A Meta-synthesis of Qualitative Research on Facilitators and Barriers to Glycemic Management in Patients with Gestational Diabetes Mellitus (Postprint)

Authors: Pan Yao, Tie-tao Di, I am sorry, but the input provided (“张瑶瑶”) appears to be a person’ s name and does not contain any ···tags or academic content to translate according to your specific instructions. Please provide the source text containing the structural tags and scientific content you wish to have translated., Chunling Zhang, Chen Lu, Wu Hexiang, Zhang Yimei, Tie-tao Di

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Abstract

Abstract

Background: In recent years, the incidence of gestational diabetes mellitus (GDM) has increased, posing a serious threat to maternal and infant health. Standardized blood glucose management can effectively improve adverse maternal and neonatal outcomes. Although current qualitative studies have explored patients’ blood glucose management behaviors and experiences in depth, they remain relatively fragmented. There is an urgent need to comprehensively understand the facilitators and barriers to blood glucose management through meta-synthesis.

Objective: To systematically integrate qualitative research on the facilitators and barriers to blood glucose management in patients with gestational diabetes mellitus, providing an evidence-based foundation for optimizing management strategies.

Methods: Qualitative research literature regarding the facilitators and barriers to blood glucose management in GDM patients was searched in PubMed, Web of Science, Embase, CINAHL, Cochrane Library, CNKI, Wanfang Data, VIP, and CBM databases from their inception to June 30, 2025. Two researchers independently evaluated the quality of the literature using the Joanna Briggs Institute (JBI) Critical Appraisal Tool for Qualitative Research. Literature screening was performed using NoteExpress software, and the results were synthesized using the meta-aggregation method.

Results: A total of 20 studies were included, from which 44 findings were extracted, categorized into 10 groups, and synthesized into 2 integrated results: facilitators, including a sense of responsibility for maternal and infant health, positive self-regulation, diversified social support, and medical support and intervention; and barriers, including endogenous cognitive impairment and exogenous stigma pressure, emotional burden and psychological adjustment difficulties, multiple practical dilemmas in pregnancy blood glucose management, an imperfect healthcare delivery system, barriers to blood glucose monitoring execution, and socioeconomic and cultural environmental challenges.

Conclusion: Blood glucose management in patients with gestational diabetes mellitus is influenced by multiple factors such as individual cognition, the healthcare system, and social support. Healthcare professionals should comprehensively improve patients' blood glucose management levels by stimulating their internal drive for self-management, strengthening cognitive and emotional interventions, and integrating diverse support resources.

Full Text

Meta-synthesis of Qualitative Research on Facilitating and Hindering Factors of Glycemic Management in Patients with Gestational Diabetes Mellitus

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Abstract

Background: In recent years, the rising incidence of gestational diabetes mellitus (GDM) has posed a serious threat to maternal and infant health. Standardized glycemic management can effectively improve adverse outcomes. While existing qualitative studies have explored patients' management behaviors and experiences, the findings remain fragmented. A meta-synthesis is required to comprehensively understand the facilitators and barriers to effective management.

Objective: To systematically synthesize qualitative research on the promoting and hindering factors of glycemic management in GDM patients, providing an evidence-based foundation for optimizing clinical strategies.

Methods: We searched PubMed, Web of Science, Embase, CINAHL, Cochrane Library, CNKI, Wanfang Data, VIP, and CBM for qualitative studies published

from database inception to June 30, 2025. Two researchers independently evaluated study quality using the Joanna Briggs Institute (JBI) Critical Appraisal Tool for Qualitative Research. Literature screening was performed using NoteExpress, and findings were synthesized using the meta-aggregation method.

Results: Twenty studies were included, yielding 44 findings categorized into 10 themes and 2 synthesized results. **Facilitating factors** included a sense of responsibility for maternal-infant health, proactive self-regulation, diverse social support, and medical support/interventions. **Hindering factors** included endogenous cognitive impairments and exogenous stigma, emotional burdens and psychological adaptation difficulties, practical dilemmas in pregnancy management, imperfect healthcare systems, obstacles to monitoring execution, and socioeconomic/cultural challenges.

Conclusion: Glycemic management in GDM patients is influenced by individual cognition, healthcare systems, and social support. Healthcare providers should enhance management levels by fostering intrinsic motivation, strengthening cognitive-emotional interventions, and integrating diverse support resources.

Keywords: Gestational diabetes mellitus; Glycemic management; Facilitating factors; Hindering factors; Qualitative research; Meta-synthesis

1. Introduction

Gestational diabetes mellitus (GDM) refers to glucose metabolism abnormalities first recognized during pregnancy that do not meet the criteria for overt diabetes [**?**]. With socioeconomic development and changes in fertility policies, the incidence of GDM has trended upward [**?**]. According to the 11th edition of the IDF Diabetes Atlas (2025) [**?**], approximately 19.7% of women of childbearing age experience hyperglycemia during pregnancy, with 79.2% of these cases attributed to GDM. Poor glycemic control significantly increases the risk of Type 2 diabetes, kidney disease, and cardiovascular complications for the mother [**?**], while leading to adverse neonatal outcomes such as preterm birth, macrosomia, and neonatal hypoglycemia [**?**].

Despite the importance of early intervention, the current state of GDM management is suboptimal, characterized by low disease awareness and unsatisfactory control rates [**?**]. While individual qualitative studies have explored the lived experiences of GDM patients, their findings are often limited by small sample sizes and regional contexts. This study utilizes a meta-synthesis approach to integrate these fragmented findings, providing a comprehensive evidence base for optimizing GDM management strategies and improving maternal-infant health outcomes.

2. Methods

2.1 Search Strategy We systematically searched major English and Chinese databases (PubMed, Web of Science, Embase, CINAHL, Cochrane Library, CNKI, Wanfang, VIP, and CBM) for qualitative studies on GDM glycemic management published up to June 30, 2025. We employed a combination of MeSH terms and free-text keywords, including "gestational diabetes," "glycemic control," and "qualitative research." The search strategy for PubMed is detailed in .

2.2 Inclusion and Exclusion Criteria Inclusion criteria followed the PICoS framework: (P) Patients diagnosed with GDM; (I) Experiences and perceptions of facilitators and barriers to glycemic management; (Co) Context of pregnancy-related management; (S) Qualitative designs (phenomenology, grounded theory, ethnography, etc.). Exclusion criteria included duplicate publications, incomplete data, non-English/Chinese studies, and low-quality (Grade C) research.

2.3 Literature Screening and Data Extraction Two researchers independently screened literature and extracted data using NoteExpress. Discrepancies were resolved through discussion or consultation with a third researcher. Extracted data included author, year, country, methodology, and primary findings.

2.4 Quality Appraisal The JBI Critical Appraisal Tool (2016) [**?**] was used to evaluate the methodological quality of the included studies across 10 items. Studies were graded as A (low risk of bias), B (moderate risk), or C (high risk).

2.5 Meta-synthesis Method We utilized the meta-aggregation approach [**?**]. Researchers repeatedly read the included studies to identify common themes across different cultural and social contexts. Similar findings were grouped into categories and synthesized into overarching results through an iterative process of comparison and refinement.

3. Results

3.1 Literature Search Results The initial search yielded 701 articles. After removing duplicates and screening based on titles, abstracts, and full texts, 20 studies [**?**] were ultimately included. The screening process is illustrated in [Figure 1: see original paper].

3.2 Study Characteristics and Quality The 20 included studies involved 416 GDM patients. Methodological characteristics and quality assessments are summarized in and . One study was graded A, while 19 were graded B.

3.3 Meta-synthesis Findings A total of 44 core findings were extracted and grouped into 10 categories, resulting in two synthesized results. The integration process is shown in [Figure 2: see original paper].

3.3.1 Synthesized Result 1: Facilitating Factors Category 1: Responsibility for Maternal-Infant Health. Patients exhibited a strong sense of duty, viewing glycemic control as essential for their baby' s safety [**?**]. Awareness of risks like stillbirth and long-term Type 2 diabetes risks for the child served as a core motivator [**?**].

Category 2: Proactive Self-Regulation. Patients actively sought knowledge via the internet and peers [**?**]. They learned to use monitoring data to adjust their diet and mastered self-monitoring skills despite initial fears of needle pricks [**?**, **?**].

Category 3: Diverse Social Support. Family members provided crucial support through meal preparation, reminders, and emotional accompaniment [**?**, **?**]. Online peer groups and supportive colleagues also helped patients balance work and disease management [**?**, **?**].

Category 4: Medical Support and Interventions. Professional guidance on diet, exercise, and insulin use, combined with psychological counseling, enhanced patients' confidence in self-management [**?**, **?**, **?**].

3.3.2 Synthesized Result 2: Hindering Factors Category 5: Cognitive Impairments and Stigma. Barriers included a lack of initial knowledge, conflicting information from different sources, and cognitive biases regarding the severity of the condition [**?**, **?**, **?**]. Some patients also faced social stigma related to public insulin use [**?**].

Category 6: Emotional Burden. Diagnosis often triggered anxiety, guilt, and a sense of being "controlled" by the disease [**?**, **?**, **?**]. Frustration occurred when blood sugar remained high despite strict adherence to protocols [**?**].

Category 7: Practical Dilemmas. Patients struggled with dietary changes, social dining, and balancing fetal nutrition with glucose control [**?**, **?**, **?**]. Physical discomfort and safety concerns regarding exercise during pregnancy further hindered management [**?**, **?**].

Category 8: Systemic Imperfections. Issues included poor coordination between healthcare providers, rushed consultations, lack of culturally adapted dietary advice, and outdated paper-based recording methods [**?**, **?**, **?**, **?**, **?**].

Category 9: Monitoring Obstacles. Pain from frequent finger-pricking and doubts about the accuracy of monitors led to reduced compliance [**?**, **?**].

Category 10: Socioeconomic and Cultural Challenges. Heavy workloads, domestic responsibilities, financial costs, and traditional cultural beliefs (e.g., elders encouraging overeating for the baby' s sake) posed significant challenges [**?**, **?**, **?**, **?**].

4. Discussion

4.1 Methodological Analysis The inclusion of studies from diverse countries provides a broad perspective on GDM management. However, many studies failed to adequately describe the researchers' cultural backgrounds or their influence on the data, which may affect the depth of contextual analysis.

4.2 Fostering Health Beliefs and Motivation Maternal responsibility is a powerful intrinsic motivator, but it can be undermined by psychological burdens. Clinical interventions should use positive psychology and goal-setting to transform "responsibility" from a source of stress into a sustainable energy for action [**?**, **?**].

4.3 Empowering Self-Management through Cognitive-Behavioral Intervention Given that over half of patients may lack sufficient GDM knowledge [**?**], specialized education is critical. Digital tools that offer personalized tracking and real-time feedback can reduce the practical difficulty of management and help bridge the gap between knowledge and practice [**?**].

4.4 Integrating Resources for Comprehensive Support GDM management is a dynamic process where factors can shift between being facilitators or barriers. For instance, family involvement can be a barrier if traditional dietary views conflict with medical advice. Healthcare providers must adopt a systemic view, integrating "hospital-community-family" models and advocating for policy support, such as insurance coverage for non-invasive monitoring, to create a holistic support environment [**?**].

5. Conclusion

This meta-synthesis identifies that GDM glycemic management is a multidimensional challenge influenced by personal beliefs, cognitive factors, and external systems. Healthcare providers should focus on dynamic assessments and targeted interventions to foster positive health identities and integrate social resources for sustainable management.

Note: Figure translations are in progress. See original paper for figures.