positions of power, make decisions on behalf of patients without fully involving them in the decision-making process (Emanuel and Emanuel, 1992). This particular communication model exhibits a hierarchical structure, with healthcare professionals assuming a position of authority and believing they have a better understanding of the most beneficial course of action for patients, and acting on this belief (Claramita et al., 2013).

In Indonesia, local cultural norms strongly influenced the client–provider dyad communication. Two fundamental principles deeply embedded in people's social lives, affecting their interaction, are conflict avoidance and respect (Magnis, 1997). Indonesian society places a high value on preserving “*kerukunan*” (social harmony) and preventing the occurrence of conflict. As a result, their communication style tends to be indirect, ambiguous, and neutral (Kim et al., 2001). They hold deep respect for their parents, teachers, elders, and healthcare professionals (Claramita et al., 2020). This cultural norm contributes to the paternalistic model of medical care. Patients generally perceived themselves as being in subordinate positions in the client–provider relationship, showing respect for healthcare professionals to show appreciation and to avoid potential conflict. Consequently, in the context of Indonesia,

cultural norms may hinder patients from showing disagreement, concern, or misunderstanding towards healthcare professionals (Kim et al., 2000).

The literature has extensively emphasised the importance of partnership-oriented communication. Establishing rapport is crucial as it significantly enhances an individual's self-efficacy (Stewart, 1995). Nevertheless, studies have indicated that the level of communication between patients and healthcare professionals appears to be suboptimal (Lawson and Rajaram, 1994; Nicklas et al., 2011). Patients are often hesitant to inquire about their condition due to concerns about being dismissed or undervalued by healthcare professionals. In this current study, the healthcare professionals often fail to communicate effectively and show empathy towards women with GDM. Consequently, the women perceived healthcare professionals as being judgemental, and the consultation as unhelpful.

7.4.2 Understanding organisational culture as a barrier to GDM identification and management

The concept of organisational culture adopted in this study is defined as a shared way of thinking, acting and being in a social unit that is practised over time, shaping collective patterns within an organisation (Serpa, 2016). This study found that the health centre's organisational culture creates a barrier for women in accessing GDM management. The organisational cultures discussed here include the dynamics of roles assigned to healthcare professionals, extended waiting time to receive care, and the non-consensual sharing of patients' personal information.

- *Unclear roles of healthcare professionals in providing GDM-related services*

This study identified a conflicting view on who should be responsible for GDM management within the health centre. Most healthcare professionals considered GDM to be the responsibility of midwives, while the midwives themselves believed that the condition fell within the scope of the doctor's responsibility. According to Indonesian policy, maternal and child health is the primary area where midwives are engaged. They have the authority to provide care for non-high-risk women (MoH, 2017), but not for conditions beyond 'normal,' including GDM. However, within the health centre, there was a lack of

clarity regarding the roles of healthcare professionals in GDM management. Role overlap between the doctors and midwives was apparent, leading to a perception of blame between the two professions in the GDM discourse.

Previous studies have revealed that healthcare professionals encountered challenges in achieving smooth collaboration (Hall, 2005; Lingard et al., 2017). Factors that facilitated collaboration included the presence of clear roles, opportunities for discussions, and a willingness to cooperate among healthcare professionals (Schot et al., 2020). These factors were notably absent in this study, which could contribute to suboptimal GDM management in the health centre. It is worth noting that active ongoing collaboration in GDM-related services was not observed, indicating poor interprofessional collaboration at the study site. Therefore, reaching a specific agreement regarding the roles of each healthcare professional in GDM services is crucial as an initial step toward interprofessional collaboration.

Interprofessional collaboration and learning is well established in the Global North (e.g. UK) (Ateah et al., 2011; Ulrich et al., 2019). This way of working is less established within the Global South (e.g. Indonesia). A previous study on interprofessional collaboration in Indonesia revealed that the implementation of interprofessional collaboration at a health centre was relatively simpler compared to a hospital setting, considering that the size of the health centre was smaller (Findyartini et al., 2019). However, in health centres, the limited number of healthcare professionals with substantial workloads was regarded as a challenge, creating unclear and overlapping division of tasks (Setiadi et al., 2017). Due to a lack of numbers, healthcare professionals occasionally have to undertake their colleagues' tasks beyond their responsibility, resulting in a broader gap in interprofessional collaboration. The other barrier to interprofessional collaboration is Indonesia's strong hierarchical culture, which determines individual status in the society. Indonesian society places doctors in a higher-level authority, while other healthcare professionals are viewed as doctor's assistants (Kurniasih et al., 2022; Afandi et al., 2023). This unequal power relation among healthcare professionals serves as a hindrance to interprofessional collaboration. Furthermore, the culture of saving face for others to avoid conflicts, generally seen as positive behaviour, negatively influences interprofessional collaboration as it may perpetuate unexpressed

problems (Lestari, 2021; Wiarsih et al., 2023). In addition, interprofessional collaboration is in the early stages of development in educational health institutions in Indonesia (Findyartini et al., 2019; Soemantri et al., 2020).

- *Long waiting time and personal information sharing practice*

Another aspect related to organisational culture identified in this study that was considered a hindrance was the extended waiting time for women to access GDM services. In the Indonesian context, people often seek private health facilities to avoid this issue. Studies have reported that the average waiting time in Indonesia ranges from one to three hours (Hairani and Kusumayati, 2019; Hidayat et al., 2020), while government recommendations suggest a waiting time of less than 60 minutes (MoH, 2008). The actual waiting time in the health centre was unknown, and there is limited research on waiting times in Indonesian health centres. It is challenging to confidently conclude whether the waiting time at the health centre was similar to the findings of the aforementioned studies, as they were conducted in hospital settings. This finding can provide valuable insights for the health centre to gain awareness of the actual waiting times experienced by their patients. In general, patients satisfaction tends to decrease when the waiting time exceeds 30 minutes (McKinnon et al., 1998). By addressing and rectifying this issue, the health centre has the potential to enhance the satisfaction of their service users (Hassali et al., 2014).

In this study, the dissatisfaction related to the health centre was compounded by the practice of sharing patients' personal information. A contrasting view was observed regarding this practice. Healthcare professionals perceived that sharing patient information facilitates their work to be completed in a timely and effectively manner. However, for women, this practice represents a compromise of their privacy and confidentiality. The differing viewpoints indicated insufficient awareness of the importance of protecting patients' privacy and confidentiality among healthcare professionals. This finding is consistent with Pratiwi et al.'s (2022) study, which identified this issue in Indonesia and found that it continued to be disregarded. The study found that privacy-sensitive problems were frequent in health centres with poor attention from healthcare professionals (Pratiwi et al., 2022). The study suggested the need for better building design to protect privacy but did not offer recommendations for existing health centres.

7.4.3 Exploring the influence of policy environment on the understanding and management of GDM

Throughout this study's findings, the influence of policy has been evident. Policy, in this context, refers to guidelines, procedures, or rules that organisations develop or adopt to regulate specific healthcare services delivery (O'Donnell et al., 2012; Wafula et al., 2014). It is clear that policy plays a significant role in addressing various GDM-related issues in Indonesia. Complex policy-related findings were identified in this study, including the absence of guidelines, in-service training, and government programmes for GDM. GDM appears to be a non-priority condition that is often overlooked by Indonesian policymakers.

- *Lack of guidelines for GDM: absent or unknown?*

A notable difference between the healthcare professionals' knowledge and the collected documents was the existence of GDM guidelines. Healthcare professionals believed there was an absence of either local or national guidelines, and the health centre had not developed its own guidelines. None of the healthcare professionals at the health centre possessed any knowledge or awareness about GDM guidelines. In contrast, the documents accessed for the purpose of this study revealed three guidelines developed by the government and Indonesian professional organisations. Therefore, this study suggests that healthcare professionals were unaware of the existence of these guidelines.

Undoubtedly, the lack of knowledge about the existence of clinical guidelines has a negative influence on their implementation (Shayo et al., 2014). In the context of Indonesia, the study found that the government and professional organisations actively generated guidelines for GDM. These guidelines are available on their official websites. However, merely placing the guidelines on websites was considered insufficient, as it is essential to take adequate measures to disseminate them (Cluzeau, 2003), ensuring that healthcare professionals in primary health facilities are exposed to this information.

It is imperative for healthcare professionals to be aware of the existence of these guidelines. Only then can they effectively implement them in clinical

practices. This represents a recognised knowledge gap among healthcare professionals that must be addressed, requiring intervention by policymakers.

- *Prioritisation of GDM as a public health issue*

This study's findings revealed that GDM was not a public health priority for healthcare professionals. It was perceived as a relatively uncommon condition with a small prevalence among pregnant women. This understanding contrasts with studies showing that GDM is a common condition (Rao et al., 2019; He et al., 2021), affecting 6 to 25% of pregnancies globally (Lefkovits et al., 2022). Given its increasing prevalence and potential adverse outcomes for women and babies, it is arguable for prioritising GDM as a critical public health issue (Bennett et al., 2012).

In prioritising a health problem, several factors need to be considered, including economic, social, and environmental aspects (Brookes et al., 2015). First, GDM should be assessed from an economic perspective. In the United States, pregnancy complicated by GDM was associated with an economic burden of nearly \$1.6 billion in 2017 (Dall et al., 2019). It posed a more significant financial burden than a non-GDM pregnancy (Xu et al., 2017). Screening and preventative programmes for postpartum GDM mothers have suggested to reduce GDM management costs. Therefore, from an economic viewpoint, GDM could be considered a priority. In addition, the environmental aspect should be assessed to determine the most critical condition in light of resource allocation. Environmental impacts can include changes in the ecological balance, which in the case of GDM, appears to have no direct or minimal impact.

Subsequently, the social cost of GDM should also be examined in prioritisation. The social cost includes psychological and social burdens attributed to GDM. Stigma, discrimination, stereotyping, and negative labelling are psychological burdens that are frequently reported (Davidsen et al., 2022). Feeling of guilt about the condition, self-blame, embarrassment, and shame represent internal negative self-talk among women with GDM (Doran and Davis, 2010; Carolan-Olah et al., 2017). These aspects, although less noticeable, contribute to the negative experience of women. By considering economic, environmental, and social perspectives, GDM could be viewed as an important issue.

One of the best practices for GDM management is in the UK, which draws on the NICE guidelines (Murphy, 2021). The rise of GDM prevalence in the general population has led to the recognition of a better understanding of this issue (Eades et al., 2017; Behboudi-Gandevani et al., 2019). Over the years, studies have been conducted on GDM, improving understanding for researchers, health practitioners, and policymakers (Stacey et al., 2019; Tennant et al., 2022). Evidence-based care is the foundation for developing GDM guidelines, emphasising patient-centred care. Moreover, the authorities were aware of the burden of GDM on the economy (Jacklin et al., 2017), making them invest in diabetes prevention, including establishing GDM clinics. The clinics are characterised by multidisciplinary and patient-centred care that ensures individuals with GDM receive comprehensive care. The GDM clinic interprofessional team typically consists of a diabetes specialist midwife, diabetes specialist nurse, diabetologist or endocrinologist, registered dietitian, and an obstetrician. This holistic approach to reducing adverse outcomes of GDM may be a best practice for other countries, including Indonesia.

- *Lack of dedicated programme for GDM*

This study revealed the absence of a specific government health programme for GDM in Indonesia. Unlike other diseases that have their own programme (e.g. HIV, syphilis, and hepatitis B), there was no mandatory test in place to identify women with GDM. This contrasts with the management of HIV, syphilis, and hepatitis in health centres. There is a government programme called 'triple elimination' that requires the identification and management of these conditions. Moreover, healthcare professionals are mandated to regularly report its prevalence to the local health authority. As a result, the healthcare professionals at the health centre were aware of the extent of the issue, encouraging them to conduct routine screening for all pregnant women. Unfortunately, a similar situation has not been observed for GDM. This study identified a need for the health centre as an organisation to establish a dedicated programme for GDM. Notably, this need would not be fulfilled without the government's involvement.

- *Limited in-service training*

The findings of this study revealed that there had never been any in-service training for managing GDM in the health centre. This absence contributed to the lack of understanding among the healthcare professionals and limited discussion as well as attention to the subject. In-service training plays a significant role in fostering and enhancing the competence of employees, facilitating better service delivery (Chaghari et al., 2016). An example can be drawn from a study conducted in 44 health centres in Morocco, which found that increased patient referrals to higher-level health facilities were attributed to the lack of in-service training (Utz et al., 2017). The majority of the healthcare professionals were aware that they were 'blind' regarding how to manage GDM, emphasising the minimal knowledge they possessed. They expressed the need for training or seminars on GDM, which, once again, requires the involvement of policymakers.

7.5 Strengths and limitations

This research was initially designed as a multiple case study, involving a comparison of two cases at a primary and a tertiary healthcare levels. However, official approval to collect data in the tertiary hospital was not obtained due to the COVID-19 pandemic. After consulting with the supervisory team, the study was amended to a single exploratory case study design. The exploratory case study approach is commonly employed when preliminary data is scarce in a particular setting (Mills et al., 2009; Yin, 2009). The decision to employ an exploratory case study proved to be appropriate, as evidenced by the successful achievement of the research objectives. Using multiple sources of data provided a comprehensive understanding of GDM management dynamics in the 'real world,' including the facilitators and barriers encountered by women and healthcare professionals within the study site.

Moreover, the utilisation of the exploratory case study approach facilitated the revelation of findings that could not have been explored using interviews alone. The non-participant observation revealed that healthcare professionals' responses in interviews regarding how they provide consultations did not necessarily align with their practices in the real world. Additionally, employing the case study method enabled the identification of available GDM guidelines

developed by the government and professional organisations in Indonesia, which had been overlooked by all healthcare professionals in the health centre. This finding could only be made through document analysis.

Nevertheless, it is essential to recognise the limitations present in this study. This was a small qualitative study with a single case (a health centre and its outreach area). It may have limitations regarding the transferability of the findings to other health centres. Furthermore, the present study was carried out at a '*paripurna*' accredited health centre, the highest accreditation grade. It is worth noting that only three out of a total of 303 health centres in the Lampung province were able to achieve this prestigious accreditation. Other health centres may not exhibit the same level of performance as the study site, potentially posing challenges in terms of transferability. However, with '*paripurna*' accreditation, there is a potential opportunity for the health centre to develop a 'best practice' GDM management by considering inputs from this study, which may serve as an example for other health centres.

Non-participant observation is an essential method for gaining insight into the actual dynamics of a GDM consultation within a real-world context. This approach offers the benefit of allowing the researcher's to maintain the position as an observer, refraining from any engagement or interference throughout the consultation. This type of observation enables the activity to be conducted without external interference or interruption. However, it is important to note that only one GDM consultation session took place during the data collection timeframe. The COVID-19 pandemic, which has imposed restrictions on pregnant women seeking care at health centres, may have contributed to this circumstance. The researcher consistently visited the health centre throughout its opening hours to maximise the opportunity for conducting observations, but this issue remains a research limitation.

Another limitation of this study was related to women participants. This study had a limited number of participants, with only six women. The sample size of this study is smaller compared to other research conducted in LMICs (see Chapter 2), where the number of women participants ranged from 7 to 62. It is important to note that the women in this study did not receive a formal diagnosis of GDM. They were solely provided with glucose levels indicating hyperglycaemia, making it challenging to distinguishing between GDM and

diabetes in pregnancy (DIP) in this research. Consequently, all women with hyperglycaemia in pregnancy were recruited, which is acknowledged as a limitation in this study. Furthermore, there is a lack of findings related to the management of GDM during the postpartum period. Three women who had given birth by the time of the interview lacked any prior experience with GDM follow-up tests. Hence, it highlights the need for more research that mainly investigates the experiences of women during this particular phase.

In addition, the recruitment of healthcare professionals in this study proceeded without significant issues. The researcher was supported by colleagues who facilitated formal access to the site. Healthcare professionals from diverse professional backgrounds participated, including health professionals working in health centre's outreach areas, such as health posts midwives and private practice midwives. The ability to provide a comprehensive understanding of healthcare professionals' views is regarded as a strength of this study.

7.6 Recommendations for policy and practice

In this research, problems related to interpersonal, organisational and policy-related issues have been highlighted. The following strategies should be taken into consideration:

- ***Practice***

1. Healthcare professionals should possess knowledge of the existence of GDM guidelines and assess their suitability. The selected guideline must be adopted or adapted for implementation within the health centre. In addition, healthcare professionals need to enhance their knowledge and understanding of GDM.
2. The information provided during the consultation session should be clear and comprehensive, covering information related to nutritional therapy, physical activities, and pharmaceutical therapy.
3. Effective communication can be achieved by enhancing healthcare professional's communication skills to exhibit greater empathy. Healthcare professionals can explore women's needs to better understand their journey with GDM, and, eventually, provide personalised care for the women living with GDM.

4. Information about GDM could be shared through social media. Social media platforms are highly popular in Indonesian society, offering advantages such as rapid dissemination of information, potential cost savings, and the ability to reach a broader audience.
5. To increase the utility of GDM services at the health centre, it is essential to reduce waiting times. The healthcare professional should begin by assessing the actual waiting time and identifying why and which area of their services takes up the most time. Subsequently, they can address the identified problems related to extended waiting times.
6. To encourage women to access GDM care, healthcare professionals should pay attention to the privacy and confidentiality of patient's personal information. Seminars on this issue can be conducted to raise awareness among healthcare professionals.
7. Healthcare professionals are encouraged to develop a well-defined roles for each actor involved in GDM management, considering the authority of each profession in accordance with Indonesian policy.
8. Specific training on GDM management needs to be developed. This training should involve all the healthcare professionals at primary-level health facilities who care for women with hyperglycaemia during pregnancy. In developing the training materials, the availability of resources at health centres should be considered.
9. To raise awareness about GDM among midwifery students, as they will be healthcare professionals involved in maternal health and have a crucial role in delivering services for women in Indonesia. Lesson learnt from the undergraduate midwifery programme at the University of Leeds, where information and knowledge about GDM are embedded into their curriculum, specifically in a module titled HECS 2236 - Global and Cultural insights into Maternal Health (which the author has contributed to in order to share the key findings of this study). Adapting this module to align with Indonesian culture and values may serve as valuable input for midwifery schools in Indonesia. This adaptation is in progress.

- **Policy**

1. National and local health authorities should disseminate information regarding the GDM guidelines to primary-level health facilities.
2. Sufficient funds are required to provide in-service training on GDM management for healthcare professionals at health centres. Healthcare authorities could play a critical role in allocating resources and ensuring equitable distribution as a measure of investing in public health.
3. Policymakers should be aware of the importance of GDM identification among pregnant women. The uptake of GDM screening and testing needs to be improved. Therefore, it is imperative to develop a specific GDM identification and management programme that can be implemented in Indonesia's lowest-level health facilities.

7.7 Recommendations for further research

There is a lack of research in the area of GDM in Indonesia, both qualitatively and quantitatively. Therefore, further investigation is necessary to gather more evidence on implementation of GDM management services. In light of these limitations, further studies can explore the following domains:

1. Conducting studies to investigate the GDM issue in Indonesia, including its prevalence, associated risk factors, and adverse consequences. The data generated will have the potential to provide evidence and support further research in the field of GDM in Indonesia. Furthermore, it is crucial to conduct studies at various levels of healthcare facilities, which can help identify the pathways of care for GDM within the Indonesian health system.
2. Investigating women's experience with GDM, including the involvement of husbands as well as other family members as participants. In addition to enhancing the understanding of the challenges faced by women, this approach can potentially provide valuable insights into the obstacles that hinder women from effectively managing their condition, from the perspective of other family members. It can also identify the dynamic of women's immediate social network that influence women's health-seeking behaviour.

3. Investigating the perspectives of local and national health authorities regarding GDM. Further research should explore how policymakers prioritise diseases and identify the barriers that hinder the integration of GDM management into antenatal care programmes.

7.8 Research dissemination plan

It is crucial to disseminate the study's findings to the community and public as part of the contribution to the knowledge and provide evidence for well-informed decision-making; several seminars and conferences have been attended during the thesis development. The list of seminars and conferences can be seen in Table 13, along with the dissemination plan.

Table 13 Dissemination of the study

Dissemination to date		
Wulandari, R., McGowan, L., Scott, E. 2021. Pregnant women's experience of gestational diabetes in low and middle income countries. In: <i>International Day of the Midwife, School of Healthcare, University of Leeds, and UNISA University, Yogyakarta, Indonesia [Online]</i> .		
Wulandari, R., McGowan, L., Scott, E., Fu, Yu. 2022. Women and healthcare professional's experience of gestational diabetes in Indonesia. In: <i>International course for master of midwifery students, UNISA University, Yogyakarta, Indonesia [Online]</i> .		
Wulandari, R., McGowan, L., Scott, E., Fu, Yu. 2023. Gestational diabetes in pregnancy with a focus on Indonesia. In: <i>International day of the midwife (IDM), School of Healthcare, University of Leeds</i> .		
Wulandari, R., McGowan, L. 2023. Gestational diabetes in pregnancy: an exemplar from Indonesia. In: <i>HECS 2236 - Global and cultural insights into maternal health, School of Healthcare, University of Leeds</i> .		
Wulandari, R., McGowan, L., Fu, Yu. 2023. Women and healthcare professional's experience of gestational diabetes (GDM) in Indonesia: an exploratory case study. In: The 33 rd ICM Triennial Congress, Bali, Indonesia.		
Dissemination Plan		
	Publication	Target Journal/ Events/ Media
Academic	Paper 1: Qualitative systematic review of experiences of GDM among pregnant and postpartum women in low and middle-income countries setting	BMC Pregnancy and Childbirth International Journal of Evidence-Based Healthcare
	Paper 2: Experience, knowledge, and understanding about GDM among women and healthcare professionals in Indonesia	BMC Pregnancy and Childbirth Journal of Psychosomatic Obstetrics and Gynaecology Midwifery
Professionals	Gestational diabetes management from preconception up to postpartum period	Provincial meetings of midwives' association Lampung 'Research week' presentation in Malahayati University Bandar Lampung
Public dissemination	Gestational Diabetes: Impact on women and baby	The Conversation Indonesia https://theconversation.com/id

7.9 Conclusion

Gestational diabetes is a major public health issue, especially considering its adverse outcomes for women and babies both in the short and long term. This study investigated the experience, knowledge, and understanding of GDM among women and healthcare professionals in Indonesia by conducting a qualitative systematic review and a single exploratory case study. This study has adhered to ethical principles and has ethical approval from SHREC and the Indonesian ethical committee. Credibility, transferability, dependability, and confirmability were considered during the study process to maintain the study's rigour.

The qualitative systematic review highlighted that women with GDM in LMICs encountered a myriad of challenges in managing their condition. The obstacles includes a lack of knowledge about GDM, cultural factors, and socioeconomic limitations. Furthermore, the exploratory case study faced impediments, particularly in the identification of women with GDM. This challenge was due to the absent of routine GDM testing at the health centre. The evidence for the case study was gathered from a diverse range of perspectives, including those of women and healthcare professionals in the context of Katon health centre and its outreach area. This research highlighted challenges that women face in managing GDM in their daily lives and emphasised the disparities between the perceptions of women and healthcare professionals. The healthcare professionals exhibited a lack of interest in addressing the issue and demonstrated insufficient knowledge about GDM. It identified the gaps between the women's needs and the support provided by the healthcare professionals at the health centre, shedding light on the underlying causes of inadequate GDM management in Indonesia.

In addition, this study provided evidence of the lack of awareness and utilisation of GDM guidelines within the health centre. The unfamiliarity with the guidelines rendered their applicability challenging, hindering effective implementation. Observational data shed light on how the consultation session was conducted, revealing a unidirectional communication pattern that impeded meaningful engagement with the woman as the user of the services. The study's findings have been analysed in terms of their potential impact on policy and practice, and suggestions for future research have been provided. This study offers

valuable insights for enhancing service delivery in the Indonesian healthcare system, specifically in providing support for women with GDM.

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Appendix A: JBI critical appraisal tool

JBI Critical Appraisal Checklist for Qualitative Research

Reviewer:

Date:

Author Year:

Record Number:

	Yes	No	Unclear	N.A
1. Is there congruity between the stated philosophical perspective and the research methodology?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Is there congruity between the research methodology and the research question or objectives?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Is there congruity between the research methodology and the methods used to collect data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Is there congruity between the research methodology and the representation and analysis of data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Is there congruity between the research methodology and the interpretation of results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is there a statement locating the researcher culturally or theoretically?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Is the influence of the researcher on the research, and vice- versa, addressed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Are participants, and their voices, adequately represented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: Include Exclude Seek further info

Comments (Including reason for exclusion)

Appendix B: JBI data extraction tool

JBI QARI Data Extraction Tool for Qualitative Research

Reviewer _____ Date _____

Author _____ Year _____

Journal _____ Record Number _____

Study Description

Methodology|

Method

Phenomena of interest

Setting

Geographical

Cultural

Participants

Data analysis

Authors conclusions

Comments

Complete

Yes

No

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Findings	Illustration form Publication (page number)	Evidence		
		Unequivocal	Credible	Unsupported

Extraction of findings complete Yes No

Appendix C: Search strategy

Database	Search	Search Term	Results
Embase <1996 to 2020 Week 13>	1	(pregnan* or gestation* or prenatal* or antenatal* or pre-natal* or ante natal* or maternal or postnatal* or post-natal* or post natal* or postpartum* or post-partum* or post partum).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	993217
	2	female/ or adult/ or wom*n.mp.	8995022
	3	1 and 2	718164
	4	pregnancy diabetes mellitus/	27549
	5	GDM.tw.	11582
	6	(diabet* or DM or glucose intoleran* or impaired glucose or insulin resistan* or glyc?emia or hyperglyc?emia).tw.	915276
	7	experience*.mp. or experience/ or personal experience/	1278695
	8	(view* or perspective* or perception* or belief* or meaning* or understanding*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	2095070
	9	4 or 5 or 6	919726
	10	7 or 8	3139918
	11	9 and 10	101558
	12	Developing Country.sh.	61871
	13	(Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).hw,ti,ab,cp.	288934
	14	(Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or	3090759

	<p> Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhih or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New </p>	
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		Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,ti,ab,cp.	
	15	((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab.	113354
	16	((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).ti,ab.	664
	17	(low* adj (gdp or gnp or gross domestic or gross national)).ti,ab.	332
	18	(low adj3 middle adj3 countr*).ti,ab.	18116
	19	(lmic or Imics or third world or lami countr*).ti,ab.	7168
	20	transitional countr*.ti,ab.	227
	21	12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20	3279585
	22	3 and 11 and 21	843
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R) <1946 to April 10, 2020>	1	(pregnan* or gestation* or prenatal* or antenatal* or pre-natal* or ante natal* or maternal or postnatal* or post-natal* or post natal* or postpartum* or post-partum* or post partum).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1259279
	2	(experience* or view* or perspective* or perception* or belief* or meaning* or understanding*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	2878652
	3	(GDM or glucose intoleran* or impaired glucose or insulin resistan* or glyco?emia or hyperglyco?emia or pregnancy diabetes mellitus).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol	179217

		supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	
	4	Developing Countries.sh,kf.	85437
	5	(Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).hw,kf,ti,ab,cp.	274520
	6	(Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or	3663123

		Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or TadzhiKistan or Tadjikistan or Tadhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,kf,ti,ab,cp.	
	7	((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab.	98285
	8	((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).ti,ab.	535
	9	(low* adj (gdp or gnp or gross domestic or gross national)).ti,ab.	239
	10	(low adj3 middle adj3 countr*).ti,ab.	15771
	11	(lmic or Imics or third world or lami countr*).ti,ab.	7372
	12	transitional countr*.ti,ab.	159
	13	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12	3817518
	14	1 and 2 and 3 and 13	230
PsycInfo <2002 to March Week 4 2020>	1	(pregnan* or gestation* or prenatal* or antenatal* or pre-natal* or ante natal* or maternal or postnatal* or post-natal* or post natal* or postpartum* or post-partum* or post partum).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	90784

	2	female/ or adult/ or wom*n.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	202886
	3	exp Pregnancy Outcomes/ or exp Risk Factors/ or exp Gestational Diabetes/ or pregnancy diabetes mellitus.mp.	88808
	4	exp Gestational Diabetes/ or GDM.mp.	339
	5	(diabet* or DM or glucose intoleran* or impaired glucose or insulin resistan* or glyc?emia or hyperglyc?emia).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	30842
	6	(experience* or view* or perspective* or perception* or belief* or meaning* or understanding*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	1177177
	7	Developing Country.mp. or exp Developing Countries/	5270
	8	(Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	31656
	9	(Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast	180104

		<p>or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldavia or Moldovan or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadjikistan or Tadjikistan or Tadjik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]</p>	
	10	<p>((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).mp. [mp=title, abstract, heading word,</p>	17137

		table of contents, key concepts, original title, tests & measures, mesh]	
	11	((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	369
	12	(low* adj (gdp or gnp or gross domestic or gross national)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	41
	13	(low adj3 middle adj3 countr*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	3163
	14	(lmic or Imics or third world or lami countr*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	1381
	15	transitional countr*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]	64
	16	7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	200015
	17	3 or 4 or 5	115191
	18	1 and 2 and 6 and 16 and 17	559
CINAHL	S1	(pregnan* or gestation* or prenatal* or antenatal* or pre-natal* or ante natal* or maternal or postnatal* or post-natal* or post natal* or postpartum* or post-partum* or post partum)	324,084
	S2	female/ or adult/ or wom*n	2,500,379
	S3	pregnancy diabetes mellitus	9,950
	S4	gdm or gestational diabetes or gestational diabetes mellitus or diabetes in pregnancy	14,843
	S5	(diabet* or DM or glucose intoleran* or impaired glucose or insulin resistan* or glyc?emia or hyperglyc?emia)	255,360
	S6	experience* or view* or perspective* or perception* or belief* or meaning* or understanding*	959,503
	S7	(developing country or developing countries) OR ((Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America)) OR ((Afghanistan or Albania or Algeria or Angola	506,741

	<p>or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia</p>	
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		or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadjhikistan or Tadjikistan or Tadjhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia) OR (((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world))) OR (((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies))) OR ((low* adj (gdp or gnp or gross domestic or gross national))) OR (low adj3 middle adj3 countr*) OR ((lmic or Imics or third world or lami countr*)) OR transitional countr*	
	S8	S3 OR S4 OR S5	255,404
	S9	(S3 OR S4 OR S5) AND (S1 AND S2 AND S7 AND S8)	1,661
Social Sciences Citation Index	1	(TS= (pregnant or gestation or prenatal or antenatal or "pre-natal" or "ante natal" or maternal or postnatal or "post-natal" or "post natal" or "postpartum" or "post-partum" or "post partum")) AND LANGUAGE: (English)	
	2	(TS= (female or adult or wom*n)) AND LANGUAGE: (English)	
	3	(TS= (GDM or "Gestational Diabetes" or diabet* or DM or glucose intoleran* or impaired glucose or insulin resistan* or glycyemia or hyperglycemia))AND LANGUAGE: (English)	
	4	(TS= (experience* or view* or perspective* or perception* or belief* or meaning* or understanding*))	
	5	(TS= ("developing country" or "developing countries" OR Africa or Asia or Caribbean or "West Indies" or "South America" or "Latin America" or "Central America" OR Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or	

	<p>Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhih or Tanzania or Thailand or</p>	
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		<p>Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia OR developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*countr* or nation? or population? or world OR developing or less* developed or under developed or underdeveloped or middle income or low* income economy or economies OR low*gdp or gnp or gross domestic or gross national OR "low middle countr*" OR Imic or Imics or third world or lami countr* OR "transitional countr*") AND LANGUAGE: (English)</p>	
	6	#5 AND #4 AND #3 AND #2 AND #1	205

Appendix D Characteristics of the reviewed studies

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
1	Rafii et al., 2017	Iran	Tehran	N= 22 <ul style="list-style-type: none"> Diagnosed with GDM Had delivery in at least 6 months 	The process of postpartum diabetes screening from women's perspective	Qualitative	Interviews Grounded theory	<ul style="list-style-type: none"> Identified categories on postpartum diabetes screening processes including to be aware, to be sensitive, and to perceive severity of the threat The outcomes of postpartum screening classified into four levels: selective screening, accidental screening, primary lack of screening, and secondary lack of screening
2	Khooshechin et al., 2016	Iran	Clinics affiliated with Shahid Beheshti Medical Science University in Tehran	N= 12 <ul style="list-style-type: none"> Diagnosed with GDM 24-36 weeks of pregnancy 	Lived experiences and perceived needs of women with GDM	Qualitative	Interview Conventional Content Analysis	<ul style="list-style-type: none"> The theme of educational needs was rooted from five main categories: the sources of information, the process of education, unknown and known, insufficient public information system, and willingness to learn The theme of needs was stemmed from two categories: the support from family and social involvement
3	Kolivand et al., 2018	Iran	<ul style="list-style-type: none"> Diabetes Clinic of Kermanshah University of Medical Sciences, Imam Reza Hospital Health centres 	N= 13 (8 women with GDM) <ul style="list-style-type: none"> Diagnosed with overt diabetes or GDM 	Creating a culturally relevant self-care guide for Iranian women	Qualitative	Interview	<p>The women's needs that were identified including:</p> <ul style="list-style-type: none"> Awareness and ability (knowing diabetes, training and empowerment for women, continuity and quality of care, resources for information)

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
			across Kermanshah, Shahroud, and Tehran	<ul style="list-style-type: none"> • Non-mental illness • Absence of other high-risk pregnancies 	based on their needs		Conventional Content Analysis	<ul style="list-style-type: none"> • Lifestyle (healthy diet and exercise) • Mental health (counselling, connection, spirituality, and religion) • Support from family (the husband's role, the psychological circumstances at home)
4	Nielsen et al., 2020	India	Two settings in Tamil Nadu: <ul style="list-style-type: none"> • The rural district of Thiruvallur • The state capital, Chennai 	N= 19 Diagnosed with GDM	The experiences of rural and urban women on dietary and medicine intervention for GDM	Qualitative	Interviews Qualitative content analysis	Three emerging aspects in the study including: <ul style="list-style-type: none"> • Emotional challenges (encompassing feelings of fear regarding the health of the baby, as well as difficulties in accepting a treatment plan) • Interpersonal challenges (involving managing the impact of treatment on social life, seeking social support, and coordinating treatment with work responsibilities) • Health system-related challenges (encompassing issues such as the availability and cost of care, as well as the relationship with healthcare providers)
5	Sundarapperuma et al., 2018	Sri Lanka	Three districts in Sri Lanka, including	N= 30	Women's perspectives on postpartum	Qualitative	Focus Group Discussions	The study reveals challenges in GDM management, including myths and traditions, time, lack

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
			Colombo, Gampaha, and Galle	<ul style="list-style-type: none"> Diagnosed with GDM Speaking the native language Not an employee of the health sector 	<p>dietary practices</p>		<p>Framework Approach</p>	<p>of motivation, financial issues, cultures, and lack of awareness.</p>
6	Hirst et al., 2012	Vietnam	Hung Vuong Hospital, Ho Chi Minh City	<p>N= 34</p> <ul style="list-style-type: none"> Diagnosed with GDM Aged over 18 years Gestational ages (28 weeks to 38 weeks) 	<p>Health behaviours and attitudes of pregnant women diagnosed with GDM</p>	Qualitative	<p>Focus Group discussion</p> <p>Thematic Analysis using theoretical framework approach</p>	<ul style="list-style-type: none"> GDM caused bewilderment, worry, and guilt in women Many believed their infant was more likely to die Minimising starch was confusing. Women generally felt intense hunger and had little awareness of food alternatives. Breastfeeding and GDM transmission worried the participants. Many women gave up breastfeeding. All participants wanted further information. Information sources: interpersonal networks, printed materials, a health helpline, and the Internet. The women wanted explanatory flyers and small group sessions.
7	Suraiya AHS et al., 2015	Malaysia	Suburban Public Health Clinic in Negeri Sembilan	<p>N= 13</p> <ul style="list-style-type: none"> Diagnosed with GDM 20-28 weeks of pregnancy 	<p>Women's perspective on the management of GDM</p>	Qualitative	<p>Interviews</p> <p>Not available</p>	<p>The main reasons for non-adherence in glucose control among the women:</p> <ul style="list-style-type: none"> Negligence to recommendations given by healthcare professionals

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
				<ul style="list-style-type: none"> Received dietary counselling from a dietician 				<ul style="list-style-type: none"> Unsupported environment
8	Youngwani chsetha et al., 2016	Thailand	Antenatal care units, diabetes clinics, and obstetric wards of two government hospitals in Southern Thailand	<p>N= 30</p> <ul style="list-style-type: none"> Diagnosed with GDM 24-30 weeks of pregnancy 	Blood glucose self-monitoring among women with GDM	Qualitative	Interviews Colaizzi's Method	Themes emerging in this study including the feeling of anxiety among women, measures and strategies that women made to maintain their blood sugar, overcoming food desires for the baby's health.
9	Subarto et al., 2022	Indonesia	Three <i>Puskesmas</i> (Primary Health Centre) in Yogyakarta <ul style="list-style-type: none"> Puskesmas Umbulharjo 1 Puskesmas Danurejan Puskesmas Kotagede II 	<p>N=12</p> <ul style="list-style-type: none"> Diagnosed with GDM within the last 2 years Age >18 years 	Women's experience on the management and support on GDM affected pregnancy	Qualitative	Interviews Thematic analysis	<ul style="list-style-type: none"> Themes developing including the responses to GDM diagnosis, management of GDM during pregnancy, factors that hinder GDM management: perceived support; and self-management during the postnatal period Despite having a good understanding, adherence to diet and exercise recommendations was difficult for some participants. Psychological support and motivation in GDM management including feeling

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
								the fetus's movement and surrendering to God
10	Mufdilah et al., 2020 (a)	Indonesia	<ul style="list-style-type: none"> • Puskesmas Umbulharjo I • Puskesmas Kraton • Puskesmas Wirobrajan 	<p>N=8</p> <p>Diagnosed with GDM</p>	The experience of GDM self-management	Qualitative	<p>Interviews</p> <p>Thematic analysis</p>	<ul style="list-style-type: none"> • Pregnant women attempted to regulate their diet in accordance with the healthcare professionals' advice. • The women were advised to conduct routine glucose monitoring, perform exercises such as walking or doing household chores. • Women were recommended to use appropriate medication during the pregnancy, which involves insulin.
11	Mufdilah et al., 2020 (b)	Indonesia	<ul style="list-style-type: none"> • Puskesmas Umbulharjo I • Puskesmas Kraton • Puskesmas Wirobrajan 	<p>N=8</p> <p>Diagnosed with GDM</p>	Factors that hinder women from maintaining GDM	Qualitative	<p>Interviews</p> <p>Thematic analysis</p>	<ul style="list-style-type: none"> • The difficulties in controlling food intake and making adjustments to living with GDM were reported. • The women received lack of information and communication about GDM
12	Ge et al., 2015	China	<ul style="list-style-type: none"> • Obstetric clinic of a hospital in the provincial capital city 	<p>N=15</p> <ul style="list-style-type: none"> • Diagnosed with GDM without other pregnancy complications • Age ≥16 years • Speaking Mandarin Chinese without speech impediment 	Health beliefs and habits of urban women with GDM	Qualitative	<p>Interviews</p> <p>Qualitative content analysis</p>	<ul style="list-style-type: none"> • The factors of individual, social, and natural worlds were believed to be related to health and illness. • There were various seeking behaviours among women, which they tried to balance between adhering to the guidance of health professionals and mitigating practical challenges.

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
				<ul style="list-style-type: none"> Women from high, medium, and low educational backgrounds 				
13	Ge et al.,2016	China	<ul style="list-style-type: none"> A hospital located on the outskirts of a city in the south-east of China 	N=17 <ul style="list-style-type: none"> Diagnosed with GDM Age ≥16 years 34–38th gestational weeks Speaking Mandarin Chinese without speech impediment Women from high, medium and low educational backgrounds Living in a rural area 	Health and illness beliefs in women with GDM and health-related self-care among them	Qualitative	Interviews Qualitative content analysis	<ul style="list-style-type: none"> The fear of GDM and its negative influence on health was reported by some women, while some others believed that it was not a severe illness and doubted the diagnosis. The majority of women sought help from health professionals, but did not fully comply with the advice. The main reported self-care strategies were diet and exercise, but self-monitored blood glucose was rarely reported.
14	Ge et al.,2016	China	Two hospitals in south-east of China: <ul style="list-style-type: none"> An obstetric clinic of a provincial hospital An obstetric clinic and the obstetric ward of a 	N=44 <ul style="list-style-type: none"> Diagnosed with GDM Aged at least 16 years 34–38 weeks of pregnancy Speak Mandarin Chinese fluently 	Perceptions and experiences of women regarding the quality of care received for GDM	Qualitative	Interviews Qualitative content analysis	<ul style="list-style-type: none"> The lack of professional services and resources for GDM was reported. Lack of high-quality tailor-made care for GDM Suggestions on how to improve GDM services from women's perspectives

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
			municipal hospital					
15	Ge et al., 2017	China	Three hospitals: <ul style="list-style-type: none"> • Obstetric clinics or wards at two provincial hospitals • A municipal hospital in the southeast of China 	N= 62 <ul style="list-style-type: none"> • Diagnosed with GDM without other pregnancy complications • Age ≥18 years, • 34th gestational week—the postpartum 4th week • Speaking Mandarin Chinese without speech impediment 	Experience of living with GDM	Qualitative	Interviews Phenomenological hermeneutics based informed by Ricoeur	<ul style="list-style-type: none"> • The main theme of women's experience with GDM living in China was that they were longing for caring care. • It stemmed from four themes: being shocked by GDM diagnosis, hoping for care, being left alone with GDM, and taking measures to adjust and adapt to life with GDM.
16	Shang et al., 2021	China	Two hospitals <ul style="list-style-type: none"> • West China Hospital (WCH) • Shuangliu Maternal and Child Healthcare Hospital (SLH) 	N=20 <ul style="list-style-type: none"> • Diagnosed with GDM • Attending regular pregnancy checks • Had delivered their babies (within 6 months) 	Women's perceptions, concerns, and motives for early postpartum therapies to avoid T2DM	Qualitative	Interviews Inductive analysis	<ul style="list-style-type: none"> • Positive attitudes towards participating in T2DM screening and interventions to prevent T2DM were reported. • The women were less likely to utilise pharmacological intervention • Various factors influenced women's attitudes towards future intervention, including experiences with the health system during pregnancy, supportive environment, the presence of T2DM in their family, their knowledge and perception of risk, concerns about their own and baby's

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
					after pregnancy			health, their feelings and emotions, and lifestyle barriers
17	Doran et al., 2010	Tonga	Nuku'alofa, the capital of Tonga	N= 11 <ul style="list-style-type: none"> Diagnosed with GDM in the previous 12 months Had delivery at the study site 	Contextual perspective of women diagnosed with GDM	Qualitative	Interviews Thematic Analysis	<ul style="list-style-type: none"> Financial issues often caused the scarcity of glucose supplies, which hinder universal screening. Encouragement in behavioural change, such as a healthy diet and physical activity, was reported to be effective in managing GDM in Tonga, although the changes in physical activity levels were difficult. Being perceived as foreign idea, preventative screening was overlooked, which negatively influenced postpartum screening and monitoring.
18	Mensah et al., 2019	Ghana	Military health institutions	N=7 <ul style="list-style-type: none"> Diagnosed with GDM Attended the Medical Reception Stations during their pregnancy Had a delivery in study sites Had the six weeks postpartum follow up 	The experiences of women in relation to nursing management following the	Qualitative (descriptive phenomenology)	Unstructured individual Interviews An adapted version of Tesch's eight steps	<ul style="list-style-type: none"> The study revealed factors that affect the quality of services and adherence to the nursing management of GDM, such as lack of education, cultural and socio-economic factors. Women's need in order to optimize care was explored.

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
					diagnosis of GDM			
19	Zalwango et al., 2021	Uganda	<ul style="list-style-type: none"> Entebbe Regional Referral Hospital Masaka Regional Referral Hospital 	<p>N=10</p> <ul style="list-style-type: none"> Diagnosed with GDM Aged ≥ 18 years Between 24 and 28 weeks of gestation from the antenatal clinics between 13th June 2018 and 31st October 2019 	Women's experiences on being screened and diagnosed with GDM	Qualitative	<p>Interviews and focus group discussions</p> <p>Thematic analysis</p>	<ul style="list-style-type: none"> The importance of GDM screening was reported, and women believed that early learning diagnosis facilitated the prompt medical intervention. Feeling afraid, anxious, and worried that the condition might have a potential life-threatening nature was reported. The majority of women expressed dissatisfaction and exhibited a lack of readiness upon receiving a diagnosis.
20	Muhwava et al., 2020	South Africa	A large tertiary academic teaching hospital in Cape Town	<p>N= 35</p> <ul style="list-style-type: none"> Diagnosed with GDM Received antenatal care and delivery at the study site between 2014 and 2015 Minimum at 1 year postpartum 	Experiences of women with GDM and its impact on pregnancy and sense of well-being	Descriptive qualitative	<p>Interviews and Focus group discussion</p> <p>Thematic analysis</p>	<p>The study reveals the emotional and psychological burdens of having GDM, including:</p> <ul style="list-style-type: none"> Initial emotional responses to the GDM diagnosis Adjustment to the limitation of living with GDM The fear of childbirth and their role as mothers Feelings of abandonment in the postpartum period where support was no longer received

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
21	Muhwava et al., 2020	South Africa	A tertiary academic teaching hospital in Cape Town	<p>N= 35</p> <ul style="list-style-type: none"> • Diagnosed with GDM • Received antenatal care and delivery at the study site between 2014 and 2015 • Minimum at 1 year postpartum 	The experiences of low-income women with GDM and their ability to maintain lifestyle adjustments after pregnancy	Descriptive qualitative	<p>Interviews and Focus group discussion</p> <p>Thematic analysis</p>	<ul style="list-style-type: none"> • Women with GDM need improvement in counselling services and education • To achieve lifestyle change, women need support from family and health professionals, as GDM affected emotions and motivation for lifestyle change • Behaviour interventions need to address women's capacity, access, and inclination to adopt and sustain lifestyle changes
22	Dickson et al., 2020	South Africa	Chris Hani Baragwanath Academic Hospital	<p>N= 10</p> <ul style="list-style-type: none"> • Diagnosed with GDM • Age ≥18 years 	Personal experiences, problems, coping methods, and health decisions of urban indigenous South African	Qualitative	<p>Focus group discussion</p> <p>Thematic analysis</p>	<ul style="list-style-type: none"> • Experience of shock and fear on diagnosis was reported • Family support and sharing experiences with others serve as a relief from anxiety • Inconsistent implementation of GDM screening at different care levels compounded the existing state of confusion • GDM was associated with a favourable outcome of embracing a healthier way of life, which persisted during the postpartum period • Absence of knowledge regarding the potential long-term risks, as well as a lack of understanding regarding the

	Study/Year	Country	Setting	Number of Participant (N) and characteristics	Phenomena of interest	Design	Method(s) and analytical approach	Summary of main results
					women with GDM			importance of consistent follow-up screenings
23	Mukona et al., 2017	Zimbabwe	A central hospital	<p>N= 24 (6 women with GDM)</p> <ul style="list-style-type: none"> • Diagnosed with diabetes or GDM • Aged 18 to 49 years • Speaking Shona or English 	Antidiabetic medication adherence in pregnant women with diabetes and possible solutions.	Descriptive qualitative	<p>Focus Group Discussion and semi structure questionnaire</p> <p>Thematic Analysis</p>	<ul style="list-style-type: none"> • Barriers to adherence include socioeconomic issues, insufficient support, pregnancy's impact, complex therapeutic regimen, culture, religious beliefs, and a poor healthcare system. • The solutions proposed by the women encompassed the promotion of social support, provision of financial assistance, and enhancement of hospital services.
24	Utz et al., 2016	Morocco	The districts of Al Haouz and Marrakech	<p>N= 27 (5 women with GDM)</p> <p>Pregnant women attending women's classes</p>	Screening and management of GDM protocols across different levels of care and its challenges	Qualitative	<p>Interviews</p> <p>Thematic Analysis</p>	<ul style="list-style-type: none"> • Most of the time, women with GDM were being referred to a specialist instead of general practitioners, though the health centre level is actually responsible for the management of non-pregnant diabetic patients.

Appendix E: Example of data extraction

<p>Study code: 10</p> <p>Methods for data collection and analysis: Interviews</p> <p>Thematic analysis</p>	<p>Phenomena of interest</p> <p>The experience of GDM self- management</p>	
<p>Setting</p> <p>Puskesmas Umbulharjo I, Puskesmas Kraton and Puskesmas Wirobrajan.</p>	<p>Description of main results</p> <ul style="list-style-type: none"> • Pregnant women attempted to regulate their diet in accordance to the healthcare professionals' advice • The women were advised to conduct routine glucose monitoring, perform exercises such as walking or doing household chores • Women were recommended to use appropriate medication during the pregnancy which involves insulin 	
<p>Country</p> <p>Indonesia</p>		
<p>Participant characteristics and sample size</p> <p>8 women who diagnosed with GDM</p>	<p>Characteristic:</p> <ul style="list-style-type: none"> • Diagnosed with GDM 	
FINDINGS	ILUSTRATION	CREDIBILITY
<p>Diet management</p>	<p><i>"I eat in proper portion, reduced portion, still 3 times a day. Only reducing the portion. The rice is reduced, while the vegetables are added. It still allowed to eat sweet food, not too sweet and not too much. Should be maintained" P3 Page 73</i></p>	<p>Unequivocal</p>
<p>Education</p>	<p><i>"For education, integrated ANC is the most suitable for mother, there will be further diet consultation to nutrition department and to the psychologist. Later, the doctor will also provide explanation" P2. Page 73</i></p>	<p>Unequivocal</p>
<p>Glucose Monitoring</p>	<p><i>"I will visit the Internist once a week or once every two weeks. Sugar</i></p>	<p>Unequivocal</p>

	<i>controlling is conducted every month” P2. Page 74</i>	
Physical Exercise	<i>“Sometimes I did the walking, mopping and sweeping (doing the houseworks), yes I did it every day. For walking, if I could wake up early, I did the early walking” P3 Page 74</i>	Unequivocal
GDM Medication	<i>“During the pregnancy, I used insulin. As far as I concern that insulin is preferable for pregnancy, that has no effect to the baby. So, insulin it was” P1 Page 74</i>	Unequivocal

Appendix F: Example of category development table

Findings	Category	Synthesised finding
Shock, deny, fear, worry (S9, S18, S25)	Emotional responses to GDM diagnosis	Consequences of knowing GDM diagnosis
Feel surprised and strange (S9)		
Confusion, disbelief, shock, fear, anxiety, self-blame, guilty, sadness and fright (S21, S22 S16, 18, 19, S17)		
Experiencing emotional reactions (S24)		
Being disturbed and scared (S2)		
Overwhelmed (S19)		
Felt stigmatised (S4)		
Unsure of the purpose of the blood tests (S18)	Experiences that stemmed from the lack of understanding of the condition	
Unprepared to receive a diagnosis (S25)		
Doubt over the diagnosis of GDM (S9)		
Distress during and after delivery (S19)		
Reflect the reasons of getting GDM (S9)		
Emotional strain which stemmed from receiving information about adverse pregnancy outcomes (S26)		
Being HIV-positive is preferable to having diabetes (S21)	Perceived concerns due to the condition	
Concerned about maternal and baby health (S5, S8, S18, S9, S19)		
Afraid of elevated blood sugar (S8)		
Antenatal visit evoked fear and concern (S18)		
Worried about doing blood test (S8)		
Fear of blood loss/pain (S16)		
Concerns taking medicines during pregnancy and breastfeeding/ preference for insulin. (S17, S26)		
Refused insulin (fear) (S22, S26)		
Fear of a caesarean section (S15, S18)		
Concerned about the postpartum blood glucose (S17)		

Concerns for future T2DM risk as well as disease risk in their offspring. (S17, S9)		
Fear of transmission of GDM to the baby (S16)		
Negative thoughts because of the limitations on life, the daily treatment and the economic burden. (S5)		
Feel that they were failing to meet social expectations (S18)		
Pre-existing medical conditions compounded their fears (S18)		
Fear of developing diabetes/ family history/knowledge were reported a motivating factor for change. (S14, S15, S19, S21)		
Get sources of information (S16)		
Seek help from health professionals (S9)		
Strongly assert in order to get the answers needed (S19)		
Seek help from the popular sector (S9)		
Apply some kind of behaviour change (S15)		
Learning to test blood glucose (S8)		
Tolerating the fingerpicks pain (S8)		
Overcoming food desires/healthy diet (S8, S21, S23, S22)		
Experimented with alternate food sources. (S16)	Implemented measures and adjustments in order to manage GDM	Women's experience regarding GDM management
Brown rice was substituted in place of white rice (S22)		
Unpalatable diet (S21)		
An awareness of the benefits (exercise) (S15, S21)		
Walking and household chores as physical activity (S22, S23)		
Utilizing a pharmacological aid (S22)		
Positive attitudes towards postpartum lifestyle interventions (S17)		
Intentions to focus on their own health after delivery (S19)		
Try to be happy for the health of baby and themselves (S9)		
Avoiding any potential harm to the baby was verbalized as the core motivating factor (S26)		
Avoid practical difficulties (S9)		

Desire for another baby (S19)		
Maintaining healthy choices (S21)		
Self-reliance (S21)		
General lack of knowledge among women and HCPs (S2, S3, S6, S19, S16, S10)		
Perceived GDM was not a severe illness (S4)		
Affected by the view of 'GDM not mattering' (S9)		
Affected by seeing healthy babies whose mother had GDM (S9)		
Affected by feeling no physical body symptoms (S9)		
Ignored blood glucose that was at the border line (S14)		
Do not know the future influence of GDM (S9, S14)		
No necessity to restrict carbohydrates after birth (S11)		
No interest to follow healthy dietary after birth (S11)		
Anxiety and depression are barriers for early engagement with postpartum interventions (S17)		
Control GDM based on the received information, but feel helplessness (S9)	Challenges in controlling hyperglycaemia in pregnancy	
Lack of physical activity (S15, S19)		
Time (S3, S10, S17)		
Irregular blood glucose check (S4, S22)		
Difficulty in controlling blood glucose during and after pregnancy (S17, S19)		
Inadequate family, peer, and community support. (S7, S17, S18)		
Limited care/resources after delivery (S10, S11)		
Constant monitoring and overbearing scrutiny by healthcare providers (S18, S21)		
Socioeconomic challenges (S2, S11, S26)		
Difficulties during pregnancy (S24)		
Shifting from the social norm (S19, S26)		
Difficulties to follow the professionals' advice (S5, S19)		

Cravings and temptations, cheating on food (S3, S16, S18)		
Disappointment and frustration due to new dietary habit. (S3, S15, S21, S24, S26)		
Difficult to calculate the amount of food (S5)		
Difficulties in replacing rice (S16)		
Healthy foods were more expensive (S19, S21)		
Negligence (S3)		
Family, friends, others support (S3, S10, S17, S19, S9, S12, S21, S22, S26)	Support from significant others and healthcare professionals in managing GDM	
The psychological atmosphere at home (S12)		
Available opportunities in their communities (S19)		
Social support and feelings of connection (S19, S26)		
Involving and educating the women and their significant others were important (S2, S12)		
Being part of groups (pregnant women with GDM through social media chats) (S17)		
Perceive support from health professionals (S9, S10, S22)		
Spirituality and religion (S12, S22)	Cultural beliefs related to GDM management	
Worshiping Buddha for attaining health and psychological comfort. (S5)		
Sought help from the folk sector—a fortune-teller and a folk healer separately (S5)		
Consuming traditional food in the postpartum period. (S11)		
Restriction of certain food items (S11)		
Specific food groups being prohibited or permitted (S16)		
Breastfeeding women have special recipes and complex food restrictions (S17)		
Counterintuitive diet to local and individual perceptions (S26)		
Felt the risk of developing diabetes makes aware of postpartum screening (S14)	Experiences and lessons learned during postpartum period	
Fear of diabetes consequences increases their interest in postpartum screening (S14)		

Maintaining health to protect the baby led to perceived need of test (S14)		
Postpartum screening information were given by HCPs (S14)		
Reading books/ having a college education/ having a family history make aware of postpartum screening. (S14)		
Did not believe future impact and were feeling healthy (S14)		
Postpartum screening info were not given by HCPs (for non-insulin women) (S14)		
Perceived breastfeeding prevents future impact, so they ignore the postpartum screening (S14)		
High level of procrastination, which led to lack of screening (S14)		
Inconvenience of coming to the hospital for testing (time) S16)		
“learning moment” (S22)		
Think GDM is an alarm for the future health (S9, S18)		
Strive to control GDM (S9, S10, S24)		
Urban women were easier to follow the dietary treatment (S26)		
Long travelling distances (S6)		
Lack of HCPs (S6, S2, S16)		
Lack of medical resources (S6, S21)		
Overcrowding (S6)		
Need for more effective communication (S3, S13)		
Lack of comfort and privacy (S6)		
Improve the process of making appointments (S6)		
Lack of trust (S6)	Perception on quality services and needs	Perception on quality services and needs
Need more opportunities for physical activity (S19)		
Need more knowledge and skills for HCPs (S6)		
Lack of sympathy on provider side (S13)		
Impatience among staff (S6, S9, S13, S18)		
Need info on exercises, diet, counselling. (S12, S24, S10, S9, S16, S18, S25, S19)		
Judgmental and blaming attitudes of HCPs (S19, S21)		

Perceive insufficient care of GDM from health professionals (S9, S26)		
Lack of tailored and continuous care (S6, S12)		
Felt a sense of abandonment when care abruptly ceased after delivery (S18)		
Need clear roles of HCPs (S6)		
Need lifestyle education to women before marriage and pregnancy (S15)		
Inconsistent health information (S21, S26)		
Preference about type, method, content and educator (S10, S12)		
Received education, glucose check and medicines from HCP (S23)		

Appendix G: ConQual summary of findings

Synthesised findings	Type of research	Dependability	Credibility	ConQual score	Comments
<p>Consequences of knowing GDM diagnosis: Diagnosis of GDM creates emotional impacts for women. They expressed negative emotional responses and reported concerns about the well-being of their baby and themselves.</p> <p>(S4, S6, S8, S9, S11, S12, S13, S15, S16, S17, S18, S19, S20, S21, S22)</p>	Qualitative	Downgraded one*	Remains unchanged	Moderate	* The majority of studies (9 out of 15) scored 3 for the dependability questions. therefore the score downgraded one level
<p>Women's experience regarding GDM management: Women strived to manage their condition with support from their family as a significant facilitator. They revealed the barriers to GDM management, including lack of motivation, financial constraints, and poor understanding of GDM.</p> <p>(S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13, S14, S15, S16, S17, S18, S20, S21, S22, S23)</p>	Qualitative	Downgraded one*	Remains unchanged	Moderate	*The majority of studies (14 out of 22) scored <4 for the dependability questions, resulting score to be downgraded one level
<p>Perception on quality services and needs: Women encountered challenges in managing GDM, such as inadequate resources at healthcare facilities, long-distance travel, and crowded health facilities. They also expressed dissatisfaction with GDM services due to a lack of empathy from healthcare professionals.</p> <p>(S2, S3, S4, S6, S7, S10, S11, S14, S15, S17, S18, S20, S21, S22, S24)</p>	Qualitative	Downgraded one*	Remains unchanged	Moderate	*The majority of studies (10 out of 15) scored <4 for the dependability questions. The score is downgraded one level

Appendix H Support letter from the study site (English Version)



**GOVERNMENT OF BANDAR LAMPUNG CITY
HEALTH OFFICE OF BANDAR LAMPUNG CITY
TECHNICAL IMPLEMENTATION UNIT OF
KEDATON INPATIENT HEALTH CENTRE**

Teuku Umar Street No. 62 Kedaton, Bandar Lampung Telp 0721- 702045
Bandar Lampung

Bandar Lampung, February 4th,2021

Number : 440.026.09.II.2021

Attachment :

Subject : Support Letter

To:

Research Advisor of School of Healthcare

University of Leeds, The United Kingdom

Correspond with your letter dated January 26th, 2021 regarding the application for a support letter that will be permitted, on behalf of **RIRIN WULANDARI**, a student of the Doctoral School of Healthcare University of Leeds, the UK, with the topic of gestational diabetes research (GDM).

We need to inform a few things as follow:

- a. In principle, we have no objection and be able to approve the request.
- b. Research permit in the area of the Kedaton Bandar Lampung Health Center refers to the regulations of the Bandar Lampung City Health Office
- c. Due to the current condition is entering a new habit in the context of **Covid-19 Prevention**, student is required to use health protocols while at the Health Centre.
- d. Data collection permit is used solely for academic / study purposes.

Thank you for your attention and cooperation.

Head of Kedaton Inpatient Health Center

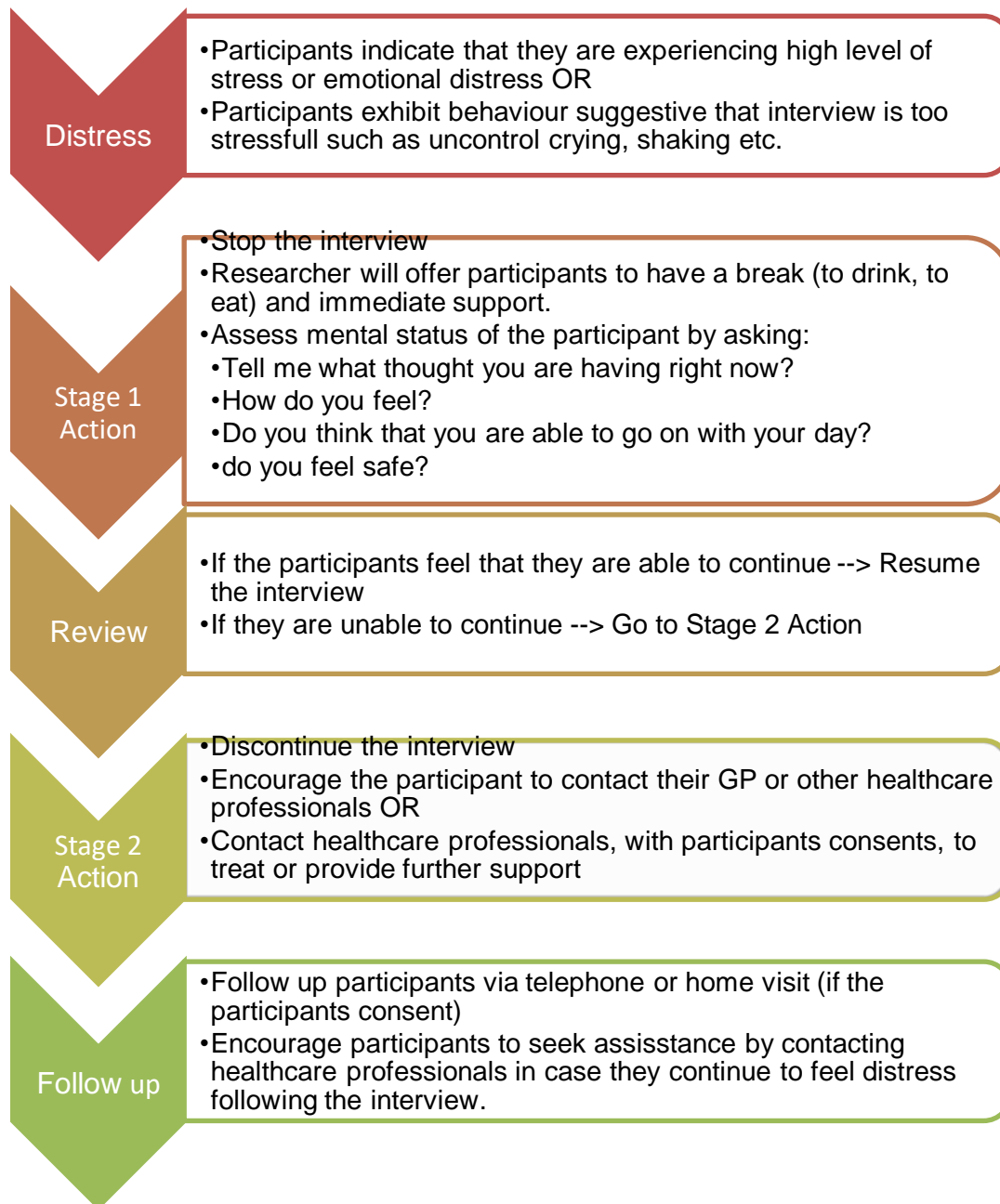
SIGNED AND STAMPED

Drg. Rini Alita, M.Kes.

NIP. 19690402 200212 2 002

Appendix I: Distress Protocol: The protocol for managing distress during an interview

Modified from: Draucker C B, Martsolf D S and Poole C (2009) Developing Distress Protocols for research on Sensitive Topics. Archives of Psychiatric Nursing 23 (5) pp 343-350.





UNIVERSITY OF LEEDS

PARTICIPANTS INVITED

Women and Health Professionals 'Experience, Knowledge and Understanding of Gestational Diabetes (GDM) in Indonesia : A case Study

Ethical approval has been granted from School of Healthcare Research Ethics Committee and Poltekes Tanjung Karang Research Ethics Committee (Reference Number).

WHAT ?

You are invited to participate in the study that explore experience, knowledge and understanding of women and healthcare professionals about GDM (a slight increase of blood glucose in pregnancy).

WHO ?

If you ever have a slight increase of blood glucose during pregnancy OR you are considered as a potential participant for this study by your healthcare professionals at Katon public health centre.

WHY ?

Your participation will help us and healthcare professionals to understand what women think about GDM. This information may help the healthcare professionals in providing good services for pregnant women in the future.

WHERE ?

This study will be conducted in Katon Public Health Centre.

FOR MORE INFORMATION
PLEASE CONTACT

Ririn Wulandari

PhD Student - University of Leeds, UK

Phone : 081367247294

Email : ririnkadarusno@gmail.com



Appendix K: Informational leaflet



UNIVERSITY OF LEEDS

PARTICIPANTS INVITED

Women and Health Professionals' Experience, Knowledge and Understanding of Gestational Diabetes Mellitus (GDM) in Indonesia (A Single Exploratory Case Study)

Ethical approval has been granted from School of Healthcare Research Ethics Committee and Poltekkes Tanjung Karang Research Ethics Committee (Reference Number and Date).

WHAT IS THE PURPOSE OF THIS STUDY?

The purpose of this research is to explore experience, knowledge and understanding of GDM (a slight increase of blood glucose in pregnancy) among women and healthcare professionals and to understand the routine practice of GDM management in public health centre in Indonesia.

WHO IS DOING THIS STUDY?

This study is being completed as part of a PhD programme that is being carried out by Ririn Wulandari, and is supervised by Professor Linda McGowan, Professor Eleanor Scott, and Dr. Yu Fu from University of Leeds.

WHY AM I INVITED TO PARTICIPATE?

You have been invited to participate in this study because you are considered as a potential participant for this study by the healthcare professionals at Katon Public Health Centre



WHAT ARE THE POSSIBLE BENEFITS OR RISK OF TAKING PART?

There will be no direct benefit to you from taking part in this study. However, your views will help us to understand important issues related to GDM management. There will be no physical risks to you, and the participation is voluntarily.

WHAT WILL BE INVOLVED IF I TAKE PART IN THIS STUDY?

This study consists of two activities including an interview and an observation of one of your routine consultation appointments with the healthcare professionals (who agreed to participate in this study). You may choose to participate either of the activities or in one of them

If you would like to participate, have queries, or would like more information, please contact :

Ririn Wulandari
PhD Student - University of Leeds, UK

☎ 081367247294
✉ ririnkadarusno@gmail.com

Appendix L Participant information sheet for women

ENGLISH VERSION



UNIVERSITY OF LEEDS

School of Healthcare (Faculty of Medicine and Health)

Women and Healthcare Professionals Experience, Knowledge and Understanding of Gestational Diabetes Mellitus (GDM) in Indonesia: A Single Exploratory Case Study

PARTICIPANT INFORMATION SHEET

[A large-print version of this sheet is available on request]

This project is about exploring experience, knowledge and understanding of Gestational Diabetes Mellitus (GDM) among women and healthcare professionals in Indonesia. Before you decide to take part or not, it is important for you to understand why this research is being conducted and how you will be involved. This information sheet will explain more about the study, so please take your time to read the following information.

What is the purpose of this study?

Gestational Diabetes (GDM) is a condition where women have a slightly higher sugar level in their blood, detected for the first time during pregnancy. It can have negative impacts on women and babies in the short and long term such as giant baby, birth trauma, hypertension in pregnancy, risk of getting type 2 diabetes in the future, etc. GDM needs to be managed for the sake of the women and the baby's wellbeing.

In Indonesia, despite it has the seventh largest number of diabetic patients in 2019, the number of pregnant women who have GDM is unknown. There is limited information from studies about GDM in Indonesia which makes issues about GDM are unexplored. Therefore, the purpose of this research is to explore the experience, knowledge and understanding of GDM among women and healthcare professionals and also to understand the routine practice of GDM care in a public health centre in Indonesia.

Who is doing this study?

This study is led by Ririn Wulandari, and supervised by Professor Linda McGowan, Professor Eleanor Scott and Dr Yu Fu. This study is being completed as part of a PhD programme that is being carried out by Ririn Wulandari at the University of Leeds, which is funded by the Indonesia Endowment Fund for Education (LPDP).

Why I have been invited?

You have been invited to participate in this study because you are considered as a potential participant for this study by the healthcare professionals at Katon public health centre. We are expecting to include between six to ten women at this site to participate in this research.

Do I have to take part?

Participation in this research is entirely voluntary. You will be given this information sheet and time (minimum 24 hours) to consider your decision. In case you have questions about the study, you may ask the researcher for further information. You will be asked to sign a consent form once you decide to participate. If you change your mind after signing the consent form, you have the right to withdraw from this study at any time without giving any reason and without detriment to your present or future care. If you do not wish to participate, it will not affect your care in any way.

What will happen to me if I take part?

There are two activities in this study including an interview and an observation of one of your routine consultation appointments with the healthcare professionals at Katon Public Health Centre. You may choose to participate in either or both of the activities.

The interview will be conducted with your consent at the public health centre, at your house or a public place (depending on your preference). The interview will take about one hour to complete and will be audio-recorded with your consent. You will be asked to describe your experience and perceptions of being a woman identified with GDM. The researcher will ask you about your knowledge and understanding of GDM. Also, the researcher also will ask you to describe your perceptions regarding the support you received from home, working place and the health centre. The interview will be guided by a list of questions from the researcher. However, if you feel there is important information to add, you are free

to tell the researcher about your thought. You are also free to take a break or stop the interview if you feel uncomfortable.

Furthermore, to understand what happens in a routine consultation session, the researcher will observe that activity with your consent. This will be done during one of your routine consultation sessions at the public health centre, where the researcher will observe the interaction and the communication between you and the healthcare professional. This activity will only be carried out once and will not interrupt any services provided for you. You may interrupt or stop the observation at any time if you feel uncomfortable.

What are the possible benefits of taking part?

The information we get from this study is unlikely to benefit you directly. However, the information that you provide will help us and the healthcare professionals to understand the views of women. Also, your participation will give us the information which may enable the healthcare professionals to develop a future intervention that meet the needs of the women with GDM in helping them to prevent adverse pregnancy outcomes. Apart from that, we will be informed of women with GDM's experiences which may be a solid base for future research about GDM in Indonesia. Ultimately, the finding of this research hopefully, may improve policy, practices and enhance the quality of care of GDM management in Indonesia.

What are the possible risks of taking part?

We do not anticipate any risks if you take part. However, it is possible that you may have some unpleasant feelings during the interview because of previous experiences with GDM in your pregnancy. This research may activate your negative emotions. If you feel uncomfortable with any of the questions being asked during the interview, you are free not to answer those questions. If you do feel upset at any stage, feel free to talk to the researcher and the researcher will get appropriate support for you.

What will happen to my personal information?

All your information that is given to the researcher will remain strictly confidential. All information recorded during the interviews and the observations will be handled in the strictest confidence. The consent form and the written information containing your personal details will be stored in a locked cabinet, while the interviews transcript and other files will be stored in the M Drive of the University desktop or Microsoft One Drive provided by the University of Leeds. All identifiable data only

can be accessed by the researcher and the supervisors. The entire interview transcripts will be a pseudonym and no real names will appear in any reports. Results from this study will be in the form of pseudonym quotes. All your personal details will be destroyed once the study is completed or when they are no longer required. No personal information will be traced back for any reason.

What will happen to the results of this study?

The researcher will take steps wherever possible to anonymise the data so that only the researcher and the supervisors knows your true identity. Your quotes may be used in the result of this study in pseudonym form. The results of this research will be published in peer-reviewed scientific journals which will be available on-line and be presented at conferences or seminars. Also, the research data will be preserved in Research Data Leeds Repository in anonymised form, so that it can be utilised by researchers outside the project who agrees to the specified conditions (e.g. they will use the data for research or teaching only, and not use it for commercial purposes).

Who has reviewed this study?

Ethical approval has been granted by the University of Leeds, School of Healthcare Research Ethics Committee and Poltekkes Tanjung Karang Research Ethics Committee (*project reference number and date*).

What if I have concerns about the study?

If you have any questions or would like further details about the study, please contact Ririn Wulandari (see contact details below) who will do her best to answer your questions. You can also contact her supervisors Professor Linda McGowan, Professor Eleanor Scott and Dr. Yu Fu (see contact details below).

What do I do now?

If you decided to participate in this research, you can contact me (the researcher) by phone or at the email address stated below. I will discuss the date, time, and place for the interview with you. If you would like to take part in the observation only, just let me know the date of your appointment and I will meet you at the public health centre. Prior to the start of the interview or observation, I will need to ask you to sign the attached informed consent form and I will provide a copy for you to keep.

Thank you for taking time to read this information sheet and for considering involve in the study. Contact for further information

Ririn Wulandari

PhD student of School of Healthcare University of Leeds

PhD Suite Baines Wing Leeds LS2 9DA UK

E-mail: ririnkadarusno@gmail.com

Tel: 081367247294

The supervisors:

Professor Linda McGowan

Leadership Chair-Applied Health Research

School of Healthcare University of Leeds

Baines Wing, Woodhouse, Leeds LS2 9DA UK

E-mail: L.McGowan@leeds.ac.uk

Professor Eleanor Scott

Professor of Medicine (Diabetes and Maternal Health)

School of Medicine University of Leeds

7.29 LIGHT Laboratories UK

Email: E.M.Scott@leeds.ac.uk

Dr. Yu Fu

Research Fellow

School of Medicine University of Leeds

10.39 Worsley Building

Email: Y.Fu@leeds.ac.uk

<i>Project title</i>	<i>Document type</i>	<i>Version #</i>	<i>Date</i>
Women and Healthcare Professionals Experience, Knowledge and Understanding of Gestational Diabetes Mellitus (GDM) in Indonesia: A Single Exploratory Case Study	PIS for women identified with GDM	1.2	

Appendix M: Participant information sheet for healthcare professionals
School of Healthcare (Faculty of Medicine and Health)



UNIVERSITY OF LEEDS

Women and Health Professionals Experience, Knowledge and Understanding of Gestational Diabetes Mellitus (GDM) in Indonesia: A Single Exploratory Case Study

PARTICIPANT INFORMATION SHEET

[A large-print version of this sheet is available on request]

This project is about exploring experience, knowledge and understanding of Gestational Diabetes Mellitus (GDM) among women and healthcare professionals in Indonesia. Before you decide to take part or not, it is important for you to understand why this research is being conducted and how you will be involved. This information sheet will explain more about the study, so please take your time to read the following information.

What is the purpose of this study?

Gestational Diabetes (GDM) is a condition where women have a slightly higher sugar level in their blood, detected for the first time during pregnancy. It can have negative impacts to the women and babies in the short and long term such as giant baby, birth trauma, hypertension in pregnancy, risk of getting type 2 diabetes in the future, etc. GDM needs to be managed for the sake of the women and the baby's wellbeing.

In Indonesia, despite it has the seventh largest number of diabetic patients in 2019, the number of pregnant women who have GDM is unknown. There is limited information from studies about GDM in Indonesia which makes issues about GDM are unexplored. Therefore, the purpose of this research is to explore experience, knowledge and understanding of GDM among women and healthcare professionals and also to understand the routine practice of GDM care in public a health centre in Indonesia.

Who is doing this study?

This study is led by Ririn Wulandari, and supervised by Professor Linda McGowan, Professor Eleanor Scott and Dr Yu Fu. This study is being completed as part of a PhD programme that is being carried out by Ririn Wulandari at the University of Leeds, which is funded by the Indonesia Endowment Fund for Education (LPDP).

Why I have been invited?

You have been invited to participate in this study because you are a healthcare professional who work within maternity services at Katon Public Health Centre. We are expecting to include between six to eight healthcare professionals at this site to participate in this research.

Do I have to take part?

Participation in this research is entirely voluntary. You will be given this information sheet and time (minimum 24 hours) to consider your decision. In case you have questions about the study, you may ask the researcher for further information. You will be asked to sign a consent form once you decide to participate. If you change your mind after signing the consent form, you have the right to withdraw from this study at any time without giving any reason and without any negative consequences. If you do not wish to participate, it will not affect you in any way.

What will happen to me if I take part?

There are two activities in this study including an interview and an observation of one of your routine consultation appointments with women who considered living with GDM (who agreed to participate in this study) at Katon Public Health Centre. You may choose to participate either or both of the activities.

The interview will be conducted with your consent at the public health centre, at your house or a public place (depending on your preference). The interview will take about one hour to complete and will be audio-recorded with your consent. You will be asked to describe your experience on giving services to the women identified with GDM and your perceptions of GDM itself. The researcher also will ask you to describe your views regarding the current practice of GDM management in the site. The interview will be guided by a list of questions from the researcher. However, if you feel that there is important information to add, you are free to tell the researcher about your thought. You are also free to take a break or stop the interview if you feel uncomfortable.

Furthermore, to understand what happens in a routine consultation session, the researcher will observe that activity with your consent. This will be done during one of your routine consultation sessions with the women at the public health centre, where the researcher will observe the interaction and the communication between you and the women. This activity will only be carried out once and it will not interrupt any services that you provide for the women. You may interrupt or stop the observation at any time if you feel uncomfortable.

What are the possible benefits of taking part?

The information we get from this study is unlikely to benefit you directly. However, the information that you provide will help us to understand the views from healthcare professionals which may assist the development of future intervention of GDM care and future research on GDM in Indonesia. In addition, the finding of this research, hopefully, may improve policy, practices and enhance the quality of care of GDM management in Indonesia.

What are the possible risks of taking part?

We do not anticipate any risks if you take part. However, it is possible that you may have some unpleasant feelings during interview because of previous experiences on managing GDM. This research may activate your negative emotions. If you feel uncomfortable with any of the questions being asked during the interview, you are free not to answer those questions. Please do not hesitate to contact the researcher if you have any concern related to this given information.

What will happen to my personal information?

All your information that is given to the researcher will remain strictly confidential. All information recorded during the interviews and the observations will be handled in the strictest confidence. The consent form and the written information containing your personal details will be stored in a locked cabinet, while the interviews transcript and other files will be stored in the M Drive of the University desktop and Microsoft One Drive provided by the University of Leeds. All identifiable data only can be accessed by the researcher and the supervisors. The entire interview transcripts will be pseudonym and no real names will appear in any reports. Results from this study will be in the form of pseudonym quotes. All your personal details will be destroyed once the study is completed or when they are no longer required. No personal information will be traced back for any reason.

What will happen to the results of this study?

The researcher will take steps wherever possible to anonymise the data so that only the researcher knows your true identity. Your quotes may be used in the result of this study in pseudonym form. The results of this research will be published in peer-reviewed scientific journals which will be available on-line and be presented at conferences or seminars. Also, the research data will be preserved in Research Data Leeds Repository in anonymised form, so that it can be utilised by researchers outside the project who agrees to the specified conditions (e.g. they will use the data for research or teaching only, and not use it for commercial purposes).

Who has reviewed this study?

Ethical approval has been granted by the University of Leeds, School of Healthcare Research Ethics Committee and Poltekkes Tanjung Karang Research Ethics Committee (*project reference number and date*).

What if I have concerns about the study?

If you have any questions or would like further details about the study, please contact Ririn Wulandari (see contact details below) who will do her best to answer your questions. You can also contact her supervisors Professor Linda McGowan, Professor Eleanor Scott and Dr. Yu Fu (see contact details below).

What do I do now?

If you decided to participate in this research, you can contact me (the researcher) by phone or at the email address stated above. I will discuss the date, time and place for the interview with you. If you would like to take part in the observation only, just let me know the date of your appointment with the women, and I will meet you at the public health centre. Prior to the start of the interview or observation, I will need to ask you to sign the attached informed consent form and I will provide a copy for you to keep.

Thank you for taking time to read this information sheet and for considering involve in the study.

Contact for further information

Ririn Wulandari

PhD student of School of Healthcare University of Leeds

PhD Suite Baines Wing Leeds LS2 9DA UK

E-mail: ririnkadarusno@gmail.com

Tel: 081367247294

The supervisors:

Professor Linda McGowan

Leadership Chair-Applied Health Research

School of Healthcare University of Leeds

Baines Wing, Woodhouse, Leeds LS2 9DA UK

E-mail: L.McGowan@leeds.ac.uk

Professor Eleanor Scott

Professor of Medicine (Diabetes and Maternal Health)

School of Medicine University of Leeds

7.29 LIGHT Laboratories UK

Email: E.M.Scott@leeds.ac.uk

Dr. Yu Fu

Research Fellow

School of Medicine University of Leeds

10.39 Worsley Building

Email: Y.Fu@leeds.ac.uk

<i>Project title</i>	<i>Document type</i>	<i>Version #</i>	<i>Date</i>
Women and Healthcare Professionals Experience, Knowledge and Understanding of Gestational Diabetes Mellitus (GDM) in Indonesia: A Single Exploratory Case Study	PIS for healthcare professionals	1.2	

Appendix N: Participant information sheets (women) in Bahasa

Lembar Penjelasan bagi Wanita yang diidentifikasi dengan DMG

VERSI BAHASA INDONESIA



UNIVERSITY OF LEEDS

School of Healthcare (Fakultas Kedokteran dan Kesehatan)

Pengalaman, Pengetahuan dan Pemahaman Wanita dan Tenaga Kesehatan tentang Diabetes Melitus Gestasional (DMG) di Indonesia: Single Case Studi

Lembar Penjelasan

Penelitian ini adalah tentang mengeksplorasi pengalaman, pengetahuan dan pemahaman tentang Diabetes Mellitus Gestasional (GDM) di kalangan wanita dan profesional kesehatan di Indonesia. Sebelum Anda memutuskan untuk ikut atau tidak, penting bagi Anda untuk memahami mengapa penelitian ini dilakukan dan bagaimana Anda akan terlibat. Lembar informasi ini akan menjelaskan lebih lanjut tentang penelitian ini, jadi mohon luangkan waktu Anda untuk membaca informasi berikut.

Apa tujuan dari penelitian ini?

Gestational Diabetes (GDM) adalah suatu kondisi di mana wanita memiliki kadar gula yang sedikit lebih tinggi dalam darahnya, terdeteksi untuk pertama kalinya selama kehamilan. Dapat berdampak negatif pada wanita dan bayi dalam jangka pendek dan jangka panjang seperti bayi raksasa, trauma lahir, hipertensi dalam kehamilan, risiko terkena diabetes tipe 2 di masa depan, dll. GDM perlu dikelola untuk kepentingan wanita. dan kesejahteraan bayi.

Di Indonesia, meskipun memiliki jumlah penderita diabetes ketujuh terbesar pada tahun 2019, jumlah ibu hamil yang mengalami GDM tidak diketahui. Keterbatasan informasi dari studi-studi tentang GDM di Indonesia membuat isu-isu tentang GDM tidak tergal. Oleh karena itu, tujuan dari penelitian ini adalah untuk menggali pengalaman, pengetahuan dan pemahaman tentang GDM di kalangan wanita dan tenaga kesehatan serta untuk memahami praktik rutin perawatan GDM di Puskesmas di Indonesia.

Siapa yang melakukan studi ini?

Penelitian ini dipimpin oleh Ririn Wulandari, dan dibimbing oleh Profesor Linda McGowan, Profesor Eleanor Scott dan Dr Yu Fu. Studi ini sedang diselesaikan sebagai bagian dari program PhD yang sedang dilakukan oleh Ririn Wulandari di University of Leeds, yang didanai oleh LPDP.

Mengapa saya diundang?

Anda diundang untuk berpartisipasi dalam penelitian ini karena Anda dianggap sebagai calon peserta penelitian ini oleh para profesional kesehatan di Puskesmas Kedaton. Kami mengharapkan untuk merekrut antara enam sampai sepuluh wanita di Puskesmas ini untuk berpartisipasi dalam penelitian ini.

Apakah saya harus ambil bagian?

Partisipasi dalam penelitian ini sepenuhnya bersifat sukarela. Anda akan diberikan lembar informasi ini dan waktu (minimal 24 jam) untuk mempertimbangkan keputusan Anda. Jika Anda memiliki pertanyaan tentang penelitian ini, Anda dapat bertanya kepada peneliti untuk informasi lebih lanjut. Anda akan diminta untuk menandatangani formulir persetujuan setelah Anda memutuskan untuk berpartisipasi. Jika Anda berubah pikiran setelah menandatangani formulir persetujuan, Anda berhak untuk mengundurkan diri dari penelitian ini kapan saja tanpa memberikan alasan apa pun dan tanpa merugikan perawatan Anda saat ini atau di masa depan. Jika Anda tidak ingin berpartisipasi, itu tidak akan memengaruhi perawatan Anda dengan cara apa pun.

Apa yang akan terjadi pada saya jika saya ambil bagian?

Ada dua kegiatan dalam penelitian ini termasuk wawancara dan observasi salah satu konsultasi rutin Anda dengan profesional kesehatan di Puskesmas Kedaton. Anda dapat memilih untuk berpartisipasi dalam salah satu atau kedua kegiatan tersebut.

Wawancara akan dilakukan dengan persetujuan Anda di puskesmas, di rumah Anda atau di tempat umum (tergantung pilihan Anda). Wawancara akan memakan waktu sekitar satu jam untuk diselesaikan dan akan direkam dengan persetujuan Anda. Anda akan diminta untuk menjelaskan pengalaman dan persepsi Anda sebagai seorang wanita yang diidentifikasi dengan GDM. Peneliti akan menanyakan tentang pengetahuan dan pemahaman Anda tentang GDM. Selain itu, peneliti juga akan meminta Anda untuk menggambarkan persepsi Anda tentang dukungan yang Anda terima dari rumah, tempat kerja dan pusat kesehatan. Wawancara akan dipandu oleh daftar pertanyaan dari peneliti. Namun, jika Anda merasa ada informasi penting untuk ditambahkan, Anda bebas memberi

tahu peneliti tentang pemikiran Anda. Anda juga bebas untuk istirahat atau menghentikan wawancara jika merasa tidak nyaman.

Selanjutnya, untuk memahami apa yang terjadi dalam sesi konsultasi rutin, peneliti akan mengamati aktivitas tersebut dengan persetujuan Anda. Ini akan dilakukan selama salah satu sesi konsultasi rutin Anda di pukesmas, di mana peneliti akan mengamati interaksi dan komunikasi antara Anda dan profesional kesehatan. Aktivitas ini hanya akan dilakukan satu kali dan tidak akan mengganggu layanan apa pun yang disediakan untuk Anda. Anda dapat menyela atau menghentikan pengamatan kapan saja jika Anda merasa tidak nyaman.

Apa manfaat yang mungkin didapat dari ikut serta?

Informasi yang kami dapatkan dari penelitian ini tidak bermanfaat bagi Anda secara langsung. Namun, informasi yang Anda berikan akan membantu kami dan tenaga kesehatan untuk memahami pandangan wanita. Juga, partisipasi Anda akan memberi kami informasi yang memungkinkan para tenaga kesehatan untuk mengembangkan intervensi masa depan yang memenuhi kebutuhan wanita dengan GDM dalam membantu mereka mencegah hasil kehamilan yang merugikan. Selain itu, kami juga akan diinformasikan kepada para wanita dengan pengalaman GDM yang dapat menjadi dasar yang kuat untuk penelitian masa depan tentang GDM di Indonesia. Pada akhirnya, temuan penelitian ini diharapkan dapat memperbaiki kebijakan, praktik dan meningkatkan kualitas asuhan manajemen GDM di Indonesia.

Apa saja risiko yang mungkin timbul dari mengambil bagian?

Kami mengantisipasi tidak adanya risiko apa pun jika Anda ikut serta. Namun, ada kemungkinan bahwa Anda mungkin memiliki perasaan yang tidak menyenangkan selama wawancara karena pengalaman sebelumnya dengan GDM dalam kehamilan Anda. Penelitian ini dapat mengaktifkan emosi negatif Anda. Jika Anda merasa tidak nyaman dengan salah satu pertanyaan yang diajukan selama wawancara, Anda bebas untuk tidak menjawab pertanyaan tersebut. Jika Anda merasa kesal pada tahap apa pun, jangan ragu untuk berbicara dengan peneliti dan peneliti akan mendapatkan dukungan yang sesuai untuk Anda.

Apa yang akan terjadi dengan informasi pribadi saya?

Semua informasi yang Anda berikan kepada peneliti akan dijaga kerahasiaannya. Semua informasi yang dicatat selama wawancara dan observasi akan ditangani

dengan sangat rahasia. Formulir persetujuan dan informasi tertulis yang berisi data pribadi Anda akan disimpan dalam lemari terkunci, sedangkan transkrip wawancara dan file lainnya akan disimpan di Drive M desktop Universitas. Semua data yang dapat diidentifikasi hanya dapat diakses oleh peneliti dan supervisor. Seluruh transkrip wawancara akan menjadi nama samaran dan tidak ada nama asli yang akan muncul dalam laporan apa pun. Hasil dari penelitian ini akan berupa kutipan nama samaran. Semua data pribadi Anda akan dimusnahkan setelah studi selesai atau ketika tidak lagi diperlukan. Tidak ada informasi pribadi yang akan dilacak kembali dengan alasan apapun.

Apa yang akan terjadi dengan hasil penelitian ini?

Peneliti akan mengambil langkah sedapat mungkin untuk menganonimkan data sehingga hanya peneliti dan supervisor yang mengetahui identitas Anda yang sebenarnya. Kutipan Anda dapat digunakan dalam hasil penelitian ini dalam bentuk nama samaran. Hasil penelitian ini akan dipublikasikan dalam jurnal ilmiah peer-review yang akan tersedia secara online dan dipresentasikan pada konferensi atau seminar. Selain itu, data penelitian akan disimpan dalam Repositori Data Penelitian Leeds dalam bentuk anonim, sehingga dapat digunakan oleh peneliti di luar grup peneliti yang menyetujui persyaratan yang ditentukan (misalnya mereka akan menggunakan data untuk penelitian atau pengajaran saja, dan tidak menggunakan itu untuk tujuan komersial).

Siapa yang telah mengulas penelitian ini?

Persetujuan etik telah diberikan oleh University of Leeds, Komite Etik Penelitian Fakultas Kesehatan dan Komite Etik Penelitian Poltekes Tanjung Karang.

Bagaimana jika saya memiliki kekhawatiran tentang penelitian ini?

Jika Anda memiliki pertanyaan atau ingin mengetahui informasi lebih lanjut tentang studi ini, silakan hubungi Ririn Wulandari (lihat detail kontak di bawah) yang akan berusaha sebaik mungkin untuk menjawab pertanyaan Anda. Anda juga dapat menghubungi supervisornya Profesor Linda McGowan, Profesor Eleanor Scott dan Dr. Yu Fu (lihat detail kontak di bawah).

Apa yang saya lakukan sekarang?

Jika Anda memutuskan untuk berpartisipasi dalam penelitian ini, Anda dapat menghubungi saya (peneliti) melalui telepon atau alamat email yang tertera di bawah ini. Saya akan mendiskusikan tanggal, waktu, dan tempat wawancara dengan Anda. Jika Anda ingin ikut serta dalam observasi saja, mohon beri tahu

saya tanggal kunjungan Anda dan saya akan menemui Anda di Puskesmas. Sebelum memulai wawancara atau observasi, saya perlu meminta Anda untuk menandatangani formulir persetujuan terlampir dan saya akan memberikan salinannya untuk Anda simpan.

Terima kasih telah meluangkan waktu untuk membaca lembar informasi ini dan telah mempertimbangkan untuk terlibat dalam penelitian ini.

Hubungi untuk informasi lebih lanjut

Ririn Wulandari

PhD student of School of Healthcare University of Leeds

PhD Suite Baines Wing Leeds LS2 9DA UK

E-mail: ririnkadarusno@gmail.com

Tel: 081367247294

Alamat kantor in Indonesia:

Malahayati University

Jl. Pramuka 27. Kemiling

Bandar Lampung - Indonesia

Pembimbing:

Professor Linda McGowan

Leadership Chair-Applied Health Research

School of Healthcare University of Leeds

Baines Wing, Woodhouse, Leeds LS2 9DA UK

E-mail: L.McGowan@leeds.ac.uk

Professor Eleanor Scott

Professor of Medicine (Diabetes and Maternal Health)

School of Medicine University of Leeds

7.29 LIGHT Laboratories UK

Email: E.M.Scott@leeds.ac.uk

Dr. Yu Fu
Research Fellow
School of Medicine University of Leeds
10.39 Worsley Building
Email: Y.Fu@leeds.ac.uk

<i>Judul Penelitian</i>	<i>Tipe dokumen</i>	<i>Versi#</i>	<i>Tanggal</i>
Pengalaman, Pengetahuan dan Pemahaman Wanita dan Tenaga Kesehatan tentang Diabetes Melitus Gestasional (DMG) di Indonesia: Single Case Studi (no ref: HREC 20-018)	Lembar Penjelasan untuk Wanita	1.3	

Appendix O: Participant information sheets (HCPs) in Bahasa
Lembar Penjelasan bagi Tenaga Kesehatan



School of Healthcare (Fakultas Kedokteran dan Kesehatan)

UNIVERSITY OF LEEDS

**Pengalaman, Pengetahuan dan Pemahaman Wanita dan Tenaga Kesehatan
tentang Diabetes Melitus Gestasional (DMG) di Indonesia: Single Case Studi**

Lembar Penjelasan

Penelitian ini adalah tentang mengeksplorasi pengalaman, pengetahuan dan pemahaman tentang Diabetes Mellitus Gestasional (GDM) di kalangan wanita dan tenaga kesehatan di Indonesia. Sebelum Anda memutuskan untuk ikut atau tidak, penting bagi anda untuk memahami mengapa penelitian ini dilakukan dan bagaimana anda akan terlibat. Lembar informasi ini akan menjelaskan lebih lanjut tentang penelitian ini, jadi mohon luangkan waktu anda untuk membaca informasi berikut.

Apa tujuan dari penelitian ini?

Gestational Diabetes (GDM) adalah suatu kondisi di mana wanita memiliki kadar gula yang sedikit lebih tinggi dalam darahnya, terdeteksi untuk pertama kalinya selama kehamilan. GDM dapat berdampak negatif bagi ibu dan bayi dalam jangka pendek dan jangka panjang seperti bayi besar, trauma lahir, hipertensi dalam kehamilan, risiko terkena diabetes tipe 2 di masa depan, dll. GDM perlu dikelola demi kepentingan kesehatan wanita dan bayi.

Di Indonesia, meskipun memiliki jumlah penderita diabetes ketujuh terbesar pada tahun 2019, jumlah ibu hamil yang mengalami GDM tidak diketahui. Keterbatasan informasi dari studi-studi tentang GDM di Indonesia membuat isu-isu tentang GDM tidak tergali. Oleh karena itu, tujuan dari penelitian ini adalah untuk menggali pengalaman, pengetahuan dan pemahaman tentang GDM di kalangan wanita dan tenaga kesehatan serta untuk memahami praktik rutin perawatan GDM di puskesmas di Indonesia.

Siapa yang melakukan studi ini?

Penelitian ini dilakukan oleh Ririn Wulandari, dan dibimbing oleh Profesor Linda McGowan, Profesor Eleanor Scott dan Dr Yu Fu. Studi ini sedang diselesaikan sebagai bagian dari program PhD yang sedang dilakukan oleh Ririn Wulandari di University of Leeds, yang didanai oleh LPDP.

Mengapa saya diundang?

Anda diundang untuk berpartisipasi dalam penelitian ini karena Anda adalah seorang tenaga kesehatan yang bekerja dalam layanan kesehatan ibu di Puskesmas Kedaton Bandar Lampung. Kami mengharapkan untuk dapat merekrut antara enam sampai delapan tenaga kesehatan di Puskesmas ini untuk berpartisipasi dalam penelitian.

Apakah saya harus ambil bagian?

Partisipasi dalam penelitian ini sepenuhnya bersifat sukarela. Anda akan diberikan lembar informasi ini dan waktu (minimal 24 jam) untuk mempertimbangkan keputusan anda. Jika anda memiliki pertanyaan tentang penelitian ini, anda dapat bertanya kepada peneliti untuk informasi lebih lanjut. Anda akan diminta untuk menandatangani formulir persetujuan setelah anda memutuskan untuk berpartisipasi. Jika Anda berubah pikiran setelah menandatangani formulir persetujuan, anda berhak untuk mengundurkan diri dari penelitian ini setiap saat tanpa memberikan alasan apapun dan tanpa konsekuensi negatif apapun. Jika anda tidak ingin berpartisipasi, itu tidak akan memengaruhi anda dengan cara apapun.

Apa yang akan terjadi pada saya jika saya ambil bagian?

Ada dua kegiatan dalam penelitian ini yaitu wawancara dan observasi terhadap salah satu konsultasi rutin anda dengan wanita yang dianggap memiliki GDM (yang setuju untuk berpartisipasi dalam penelitian ini) di Puskesmas Kedaton. Anda dapat memilih untuk berpartisipasi dalam salah satu atau kedua kegiatan tersebut.

Wawancara akan dilakukan dengan persetujuan anda di Puskesmas, di rumah anda atau di tempat umum (tergantung pilihan Anda). Wawancara akan memakan waktu sekitar satu jam untuk diselesaikan dan akan direkam dengan persetujuan anda. Anda akan diminta untuk menjelaskan pengalaman anda dalam memberikan layanan kepada wanita yang diidentifikasi dengan GDM dan persepsi anda tentang GDM itu sendiri. Peneliti juga akan meminta anda untuk menjelaskan pandangan anda mengenai praktik manajemen GDM saat ini di puskesmas. Wawancara akan dipandu oleh daftar pertanyaan dari peneliti. Namun, jika anda merasa ada informasi penting untuk ditambahkan, anda bebas memberi tahu peneliti tentang pemikiran anda. Anda juga bebas untuk istirahat atau menghentikan wawancara jika merasa tidak nyaman.

Selanjutnya, untuk memahami apa yang terjadi dalam sesi konsultasi rutin, peneliti akan mengamati aktivitas tersebut dengan persetujuan anda. Ini akan dilakukan selama salah satu sesi konsultasi rutin anda dengan para wanita di Puskesmas, di mana peneliti akan mengamati interaksi dan komunikasi antara anda dan wanita tersebut. Kegiatan ini hanya akan dilakukan sekali dan tidak akan mengganggu layanan yang anda berikan untuk para wanita. Anda dapat menyela atau menghentikan pengamatan kapan saja jika Anda merasa tidak nyaman.

Apa manfaat yang mungkin didapat dari ikut serta?

Informasi yang kami dapatkan dari penelitian ini tidak dapat bermanfaat bagi anda secara langsung. Namun, informasi yang anda berikan akan membantu kami untuk memahami pandangan dari para tenaga kesehatan yang dapat membantu pengembangan intervensi masa depan perawatan GDM dan penelitian masa depan GDM di Indonesia. Selain itu, temuan penelitian ini diharapkan dapat memperbaiki kebijakan, praktik dan meningkatkan kualitas asuhan manajemen GDM di Indonesia.

Apa saja risiko yang mungkin timbul dari keikutsertaan?

Tidak ada risiko apa pun jika anda ikut serta. Namun, mungkin saja anda memiliki perasaan yang tidak menyenangkan selama wawancara karena pengalaman sebelumnya dalam mengelola GDM. Penelitian ini dapat mengaktifkan emosi negatif anda. Jika Anda merasa tidak nyaman dengan salah satu pertanyaan yang diajukan selama wawancara, anda bebas untuk tidak menjawab pertanyaan tersebut. Harap jangan ragu untuk menghubungi peneliti jika anda memiliki kekhawatiran terkait dengan informasi yang diberikan ini.

Apa yang akan terjadi dengan informasi pribadi saya?

Semua informasi yang anda berikan kepada peneliti akan dijaga kerahasiaannya. Semua informasi yang dicatat selama wawancara dan observasi akan ditangani dengan sangat rahasia. Formulir persetujuan dan informasi tertulis yang berisi data pribadi Anda akan disimpan dalam lemari terkunci, sedangkan transkrip wawancara dan file lainnya akan disimpan di Drive M desktop Universitas. Semua data yang dapat diidentifikasi hanya dapat diakses oleh peneliti dan supervisor. Seluruh transkrip wawancara akan menggunakan nama samaran dan tidak ada nama asli yang akan muncul dalam laporan apa pun. Hasil dari penelitian ini akan berupa kutipan nama samaran. Semua data pribadi Anda akan dimusnahkan setelah studi selesai atau ketika tidak lagi diperlukan. Tidak ada informasi pribadi yang akan dilacak kembali dengan alasan apapun.

Apa yang akan terjadi dengan hasil penelitian ini?

Peneliti akan mengambil langkah sedapat mungkin untuk menganonimkan data sehingga hanya peneliti yang mengetahui identitas anda yang sebenarnya. Kutipan anda dapat digunakan dalam hasil penelitian ini dalam bentuk nama samaran. Hasil penelitian ini akan dipublikasikan dalam jurnal ilmiah peer-review yang akan tersedia secara online dan dipresentasikan pada konferensi atau seminar. Selain itu, data penelitian akan disimpan dalam Repositori Data Penelitian Leeds dalam bentuk anonim, sehingga dapat digunakan oleh peneliti di luar tim peneliti yang menyetujui persyaratan yang ditentukan (misalnya mereka akan menggunakan data untuk penelitian atau pengajaran saja, dan tidak menggunakan itu untuk tujuan komersial).

Siapa yang telah mengulas penelitian ini?

Persetujuan etik telah diberikan oleh University of Leeds, Komite Etik Penelitian Fakultas Kesehatan dan Komite Etik Penelitian Poltekes Tanjung Karang.

Bagaimana jika saya memiliki kekhawatiran tentang penelitian ini?

Jika Anda memiliki pertanyaan atau ingin mengetahui informasi lebih lanjut tentang studi ini, silakan hubungi Ririn Wulandari (lihat detail kontak di bawah) yang akan berusaha sebaik mungkin untuk menjawab pertanyaan Anda. Anda juga dapat menghubungi supervisornya Profesor Linda McGowan, Profesor Eleanor Scott dan Dr. Yu Fu (lihat detail kontak di bawah).

Apa yang saya lakukan sekarang?

Jika Anda memutuskan untuk berpartisipasi dalam penelitian ini, Anda dapat menghubungi saya (peneliti) melalui telepon atau alamat email yang disebutkan di atas. Saya akan membahas tanggal, waktu dan tempat wawancara dengan Anda. Jika Anda ingin ikut serta dalam observasi saja, anda dapat memberi tahu saya tanggal pertemuan anda dengan pasien, dan saya akan menemui anda di Puskesmas. Sebelum memulai wawancara atau observasi, saya perlu meminta anda untuk menandatangani formulir persetujuan terlampir dan saya akan memberikan salinannya untuk Anda simpan.

Terima kasih telah meluangkan waktu untuk membaca lembar informasi ini dan telah mempertimbangkan untuk terlibat dalam penelitian ini.

Hubungi untuk informasi lebih lanjut

Ririn Wulandari

PhD student of School of Healthcare University of Leeds
PhD Suite Baines Wing Leeds LS2 9DA UK
E-mail: ririnkadarusno@gmail.com
Tel: 081367247294

Alamat kantor in Indonesia:
Malahayati University
Jl. Pramuka 27. Kemiling. Bandar Lampung

Pembimbing:

Professor Linda McGowan
Leadership Chair-Applied Health Research
School of Healthcare University of Leeds
Baines Wing, Woodhouse, Leeds LS2 9DA UK
E-mail: L.McGowan@leeds.ac.uk

Professor Eleanor Scott
Professor of Medicine (Diabetes and Maternal Health)
School of Medicine University of Leeds
7.29 LIGHT Laboratories UK
Email: E.M.Scott@leeds.ac.uk

Dr. Yu Fu
Research Fellow
School of Medicine University of Leeds
10.39 Worsley Building
Email: Y.Fu@leeds.ac.uk

<i>Judul Penelitian</i>	<i>Tipe dokumen</i>	<i>Versi#</i>	<i>Tanggal</i>
Pengalaman, Pengetahuan dan Pemahaman Wanita dan Tenaga Kesehatan tentang Diabetes Melitus Gestasional (DMG) di Indonesia: Single Case Studi (no ref: HREC 20-018)	Lembar Penjelasan untuk Tenaga Kesehatan	1.3	

Appendix P: Consent forms for interview

(for Healthcare Professionals and Women identified with GDM)

Consent to take part in Women and Health Professionals Experience, Knowledge and Understanding of Gestational Diabetes Mellitus (GDM) in Indonesia: A Single Exploratory Case Study	Add your initials if you agree
I confirm that I have read and understood the information sheet version 1.2 dated dd/mm/yyyy explaining the above research project and I have had the opportunity to ask questions about the project.	
<p>I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences. Also, should I not wish to answer any particular question or questions, I am free to decline.</p> <p>To withdraw, please contact the lead researcher Ririn Wulandari: 081367247294.</p> <p>I understand that I can withdraw my data up to 24 hours after the data collection without providing any reason. However, the data collected cannot be discarded if I withdraw over that period.</p>	
<p>I give permission for the research team to have access to my anonymised responses. I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the report or reports that result from the research.</p> <p>I understand that my responses will be kept strictly confidential.</p>	
I agree with the data collected from me to be stored and used in relevant future research in an anonymised form.	

I understand that relevant sections of the data collected during the study may be looked at by auditors from the University of Leeds where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.	
I agree to take part in the individual interview	
I agree to inform the lead researcher should my contact details change.	

Name of participant	
Participant's signature	
Date	
Name of lead researcher	Ririn Wulandari
Signature	
Date*	

Appendix Q: Consent form for observation of a Routine Consultation of Women with Potential GDM (for Healthcare Professionals and Women identified with GDM)

<p>Consent to take part in Women and Health Professionals Experience, Knowledge and Understanding of Gestational Diabetes Mellitus (GDM) in Indonesia: A Single Exploratory Case Study</p>	<p>Add your initials if you agree</p>
<p>I confirm that I have read and understood the information sheet version 1.2 dated dd/mm/yyyy explaining the above research project and I have had the opportunity to ask questions about the project.</p>	
<p>I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences.</p> <p>To withdraw, please contact the lead researcher Ririn Wulandari: 081367247294.</p>	
<p>I understand that I can withdraw my data up to 24 hours after the data collection without providing any reason. However, the data collected cannot be discarded if I withdraw over that period.</p> <p>However, if one of the parties (healthcare professionals or women) withdraws from the study after the observation completed, the data that has been collected cannot be deleted unless both parties decide to withdraw from this study.</p>	
<p>I give permission for the research team to have access to the data collected in anonymised form. I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the report or reports that result from the research.</p> <p>I understand that my responses will be kept strictly confidential.</p>	
<p>I agree with the data collected from me to be stored and used in relevant future research in an anonymised form.</p>	
<p>I understand that relevant sections of the data collected during the study, may be looked at by auditors from the University of Leeds where</p>	

it is relevant to my taking part in this research. I give permission for these individuals to have access to the data.	
I agree to take part in the observation.	
I agree to inform the lead researcher should my contact details change.	

Name of participant	
Participant's signature	
Date	
Name of lead researcher	Ririn Wulandari
Signature	
Date*	

Appendix R: Consent forms for interview (for Healthcare Professionals and Women identified with GDM) in Bahasa



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Formulir Persetujuan untuk Wawancara (untuk Tenaga Kesehatan dan Wanita yang diidentifikasi dengan DMG)

<p>Persetujuan untuk berpartisipasi dalam penelitian Pengalaman, Pengetahuan, dan Pemahaman Wanita dan Tenaga Kesehatan tentang Diabetes Mellitus Gestasional (DMG) di Indonesia: Single Case Studi</p>	<p>Tambahkan inisial Anda jika Anda setuju</p>
<p>Saya menyatakan bahwa saya telah membaca dan memahami lembar penjelasan versi 1.3 tanggal hh/bb/tttt yang menjelaskan tentang penelitian di atas dan saya telah mendapat kesempatan untuk bertanya tentang penelitian tersebut.</p>	
<p>Saya mengerti bahwa keikutsertaan saya bersifat sukarela dan saya bebas untuk mengundurkan diri kapan saja tanpa memberikan alasan apapun dan tanpa ada akibat negatif apapun. Selain itu, jika saya tidak ingin menjawab pertanyaan tertentu, saya bebas untuk menolak.</p> <p>Untuk mengundurkan diri, silahkan hubungi ketua peneliti Ririn Wulandari: 081367247294.</p> <p>Saya mengerti bahwa saya dapat menarik data saya hingga 2 minggu setelah pengumpulan data tanpa memberikan alasan apapun.</p>	
<p>Saya memberikan izin kepada tim peneliti untuk mengakses jawaban saya dalam bentuk anonim. Saya mengerti bahwa nama saya tidak akan dikaitkan dengan penelitian, dan saya tidak akan diidentifikasi serta tidak dapat diidentifikasi dalam laporan yang dihasilkan dari penelitian ini.</p> <p>Saya mengerti bahwa tanggapan saya akan dijaga kerahasiaannya.</p>	

Saya setuju bahwa data yang dikumpulkan dari saya dalam bentuk anonym disimpan dan digunakan untuk penelitian yang relevan di masa mendatang.	
Saya memahami bahwa bagian tertentu dari data yang dikumpulkan selama penelitian dapat dilihat oleh auditor dari University of Leeds jika relevan dengan keikutsertaan saya dalam penelitian ini. Saya memberikan izin kepada orang-orang ini untuk memiliki akses ke catatan saya.	
Saya setuju untuk berpartisipasi dalam wawancara individu	
Saya setuju untuk memberi tahu peneliti utama jika detail kontak saya berubah.	

Nama peserta	
Tanda tangan peserta	
Tanggal	
Nama peneliti utama	Ririn Wulandari
Tanda tangan	
Tanggal*	

<i>Judul Penelitian</i>	<i>Tipe dokumen</i>	<i>Versi#</i>	<i>Tanggal</i>
Pengalaman, Pengetahuan dan Pemahaman Wanita dan Tenaga Kesehatan tentang Diabetes Melitus Gestasional (DMG) di Indonesia: Single Case Studi (no ref: HREC 20-018)	Lembar Persetujuan Wawancara	1.3	

Appendix S: Consent form for observation of a Routine Consultation of Women with Potential GDM (for Healthcare Professionals and Women identified with GDM) in Bahasa



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Formulir Persetujuan untuk Observasi Konsultasi DMG (untuk Tenaga Kesehatan dan Wanita yang diidentifikasi dengan GDM)

<p>Persetujuan untuk berpartisipasi dalam penelitian Pengalaman, Pengetahuan, dan Pemahaman Wanita dan Tenaga Kesehatan tentang Diabetes Mellitus Gestasional (DMG) di Indonesia: Single Case Studi</p>	<p>Tambahkan inisial Anda jika Anda setuju</p>
<p>Saya menyatakan bahwa saya telah membaca dan memahami lembar penjelasan versi 1.3 tanggal hh/bb/tttt yang menjelaskan tentang penelitian di atas dan saya telah mendapat kesempatan untuk bertanya tentang penelitian tersebut.</p>	
<p>Saya mengerti bahwa keikutsertaan saya bersifat sukarela dan saya bebas untuk mengundurkan diri kapan saja tanpa memberikan alasan apapun dan tanpa ada akibat negatif apapun. Untuk mengundurkan diri, silahkan hubungi ketua peneliti Ririn Wulandari: 081367247294.</p>	
<p>Saya mengerti bahwa saya dapat menarik data saya hingga 2 minggu setelah pengumpulan data tanpa memberikan alasan apapun. Jika salah satu pihak (tenaga kesehatan atau wanita) mengundurkan diri dari penelitian setelah observasi selesai, data yang telah dikumpulkan akan dihapus.</p>	
<p>Saya memberikan izin kepada tim peneliti untuk mengakses jawaban saya dalam bentuk anonim. Saya mengerti bahwa nama saya tidak akan dikaitkan dengan penelitian, dan saya tidak akan diidentifikasi serta tidak dapat diidentifikasi dalam laporan yang dihasilkan dari penelitian ini.</p> <p>Saya mengerti bahwa tanggapan saya akan dijaga kerahasiaannya.</p>	

Saya setuju bahwa data yang dikumpulkan dari saya dalam bentuk anonym disimpan dan digunakan untuk penelitian yang relevan di masa mendatang.	
Saya memahami bahwa bagian tertentu dari data yang dikumpulkan selama penelitian dapat dilihat oleh auditor dari University of Leeds jika relevan dengan keikutsertaan saya dalam penelitian ini. Saya memberikan izin kepada orang-orang ini untuk memiliki akses ke catatan saya.	
Saya setuju untuk berpartisipasi dalam observasi	
Saya setuju untuk memberi tahu peneliti utama jika detail kontak saya berubah.	

Nama peserta	
Tanda tangan peserta	
Tanggal	
Nama peneliti utama	Ririn Wulandari
Tanda tangan	
Tanggal*	

<i>Judul Penelitian</i>	<i>Tipe dokumen</i>	<i>Versi#</i>	<i>Tanggal</i>
Pengalaman, Pengetahuan dan Pemahaman Wanita dan Tenaga Kesehatan tentang Diabetes Melitus Gestasional (DMG) di Indonesia: Single Case Studi (no ref: HREC 20-018)	Lembar Persetujuan Observasi	1.3	

Appendix T: Example of interview guide (for midwives)

Demographic Data

Respondent's initial/code :
Age (in years) :
Job Experience (in years) :
Gender :
Professional Qualification :
Date of data collection :

Topic Interview Guide

Introduction:

Thank you for your participation in this interview. My name is Ririn Wiulandari a PhD student at University of Leeds and I am the researcher of this study. I am interviewing you to understand your experience on managing Gestational Diabetes as well as your knowledge and understanding about this issue. There are no right or wrong answers to any of my questions, so it is very important to say what you feel or think, rather than what you think I want to hear.

Participation in this study is voluntary and all your information that is given to me will remain strictly confidential. No real names will appear in any reports of this study. You are free to take a break, decline to answer my questions, or stop the interview if you feel uncomfortable. We will be about one hour and the interview will be audio recorded with your consent. Before we begin the interview, I would like to check some information.

Have you fully read the participant information sheet? Yes/no

Have you signed the consent form? Yes/no

Are there any questions before we start the interview?

May I start the recorder?

Topic	Exemplar Question	Exemplar Probing Question
Expertise and clinical role	<ul style="list-style-type: none"> • How long you have been working in maternity services? 	<ul style="list-style-type: none"> • How you involved in managing women identified with GDM? • Could you please elaborate?
GDM guideline	<ul style="list-style-type: none"> • Does the site have path of care or guidelines of GDM? If yes, how does they are utilised? 	<ul style="list-style-type: none"> • What is your opinion about the guidelines? • Are you consider/think about other options/ways to manage the condition?
Experience in managing the women identified with GDM.	<ul style="list-style-type: none"> • Do you have experience in managing pregnant women with higher level of blood glucose? 	<ul style="list-style-type: none"> • How you involved in managing women identified with GDM? • Tell me more about that, please?
Midwives' role in managing GDM.	<ul style="list-style-type: none"> • How you intervene/ manage a GDM case? if he/she involve in interventions process) 	<ul style="list-style-type: none"> • What are the hinder or/and enabler to deliver these services? • How do you see your role in managing GDM? • How do you approach it?
Counselling with the women.	<ul style="list-style-type: none"> • How do you counsel the patients? 	<ul style="list-style-type: none"> • How you explain to your patients about their health issues? • How do you approach it?

<p>Recommendations to the women.</p>	<ul style="list-style-type: none"> • Can you tell me how you deliver your recommendations to women? 	<ul style="list-style-type: none"> • How you follow up your recommendations to see the progress that women made? • Can you tell me more about your experience on this?
<p>Services/ support/ facilities/ resources provided at the public health centre in helping the women with GDM.</p>	<ul style="list-style-type: none"> • Could you explain the services/ supports/ facilities/ resources provided at the public health centre in helping the women with GDM? 	<ul style="list-style-type: none"> • Do you think that the services can be done better? If yes, in what way and how?
<p>Exploring midwives' knowledge and understanding about GDM.</p>	<ul style="list-style-type: none"> • How likely it is for a pregnant woman to get GDM? 	<ul style="list-style-type: none"> • Are there What is the possibility for women to get GDM (recurrence) in the next pregnancy? • Why do you think it may/may not occur again?
<p>Perceived needs in managing GDM.</p>	<ul style="list-style-type: none"> • What are your expectations to enhance the GDM care services? 	<ul style="list-style-type: none"> • Do you have needs that should be addressed to be able to improve GDM care (resources, support, budget allocation)? • How can the health centre help you with your responsibilities?
<p>Midwives' view about women's beliefs and culture.</p>	<ul style="list-style-type: none"> • Do you think that women have specific beliefs and culture related to GDM? 	<ul style="list-style-type: none"> • How do you assess the beliefs and culture related GDM of the patients?

		<ul style="list-style-type: none"> • Could you tell me more?
Closing question.	<ul style="list-style-type: none"> • What did you feel was the most important thing we talked about today, and why? 	<ul style="list-style-type: none"> • Is there any information you want to tell?

Closing:	Add (✓)
Ask the participant if they have questions about the study/interview	
Check the participant's contact details	
Let the participant know how they can contact the researcher to keep them updated about the study	
Thank the participant for their time	

Appendix U: Example of interview guide (for women)

Demographic Data

Respondent's initial/code :
Age (In Years) :
History of Diabetes :
Family member with Diabetes :
Weight (in Kg) :
Height (in Cm) :
Date of data collection :

Topic Interview Guide

Introduction:

Thank you for your participation in this interview. My name is Ririn Wiulandari a PhD student at the University of Leeds and I am the researcher of this study. I am interviewing you to understand your experience, knowledge and understanding about a slight increase in blood glucose during your pregnancy. There are no right or wrong answers to any of my questions, so it is very important to say what you feel or think, rather than what you think I want to hear.

Participation in this study is voluntary and all your information that is given to me will remain strictly confidential. No real names will appear in any reports of this study. You are free to take a break, decline to answer my questions, or stop the interview if you feel uncomfortable. We will be about one hour and the interview will be audio recorded with your consent. Before we begin the interview, I would like to check some information.

Have you fully read the participant information sheet? Yes/no

Have you signed the consent form? Yes/no

Are there any questions before we start the interview?

May I start the recorder?

Topic	Exemplar Question	Exemplar Probing Question
Experiences on knowing the condition (GDM)	<ul style="list-style-type: none"> • After knowing that your blood glucose slightly increase, is there any changes in your daily life? 	<ul style="list-style-type: none"> • How did you feel when you first heard of a diagnosis of GDM? • Can you explain how it feels to have this condition?
Experiences on testing and diagnosis	<ul style="list-style-type: none"> • How you are referred to health centre to be tested for GDM? 	<ul style="list-style-type: none"> • Are there things that you see as obstacles in the series of processes mentioned above? • Is there anything else that hinder you from getting the test?
Experience on interventions	<ul style="list-style-type: none"> • How you maintain the glucose levels? 	<ul style="list-style-type: none"> • Can you explain how you maintain your diet? • Did you face any challenges?
Supports	<ul style="list-style-type: none"> • Do you get any support from family/ friends/ colleagues/ community/ healthcare professionals in managing your condition? 	<ul style="list-style-type: none"> • How does your family/ friends/ colleagues/ community/ healthcare professionals support you? • Is there any other supports you received from society?
Knowledge and Understanding about GDM overview	<ul style="list-style-type: none"> • What is GDM in your view? 	<ul style="list-style-type: none"> • Are there any signs that indicate someone has GDM? • Can you tell me more about that?
Understanding about testing and diagnosis	<ul style="list-style-type: none"> • When is the right time for women to get a GDM test? 	<ul style="list-style-type: none"> • What happens if a woman is not tested for GDM? • Can you tell me about your views on this?
Understanding about Interventions	<ul style="list-style-type: none"> • What things can women do to improve their pregnancy outcomes? 	<ul style="list-style-type: none"> • What kind of diet should pregnant women with GDM do? • How do you cope with the condition?
Understanding about Consequences	<ul style="list-style-type: none"> • What consequences might women face with GDM? 	<ul style="list-style-type: none"> • Are there long-term effects that women should be aware of?

		<ul style="list-style-type: none"> • Have you heard about any impacts caused by this condition?
Needs	<ul style="list-style-type: none"> • What are your needs regarding GDM? 	<ul style="list-style-type: none"> • Which are the need you consider as the most important? • Is there anything you want to receive as supports from people?
Expectation	<ul style="list-style-type: none"> • What kind of care do you expect from healthcare professionals? 	<ul style="list-style-type: none"> • How healthcare professionals behave towards the patient in terms of GDM services? • What do you really want from healthcare professionals?
Concerns	<ul style="list-style-type: none"> • What are your concerns regarding GDM? 	<ul style="list-style-type: none"> • Do you have fears caused by GDM in your pregnancy? • Can you tell me more about that?
Beliefs and cultures	<ul style="list-style-type: none"> • What are your beliefs and cultures related to GDM? 	<ul style="list-style-type: none"> • How healthcare professionals addressed these issues? • Can you tell me about people's habit related to this condition?
Counselling	<ul style="list-style-type: none"> • How healthcare professionals advise or guide you on your GDM issues? 	<ul style="list-style-type: none"> • How do healthcare professionals explain to you about your health issues? • How is it discussed?
Closing question.	<ul style="list-style-type: none"> • What did you feel was the most important thing we talked about today, and why? 	<ul style="list-style-type: none"> • Is there any information you want to tell?

Closing:	Add (√)
Ask the women if they have questions about the study/interview	
Check the women's contact details	
Let the women know how they can contact the researcher to keep them updated about the study	
Thank the women for their time	

Appendix V Consent contact form

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hello

I am Ririn Wulandari, a PhD student of University of Leeds, UK. Currently I am doing a study titled "Women and Healthcare Professionals' Experience, Knowledge and Understanding of Gestational Diabetes Mellitus (GDM) in Indonesia: A Single Exploratory Case Study". I am recruiting women and healthcare professionals to participate in this study.

☎ 081367247294 ✉ ririnkadarusno@gmail.com

Contact Permission

Name : _____
Address : _____
Phone Number : _____
Email : _____

I agree to be contacted by the researcher in order to get more information about the study.

Appendix W Ethics approval

Monday, September 11, 2023 at 18:08:37 British Summer Time

Subject: <no subject>

Date: Tuesday, 03 August 2021 14.06.16 British Summer Time

From: Ririn Wulandari

Dear Ririn

HREC 20-018 - 'Women and Healthcare Professionals' Experience, Knowledge and Understanding of Gestational Diabetes Mellitus (GDM) in Indonesia: A Single Exploratory Case Study.

NB: All approvals/comments are subject to compliance with current University of Leeds and UK Government advice regarding the Covid-19 pandemic.

I am pleased to inform you that the above research ethics application has been reviewed by the School of Healthcare Committee and on behalf of the Chair, I can confirm a favourable ethical opinion based on the documentation received at date of this email.

Please note below comments for consideration from reviewers:

- Applicant will need to change the fieldwork dates to reflect the date approval is given.

Please retain this email as evidence of approval in your study file.

Please notify the committee if you intend to make any amendments to the original research as submitted and approved to date. This includes recruitment methodology; all changes must receive ethical approval prior to implementation. Please see <https://ris.leeds.ac.uk/research-ethics-and-integrity/applying-for-an-amendment/> or contact the Research Ethics Administrator for further information (FMHUniEthics@leeds.ac.uk) if required.

Ethics approval does not infer you have the right of access to any member of staff or student or documents and the premises of the University of Leeds. Nor does it imply any right of access to the premises of any other organisation, including clinical areas. The committee takes no responsibility for you gaining access to staff, students and/or premises prior to, during or following your research activities.

Please note: You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, risk assessments and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes. You will be given a two week notice period if your project is to be audited.

It is our policy to remind everyone that it is your responsibility to comply with Health and Safety, Data Protection and any other legal and/or professional guidelines there may be.

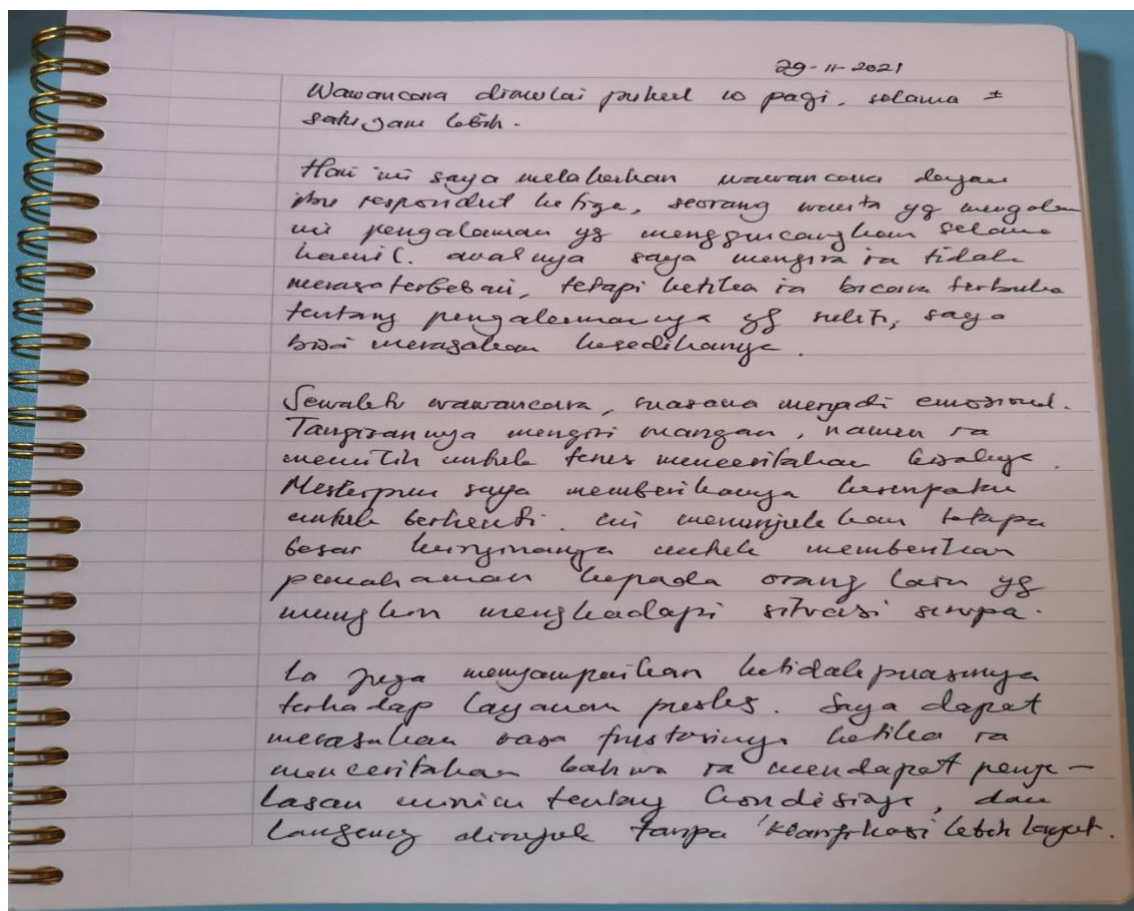
I hope the study goes well.

Best wishes

George

On behalf of Helen Convey, Chair, SHREC

Appendix X: Example of field-notes after interview



Translation: the interview began around 10 am, and lasts for more than one hour.

Today, I had an interview with the third women participant, a woman who experienced a shocking experience while pregnant. initially, I thought she had not any concerns as she appeared relaxed. However, when she shared openly about her difficult journey, I could feel her misery.

During the interview, the atmosphere became very emotional. Her cries filled the room, but she chose to continue telling her story, even though I gave her the opportunity to stop. This shows how willing she is to provide understanding to others who may be facing a similar situation.

She also expressed her dissatisfaction with the services she received at the health centre. I could feel her frustration when she said that she did not receive any explanation regarding her condition, and was immediately referred without further clarification.

Appendix Y Observation schedule

Descriptive observation

OBSERVATION SCHEDULE

Name of healthcare professionals:

Name of woman:

Date of observation:

Location:

Dimensions that will be observed

SPACE	SPACE Can you describe in detail all the <i>places</i>	OBJECT What are all the ways space is organised by objects	ACT What are all the ways space is organised by acts	ACTIVITY What are all the ways space is organised by activities	EVENT What are all the ways space is organised by events	TIME What spatial changes over time	ACTOR What are all the ways space is used by actors	GOAL What are all the space is related to goals	FEELING What places are associated with feelings
OBJECT	Where are objects located	Can you describe in detail all the <i>objects</i>	What are all the ways objects are used in acts	What are all the ways objects are used in activities	What are all the ways that objects are used in events	How are objects used in different tome?	What are all the ways objects are used by actors	How are objects used in seeking goals?	What are all the ways objects evoke feelings?
ACT	Where do acts occur?	How do acts incorporate the use of objects?	Can you describe in detail all the <i>acts</i> ?	How are acts a part of activities?	How are acts a part of events?	How do acts vary over time?	What are the ways acts performed by actors?	What are all the ways acts are related	What are all the ways acts are linked to feelings?

								to goals?	
ACTIVITY	What are all the places activities occur?	What are all the ways activities incorporate objects?	What are all the ways activities incorporate acts?	Can you describe in detail all the activities	What are all the ways activities are part of events?	How do activities vary at different time?	What are the ways activities involve actors?	What are the ways activities involve goals?	How do activities involve feelings?
EVENT	What are all the places events occur?	What are all the ways events incorporate objects?	What are all the ways events incorporate acts?	What are all the ways events incorporate activities?	Can you describe in detail all the events	How do events occur overtime? Is there any sequencing?	How do events involve the various actors?	How are events related to goals?	How do events involve feelings?
TIME	Where do time periods occur?	What are all the ways times affect objects?	How do acts fall into time periods?	How do activities fall into time periods?	How do events fall into time period?	Can you describe in detail all the time periods	When are all the time actors are 'on stage'?	How are goals related to time period?	When are feelings evoked?
ACTOR	Where do actors place themselves?	What are all the ways actors use objects?	What are all the ways actors use acts?	How are actors involve in activities?	How are actors involve in events?	How do actors changed overtime or at different times?	Can you describe in detail all the actors	Which actors are linked to which goals?	What are the feelings experience by actors?
GOAL	Where are goals are	What are all the ways goals involve	What are all the ways goals	What activities are goal seeking or	What are all the ways events	Which goals are scheduled	How do the various goals	Can you describe in detail	What are all the ways goals

	sought and achieved?	use of objects?	involve acts?	linked to goals?	are linked to the goals?	for which times?	affect various actors?	all the <i>goals</i>	evoke feelings?
FEELING	Where do the various feeling states occur?	What feelings lead to the use of what objects?	What are all the ways feelings affect acts?	What are all the ways feelings affect activities?	What are all the ways feelings affect events?	How are feelings related to various time periods?	What are all the ways feelings involve actors?	What are all the ways feelings influence goals?	Can you describe in detail all the <i>feelings</i>

- Highlighted in yellow is the area that the researcher might focus on.

Observer note