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Assessment Of Knowledge And Prevalence Of Risk Factors Of Pregnancy Induced Diabetes Mellitus Among Pregnant Women At A Teaching Hospital

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ABSTRACT

This research set out to determine how many pregnant women suffer from gestational diabetes mellitus (GDM), what variables put them at risk, and how much of an effect a clinical chemist's educational intervention had on their GDM knowledge. Between April and September of 2023, researchers in Kalaburagi, India, visited Basaveshwar Teaching and General Hospital to gather data. Pregnant women's outpatient clinic (OPD) cards were analysed for this study. Pregnant women's ages were most concentrated in three age groups: 26–30 (50.8% of the total), 20–25 (55.6% of the total), and 31–35 (1.7% of the total). In the first trimester, 31.4% of the 118 samples revealed their pregnancy status, whereas 67.8% did so in the second. In pregnant women, age-related variables accounted for 72% and a family history of gestational diabetes mellitus accounted for 5.1% of the risk. Of the pregnant women who took the exam, 40.96 percent had low understanding, while the rest had moderate to excellent knowledge. Following the chemist's intervention, 42.2% of the ladies showed a considerable improvement in their post-test knowledge. Finally, the research concluded that pregnant women's understanding of risk factors for GDM was much enhanced by the chemist's intervention, suggesting that this strategy may be useful in preventing difficulties associated with GDM. Reducing maternal and foetal morbidity and preventing or delaying the development of type 2 diabetes may be achieved by early identification and education about GDM risk factors.

Keywords: Gestational Diabetes Mellitus (GDM), Diabetes Prevention, Maternal Morbidity

I. INTRODUCTION

Gestational diabetes mellitus (GDM) is a common metabolic condition during pregnancy that causes glucose intolerance and normally recovers after childbirth. Women with hyperglycemia during pregnancy (HIP) account for 16.2% of live births, and it affects one out of every seven pregnancies. The "diabetes capital of the world" status has been bestowed upon India, a nation inhabited by 69.2 million diabetic individuals, mostly due to the 4 million women diagnosed with GDM. Depending on the examined populations' ethnicities, diagnostic criteria, or body mass index (BMI), the incidence of gestational diabetes ranges from 1% to 14% of pregnancies.

Rising rates of obesity, inactivity, unhealthy eating habits, and urbanisation are all factors contributing to the global epidemic of type 2 diabetes in emerging nations. Particular focus should be directed towards this demographic in developing nations, since women with GDM and their offspring are more likely to get diabetes mellitus down the road.

Worldwide, the prevalence of GDM has been rising at a rate of 35% between 1991 and 2000. In a nationwide study conducted in 2002, the number of cases increased from 16.55 percent in 1982 to 16.1% in 2002. An estimated global prevalence of GDM of 7.0% was reached by comparing diagnostic criteria used by various nations. The frequency varies between 0.70 and 51.0 percent in Asia.

Symptoms of GDM include severe thirst, hazy vision, extreme exhaustion, and a history of urinary tract infections (bladder, vaginal, skin, and more). The following conditions can increase the likelihood of gestational diabetes mellitus (GDM): polycystic ovary syndrome (PCOS), hypertension during pregnancy, a prior history of gestational diabetes mellitus (GDM), a minimum body mass index (BMI) of 25, obstructive sleep apnoea, multiple pregnancies, premature labour, macrosomia, hypothyroidism, a history of neonatal death, obesity, a personal or family history of gestational diabetes mellitus (GMM), irregular periods, advanced neonatal age, a history of

spontaneous abortion, polyhydramnios, elevated HB levels, smoking prior to pregnancy, hypoglycaemia, and negative parenteral outcomes.

Pregnancy-related complications such as high blood pressure, macrosomia (a very large baby), premature rupture of the foetal membrane, vaginal candidiasis, abruption placentae, and an increased risk of long-term cardiovascular diseases in both the mother and the child are common in GDM, making it the most common metabolic complication of pregnancy. Maternal morbidity, pre-eclampsia, c-section infection, polyhydramnios, foetal morbidity, birth trauma, hypoglycemia, hypomagnesia, and polycythaemia are prominent metabolic problems.

The hormonal and metabolic changes that occur during pregnancy cause GDM to rapidly develop, making it a kind of kind 2 diabetes that is thought to be temporary. Midway during a normal pregnancy, insulin resistance starts to rise and stays high until the baby is born. Fat mass, lack of physical activity, and poor dietary quality are modifiable risk factors for gestational diabetes mellitus (GDM).

In order to establish diagnostic criteria for gestational diabetes mellitus (GDM), a number of organisations have collaborated. These include the following: the American Diabetes Association (ADA), the Australian Diabetes in Pregnancy Society (ADIPS), Carpenter-Coustan (CC), the International Classification of Diseases (ICD), the European Association for the Study of Diabetes (EASD), the American College of Obstetricians and Gynaecologists (ACOG), DIPSI, Japan Diabetes Society (JDS), NDDG, the World Health Organisation (WHO), and the Canadian Diabetes Association (CDA).

The results of an oral glucose tolerance test (OGTT), which may be administered as a 75-g two-hour test or a 100-g three-hour test, are the main factors used to diagnose GDM. Compared to the 100-g three-hour test, the 75-g two-hour test is more convenient and practical, and it seems to be more sensitive in predicting pregnancy problems such gestational hypertension, preeclampsia, and macrosomia. O'Sullivan, NDDG, and Carpenter and Coustan have all contributed to the 100-g three-hour test's abnormality threshold.

Treatment of gestational diabetes mellitus is on achieving and maintaining normal blood glucose levels in the mother and her unborn child. The first approach to treatment is to encourage behavioural changes, such eating healthier and exercising more. Women diagnosed with gestational diabetes should follow a diet low in carbs and moderate in fat. In order to control their blood glucose levels after eating, women should not take or significantly reduce the quantity of insulin they consume. Even if they are already eating more than usual before becoming pregnant, pregnant women usually only need an additional 300 calories per day to meet their increased energy needs.

To assist normalise blood glucose levels and maybe avoid or postpone insulin, pregnant women should also be instructed on how to safely raise their physical activity levels throughout pregnancy and the postpartum period. Getting some exercise before, during, and after pregnancy has several health advantages, including a lower chance of problems including preeclampsia and gestational diabetes mellitus (GDM) and a shorter labour.

Pregnant women may be prescribed glucose-lowering medication if lifestyle modifications do not keep blood sugar levels where they should be. Insulin is still preferred over oral hypoglycemic drugs by many doctors and is considered the best pharmacologic treatment option. Patients with GDM typically feel rewarded when their daily insulin dosage is reduced as a consequence of regular aerobic activity, which helps regulate glucose levels.

Pregnant women may learn more about the risk factors of gestational diabetes mellitus (GDM) and how to modify their lifestyles to avoid problems by reading this research.

II. REVIEW OF LITERATURE

Waleed M et al organized a cross-sectional research involving 250 pregnant women who visited the Monshaat Sultan Family Health Center between the ages of 24 and 28 weeks into their pregnancies. Within the sample, 8% of people had GDM. The following characteristics were identified as strongly linked to gestational diabetes mellitus (GDM): advanced maternal age, body mass index (BMI) of 30 or higher, hypertension, multiple

pregnancies, preeclampsia, a history of diabetes in the family, induction of labor, abortion, premature delivery, a big baby, and smoking. Nevertheless, there were no significant relationships found between GDM and socioeconomic level, small size infant, stillbirth, prior history of hypertension, or family history of hypertension. Contrary to previous research, this one identified a quite high frequency of GDM among pregnant women who visited the Monshaat Sultan Family Health Center. To improve the health of mothers and their unborn children, it is essential to reduce risk factors and implement early detection screening programs.[1]

Kalpana V et al took place in a tertiary care hospital's prenatal clinic. A total of 506 participants (6.72%) were found to have GDM. Among all GDM participants, 64.71 percent were above the age of 30, 70.59 percent had a body mass index (BMI) of 25 or more, 41.18 percent were pregnant or nursing, and there was a statistically significant relationship between age and BMI. The existence of several risk factors, a positive family history of diabetes mellitus, and a history of having a large baby all had a significant p-value. GDM is linked to a high body mass index (BMI), premature pregnancy loss, a history of gestational diabetes mellitus (DM) in the family, and a history of many pregnancies. Improvements in maternal and foetal outcomes may result from widespread screening for gestational diabetes and subsequent intensive monitoring of pregnant women for early diagnosis.[2]

Surbhi M et al performed prospective matched case-control research within a hospital setting. The study included pregnant women who were seen for normal prenatal care at two private hospitals in coastal Karnataka that were connected with a university medical college. There were 273 controls with matching frequencies and 100 incident GDM cases. Information was gathered via in-person interviews using pre-tested surveys. The risk variables identified using the DIPSI criteria and the Carpenter and Coustan criteria were found to be identical. Marital age (25-29), multiparity, delayed menarche, a history of diabetes mellitus in the family, high levels of mother felt stress (95%), inactivity, and a lack of green leafy vegetables were the major risk factors for gestational diabetes mellitus revealed by pooled data. Additional risk variables that were shown to be significant ($p < 0.05$) were recurrent vaginal infections and positive current polyhydramnios. Using two current criteria for diagnosing gestational diabetes, we found that modifiable risk variables were insufficient physical activity, high levels of felt stress before pregnancy, multiple pregnancies, marriage age of 25 years or older, and low consumption of GLV before pregnancy. Healthy lifestyle recommendations given before conception might be useful.[3]

Poly B et al studied 303 pregnant women using a cross-sectional design. Participants' oral glucose tolerance tests (OGTTs) consisted of 75 milligrams administered over the course of two hours. Completed proformas included standard information on participants' demographics, socioeconomic status, education level, parity, diabetes familial history, and GDM history, among other things. To diagnose GDM, the American Diabetes Association (ADA) employed 75 gm 2-hour OGTT criteria. In the research, 303 women were evaluated, and 22 of them (7.3%) were found to have GDM. In 33 more women (10.89%), one aberrant value was recognized. Factors linked to gestational diabetes mellitus (GDM) in bivariate analysis included age, parity, education level, socioeconomic status, hypertension, body mass index (BMI), weight gain, acanthosis nigricans, family history of diabetes, and GDM in the past. However, in multivariate analysis, only being upper middle class and having acanthosis nigricans were identified as significant risk factors for GDM. The results of this research show that GDM is rather common in Bangladesh. New recommendations for the prevention and management of gestational diabetes may benefit from these GDM figures.[4]

Lobna F et al performed a prospective research that ran from July 2016 to July 2017 at the Antenatal Clinic of the Obstetrics and Gynecology Department at Aswan University Hospital. The research included one thousand expectant mothers. At 24-28 weeks of gestation, all patients had a gestational diabetes screening. In accordance with the 2017 guidelines of the International Association of Diabetes and Pregnancy Study Groups (IADPSG), all participants underwent universal screens for gestational diabetes mellitus (GDM) using an oral glucose tolerance test (OGTT). If we look at the patients that met the criteria set forth by the IADPSG, we can see that 17.5% of them had GDM, 16.8% had fasting blood glucose levels of 92 mg/dL or higher, 15.5% had 1-hour OGTT levels of 180 mg/dL or higher, and 16.7% had levels of 153 mg/dL or higher. The results showed that compared to non-GDM, GDM was substantially associated with a greater age of 25 years or older and multiparity. those who worked while pregnant and lived in rural regions were far less likely to develop gestational diabetes mellitus (GDM) than those who lived in metropolitan areas. The most significant risk factors in our study group were a history of diabetes in the family and gestational diabetes mellitus type 1 (GDM), with p-values of less than 0.001 for both. There were no clear risk variables in 40.4% of the sample. In the GDM group, systolic and diastolic blood pressure were significantly higher than in the non-GDM group ($p < 0.001$ and $p < 0.001$, respectively). People with GDM had a much higher body mass index (BMI) than those without GDM ($p = 0.024$). At 17.5%, GDM was very common in the Aswan Governorate. Major risk factors for gestational diabetes mellitus (GDM) include having a

close relative with the disease, having a personal history of the disease, being overweight or obese, being above the age of 25, and having several pregnancies.[5]

III. METHODOLOGY

Study Approval:

In order to get ethical approval for research involving human subjects, the study protocol was drafted and submitted to the Institutional Review Board. The research received an ethical clearance certificate after being authorized by the Institutional Review Board.

The study was initiated at Basaveshwar Teaching and General Hospital, Kalaburagi after obtaining a permission letter from Medical Superintendent of Basaveshwar Hospital

Study Materials:

The following study materials were used for the Study-

A) Data Collection Form on GDM (Annexure-II)

B) Consent From on GDM (Annexure-III)

C) Quetionnaires on GDM (Annexure-IV)

D) Gestational diabetes mellitus information leaflets. (Annexure-V)

Study Site:

The research was place at the gynecology department of Kalaburagi's Basaveshwar Teaching and General Hospital.

Study Design:

This research is an educational intervention study that looks to the future.

Study Period:

The duration of this trial was six months..

Study Criteria:

The following factors were considered throughout the study's execution:

Inclusion Criteria:

1) Pregnant women above the age of 18yrs.

2) Pregnant women below 24 weeks of pregnancy.

3) Pregnant women irrespective of gravida and parity.

4) Pregnant women willing to participate in the study.

Exclusion Criteria:

1) Pregnant women below the age of 18yrs.

2) Patients who are not willing to participate.

3) Pregnant women who were already suffering with HTN and DM before pregnancy.

IV. ANALYSIS OF DATA

The data was collected and evaluated by using Paired T-Test.

Case Study Procedure:

A prospective educational interventional study was conducted in the Department of Gynaecology with the prior permission of the HOD Department of Gynaecology and with prior approval of institutional Ethics committee. The pregnant women who visit the Dept of Gynaecology who fits into the study criteria was enrolled into the study after obtaining written consent from them. The OPD cards of the enrolled patients were analysed as per the objectives of the study. The data was collected in suitably design data collection form.

The assessment of case study was carried out in the following steps:

- All pregnant women's who have come for pre-natal check-up at Basaveshwar Teaching and General Hospital were enrolled into the study provided, they were eligible as per the inclusion criteria as mentioned above.
- The socio-demographic data was collected through OPD cards by one to one interaction.
- In order to gauge the subjects' socio-demographic characteristics, researchers administered questionnaires based on information gathered from various sources. (age, occupation, BMI, parity, gravida, annual income and source of information regarding risk factors among the respondents).
- The prevalence of risk factors was assessed by suitably designed questionnaires, risk factors were obstructive sleep apnea, per term labor, PCOS, hypothyroidism, hypoglycemia, history of adverse parenteral outcomes, polyhydramnios, history of spontaneous abortion among pregnant woman.
- The basic knowledge regarding the risk factors of GDM was analysed by suitably designed knowledge assessment questionnaires.
- Thereafter, a pharmacist led educational intervention was made by providing them an educational leaflet by one to one interaction.
- Participants were provided with questionnaries and instructed on how to fill the questionnaries and were explained about each question, adequate time was given to fill up the questionnaire.
- This was followed by educating the pregnant woman about the risk factors. After one month of Pre-test, the reassessment of it was done by collecting datas with the same questionnaire on data collection form to access the knowledge of pregnant woman towards risk factors of gestational diabetes mellitus.
- Self-designed questionnaires were prepared on knowledge of GDM. 15 objective type questions were prepared in which the right answers carries a score of one [1] mark whereas as wrong one gets a score of zero [0].
- Finally, the impact of clinical pharmacist improving the knowledge regarding its risk factors was assessed.

Preparation of data collection form: -

A data collection form was suitably designed in order to collect the required data for the study by using various resources like books, journals, internet and other suitable resources.

Preparation of Educational Leaflet: -

A leaflet was suitably prepared in order to educate the pregnant women on risk factors of GDM by using various resources such as books, journals, internet and other suitable resources.

Preparation of knowledge assessment questionnaires: -

A set self-designed questionnaires were prepared in order to assess the knowledge of the respondent regarding risk factors of GDM by using various resources such as books, journals, internet and other suitable resources.

Consent Form: -

A written consent form was taken from the enrolled respondent in a suitably designed consent form by using various resources such as books, journals, internet and other suitable resources.

V. RESULTS

TABLE-1: Details of age groups involved in the study among pregnant women

AGE_GROUP	Frequency	Percent
20-25	55	46.6
26-30	60	50.8
31-35	2	1.7
36-40	1	0.8
Total	118	100

In our study about 118 subjects were enrolled, out of which 60(50.8%) highest number of subjects were in the age of 26-30 years, 55(46.6%) subjects were seen in the age group of 20-25 years, 2(1.7%) were seen in the age group of 31-35years and about 1(0.8%) lowest subject were seen in the age group of 36-40years. The population was seen to be more in the age group 26-30 years.

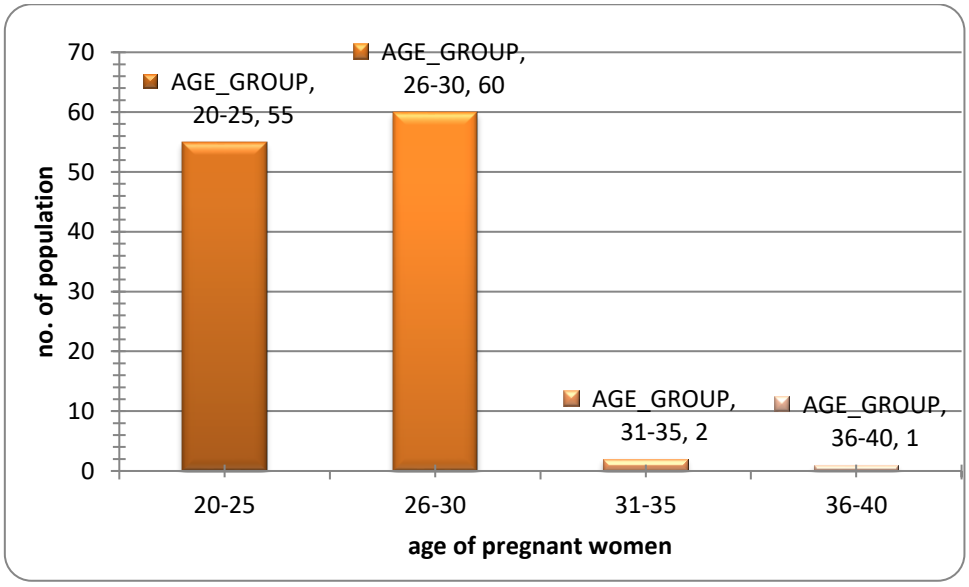

Figure-1: Age group among pregnant women

TABLE-2: Details of occupation of pregnant women involved in the study

Occupations	Frequency	Percent
Housewife	96	81.4
Labor	2	1.7
Tailor	6	5.1
Teacher	13	11
Worker	1	0.8
Total	118	100

In our study 118 subjects were enrolled, out of which 96(81.4%) were housewife, 13(11%) were teachers and about 6(5.1%) were tailor, 2(1.7%) were labor and about 1(0.8%) were worker. The study result shows that there are more housewife than other occupation.

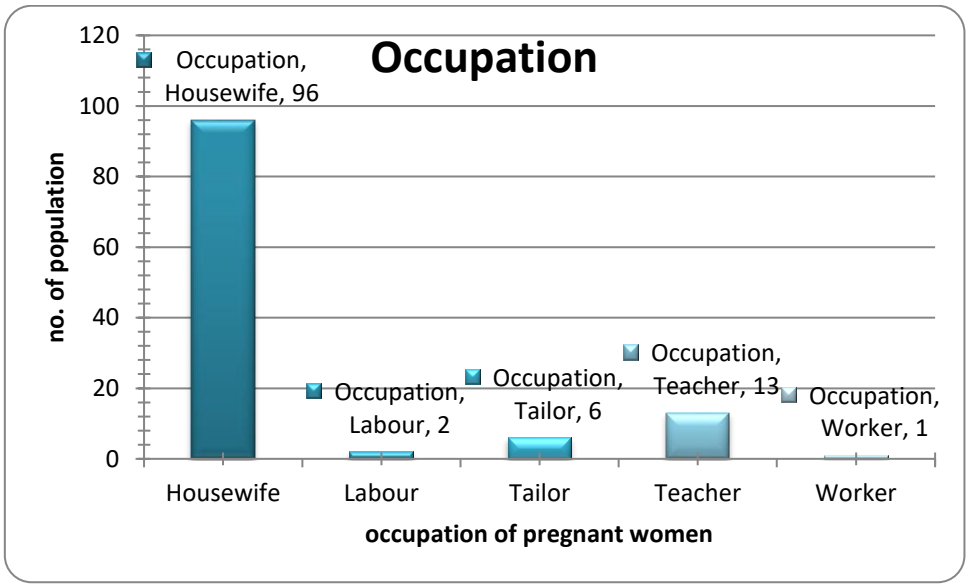

Figure-2: Occupation among pregnant women

TABLE-3: Details of BMI of pregnant women involved in the study

BMI	Frequency	Percent
NORMAL	70	59.3
OVERWEIGHT	48	40.7
Total	118	100

In our study 118 subjects were enrolled, out of which 70(59.3%) were normal in weight and about 48(40.7%) were overweight.

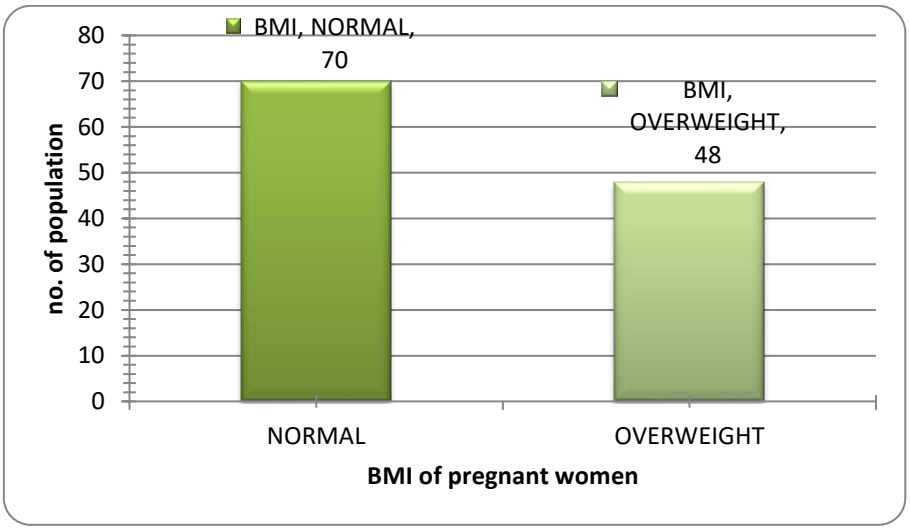

Figure-3: BMI among pregnant women

TABLE-4: Details of food habits of pregnant women involved in the study

Food Habits	Frequency	Percent
Mixed	**48**	**40.7**
Veg	**70**	**59.3**
Total	**118**	**100**

In our study 118 subjects were enrolled, in which vegetarians were found highest in number when compared to mixed, [i.e,70 (59.3%) were vegetarian and about 48(40.7%) were non- vegetarian].

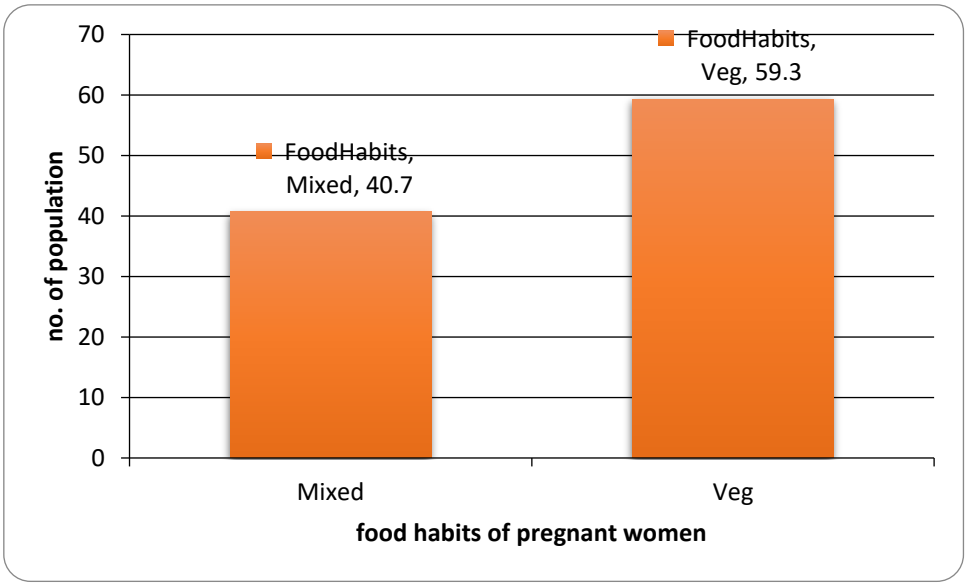

Figure-4: Food habits of pregnant women

TABLE-5: Details of rural and urban among pregnant women

Place	Frequency	Percent
RURAL	**34**	**28.8**
URBAN	**84**	**71.2**
Total	**118**	**100**

In our study 118 subjects were enrolled, out of which urban women were higher when compared to rural women. [ie., 84(71.2%) were urban and about 34(28.8%) were rural]. The study result states that more knowledge on GDM were seen in urban than rural.

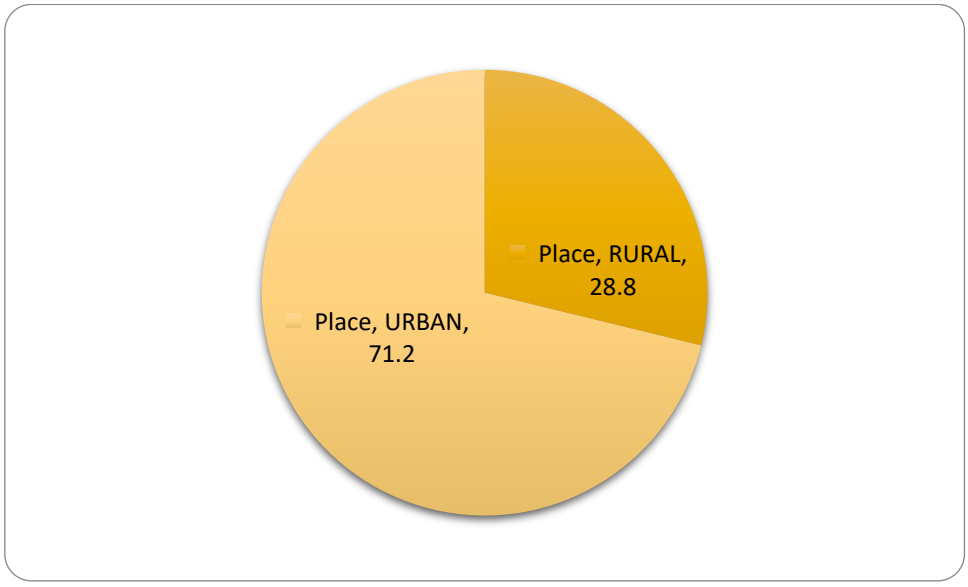

Figure-5: Pie diagram of pregnant women in rural and urban

TABLE-6: Details of past history among pregnancy induced diabetes mellitus

Past History	Frequency	Percent
FH OF GDM	**6**	**5.1**
H/O GDM	**4**	**3.4**
N.S	**108**	**91.0**
Total	**118**	**100**

In our study, 118 samples of pregnant women were involved in that 6 (5.1%) of family history of gestational diabetes mellitus, 4 (3.4%) of history of gestational diabetes mellitus and 108 (91.0%) of nothing significant in past history.

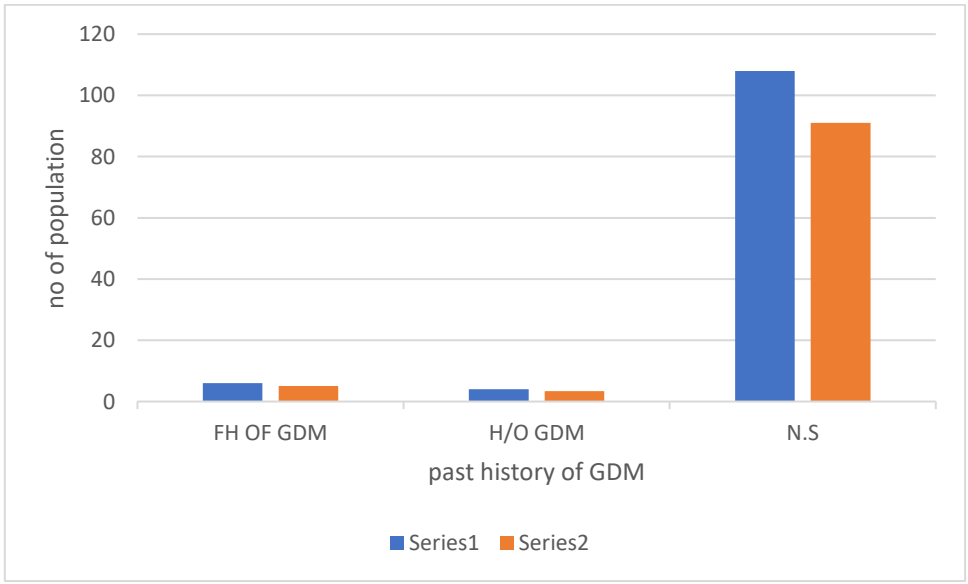

Figure-6: Past history of GDM among pregnant women

TABLE-7: Details of Trimester-I among pregnant women involved in the study

TRIMESTER_I	Frequency	Percent
NO	81	68.6
Yes	37	31.4
Total	118	100

In our study 118 pregnant women were involved in that 37 (31.4%) of Trimester-1 pregnant women were seen.

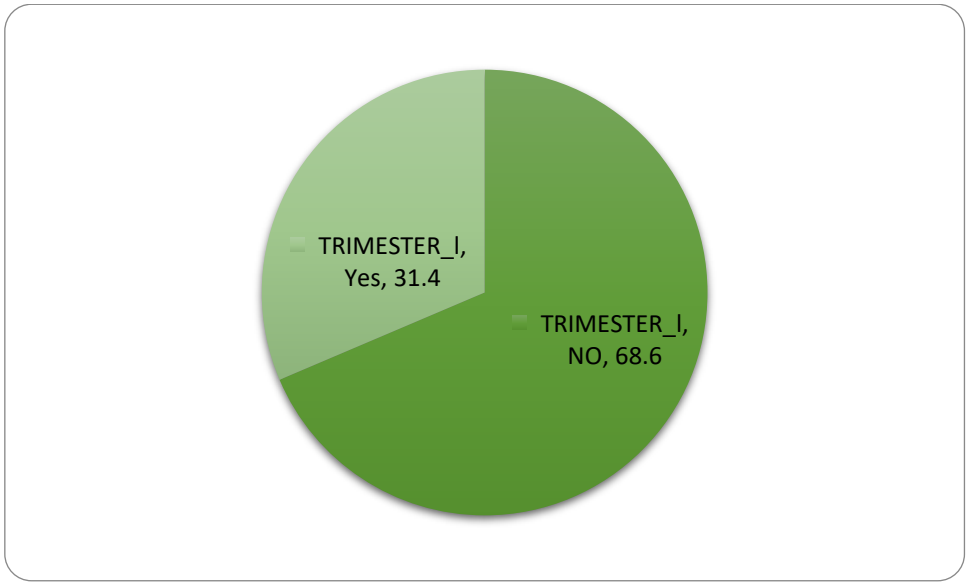

Figure-7: Pie diagram represents about Trimester-I in pregnant women

TABLE-8: Details of Trimester-II among pregnant women involved in the study

Trimester II	Frequency	Percent
NO	38	32.2
Yes	80	67.8
Total	118	100

In our study 118 pregnant women were involved in that 80 (67.8%) of Trimester-2 of pregnant women were seen.

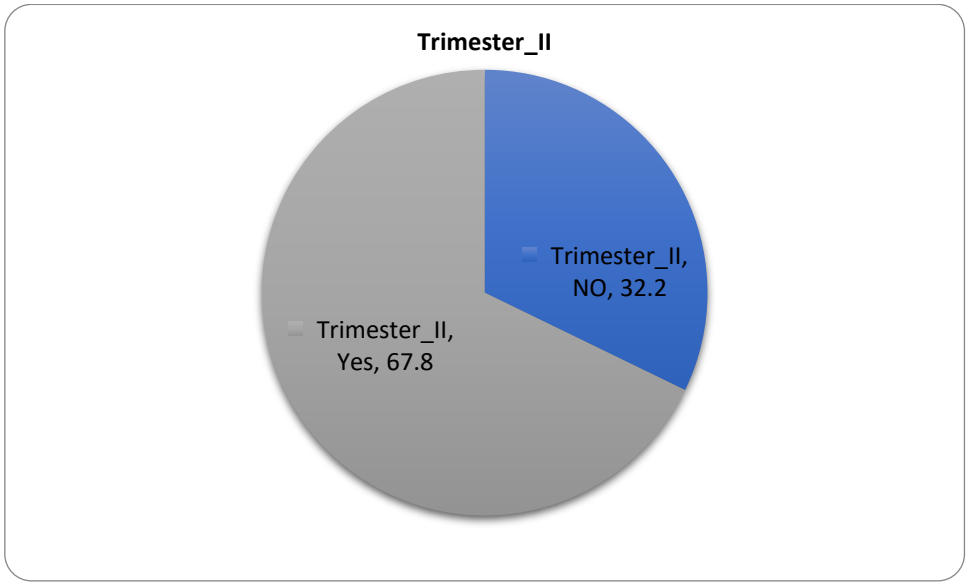

Figure-8: Pie diagram represent about Trimester-II in pregnant women

TABLE-9: Details of Trimester-III among pregnant women involved in the study

Trimester III	Frequency	Percent
NO	117	99.2
Yes	1	0.8
Total	118	100

In our study 118 pregnant women were involved in that 1 (0.8%) of Trimester-3 pregnant women were seen.

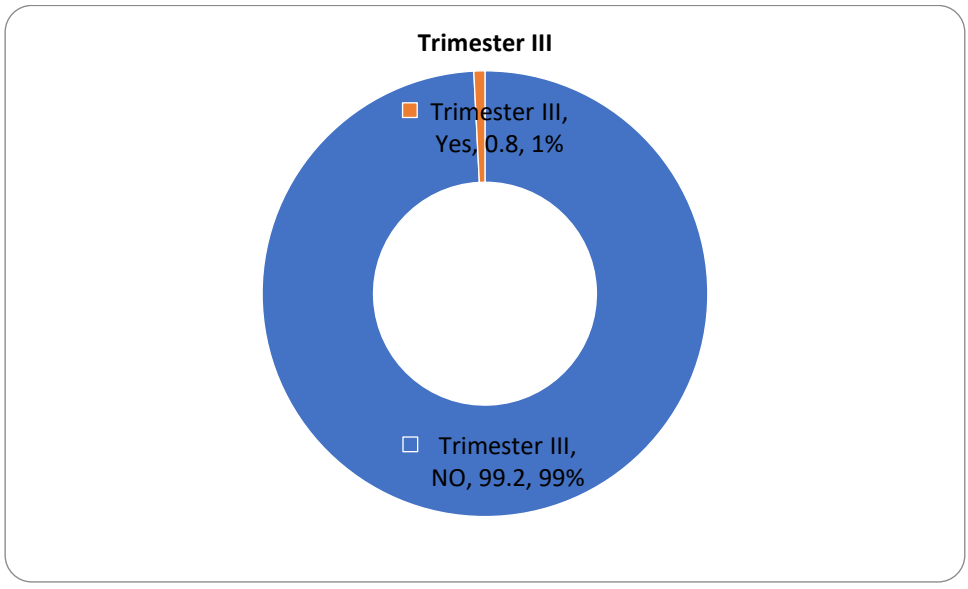

Figure-9: Pie diagram represent Trimester-III among pregnant women

TABLE-10: Details of gravida among pregnant women involved in the study

Gravida	Frequency	Percent
1	66	55.9
2	44	37.3
3	8	6.8
Total	118	100

Out of 118 samples of pregnant women in that 66 (55.9%) of gravida-1, 44 (37.3%) of gravida 2 and 8(6.8%) of gravida 3 was observed in pregnant women.

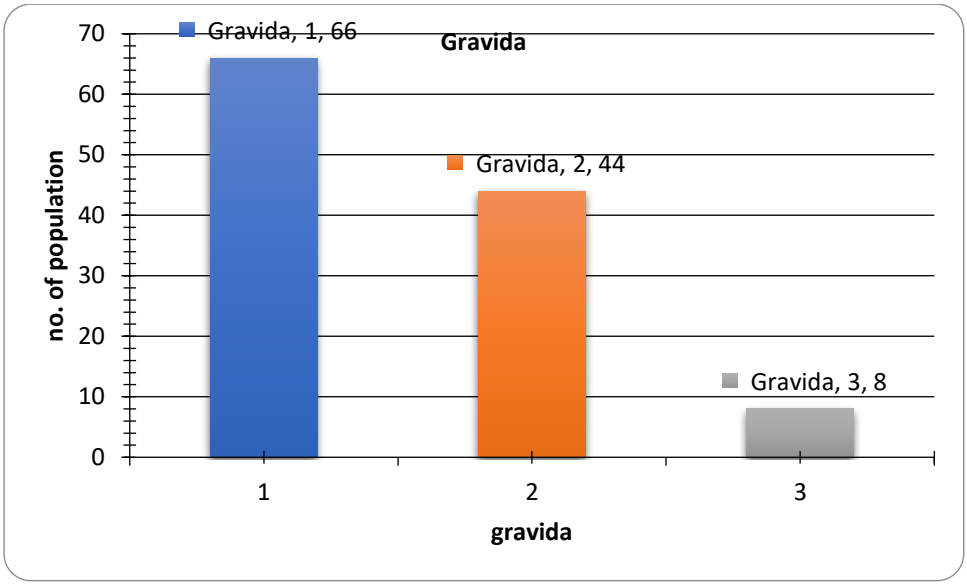

Figure-11: Gravida among pregnant women

TABLE-11: Details of parity among pregnant women involved in the study

Parity	Frequency	Percent
0	70	59.3
1	40	33.9
2	8	6.8
Total	N=118	100

Out of 118 samples of pregnant women in that 70 (59.3%) of parity, 40 (33.9%) of parity 1 and 8 (6.8%) of parity 3 was observed in pregnant women.

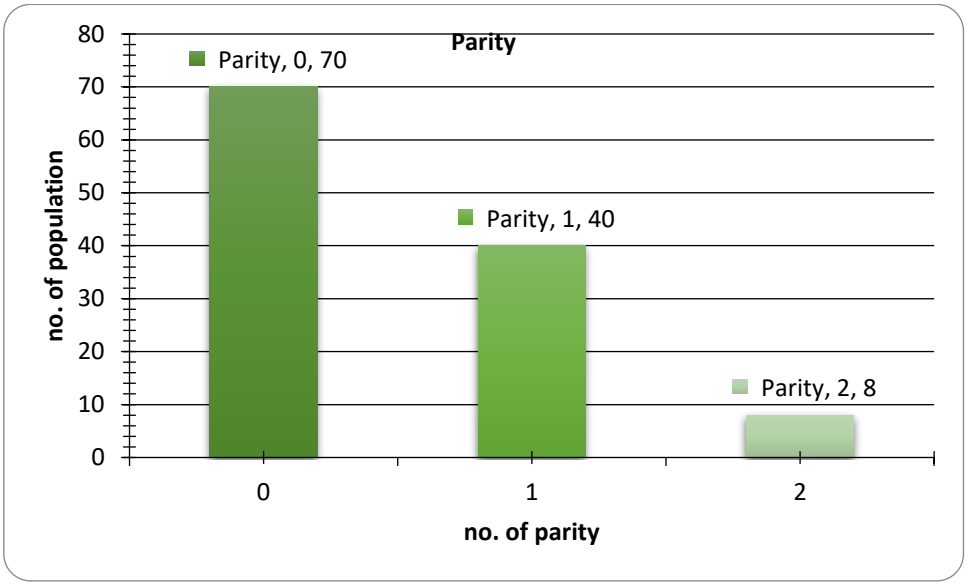

Figure-11: Parity among pregnant women

TABLE-12: Details of risk factors among pregnant woman involved in the study

RISK FACTORS	YES (N=118)	PERCENTAGE
GHTN	46	39%
PHGDM	11	9.3%
>25 YRS	72	61%
BMI> 25	52	44.1%
OBSA	46	39%
MG	52	44.1%
MP	8	6.8%
PTL	19	16.1%
MS	25	21.2%
HYPOTHYROIDISM	47	39.8%
PCOS	39	33.1%
PND	8	6.8%
OBESITY	10	8.5%
FHGDM	6	5.1%
IMH	30	25.4%
AMA	9	7.6%
HOSA	12	10.2%
PH	17	14.4%
Increase in HB	23	19.5%
HSBGP	13	11%
HG	17	14.4%
HAPO	14	11.9%

Above table explains about the percentage of risk factors observed in pregnant woman 46 (39%) of gestational hypertension (GHTN), 11 (9.3%) of previous history of GDM (PHGDM), 72 (61%) of >25 years, 52 (44.1%) of body mass of index (BMI >25), 46 (39%) of obstructive sleep apnea (OSA), 52 (44.1%) of multigravida (MG), 7 (5.9%) of multiparity (MP), 19 (16.1%) of pre-term labor(PTL), 25 (21.2%) of macrosomia (MS), 47 (39.8%) of hypothyroidism, 39 (33.1%) of PCOS, 8 (6.8%) of previous neonatal death (PND),10 (8.5%) of obesity, 6 (5.1%) of family history of gestational diabetes mellitus (FHGDM), 30 (25.4%) of irregular menstrual history (IMH), 9 (7.6%) of advanced maternal age (AMA), 12 (10.2%) of history of spontaneous abortion (HAS), 17 (14.4%) of polyhydramnios(PH), 23 (19.5%) of increase level of HB (>13 mg/dl), 13 (11%) of history of smoking before getting pregnant(HSBGP), 17 (14.4%) of hypoglycemia(HG), 14 (11.9%) of history of adverse parenteral outcomes (HAPO). In this study, the highest percentage of risk factors of pregnant women were observed in the age related ie., 72(61%) and the lowest percentage of risk factors of pregnant women involved were family history of gestational diabetes mellitus with 6(5.1%).

Table-13: Comparison of pre test and post test scores

Pre test – Post test Scores	Score	Total	Percentage
Pre test	725	1770	40.96%
Post test	1473	1770	83.22%

The scores of pre-test and post-test were compared and it was evident that their was improvement in post-test 1473 compared to pre-test which was 725. Out of 1770 i.e 83.22% from 40.96%.

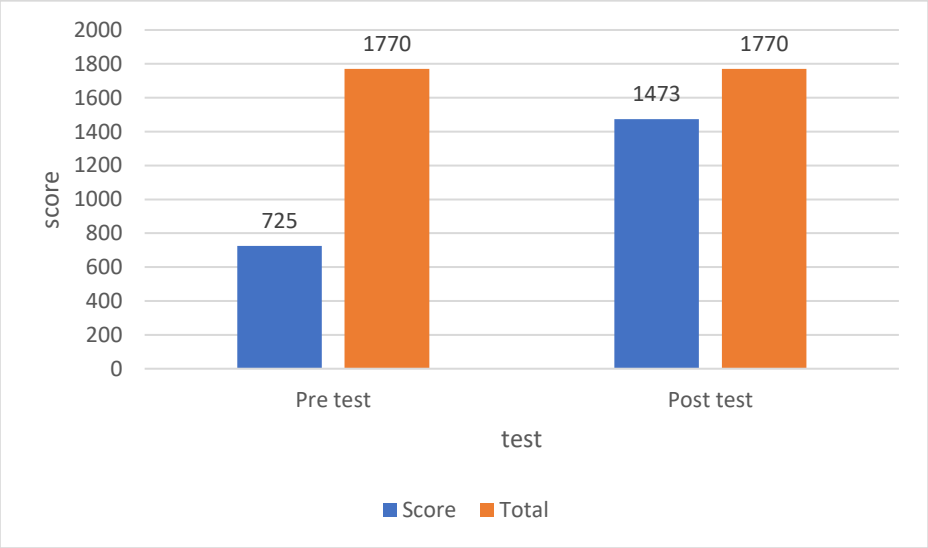

Figure-12: Pre test and post test scores

TABLE-14: Comparison of pre-test and post-test among pregnancy induced diabetes mellitus

Paired T - TEST			
GROUP	**Mean ± SD**	**T VALUE**	**P VALUE**
PRE RESULT	**4.64 ± 1.528**	**33.281**	**0.0001**
POST RESULT	**12.48 ± 2.111**		

Paired t test was employed to test the statistical significance which shows that t value was 33.281 and p value was 0.0001 which concludes that this study was statistically significant at p value <0.01.

VI. DISCUSSION

Our results show that the prevalence of GDM risk factors rises sharply with advancing age. Research by Kalpana et al. and Veluswamy S. et al. corroborated the prevalence study's findings of high GDM risk factors among those aged 26–30.

Similar to the research by Surbhi M et al., this study also demonstrated a statistically significant prevalence of GDM risk variables (<0.0001).

Consistent with previous research by Poly B et al. and Narendra KS et al., the current study also discovered that 40.7% of the participants were obese. One known risk factor of gestational diabetes is being multigravida. Similar to the research of Surbhi M et al., 37.3% of the women in our study were found to be multigravida.

Our research showed that having a family history of GDM was a risk factor for GDM (5.1%) with a P-value of less than 0.0001. The results are consistent with what Logan F E et al. found in their research in Egypt. Our survey found that 71.2% of the population lives in urban areas, whereas only 9.4% of West Bengalis live in rural areas, according to research by Narendra KS et al.

While Priyanka K et al. found a frequency of 12.12% in their research, we found a prevalence of 14.4%.

Multiple studies have shown that gestational diabetes mellitus may recur in future pregnancies in women with a history of the condition. We found a 9.3% prevalence of GDM in our investigation, which is lower than the 7.57% seen in the study by Velusamy S et al.

The incidence of risk factors for gestational diabetes mellitus is greater in women with more children. While Narendra KS et al. found 27.27 percent of cases of macrosomia in their research, we only found 21.22 percent. According to the research of Velusamy S et al., a 24% increased risk of gestational diabetes mellitus was associated with a history of irregular menstruation. The percentage of women having a history of irregular periods was 25.4% in our research.

While 15.2% of women in the research by Kai W. L. et al. had preterm labor, 16.1% of women in our study did. In our research, 11% of participants had a history of smoking before becoming pregnant, compared to 10% in the study by Kai WL.

VII. CONCLUSION

The development of gestational diabetes mellitus (GDM) is influenced by age, body mass index (BMI), multigravida, primiparity, a family history of diabetes, and an irregular menstrual cycle. The risk factors for the early development of gestational diabetes mellitus (GDM) include being older, having a higher body mass index (BMI), becoming pregnant, and having more children. The onset of GDM may be influenced by these risk factors. It is crucial to identify these women as a high-risk category for gestational diabetes mellitus (GDM) in order to diagnose the disease early on, and these risk factors are similar to those that have been recorded globally.

Among pregnant women, 40.96 percent had inadequate understanding of GDM risk factors before the test, whereas the other pregnant women had moderate to high knowledge.

About 42.2% of women had a moderate to excellent improvement in their understanding of GDM risk factors following the pharmacist's intervention, according to the evaluation of post-test knowledge.

Pregnant women who are at high risk of gestational diabetes may be able to avoid the disease by making healthy lifestyle changes. Improving one's diet and increasing physical activity are usually adequate to control hyperglycemia in people with GDM; however, insulin may be administered if these measures are insufficient. The health of the mother and the unborn child are both enhanced by controlling blood sugar levels throughout pregnancy.

To help pregnant women avoid or control gestational diabetes, it is important to provide them with a valid prescription for physical activity that they can follow safely and successfully. It is now recommended that all pregnant women exercise for at least 30 minutes per day at a moderate level.

There was a statistically significant increase in the awareness of GDM risk variables between the pre- and post-tests.

Our research concludes that pharmacists may play an important role in educating pregnant women about the risks of gestational diabetes mellitus (GDM) and how to manage the disease's consequences.

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