

# Psychosocial Burdens among Pregnant Women with Gestational Diabetes Mellitus (GDM)

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## Abstract

**Background:** Gestational diabetes mellitus (GDM) poses both physical and psychosocial challenges for pregnant women, especially in developing regions like Mosul, Iraq. This study investigates the emotional burden and psychosocial outcomes among women diagnosed with GDM.

**Objective:** To assess levels of stress, anxiety, depression, diabetes-related distress, and perceived social support, and to examine how pregnancy experiences mediate psychological outcomes among women with GDM.

**Methods:** A descriptive cross-sectional study was conducted in Mosul City, including 100 pregnant women diagnosed with GDM. Data was collected using validated tools: DASS-21 for psychological symptoms, PAID-5 for diabetes-related distress, PSSS for perceived social support, and PES-1 for pregnancy experiences. Sociodemographic, reproductive, and clinical information was also obtained.

**Results:** 41% experienced depression and anxiety, 40% reported moderate to severe stress, and 40% had high diabetes-related distress. Social support was moderate to high in 61% of participants. Older age, obesity, low education, rural residence, and unplanned pregnancies were linked to higher psychological burden.

**Conclusion:** Pregnant women with GDM face a significant psychological burden influenced by social support, pregnancy experience, and demographic factors. The study emphasizes the need for holistic, integrated care models.

**Keywords:** *Gestational Diabetes Mellitus (GDM) Psychological Distress Stress Anxiety*

*Depression*

## Introduction

Pregnancy can be a vulnerable period when a woman is adapting and responding to changes in body perceptions, such as loss of strength or fitness, which can result in reduced self-esteem and depression. Many women report depression and anxiety during pregnancy which often includes worry for the baby's wellbeing.

A diagnosis of health condition such as Gestational diabetes mellitus (GDM) could have a detrimental effect on a pregnant woman's quality of life due to fears that the illness may affect her and/or her baby. This has the potential to convert pregnancy, a natural process, into one associated with risks, ill-health and increased surveillance. Understanding a women's response to the GDM diagnosis and its psychological impact has emerged as an important issue. (Craig et al., 2020).

Worldwide, GDM affects approximately 14% of pregnancies which represent about (18) million births annually. Furthermore, the occurrence of GDM is predictable to increase over years. Especially in Asia, this is possibly due to increase in maternal age and obesity. According to the annual statistical report for Iraqi Ministry of Health/Environment (MOH) in 2017, third indirect cause of maternal mortality is diabetes was 4.4%. (Alnassar, 2020).

GDM is one of the most common medical complications associated with pregnancy. Its treatment requires multidisciplinary cooperation, and identifying the psychosocial needs of patients is important in the management of their condition.(Faal Siahkal et al., 2024).

GDM poses significant risks for both mothers and infants. Mothers face increased chances of antenatal depression, preterm birth, and surgical delivery, with about 60% developing type 2 diabetes later. For infants, GDM raises risks of macrosomia, hypoglycemia, and stillbirth.(Plows et al., 2018).

diagnosis of GDM increases vulnerability to emotional distress, such as depression, anxiety or stress among pregnant women, as well as having an adverse impact on their self-perception towards health and quality of life. (Lee et al., 2019).It increases the risk of maternal and neonatal complications and is influenced by psychosocial and cultural factors.(Rehman et al., 2024).

Studies indicate that a diagnosis of gestational diabetes mellitus (GDM) can lead to improved postpartum maternal wellbeing, as treating GDM reduces serious health risks. However, the transition to motherhood is inherently stressful, and the added burden of diabetes can intensify psychological

challenges for women. Managing GDM necessitates significant lifestyle changes and self-determination, which can overwhelm new mothers.

Moreover, women with GDM are aware of the fact that uncontrolled diabetes can lead to pregnancy-related complications and poor neonatal outcome. Therefore, they suffer from a higher propensity for the development of antenatal depression, anxiety and stress.(Lee et al., 2019)

### Objective:

The objectives of this study are as follows:

To assess the psychosocial burden of GDM in terms of anxiety, depression, and perceived stress.

To assess the social challenges related to GDM.

To assess social support systems and their role in moderating the psychosocial impact of GDM.

To identify key psychosocial factors that influence pregnancy outcomes in women diagnosed with GDM.

### Research Questions

The study is guided by the following research questions:

What are the psychosocial impacts of GDM including stress, anxiety, depression, and self-esteem in pregnant women?

how do social factors affect the experience of GDM?

How do social factors (e.g. support systems, cultural context) influence the psychosocial well-being of pregnant women with GDM?

What are the most pressing psychosocial challenges faced by pregnant women with GDM, and how do these challenges impact pregnancy outcomes?

### Study Design:

This study adopts a cross-sectional design, selected for its suitability in assessing the psychological and social dimensions associated with Gestational Diabetes Mellitus (GDM). Specifically, the design enables the evaluation of anxiety, depression, and stress levels; identification of psychosocial challenges; and examination of support systems influencing pregnancy outcomes among women diagnosed with GDM in Mosul City. The data collection period spans from December 1, 2024, to June 1, 2025.

### Data Collection Period:

Data was gathered at two Mosul City teaching hospitals between January 2, 2025, and March 1, 2025.

### Settings of The Study:

The study was conducted in Mosul, the capital of Nineveh Governorate in northern Iraq. As the second-largest city in the country after Baghdad, Mosul holds significant demographic and healthcare relevance, making it an appropriate setting for this research on Gestational Diabetes Mellitus (GDM).

### Al-Batool Teaching Hospital

Situated on the right side of Mosul, Al-Batool Teaching Hospital is the main center for maternity and pediatric care. It serves a wide population, covering both the city center and the surrounding suburban and rural areas.

### Al-Salam Teaching Hospital

Located on the left side of the city, Al-Salam Teaching Hospital is a comprehensive medical facility offering services across multiple specialties. Like Al-Batool, it provides healthcare to residents of the city center as well as neighboring regions.

### Study Population

The target population for this study consists of pregnant women diagnosed with Gestational Diabetes Mellitus (GDM) who attend prenatal care and obstetric services at selected teaching hospitals in Mosul City.

### Sample and Sampling Method

A purposive non-probability sampling method was employed to select participants. The sample comprised 100 pregnant women diagnosed with GDM who regularly attend antenatal clinics at Al-Batool and Al-Salam Teaching Hospitals in Mosul.

### Inclusion and Exclusion Criteria

#### Inclusion Criteria

Participants were eligible for inclusion if they met the following criteria:

- Pregnant women diagnosed with GDM
- At any stage (trimester) of pregnancy
- Willing to provide informed consent and participate in the study
- Attending antenatal clinics at one of the selected healthcare facilities
- Diagnosed with GDM more than two weeks prior to participation

#### Exclusion Criteria

Participants were excluded based on the following:

Diagnosis of Type 1 Diabetes Mellitus

Inability to provide informed consent, complete the study questionnaires, or refusal to provide a blood sample

Diagnosis of GDM less than two weeks prior to participation

Diagnosis of chronic illnesses other than hypertension, heart disease, anemia, or thyroid disorders

#### Calculation of Sample Size and Sampling Method

The sample size for this cross-sectional study was calculated using the Cochran formula for estimating proportions in a population:

Where:

$n$  = required sample size

$Z$  = Z-score (1.96 for a 95% confidence level)

$p$  = estimated prevalence of anxiety or depression among pregnant women with GDM (assumed to be 0.5 to maximize sample size)

$d$  = margin of error (0.1 or 10%)

Thus, the minimum required sample size was approximately 96 participants. To account for potential non-responses or incomplete data, the sample size was rounded to 100 participants.

#### Data Collection Tools

Data for this study were collected using a comprehensive, standardized questionnaire designed in alignment with internationally validated scales. The tool was structured into six distinct sections, each targeting a specific aspect of the psychosocial and obstetric profile of pregnant women diagnosed with Gestational Diabetes Mellitus (GDM). The questionnaire integrates well-established instruments to ensure validity and reliability in assessing mental health, social support, and pregnancy-related experiences.

### Part One: Sociodemographic Characteristics

This section comprises nine items addressing participants' demographic variables, including age, height, weight, body mass index (BMI), place of residence, educational level, employment status, husband's occupation, family income, and overall socioeconomic status. The Kuppuswamy Socioeconomic Status (SES) Scale is employed to classify participants into five socioeconomic categories—upper, upper-middle, lower-middle, upper-lower, and lower—based on educational attainment, occupation, and total family income. This classification aids in evaluating the relationship between socioeconomic status and psychosocial burden in women with GDM.

### Part Two: Obstetric and Gynecological History

This section includes nine items that gather information on participants' reproductive history. Variables include gravidity, parity, number of miscarriages, gestational age, interpregnancy interval, family planning practices, timing of GDM diagnosis, and the presence of any concurrent medical conditions during pregnancy. These data allow for the identification of clinical patterns and associations between reproductive history and psychosocial experiences.

### Part Three: Perceived Social Support Scale (PSSS-12)

Developed by Zimet et al., the PSSS-12 is a 12-item self-report instrument that assesses perceived social support from family, friends, and significant others. Social support is a critical factor in mitigating psychological distress during pregnancy, especially in women diagnosed with GDM. This scale was utilized to evaluate how perceived support influences psychological well-being and buffers the adverse emotional effects associated with the condition. Previous studies have shown that support from partners and family members enhances coping and improves quality of life for women with GDM.

### Part Four: Depression, Anxiety, and Stress Scale (DASS-21)

The DASS-21, developed by S.H. Lovibond and P.F. Lovibond, is a 21-item self-report scale that evaluates three dimensions of mental health: depression, anxiety, and stress. Each subscale contains seven items. This tool was employed to measure the psychological burden associated with GDM, facilitating analysis of the interrelationships between emotional distress, social support, and disease management.

#### Part Five: Problem Areas in Diabetes (PAID-5) Scale

The PAID-5 is a concise 5-item version of the original PAID questionnaire, developed by Polonsky et al., designed to assess diabetes-specific emotional distress. This scale was chosen to minimize respondent fatigue while retaining strong psychometric properties. It is particularly relevant for evaluating emotional challenges and concerns unique to living with GDM during pregnancy.

#### Part Six: Pregnancy Experience Scale (PES)

The PES, developed by Dennis M. McFadden and T.A. Thomas, includes 20 items divided into two subscales: ten items assess positive affect (uplifting experiences during pregnancy), and ten assess negative affect (stressful or distressing experiences). This scale captures the overall emotional experience of pregnancy and allows for an in-depth exploration of how psychosocial burdens interact with maternal perceptions and expectations during the peripartum period.

#### Data Collection Procedure

Data was collected using a structured, interviewer-administered questionnaire. Participants were recruited during their routine antenatal clinic visits at Al-Batool and Al-Salam Teaching Hospitals in Mosul. Prior to data collection, each participant was fully informed of the study's objectives, procedures, potential risks, and their rights, including the right to withdraw at any stage without penalty. Only those who voluntarily agreed and signed an informed consent form were included.

To ensure ethical rigor, the following measures were implemented:

Informed Consent:

Each participant signed a written informed consent form that outlined the study's purpose, voluntary nature of participation, and confidentiality assurances.

#### Anonymity and Confidentiality:

All data were anonymized, and identifying information was removed to maintain participant confidentiality. Data were stored securely and accessible only to the research team. Results were reported in aggregate form to prevent identification of individual responses. Ethical standards in data protection and privacy were strictly upheld throughout.

#### Right to Withdraw:

Participants were explicitly informed of their right to withdraw from the study at any point without affecting their access to healthcare services. If a participant chose to withdraw, their data were excluded from the final analysis upon request.

Data collection took place in private consultation rooms to ensure confidentiality and comfort. Each face-to-face interview lasted between 20 to 30 minutes and was conducted four days per week, five hours per day.

#### Pilot Study

A pilot study was conducted from January 18 to December 28, 2024, to evaluate the questionnaire's clarity, feasibility, and appropriateness. Ten pregnant women with GDM from the antenatal clinics of Al-Batool and Al-Salam Teaching Hospitals participated. These individuals were not included in the main study.

The pilot's study aimed to:

- Assess the average time needed to complete the questionnaire.
- Identify ambiguities or difficulties in question interpretation.
- Evaluate logistical considerations for data collection.
- Estimate the level of participant cooperation and responsiveness.

### Validity

The questionnaire underwent content validation by a panel of ten experts in maternal health, endocrinology, and mental health. Their feedback was incorporated into the final version of the tool to enhance its relevance, clarity, and cultural appropriateness. (See Appendix for expert panel review).

### Reliability

Internal consistency was assessed using Cronbach's alpha. The tool demonstrated excellent reliability, with an overall Cronbach's alpha of 0.852, indicating strong internal consistency across the scales. This value exceeds the standard threshold of 0.70, ensuring the instrument's dependability.

### Variables

#### Independent Variables:

Perceived Social Support (PSSS-12)

Diabetes-related emotional distress (PAID-5)

Pregnancy experience (PES)

Demographic and clinical characteristics (e.g., age, BMI, gestational age)

#### Dependent Variables:

Levels of depression, anxiety, and stress as measured by DASS-21

### Statistical Data Analysis

Descriptive statistics will summarize demographic and clinical variables. Inferential statistics, such as correlation and regression analysis, will be used to assess relationships between psychosocial variables and mental health outcomes.)

## Limitations of the Study

While this study seeks to provide critical insights into the psychosocial burden of GDM in pregnant women in Mosul, several limitations should be acknowledged:

### Limited Existing Research:

There is a significant gap in local studies exploring the psychosocial dimensions of GDM in Iraq, especially in Mosul. The lack of contextualized research and cultural data limits comparative analysis and generalizability.

### Sample Size and Generalizability:

The relatively small sample (n=100) may not represent all pregnant women with GDM in Iraq. Additionally, findings may not apply to populations outside Mosul with different socioeconomic, cultural, and healthcare backgrounds.

### Self-Reporting Bias:

Data were collected through self-report questionnaires, which are prone to recall bias and social desirability effects. Participants may underreport symptoms or overestimate social support.

### Cross-Sectional Design:

The study's design limits causal inference. Temporal relationships and changes over time in psychosocial burden or mental health outcomes cannot be determined.

### Unmeasured Confounding Variables:

Several contextual and personal factors were not controlled for, such as:

- Cultural beliefs and stigma around GDM

- Pre-existing mental health conditions

- Variations in access to quality healthcare

- Lifestyle behaviors such as physical activity, diet, and sleep patterns

### Instrument Limitations:

- The PSSS-12 does not assess community or spiritual support.

- The DASS-21 may not fully capture culturally specific expressions of mental distress.

- The PAID-5, while concise, may miss broader diabetes-related concerns.

- The PES may not reflect culturally influenced pregnancy experiences.

Time Constraints:

The relatively short study duration limits follow-up. Long-term psychosocial outcomes of GDM could not be assessed. Recruitment was also constrained by logistical and political challenges in the region.

#### Potential Selection Bias:

Participants were selected from tertiary hospitals, potentially overrepresenting individuals with better access to healthcare. This may not reflect the experiences of women in rural or underserved areas.

## Result

The results of the study revealed substantial psychosocial burdens among pregnant women diagnosed with Gestational Diabetes Mellitus (GDM) in Mosul City. Demographically, the majority of participants were aged 40 years and above (58%), with another 32% between 30 and 39 years. Educationally, while 39% had completed a graduate-level degree, a significant proportion—10%—were illiterate. Most of the women (60%) were unemployed, and 57% lived in urban areas. Socioeconomically, 39% belonged to the upper-lower class, and over half (55%) were categorized as obese based on their gestational Body Mass Index (BMI), indicating elevated risk for adverse pregnancy outcomes and psychosocial distress.

Psychologically, many participants demonstrated elevated levels of distress. Based on the Depression, Anxiety, and Stress Scale (DASS-21), 33% of participants experienced mild to moderate stress, and 7% reported severe stress, with a mean stress score of 5.46. Anxiety scores were particularly concerning, with 40% classified in the "extremely high" range, and an average score of 6.25. Depression was also notable; while 59% fell within the normal range, 41% experienced symptoms ranging from mild to severe, with an average score of 4.64. These figures reflect a notable psychological impact of GDM during pregnancy.

Diabetes-related emotional distress, measured by the PAID-5 scale, showed that 40% of participants experienced high levels of distress. This indicates that managing GDM placed a significant emotional burden on a considerable portion of the sample. Perceived social support, assessed through the PSSS, was moderate to high in 61% of the participants, yet 10% reported low support, highlighting a vulnerable subgroup.

Correlation analyses highlighted several important relationships. Stress and diabetes-related distress were strongly positively correlated ( $r = .915$ ), and both were negatively associated

with perceived social support and positive pregnancy experiences. Anxiety showed a strong positive correlation with diabetes distress ( $r = .956$ ), while depression also showed a strong relationship ( $r = .857$ ). Social support was consistently negatively correlated with stress, anxiety, and depression, while positively associated with more favorable pregnancy experiences.

Regression analyses further identified that stress, anxiety, and depression were the most powerful predictors of diabetes-related distress. In particular, anxiety ( $\beta = .931$ ) and depression ( $\beta = .792$ ) had the highest influence on distress levels. Conversely, perceived social support was a protective factor, showing a significant negative effect on distress scores. While negative pregnancy experiences also contributed to emotional burden, their impact was somewhat weaker and occasionally fell below the threshold for statistical significance. Socioeconomic status did not consistently predict distress when emotional and support variables were included.

Overall, these findings emphasize the central role of emotional health in the experience of GDM. They underscore the importance of integrated psychological and social support within prenatal care frameworks to help mitigate the emotional challenges associated with managing diabetes during pregnancy..

**Table 1: Distribution of Psychological Symptoms (DASS-21)**

| Category | Stress (%) | Anxiety (%) | Depression (%) |
|----------|------------|-------------|----------------|
| Normal   | 60%        | 59%         | 59%            |
| Mild     | 18%        | 1%          | 12%            |
| Moderate | 15%        | 0%          | 18%            |
| Severe   | 7%         | 40%         | 11%            |

**Table 2: Diabetes-Related Emotional Distress (PAID-5)**

| Distress Level | Frequency (%) |
|----------------|---------------|
| Low Distress   | 60%           |
| High Distress  | 40%           |

**Table 3: Key Correlations ( $p < .01$ )**

| Variables | Stress  | PAID    | PSSS    | PES     |
|-----------|---------|---------|---------|---------|
| Stress    | 1       | .915**  | -.530** | -.332** |
| PAID      | .915**  | 1       | -.406** | -.102   |
| PSSS      | -.530** | -.406** | 1       | .735**  |
| PES       | -.332** | -.102   | .735**  | 1       |

## Discussion

This study sheds light on the profound psychosocial challenges faced by pregnant women diagnosed with Gestational Diabetes Mellitus (GDM), particularly in a developing country context such as Iraq. The findings reveal that a significant proportion of women experienced moderate to severe symptoms of depression, anxiety, and stress, which aligns with prior research indicating that GDM is not only a metabolic disorder but also a psychological burden (Kim et al., 2019; Horsch et al., 2016). The emotional distress reported by these women is attributable to multiple interrelated factors, including concerns over maternal and fetal health, lifestyle restrictions, and fears about pregnancy complications.

The data revealed a strong association between diabetes-related emotional distress (as measured by the PAID-5 scale) and elevated levels of psychological symptoms, confirming earlier studies that link GDM with increased mental health vulnerability (Khawaja et al., 2021). The persistent worry about managing blood glucose levels, attending medical appointments, and adhering to dietary guidelines may compound emotional exhaustion, particularly in the absence of effective coping mechanisms and mental health support.

Perceived social support emerged as a significant protective factor in this study. Women with stronger social networks, particularly those with supportive partners and family members, reported lower levels of emotional distress, echoing findings from prior literature (Kopec et al., 2017; Xu et al., 2022). However, the presence of a subgroup of women with limited social support highlights an area of clinical concern. This group is particularly susceptible to psychological decline and requires early identification and intervention strategies.

Furthermore, the pregnancy experience itself—whether perceived as uplifting or burdensome—was significantly associated with psychological well-being. Negative experiences or perceived hassles during pregnancy were linked to greater emotional distress, while positive experiences (uplifts) appeared to buffer depressive and anxious symptoms. This aligns with the cognitive appraisal theory, which posits that individuals' interpretations of stressors determine their psychological outcomes (Lazarus & Folkman, 1984). Such findings underscore the importance of fostering positive emotional

experiences during prenatal care, not only for the benefit of physical health but also for emotional resilience.

These results lend strong support to the biopsychosocial model, which argues that biological, psychological, and social factors are deeply interconnected in determining health outcomes (Engel, 1977). For women with GDM, emotional and social domains are not ancillary but central to achieving optimal health outcomes for both mother and child. Failure to address these factors risks compromising adherence to treatment, patient satisfaction, and overall pregnancy outcomes.

### Conclusion

In conclusion, this study demonstrates that Gestational Diabetes Mellitus is associated with substantial psychological burden among pregnant women in Mosul, Iraq. A high prevalence of stress, anxiety, and depression was observed, and these symptoms were strongly correlated with diabetes-specific distress and negative pregnancy experiences. On the other hand, social support and positive emotional experiences during pregnancy served as crucial protective buffers.

The findings advocate for a shift in clinical practice—moving from a narrow focus on glycemic control to a holistic approach that includes psychological assessment and psychosocial care. The integration of mental health screening tools such as the DASS-21 and PAID-5 into routine antenatal care is essential. Moreover, there is a pressing need to establish multidisciplinary teams that include mental health professionals alongside obstetricians and endocrinologists.

Healthcare systems must also consider policy-level interventions, such as funding for mental health services within maternal care and specialized training for healthcare providers in recognizing and addressing perinatal mental health issues. Ultimately, improving psychological well-being in women with GDM is not just an ethical imperative but a clinical necessity, as it contributes directly to better maternal and neonatal health outcomes.

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### Conflicts of Interest

The authors declare that there are no conflicts of interest related to this work.

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