# A systematic review of gestational diabetes mellitus

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## Abstract

The metabolic disease known as gestational diabetes mellitus (GDM) is becoming more and more common. It is characterized by glucose intolerance that is initially identified in pregnant women who have never had diabetes before. The data from meta-analyses, systematic reviews, and empirical studies published between 2005 and 2025 are combined in this review to give a thorough picture of the epidemiology, pathophysiology, diagnostic procedures, outcomes for mothers and newborns, and treatment approaches of GDM. The prevalence of GDM is a major public health concern, with estimates varying from 3.8% to 17.8% in India and from 1-4 percent worldwide in parts of Europe to over 20% in South-East Asia. Dietary practices, obesity, PCOS, genetic predispositions, and advanced maternal age are all contributing factors. The review emphasizes the need for consistent screening procedures and point out the wide range of differences in diagnostic criteria, especially between WHO, ADA, IADPSG, and DIPSI standards. Along with neonatal risks like macrosomia, hypoglycemia, and long-term vulnerability to type 2 diabetes and obesity, it also examines the connection between GDM and serious maternal complications like pre-eclampsia and cesarean delivery. There is evidence that early screening (before 20 weeks) may reduce negative outcomes, but disparities in access and initiation of treatment still exist. Pregnant women face emotional and financial challenges, particularly in environments with limited resources, according to studies. A significant gap in integrated care models and culturally appropriate education still exists, despite increased clinical awareness. As a predictor of long-term metabolic risk, GDM is reaffirmed in this review, which also supports

multidisciplinary interventions, early prevention techniques, and policy-level changes to guarantee fair and efficient management.

**Keywords:** Gestational diabetes mellitus, metabolic disease, pregnant women, GDM, Public health, type 2 diabetes.

## Introduction

In women without a history of diabetes, newly diagnosed glucose intolerance during pregnancy is a hallmark of gestational diabetes mellitus (GDM), a metabolic disease. It usually manifests in the second or third trimester and occurs when the physiologic increase in insulin resistance caused by placental hormones like estrogen, cortisol, and human placental lactogen is not met by pancreatic β-cell insulin secretion(**Mittal et al., 2025**). In addition to a rise in maternal age and obesity, the growing prevalence of GDM is also a result of a wider use of more accurate diagnostic techniques. About 16 percent of pregnancies worldwide are affected by GDM, which contributes to the 21.1 million live births that occur each year with some kind of pregnancy-related hyperglycemia, of which about 80 percent are caused by GDM(**Makasheva et al., 2024**). The prevalence differs greatly depending on the region and diagnostic criteria; it can range from 1–4% in some European countries to more than 20% in South-East Asia and some Gulf countries. Estimates in India vary by region and screening method, ranging from 3.8% to 17.8%; nonfasting DIPSI criteria (cut-off 140 mg/dL post 75 g glucose) are still widely used. GDM prevalence in Europe is estimated by meta-analyses to be approximately 10.9% overall, with rates as high as 31.5% in Eastern Europe(**Rohini et al., 2023**). Maternal hyperglycemia results from insulin resistance surpassing β-cell reserve, which is exacerbated by placental hormones and obesity. This leads to GDM. The molecular mechanisms that have been implicated include low adiponectin, high leptin, TNF α, and IL 6, reduced GLUT 4 translocation, increased free fatty acids, and disruptions in insulin receptor substrate (IRS 1) signaling(**Wang et al., 2000**). A personal or family history of diabetes, PCOS, obesity, advanced maternal age, and ethnicity are significant risk factors. Dietary habits, especially a high consumption of processed meats and saturated fats, also play a role by encouraging inflammation and β-cell dysfunction. The effects of GDM on public health are significant. The risk of pre-eclampsia, Caesarean delivery, and type 2 diabetes in the future is increased for mothers with GDM; within 10 to 20 years after giving birth, up to 50% of

women will develop diabetes. Maternal hyperglycemia can cause fetal hyperinsulinemia, which can affect the fetus and child. This can result in macrosomia, birth trauma, neonatal hypoglycemia, and long-term risks of obesity and metabolic syndrome. This phenomenon is known as "metabolic imprinting." The associations were firmly established by the groundbreaking Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study. Organizations like WHO, ADA, IADPSG, ACOG, and DIPSI in India are the source of the current diagnostic criteria. Disparities in screening procedures and timing persist in spite of these recommendations. Recent research, including a review published in the Lancet, indicates that screening earlier than the typical 24-28 week period may have advantages, as early detection has been associated with better outcomes for both the mother and the fetus.

## Objectives

- To conduct a systematic review of gestational diabetes mellitus (GDM).

## Research methodology

This review study used a quantitative (secondary) data-based methodology, drawing on systematic reviews, peer-reviewed articles, and meta-analyses from databases like Google Scholar, PubMed, Scopus, and ShodhGanga. A thorough synthesis of the body of research to find trends, gaps, and results was ensured by the selection process, which concentrated on published empirical studies addressing gestational diabetes mellitus.

## Review of previous studies

**(Le et al., 2025)** Gestational diabetes mellitus (GDM) incidence in India is well-documented, but regional variations are scarce. Thus, many pregnant women receive unnecessary diagnoses. This meta-analysis and systematic review collected data from all Indian regions to better understand gestational diabetes mellitus (GDM) in pregnant women. Only 110 of 23,393 articles from PubMed, Scopus, Google Scholar, and ShodhGanga were eligible for inclusion, so 117 prevalence estimates were derived. Using an inverse square heterogeneity model, GDM prevalence was 13% (95% CI: 9-16%). The Diabetes in Pregnancy Study of India (DIPSI) mostly followed WHO and IADPSG diagnostic criteria from 1999. Urban GDM prevalence was 12% (9-16%, $I^2 = 99\%$) while rural areas had a much lower prevalence of 10% (6-13%, $I^2 = 96\%$). According to the review, non-standardized screening and diagnostic methods cause prevalence rates to vary by state in India.

Discussions include feasibility, cost-effectiveness, population and geographic variation, screening timing, and methods that do not require fasting. States should implement consistent screening programs to improve maternal and newborn health and promote healthier pregnancies.

**(Mantri et al., 2024)** A lot of pregnant women get false positive results for gestational diabetes mellitus (GDM) because there isn't enough data on regional prevalence estimates in India, even though there's a lot of literature on the subject. In this meta-analysis and systematic review, quantitative studies published between January 1, 2020, and June 15, 2022, were sourced from PubMed, Scopus, Google Scholar, and ShodhGanga. The aim was to determine the frequency of gestational diabetes mellitus (GDM) among pregnant women in India. We included 110 papers out of 2,393 that met our inclusion criteria; these articles offered 117 prevalence estimates. A pooled estimate using the Inverse Square Heterogeneity Model found GDM prevalence at 13% (95% CI: 9-16%). When diagnosing, the 1999 World Health Organization and International Association of Diabetes and Pregnancy Study Groups (IADPSG) recommendations were second only to DIPSI results. Roughly 10% of people living in rural areas had GDM, compared to 12% in urban areas (9-16%). Demographics, location, diagnostic criteria, screening timing, fasting status, cost-effectiveness, and GDM diagnostic procedures may affect prevalence rates. India's states should implement uniform screening protocols to improve mother-child outcomes and pregnancy health.

**(Simmons et al., 2023)** A randomized controlled trial looked at the effects on mother and baby outcomes of treating gestational diabetes mellitus (GDM) prior to 20 weeks of pregnancy. One group of pregnant women with WHO 2013-diagnosed gestational diabetes mellitus (GDM) and risk factors for hyperglycemia received immediate treatment, while the other received deferred or no treatment based on repeat oral glucose tolerance test (OGTT) results at 24-28 weeks. The study's main outcomes were neonatal lean body mass, pregnancy-related hypertension, and adverse neonatal events. There were 802 women enrolled in the study; 793 (98.9%) had follow-up data available, divided between 406 in the immediate-treatment group and 396 in the control group. On average, 15.6 weeks of gestation was the time when the first OGTT was performed. Early treatment showed a slight advantage, with 24.9% of the immediate-treatment group experiencing adverse neonatal outcomes compared to 30.5% in the control group (adjusted risk difference −5.6 percentage points; 95% CI, ∉10.1 to −1.2). Serious adverse events were not

significantly different, but the rates of hypertension during pregnancy were (10.6% vs. 9.9%) and the mean neonatal lean body mass (2.86 kg vs. 2.91 kg) were quite similar. There were no significant changes in maternal hypertension or newborn body composition, but starting GDM treatment before 20 weeks may improve neonatal outcomes.

**(Vinoth, 2023)** There are negative effects on both the mother and the baby caused by gestational diabetes mellitus (GDM), which is characterized by impaired glucose tolerance that is first noticed during pregnancy. This condition is becoming more common as a result of factors such as increased urbanization, sedentary lifestyles, lack of physical activity, and changes in diet. This cross-sectional study measured the prevalence of gestational diabetes mellitus (GDM) in 164 pregnant women. Prenatal screenings included a 50 g glucose challenge test and, if needed, a 75 g oral glucose tolerance test administered at different points throughout the pregnancy. An association between GDM and maternal age over 25 years, BMI greater than 25 kg/m², family history of diabetes, previous history of GDM, and history of delivering large for gestational age (LGA) babies was found; however, there was no significant association with parity. The study found a prevalence of GDM of 23.78%. A higher incidence of complications like pre-eclampsia and polyhydramnios was also observed in GDM cases. The study recommends routine GDM screening and the establishment of dedicated diabetic antenatal clinics staffed with counselors and diabetologists as a means to increase awareness of the need for early screening and glucose control during pregnancy in order to reduce the risk of adverse outcomes.

**(Wicklow & Retnakaran, 2023)** The traditional view of gestational diabetes mellitus (GDM) is that it is a medical problem during pregnancy and an indicator of the future risk of type 2 diabetes mellitus (T2DM) in the mother. An increasing amount of research in the last several decades has shown that type 2 diabetes has additional long-term consequences beyond just an increased risk of developing cardiovascular disease. Even before a pregnancy with gestational diabetes mellitus (GDM) is detected, there are risk factors that contribute to this lifetime cardiovascular risk. So, the prevailing idea derived from these numbers is that gestational diabetes mellitus (GDM) diagnoses women who are already at an increased risk of cardiometabolic complications from a young age. New evidence from studies of children born to mothers with diabetes during complicated pregnancies suggests that this cardiometabolic risk profile may have its origins in utero and may not become clinically apparent until childhood. Because of this shift in thinking, gestational

diabetes mellitus (GDM) is now considered a chronic metabolic disorder with effects that follow the mother and child throughout their lives.

**(Nakshine & Jogdand, 2023)** The health effects of gestational diabetes mellitus (GDM) on mothers and children are examined in this review. Pregnant women without diabetes develop gestational diabetes mellitus from chronic hyperglycemia. Disrupted glucose tolerance from pancreatic beta cell dysfunction and chronic insulin resistance causes most hyperglycemia. Diabetes in the family, obesity, and an older mother are risk factors for gestational diabetes mellitus. Gestational diabetes mellitus (GDM) causes macrosomia, type 2 diabetes, maternal CVD, and delivery issues. Future obesity, type 2 diabetes, and cardiovascular disease are also risks for the infant. GDM can cause shoulder dystocia, birth hypoglycemia, and premature birth. Currently, diet and exercise changes are the only ways to treat or prevent GDM. Insulin therapy is rarely effective due to insulin resistance. Oral diabetes drugs like glyburide and metformin have shown promising results, but long-term safety for mother and child is uncertain. Identification of research gaps calls for more research and a multidisciplinary approach to improve GDM care and management for women. A situation like this would affect them.

**(Pham et al., 2022)** Pregnant women with gestational diabetes mellitus (GDM) have an increased need for healthcare, and there is an increasing amount of empirical research that investigates their healthcare experiences. Finding research gaps, mapping existing findings, and analyzing study methods were the goals of this scoping review. Studies that included first-hand narratives of participants' healthcare experiences and were specifically focused on GDM were chosen through a systematic search that was conducted in September 2021 across multiple databases. Descriptive statistics and theme analysis were used to examine data extracted from 57 research. Urban areas of high-income countries were the most common settings for these studies, and the majority of the studies involved clinical settings and used qualitative methods without solid theoretical foundations. Women frequently encountered a lack of information, considered healthcare provider support essential, and had different reactions to prescribed diets, medications, and monitoring procedures, according to the review. There was a lot of shared emotional and financial pain as well. All things considered, the review provided a global perspective synthesis, drawing attention to commonalities and differences in healthcare experiences related to GDM.

**(Ye et al., 2022)** This meta-analysis and systematic review examined GDM and poor pregnancy outcomes after controlling for confounders. Cohort and control trials of GDM pregnancy complications were included. PubMed, Medline, Web of Science, and Cochrane Database of Systematic Reviews (1990–2021) provided data. The studies classified insulin use as no, used, or not reported. A meta-regression used insulin treatment proportions, and subgroup analyses considered study quality, diagnostic criteria, screening methods, and country development status. 32.1% of 7,506,061 pregnancies in 156 studies had low or medium bias. Non-insulin users with gestational diabetes had more macrosomia, large-for-gestational-age infants, preterm birth, low one-minute Apgar scores, and cesarean sections. Pregnancy diabetes increased the risk of respiratory distress syndrome, neonatal jaundice, large-for-gestational-age infants, and NICU admissions. Instrumental delivery, stillbirth, postpartum hemorrhage, low birth weight, and neonatal death were not significantly different after confounder adjustment. Different screening methods, BMI adjustments, and countries affected studies. GDM was significantly associated with multiple unfavorable pregnancy outcomes, emphasizing the need to control for many prognostic factors in future studies.

**(Modzelewski et al., 2022)** Gestational diabetes mellitus (GDM), a condition characterized by hyperglycemia detected during pregnancy, is the leading cause of maternal complications. Gestational diabetes mellitus (GDM) affects 1 in 15 pregnancies, equaling 18 million births annually. GDM mothers risk hypertension, preeclampsia, and cesarean sections. Additionally, gestational diabetes mellitus increases the risk of cardiovascular disease, obesity, and impaired carbohydrate metabolism, which can lead to type 2 diabetes in both mother and child. Growing GDM rates require more attention and education because they are costly. Understanding risk factors and pathogenesis, especially SARS-CoV-2 and diagnostics, can reduce perinatal and metabolic complications. Effective treatment for these issues is needed. Type 2 gestational diabetes treatment focuses on diet and exercise. Adding insulin, glibenclamide, and metformin improves treatment. This article summarizes recent GDM epidemiology, etiology, diagnosis, and treatment studies.

**(Prabhu J et al., 2021)** Gestational diabetes mellitus (GDM) is spread worldwide, with alarming rates in Southeast Asia. It threatens future generations. In this cross-sectional study, pregnant women at a semi-urban tertiary care hospital were assessed for GDM knowledge. An 18-item

validated questionnaire was given to 200 participants to assess general knowledge, risk factors, screening, treatment, and GDM's immediate and future effects. Knowledge scores were categorized as good (>12), fair (7-12), and poor (≤6). According to the results, 46% of participants knew diabetes can start during pregnancy, 51.5% knew well, 34% knew fair, and 14.5% knew poorly. Only 34.5% knew that all pregnant women should be tested for gestational diabetes, even though most knew that being overweight or having a family history of diabetes were risk factors. There was 30-50% knowledge of neonatal and fetal complications. Education level and family history of diabetes were associated with better diabetes knowledge (P = 0.0002 and P = 0.03 respectively). According to the study, grassroots healthcare workers should educate rural pregnant women and non-graduate populations about gestational diabetes mellitus (GDM) and its effects on mother and child.

**(Choudhury & Devi Rajeswari, 2021)** The serious risk and negative health effects of Gestational Diabetes Mellitus (GDM) have prompted much research into maternal health issues. During pregnancy, GDM is the most common health issue. The most common metabolic disease can affect 25% of pregnant women. The health of the mother and her unborn child is delicate during pregnancy. Diabetes and cancer are acknowledged as the leading causes of death worldwide. Breast cancer (BC) is more likely in diabetic women. Reproductive diseases affect diabetic women as much as others. Diabetes-related reproductive dysfunctions are caused by PCOS, obesity, hyperinsulinemia, etc. Women who are pregnant or breastfeeding are disproportionately affected by diabetes, and India has long been known as the diabetes capital of the world. At least 33% of Indian GDM patients had a mother with diabetes. Gestational diabetes increases the risk of cardiometabolic complications in both mother and child, according to new research. GDM challenges 21st-century healthcare providers. Due to recent advances in GDM prevention, prevalence, and prognosis, we plan to study how diabetes affects reproductive function in women at different life stages.

**(McIntyre et al., 2019)** Despite 50 years of recognition of pregnancy-related hyperglycemia, "gestational diabetes mellitus" (GDM) and its treatment are still debated. The most common pregnancy complication is gestational diabetes mellitus (GDM), and young women are developing undiagnosed hyperglycemia and diabetes. Women's weight, age at conception, ethnicity, family history, and personal experiences increase gestational diabetes risk. Although OGTTs are the best

diagnostic tool, some areas use non-fasting glucose challenge tests (GCTs) to identify women who don't need them. Exercise and diet treat type 1 gestational diabetes. Insulin is used without normoglycemia. Oral hypoglycaemia is treated mostly with metformin and glibenclamide (glyburide) in some countries With treatment, obesity, pregnancy-related hypertension, and excessive foetal growth decrease. Obesity, glucose metabolism issues, and cardiovascular disease are linked to gestational diabetes. In most areas, preventive measures make long-term mother-infant management difficult. Gestational diabetes is the most common pregnancy complication. Both mother and child suffer immediately and long-term. Introduction to type 2 diabetes: definitions, diagnostic criteria, treatment options, and research gaps.

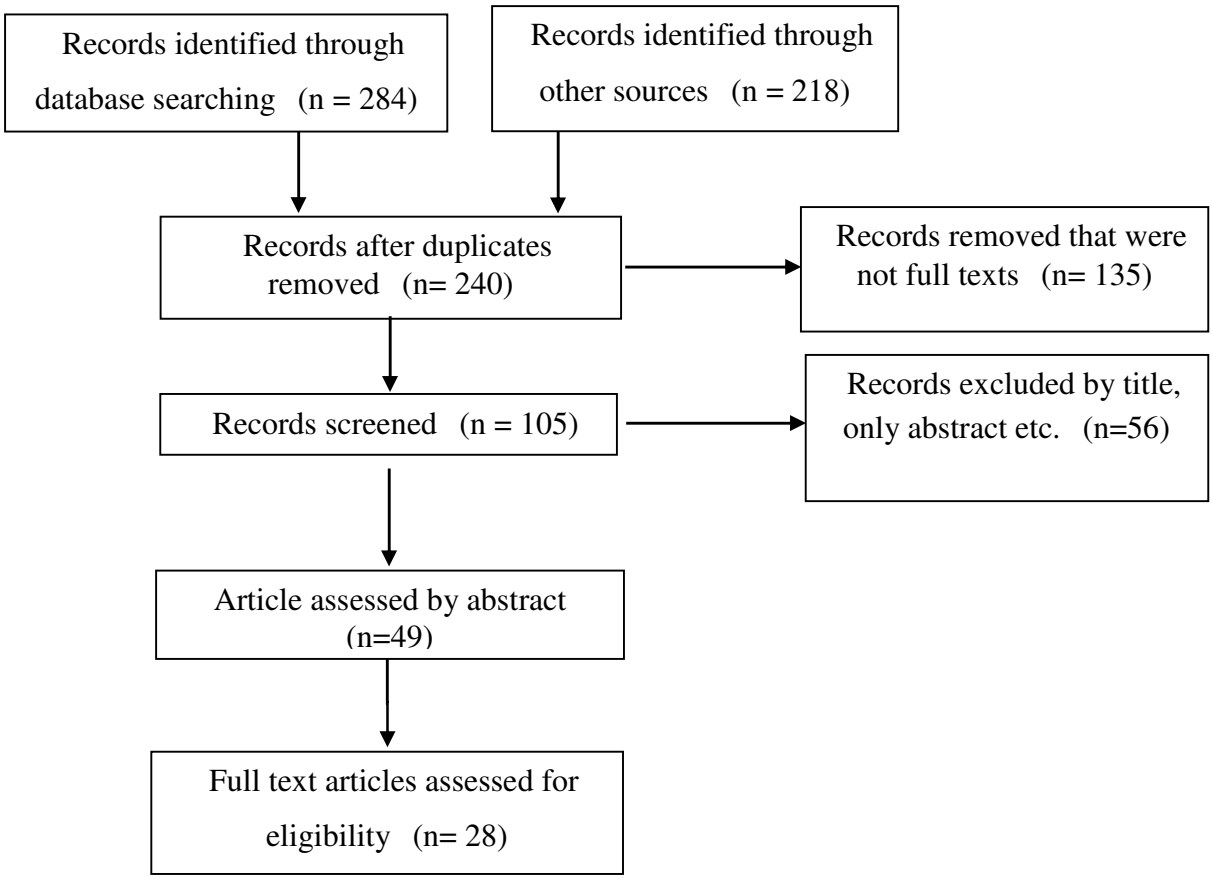
**(Plows et al., 2018)** Chronic hyperglycemia in non-diabetic pregnant women causes gestational diabetes mellitus (GDM). High blood sugar is often caused by improper pancreatic β-cell function, resulting in impaired glucose tolerance and chronic insulin resistance. Pregnancy-related diabetes is more likely in overweight or obese mothers, older mothers, and those with a family history of diabetes. GDM can cause maternal cardiovascular disease, type 2 diabetes, macrosomia, and neonatal issues. Children may develop obesity, diabetes type 2, and heart disease. GDM affects 16.5% of pregnancies worldwide, and the obesity epidemic is expected to increase that frequency. Management methods include insulin and lifestyle changes, but there is no cure or effective prevention method. Difficulties in understanding GDM's molecular mechanisms contribute. This review covers GDM pathophysiology and literature gaps.

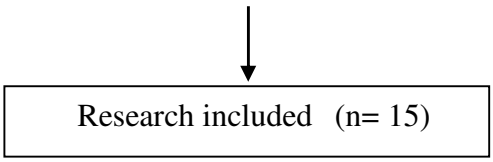
**(Makwana et al., 2017)** Diabetes in pregnant women is rising due to older maternal age, higher BMI, more pregnancies, a family history of the disease, inactivity, diet changes, and immigration. Asymptomatic gestational diabetes mellitus (GDM) is most often detected by regular pregnancy screenings. According to research from Dr. S.N. Medical College's Departments of Medicine and Obstetrics and Gynecology in Jodhpur, Rajasthan, 7.98% of 476 pregnant women at Umaid Hospital had gestational diabetes. Incident rates increased with maternal age, especially among women 30 and older (10.71%), higher parity (>G5, 12.5%), lower socioeconomic status, and city dwellers. GDM was more common in women with pregnancy-induced hypertension (36.36%), family diabetes (33.3%), previous GDM (12.12%), perinatal loss (15.15%), congenital anomalies (9.09%), or a high BMI (67%). GDM increased the prevalence of PIH (36.4%), polyhydramnios (27.2%), vaginal candidiasis (24.2%), and UTIs (39.3%), among other pregnancy complications.

Infants whose diabetic mothers failed to control their blood sugar had hypoglycemia (32.29%), respiratory distress (26.47%), macrosomia (32.35%), congenital anomalies (23.53%), birth injuries (14.70%), polycythemia (8.82%), and hypocalcemia. The results confirm that GDM is a major obstetric concern with significant feto-maternal morbidity, especially in cases of inadequate maternal glycaemic control.

**(Buchanan & Xiang, 2005)** In pregnant women, glucose intolerance of varying degrees is first identified as gestational diabetes mellitus (GDM). Clinical risk factor screening during pregnancy and testing for abnormal glucose tolerance, which is often but not always mild and asymptomatic, are the two main ways that gestational diabetes mellitus (GDM) is identified. Similar to the wide range of non-pregnancy-related physiological and genetic abnormalities that define diabetes, GDM seems to have a similar etiology. True, gestational diabetes mellitus increases a woman's risk of developing diabetes even when she isn't pregnant. As a result, GDM offers a once-in-a-lifetime chance to learn about the foundational processes that lead to diabetes and to create treatments to stave it off.

## Prisma chart






## Discussion

Gestational diabetes mellitus (GDM) is a complicated and multidimensional health problem that has a major impact on the outcomes of both the mother and the fetus, according to a systematic review of research on the condition. The increasing incidence of GDM worldwide, especially in South-East Asia and India, highlights a serious public health concern that is fueled by genetic predispositions, advanced maternal age, obesity, and lifestyle changes. According to the meta-analyses by Le et al. (2025) and Mantri et al. (2024), the pooled prevalence of GDM in India was estimated to be around 13% based on the reviewed studies; however, regional disparities are still noticeable because of non-standardized diagnostic criteria and inconsistent screening practices. These results underline the pressing need for standardized nationwide screening procedures and education initiatives catered to both urban and rural communities. There is evidence from studies like Vinoth (2023) and Simmons et al. (2023) that neonatal complications can be decreased by early detection and intervention, especially if treatment is started before the typical 24-28-week mark. More longitudinal and randomized control trials are necessary because there is still uncertainty about how early treatment affects maternal hypertension and neonatal body composition. The traditional view of GDM as a temporary pregnancy ailment is contested by Wicklow & Retnakaran (2023), who present it as a sign of chronic metabolic dysfunction with long-term consequences for both the mother and the unborn child. Studies showing intergenerational effects, such as metabolic imprinting that predisposes children to obesity, type 2 diabetes, and cardiovascular diseases, lend additional credence to this paradigm shift. Furthermore, the prevalence and consequences of GDM are influenced by cultural beliefs, dietary practices, socioeconomic status, and the availability of healthcare. Women's healthcare experiences and knowledge gaps are highlighted in studies like Pham et al. (2022) and Prabhu et al. (2021), especially in lower-income and semi-urban areas. These studies highlight the importance of community health workers, prenatal counseling, and culturally sensitive educational programs by exposing the emotional, financial, and informational difficulties faced by expectant mothers.

Crucially, timely intervention is still hampered by a lack of knowledge about the long-term consequences of GDM and the need for routine screening, particularly in populations with limited access to healthcare or literacy. Clinically, GDM is linked to serious maternal and neonatal complications, from preeclampsia, macrosomia, and cesarean delivery to neonatal jaundice, hypoglycemia, and NICU admissions, according to data from studies like Ye et al. (2022) and Modzelewski et al. (2022). However, there is an urgent need for methodological standardization given the variation in results across studies caused by methodological differences, such as sample populations, diagnostic criteria, and confounding adjustments. Additionally, there are still few treatment options available, which frequently involve insulin or oral hypoglycemics like metformin along with lifestyle changes. There are still concerns regarding the long-term safety of pharmaceutical interventions, particularly in the early stages of pregnancy, despite some encouraging findings. Crucially, the review highlights important research gaps, especially with regard to low-resource and rural settings where GDM may go undiagnosed or be mismanaged. There is increasing agreement that a multidisciplinary approach—combining endocrinology, obstetrics, nutrition, and public health—is essential for improving outcomes, as suggested by Nakshine & Jogdand (2023) and McIntyre et al. (2019). A strategic window for early preventive interventions, which are currently underutilized, is provided by the association between GDM and the future development of type 2 diabetes in both mothers and their offspring. This review reaffirms that GDM is a substantial predictor of long-term metabolic and cardiovascular risks rather than just a temporary obstetric complication. Effective GDM management requires early screening, multidisciplinary care models, culturally sensitive public health initiatives, and consistent diagnostic procedures. Additionally, the evidence synthesis supports more research on healthcare equity, prevention, and early intervention, especially in underserved areas.

## Conclusion

Maternal and fetal outcomes are significantly impacted by gestational diabetes mellitus (GDM), a serious and expanding global public health issue that extends beyond pregnancy. Through the synthesis of a wide range of published research, meta-analyses, and clinical findings, this review has demonstrated the intricate interactions that shape the prevalence and outcomes of GDM between genetic predisposition, lifestyle, dietary practices, and access to healthcare. Preeclampsia, macrosomia, cesarean delivery, neonatal hypoglycemia, and future cardiometabolic

disorders are among the extreme maternal and neonatal complications that are linked to GDM, despite the fact that its prevalence varies by region, especially in India because of uneven screening practices. Early diagnosis and intervention are crucial, as the review emphasizes. A number of studies indicate that starting treatment before the typical 24-28-week window can reduce the risk of poor neonatal outcomes; however, more thorough, long-term studies are required to validate these results and investigate the effects on mothers. Furthermore, GDM is no longer only thought of as a temporary pregnancy-related condition; rather, it is now recognized as a sign of chronic metabolic dysfunction, which can have multigenerational health effects, such as raising the risk of type 2 diabetes and obesity in offspring. The review is significant because it emphasizes enduring differences in diagnosis, treatment, and awareness, especially in settings with limited resources. It highlights the necessity of culturally appropriate health education, community-based screening programs, standardized diagnostic guidelines, and integrated care models that include nutritionists, endocrinologists, and obstetricians. Clinical vigilance and a sustained public health commitment to reducing long-term complications are both necessary for effectively addressing GDM. In summary, in order to prevent a range of metabolic diseases, GDM needs to be reframed as a crucial window of opportunity for early intervention. This calls for a strategic, multidisciplinary, and equity-driven response from policymakers and healthcare systems.

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