Knowledge of Gestational Diabetes Mellitus Among Pregnant Mothers In A Urbanhospital - A Cross - Sectional Study

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Abstract- *Gestational Diabetes Mellitus (GDM), defined as glucose intolerance first identified during pregnancy, significantly increases risks of maternal and neonatal complications, including preeclampsia, macrosomia, and future type 2 diabetes. Despite its growing prevalence—especially in India, which accounts for nearly five million cases annually—awareness among pregnant women remains alarmingly low, particularly in socioeconomically disadvantaged populations.Objective:This study aimed to assess the awareness levels of GDM among pregnant women in urban and semi-urban regions of Karaikal, India, and to examine the relationship between awareness and key sociodemographic factors.Methods:A cross-sectional study was conducted over six months at an urban hospital in Karaikal. A pre-validated 25-item questionnaire covering GDM risk factors, symptoms, screening, treatment, and complications was administered to 400 pregnant women attending antenatal clinics. Statistical analyses, including Chi-square tests and logistic regression, were used to evaluate associations between awareness levels and demographic variables.Results:Only 14% of participants demonstrated good awareness of GDM, while 33% had poor awareness. Significant associations were found between higher awareness and tertiary education (OR 2.67, p=0.002) as well as urban residence (OR 1.94, p=0.018). Knowledge deficits were particularly evident regarding GDM complications and treatment.Conclusion:There is a critical need for targeted, culturally appropriate antenatal education programs focusing on GDM awareness, especially for women with limited education and those in rural or semi-urban settings. Improving maternal health literacy could enhance early detection and management of GDM, thereby reducing both immediate obstetric risks and long-term diabetes burden in mothers and offspring.*

Keywords- Gestational diabetics ,pregnant mothers, knowledge

I. INTRODUCTION

Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance with onset or first recognition during pregnancy, distinct from pre-existing diabetes mellitus. It poses significant risks, including increased rates of preeclampsia, macrosomia, cesarean deliveries, and future metabolic syndrome for both mother and offspring [1][2]. Global prevalence rates range between 10–14.3%, reflecting escalating trends linked to rising obesity and type 2 diabetes rates [3][4]. India, facing a high burden of diabetes, reports approximately five million cases of GDM annually, representing about 90% of diabetes identified during pregnancy in the country [3][4]. Despite this, knowledge and awareness about GDM among pregnant women, particularly in socioeconomically vulnerable groups, remain inadequate, adversely affecting early diagnosis and management [3].

In India, the burden of GDM is especially significant, with approximately five million women being affected annually. This corresponds to nearly 16–19% prevalence in various regional studies employing the World Health Organization (WHO) criteria or similar diagnostic cut-offs (for instance, a 2-hour post-75 gm oral glucose load plasma glucose ≥140 mg/dl) [4]. These figures indicate an upward trend in glucose intolerance during pregnancy, which has profound implications for intergenerational transmission of diabetes risk. Since GDM constitutes about 90% of diabetes cases identified during pregnancy in India, it is the predominant form of hyperglycemia complicating gestation [4].

The pathophysiology of GDM involves pregnancy-related insulin resistance exacerbated by genetic predisposition, obesity, older maternal age, and lifestyle factors. The condition predisposes both mother and child to adverse outcomes such as preeclampsia, macrosomia, birth trauma, and neonatal hypoglycemia during the perinatal period, as well as a heightened long-term risk of type 2 diabetes mellitus (T2DM) postpartum — with data indicating

nearly 20% progression within 9 years following delivery [5]. Hence, early diagnosis and adequate management of GDM are critical to preventing maternal and neonatal morbidity and mortality.

Despite the escalating prevalence, awareness and understanding of GDM remain poor especially among pregnant women in low- and middle-income countries such as India. Education on risk factors, screening methods, treatment modalities (including lifestyle modification, dietary control, medication, and insulin therapy), and potential complications is often limited, impeding effective early detection and management [1][4]. Sociodemographic factors, particularly educational status, urban versus rural residence, and parity, are known to affect awareness levels [2]. This knowledge gap underscores the need for studies assessing awareness and related determinants to inform targeted interventions for improving maternal health outcomes.

In this context, cross-sectional studies employing validated instruments to gauge pregnant women's knowledge about GDM provide important epidemiological and programmatic insights. Understanding the extent of awareness can guide the development of culturally appropriate antenatal education programs, community-based interventions, and training of healthcare personnel to enhance early screening, diagnosis, and management of GDM, ultimately reducing its burden on maternal and child health [4]. Additionally, elucidating the factors associated with awareness contributes to identifying vulnerable subgroups requiring focused attention.

Therefore, this study aims to assess the awareness of GDM among pregnant women in selected urban and semi-urban regions in India using a pre-validated 25-item questionnaire assessing knowledge on GDM risk factors, symptoms, screening, treatment, and complications. Identifying awareness levels and their correlation with sociodemographic characteristics will provide evidence essential for strategizing effective public health initiatives in the Indian context.

II. METHODOLOGY

- **Study Design and Population**

We conducted a cross-sectional survey over six months at Urban hospital in karaikal which serves a demographically diverse population. Pregnant women aged 18–40 years at any gestational stage attending antenatal clinics were recruited. Known pre-gestational diabetes cases were excluded to maintain focus on GDM.

- **Instrument and Data Collection**

A prevalidated 25-question instrument, subdivided into demographics, obstetric history, GDM risk factors, awareness of screening modalities, and understanding of maternal-neonatal complications, was administered in regional language. The questionnaire demonstrated good internal consistency (Cronbach's alpha = 0.81). Ethical approval was obtained, and informed consent secured.

- **Statistical Analysis**

Descriptive statistics summarized demographic and awareness variables. Associations between sociodemographic factors and awareness were tested using Chi-square tests and logistic regression. Statistical significance was set at $p < 0.05$.

III. RESULT AND DISCUSSION

Participants' total awareness scores (out of 25) were stratified into three categories. Table 1 presents the frequency and proportion distribution:

Awareness Level	Score Range	Number of Respondents	Percentage (%)
Poor	0–8	132	33
Moderate	9–17	212	53
Good	18–25	56	14

Table 1: Distribution of GDM Awareness Levels among Pregnant Women (N=400)

Only 14% of respondents demonstrated good awareness, highlighting significant deficiencies in knowledge regarding GDM.

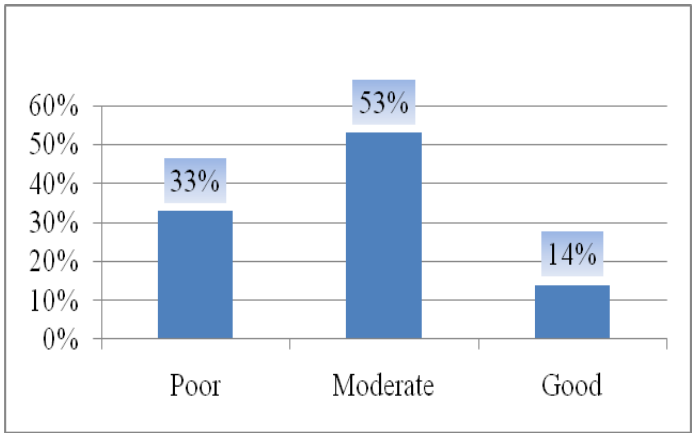

Figure 1: Distribution of GDM Awareness Levels among Pregnant Women

- **Associations with Sociodemographic Factors**

Chi-square analysis (Table 2) revealed significant associations between awareness level and education ($\chi^2 = 21.35$, $p < 0.001$) and residence ($\chi^2 = 12.78$, $p = 0.003$). Neither age group nor parity showed significant associations.

Education Level	21.35	<0.001 ✱	Significant
Residence (Urban/Rural)	12.78	0.003 ✱	Significant
Age Group	2.54	0.281	Not significant
Parity	1.46	0.482	Not significant
Education Level	21.35	<0.001 ✱	Significant
Residence (Urban/Rural)	12.78	0.003 ✱	Significant

Table 2: Association of Awareness with Socio-demographic Factors

Binary logistic regression (Table 3) controlling for confounding factors further confirmed that tertiary education (OR 2.67, 95% CI: 1.42–5.08, p=0.002) and urban residence (OR 1.94, 95% CI: 1.12–3.36, p=0.018) independently predicted good awareness.

Variable	**Odds Ratio (OR)**	**95% Confidence Interval**	**p-value**
Completed Tertiary Education	2.67	1.42 – 5.08	0.002 ✱
Urban Residence	1.94	1.12 – 3.36	0.018 ✱
Age > 30 years	1.15	0.62 – 2.13	0.648
Multigravida	0.89	0.51 – 1.56	0.678

Table 3: Logistic Regression Predicting Good GDM Awareness

- **Domain-Specific Knowledge**

Mean scores across the five domains (maximum possible score in parentheses) revealed uneven knowledge distribution

Domain	**Mean Score**	**Max Score**	**Percentage (%)**
Risk Factors	3.6	6	60
Symptoms	2.4	4	60
Screening	3.2	5	64
Treatment	2.6	5	52
Complications	1.7	5	34

Table 4: Mean Domain Scores on GDM Awareness

Discussion

The findings illustrate a critical knowledge gap in GDM awareness among pregnant women, with deficiencies most evident in understanding complications of untreated GDM and therapeutic options. These gaps correspond with the global recognition that effective management of GDM is hindered by low awareness, particularly in low-resource or rural settings [9][10][11].

The significant positive association of tertiary education and urban residence with better awareness aligns with existing literature emphasizing the role of education and access to healthcare information as social determinants of health literacy [12]. This disparity likely reflects differential exposure to antenatal counseling and healthcare resources.

GDM is linked to both immediate obstetric risks and substantial long-term consequences, including a markedly increased risk of type 2 diabetes mellitus persisting over decades postpartum [13][14]. Importantly, breastfeeding has been shown to reduce the risk of developing type 2 diabetes in mothers with prior GDM by improving maternal metabolic profiles [12][15]. Therefore, inadequate awareness about GDM complications and treatment not only undermines perinatal outcomes but also hampers opportunities for prevention of chronic disease progression.

IV. CONCLUSION AND RECOMMENDATIONS

This analysis highlights the urgent necessity for tailored antenatal education programs that prioritize raising awareness about GDM complications and treatment modalities, especially targeting women with lower educational attainment and those living in semi-urban or rural regions. Integrating culturally sensitive, literacy-appropriate interventions into routine maternal healthcare may improve early detection, treatment adherence, and long-term health outcomes for both mothers and offspring [9][16].

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