

## Gestational Diabetes Mellitus: Closely Monitored yet Ignored

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### ABSTRACT

**Objective:** To assess the perception and knowledge of women regarding gestational diabetes mellitus and to identify the barriers faced in acquiring health care and lifestyle modifications.

**Study Design:** Mix Method Study.

**Place and Duration of Study:** This study was carried out at Shifa College of Medicine and Shifa Foundation Community Health Centre, Islamabad Pakistan, from Jan to Jul 2020. Sixty women with gestational diabetes mellitus were recruited from a clinic in Shifa Foundation Community Health Centre.

**Methodology:** A mix method study was carried out in Shifa international hospital. 60 patients suffering from gestational diabetes mellitus were recruited for the study in order to assess the awareness and knowledge of gestational diabetes mellitus among patients suffering from Gestational Diabetes Mellitus. Questionnaire based survey was carried out. Quantitative analysis was done using Microsoft excel. In the next phase. Four Focus group interviews were carried out by principal investigator in a selected area giving an ample amount of time for Focus Group Discussions. Perception of patients were inquired and predetermined questions were asked to guide the discussion. Data from each participant was tape recorded and transcribed using verbatim afterwards.

**Results:** N=18(30%) of the population had much information on gestational diabetes mellitus while 24(40%) of them had some information, the rest had little or no information on it. A high percentage of respondents 21(35%) had a perception that gestational diabetes mellitus has future effects on child or both, whereas others were unaware of the impact. 36(60%) of the participants were concerned about the development of diabetes mellitus type-II among which 42(70%) had regular clinical check-ups and follow-ups. Although 40(67%) of population was satisfied with the counseling provided, 27(45%) of population suggested to improve the counseling.

**Conclusion:** The overall perception of women regarding gestational diabetes mellitus and its impact on their future generations was found to be not as much discrete. A high number of women do not face barriers while acquiring health care for Gestational Diabetes Mellitus. However, some may find it difficult to adapt the lifestyle modification.

**Keywords:** Awareness of gestational diabetes mellitus, Gestational diabetes mellitus, Lifestyle modifications in pregnancy.

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### INTRODUCTION

Gestational diabetes is termed as the most common metabolic disorder during pregnancy and can be defined as the type of glucose intolerance that develops in the second and third trimesters of pregnancy, leading to variable hyperglycemia.<sup>1</sup> Due to the rising prevalence of obesity and the increase in maternal age, the incidence of diabetes during pregnancy worldwide has increased, placing a huge economic burden on the public health care system. In fact, gestational diabetes mellitus increases the risk of serious pregnancy complications for mothers and infants that include cesarean section, shoulder dystocia, breast enlargement, and neonatal hypoglycemia.<sup>2</sup> During a normal pregnancy, there are some changes in glucose regulation to boost the nutrient supply to the

developing fetus.<sup>3</sup> A study of insulin synapse glucose in a healthy lean woman showed that, compared to pre-pregnancy, third trimester had a 56% decrease in insulin sensitivity and a 30% increase in internal basal glucose production.<sup>4,5</sup>

Additionally, women with gestational diabetes mellitus have a significantly increased risk for type-II diabetes (DM-II) and cardiovascular disease after pregnancy, while their offspring are more likely to develop early obesity and the development of DM-II. In women with gestational diabetes mellitus, lifestyle intervention and / or medication can be used to prevent or delay the development of diabetes mellitus type-II.<sup>6</sup> The prevalence of gestational diabetes mellitus in pregnant women usually reflects the prevalence of diabetes mellitus type-II in the population. Due to the unfavorable global shift to overeating and sedentary western lifestyles, the diabetes mellitus type-II epidemic is happening all

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over the world today, which has greatly contributed to a significant increase in the incidence of gestational diabetes mellitus.<sup>7</sup> However, due to the lack of systematically collected meticulous data on gestational diabetes mellitus, the exact incidence of global gestational diabetes mellitus is still unknown.<sup>7</sup> The only information available is that the incidence of gestational diabetes mellitus varies between countries, even between regions within a country, there are large differences, ranging from 0.6% to 15%, by gender/race and individual socioeconomic status.<sup>7</sup>

The long-term maternal metabolic risk after gestational diabetes mellitus has been well established, but the long-term risk of offspring has not been well studied. Multiple animal studies have shown that the offspring of mothers with gestational diabetes mellitus have an increased risk of developing gestational diabetes mellitus, diabetes, obesity, cardiovascular disease, and structural changes in the hypothalamus.<sup>8,9</sup> In addition, some studies have shown that normalizing pregnant women's blood glucose levels during pregnancy can prevent these adverse consequences. Although research on adults and offspring is limited, multiple human studies have been conducted on children of different populations, including a combination of diabetes in different populations.<sup>10</sup> The results of these studies are consistent with animal studies, and most found that children with maternal diabetes have an increased risk of diabetes and obesity.

Although most women with gestational diabetes mellitus are motivated to be able to make necessary lifestyle changes during pregnancy and adhere to strict treatment regimens, when glucose tolerance returns to normal after childbirth, challenges in daily life continue to accumulate and make it more difficult for them to continue a follow-up with their physicians. These women are usually full-time working mothers, and as correlated with a previous study in Copenhagen, only few people were able to maintain a healthy lifestyle. In most regions of the world, the implementation of prevention strategies is very limited, so optimal management of mothers and infants during long-term follow-up remains challenging.

This study aimed to explore experiences, knowledge and perceptions of women about impact of gestational diabetes mellitus on their own life and future generations. It also identifies the barriers which are affecting their utilization of health care provision and lifestyle modification.

## METHODOLOGY

This study was conducted in order to assess the knowledge and perception of women regarding gestational diabetes mellitus and to identify the potential barriers that can affect the health care system. A descriptive analysis and cross-sectional study were carried out in Shifa College of Medicine and Shifa Foundation Community Health Centre, from Jan to Jul 2020 after the approval from the Institutional Review Board (IRB) (Ref # IRB-1029-304-2018). Participants were purposively sampled and were representative of the population being studied in terms of ethnicity, age and body mass index (BMI).

**Inclusion criteria:** Patients with GDM, booked patients who had regular follow ups were included in the study.

**Exclusion criteria:** Patients with normal blood sugar levels, patients with other co-morbidities, patients with poor follow up history were excluded from the study.

The awareness of women suffering from GDM was assessed using a questionnaire. A descriptive statistical analysis of the data gathered through questionnaires was carried out using Microsoft Excel calculating the frequencies of distribution.

In the next phase of study, 4 focus group discussions were carried out with 60 women with gestational diabetes mellitus recruited from a clinic in Shifa Foundation Community Health Centre. Each FGD included 9 participants.

A session was held about the purpose of study all participants before the start of this study. After the patient's agreement, a written consent for research and publication was taken. The Focus group discussions were carried out by principal investigator in a selected area giving an ample amount of time for each participant. Open ended questions based on the questionnaire were used for discussion in Focus Group discussions. Perceptions of patients were inquired and few predetermined questions were asked to guide the discussion. Data from each interviewee were tape recorded and transcribed verbatim afterwards.

## RESULTS

### **Understanding of gestational diabetes mellitus:**

Participants when asked about their understanding of the illness, a range of mixed responses were given. Among all participants, 30% females reported that they were informed by their physician about the illness after test and they don't know

anything else. The verbatim of the participants also proposed that they were not given any information about the illness, its course and prognosis or future implications and complications. Further, 40% of the participants reported some understanding of the illness based on the rumors and opinions. They had basic information of the disease that it is the disturbance of sugar levels and insulin in the body but they have no further knowledge of this condition they were suffering from. Only 30% of the participants showed much better understanding of diabetes mellitus among which 15% had knowledge about this disease because of the prevalence of diabetes in family. While other 15% of the participants demonstrated better understanding of the illness without any such history. Figure-1 shows the distribution of responses obtained by the participants on the understanding of gestational diabetes mellitus.

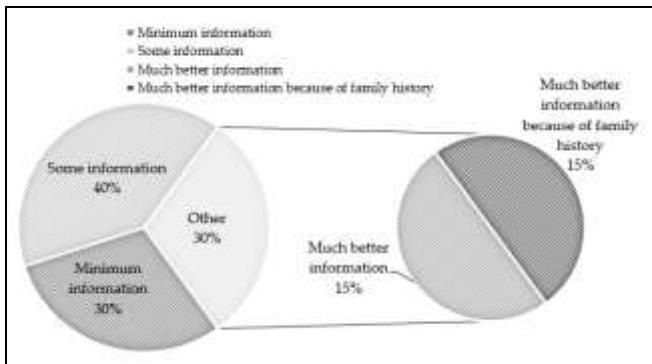


Figure-1: Understanding of gestational diabetes mellitus

**Impact of gestational diabetes mellitus on pregnancy, health and future child:**

While inquiring about the participants' knowledge about the impact of gestational diabetes mellitus on participant's pregnancy and health of fetus, 35% participants knew that gestational diabetes mellitus is detrimental only for the baby and can harm the baby's health and has no impact on mother. But the knowledge of the damage that can be done by the illness on baby was very basic. Some participants just knew that it is not good for the baby but there was no answer to how or why. Figure-2 depicts the perception of women about gestational diabetes mellitus and its impact on the health of mothers and future child.

**Concerns about developing Diabetes Mellitus Type-II:**

Development of gestational diabetes mellitus can lead to an increased risk of diabetes mellitus type-II. The participants were asked whether they were concerned about developing diabetes mellitus type-II in future and whether or not they will go for follow up

visits after delivery. Twelve participants (60%) reported that they were quite concerned about suffering from chronic illness. Some of them also mentions going for follow up appointments and precautionary measures taken by them to avoid any such issue in future. A few of the participants were totally unaware of the future risks of developing diabetes mellitus type-II. The distribution of these responses is shown in figure-3.

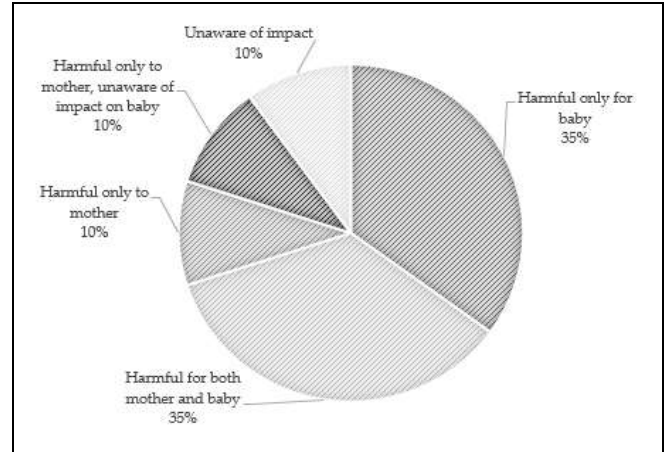


Figure-2: Awareness on gestational diabetes mellitus impact on mother and child

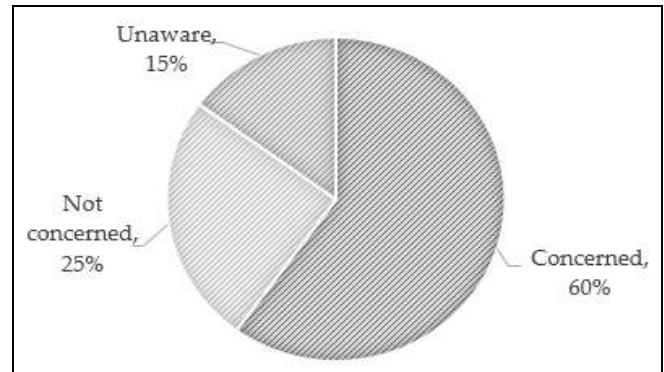


Figure-3: Concerns about developing DM-II

**Barriers responsible for poor follow-up in clinic:**

When a patient develops gestational diabetes mellitus, it is very important to have regular checkups afterwards to monitor the sugar levels regularly and to see if there is any need of medication or lifestyle change. When participants asked about the barriers and issues, they encounter for follow-up check-ups and appointments, 70% participants reported that they went for follow-up check-ups regularly. However, the rest of the participants either visited their physicians occasionally or not at all. Figure-4 summarizes the responses of patients on follow-up trend subsequent the diagnosis of gestational diabetes mellitus.

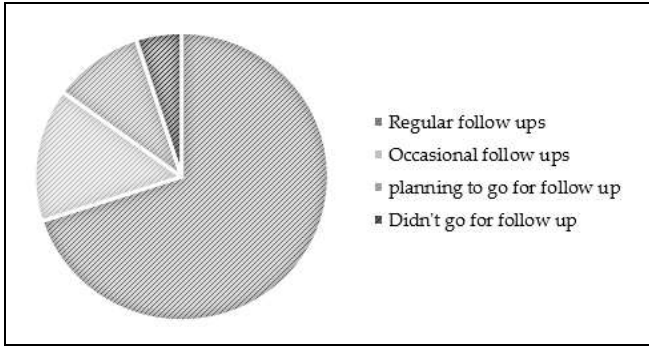


Figure-4: follow-ups in clinics for Gestational diabetes mellitus

**Understanding of counselling and missing element in gestational diabetes mellitus management:**

Getting proper guidance and counseling about the illness and its management is the basic right of patients. When the participants were asked about their experience of getting counselling and treatment of gestational diabetes mellitus 67% of the participants reported that they were satisfied with the counselling and management of illness. On the other hand, 33% of the participants were not happy with the doctor’s practice. They weren’t providing with any counselling about the illness and its management. Figure-5 depicts the responses obtained from the questionnaires.

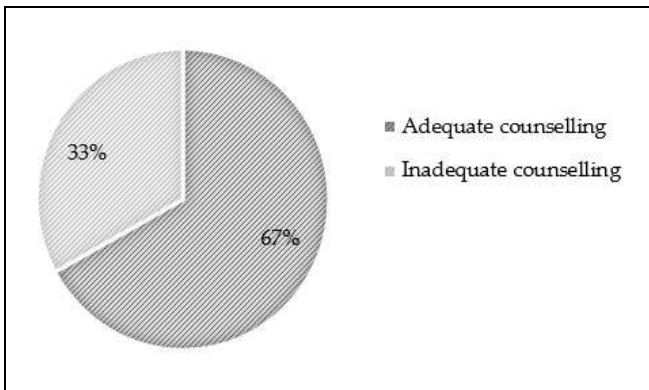


Figure-5 Counselling in gestational diabetes mellitus management

**Ways that could have been introduced to make it easier/ better patients:**

After probing the areas related to gestational diabetes mellitus, participants were asked for suggestions that what should they want to change about the system as per their experience. 55% of the participants asked for better guidance and information about the illness, its course, prognosis, risks of recurring, and precautionary measures like lifestyle changes. While on the other hand, there were 45%

participants who were extremely satisfied with the system and don’t want to change anything as such.

**DISCUSSION**

Gestational diabetes mellitus is one of the main metabolic disorders prevailing among the women during pregnancy<sup>11-13</sup> and is also known to develop diabetes mellitus type-II. In the following study, the impact of gestational diabetes mellitus on the health of women was assessed in terms of their knowledge and understanding related to the condition and its future impacts. Moreover, the attitude of women towards the follow-up and lifestyle modification was also assessed. As in the rest of the world, women in Pakistan are either working or non-working individuals. However, working women face more problems in dealing with the work-life balance, that also affect their schedules related to the regular check-up especially after delivery.<sup>14,15</sup> In order to properly use antenatal services and adapt to the high-risk group lifestyle and to know what would happen if gestational diabetes mellitus is not diagnosed and treated in a timely manner, the mother must fully understand the risk factors and complications before birth.<sup>16</sup>

The present study depicted the perspective of women towards gestational diabetes mellitus. It was revealed that almost a quarter of people from the population were very well aware of gestational diabetes mellitus and its impact on the mother and fetus. However, the knowledge of women on Diabetes mellitus type-II was quite overwhelming along with their concerns on the matter, they had regular follow-ups and were much satisfied with the knowledge shared with them. The main source of information about gestational diabetes mellitus for prenatal care of mothers is through a doctor or other medical staff. This is quite enough information provided by the healthcare givers. The information that only gestational diabetes mellitus exists is certainly insufficient to improve pregnancy and neonatal outcomes. All paramedical staff on gestational diabetes mellitus should be updated, and physicians and medical staff should be attributed to raising prenatal awareness among mothers. Gestational diabetes mellitus should be part of the health awareness program of pregnant women routine organization.<sup>17</sup>

Lifestyle interventions, including diet adjustment, physical exercise, and weight management, are important components of gestational diabetes mellitus management. It is estimated that this strategy may be sufficient to achieve a blood glucose goal of 70-85% in

women.<sup>18</sup> The goal of weight gain during pregnancy should be set separately to improve the outcome of the mother and fetus.<sup>19,20</sup>

### LIMITATION OF STUDY

The study was confined to a small group of women that only visited Shifa Foundation Community Health Centre for their care, which excludes a vast majority of females from the study and also did not evaluate the perception of women visiting government tertiary cares for their pregnancy.

### CONCLUSION

Patients with gestational diabetes mellitus are generally well aware of the effect of GDM on maternal and fetal well-being and the risks associated with GDM. The overall perception of women regarding gestational diabetes mellitus and its impact on their future generations was found to be not as much discrete. A high number of women do not face barriers while acquiring health care for GDM. However, some may find it difficult to adapt the lifestyle modification.

**Conflict of Interest:** None.

### Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

TA & HT: Data acquisition, data analysis, critical review, approval of the final version to be published.

GAS & JZK: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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