

# Depression Symptoms among Diabetic Pregnant Women in Beni-Suef

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**Abstract:** ***Background:** Hyperglycaemia is associated with adverse pregnancy outcomes. The classification of diabetes mellitus has evolved considerably over time, taking into account recent advances in the diabetes field. Antenatal depression, hence may have significant adverse effects that may extend beyond pregnancy and cause more significant long-term effects on psychosocial functioning. **Aim:** Assess prevalence of diabetes mellitus among pregnant women and the relationship between diabetes mellitus among pregnant women and depressive symptoms level in Beni Suef. **Method:** In-depth interviews for the convenience of 400 pregnant women associated with medical disorders and undergoing either intervention in the high-risk obstetric departments, and the antenatal outpatient clinics for all governmental hospitals in Beni-Suef City. **Results:** The findings of this study indicated that, depressive symptoms were severe in early gestational age, obese, multigravida, multipara, and history of abortion. **Conclusion:** Based on the findings of the present study, it can be concluded that, different levels of depressive symptoms have been related to be associated with pregnant diabetic women. Statistically significant association between pregnancy associated with and level of depression symptoms.*

**Keywords:** Diabetes Mellitus, Pregnancy, Depression

## 1. Introduction

Diabetes mellitus is one of the most common noncommunicable diseases, and its epidemic proportion has placed it at the forefront of public health challenges currently facing the world. The World Health Organization (WHO) estimated the worldwide load of diabetes at 135 million cases in 1995, in a worldwide adult population of under 4 billion, and has projected that there will be 299 million cases by the year 2025. Although WHO recently accorded priority status to diabetes mellitus, many public health planners remain largely unaware of its magnitude and the seriousness of its complications.<sup>[1]</sup>

There is now no doubt that hyperglycemia, at levels less than those that occur in overt diabetes, is linked to adverse pregnancy outcomes, such as large-for-gestational age infants, neonatal hyperinsulinism, neonatal hypoglycemia and pre-eclampsia.<sup>[2]</sup> Others, including shoulder dystocia, preterm delivery, miscarriage, stillbirth, congenital malformations, risks of operative delivery, and brachial plexus injury. Additional adverse neonatal outcomes include respiratory distress syndrome, hyperbilirubinemia, hypoglycemia, hypocalcemia and hypomagnesemia. In that respect is an also an increased lifetime risk of developing diabetes mellitus and obesity.<sup>[3]</sup>

Diabetes prevalence in some Eastern Mediterranean countries is among the highest in the world. The Eastern Mediterranean Region extends from Pakistan in the east to Morocco in the west, and the population is a mosaic of several ethnic groups. The age distribution pattern of the population is pyramidal, with nearly 50% of the population aged under 20 years. In the Eastern Mediterranean Region as a whole, approximately half of countries have published

incidence rates. The highest rates are reported in Egypt, Kuwait, Lebanon, Oman and Qatar, where the incidence of type 1 diabetes is reported to be 8-10 per 100,000 population per year in children aged less than 15 years while in Pakistan it is only 1 per 100,000.<sup>[1]</sup>

The classification of diabetes mellitus has evolved considerably over time, taking into account recent advances in the diabetes field.<sup>[4]</sup> Type 1 diabetes mellitus encompasses the bulk of events, which are mainly due to pancreatic islet  $\beta$ -cell destruction and are prone to ketoacidosis, coma and death. Type 1 includes those cases attributable to an autoimmune process, as considerably as those with  $\beta$ -cell destruction for which neither etiology nor pathogenesis is known (idiopathic). It does not include those forms of  $\beta$ -cell destruction or failure to which specific causes can be attributed (e.g. Cystic fibrosis, mitochondrial defect, etc.).<sup>[5]</sup> Type 2 is the most common form of diabetes and is characterized by disorders of insulin action and insulin secretion, either of which may be the predominant feature. Both are usually present at the time that this form of diabetes is clinically manifest. The specific reasons for the development of these abnormalities are not yet known.<sup>[5]</sup> Ketoacidosis is very rare in type 2 diabetes. The insulin resistance that occurs in this type is partly explained by the obesity that often coexists with the disease.

Gestational diabetes is a state of carbohydrate intolerance resulting in hyperglycemia of variable severity, with onset or first recognition during pregnancy. It does not exclude the possibility that the glucose intolerance may antedate pregnancy, but has previously gone unrecognized. The definition applies regardless of whether or not insulin is used for treatment or whether the condition persists after pregnancy. Women who are known to have diabetes mellitus

and who later become pregnant do not have gestational diabetes, but have “diabetes mellitus and pregnancy” and should be treated accordingly before, during and after the pregnancy.<sup>[4, 5]</sup>

Gestational diabetes mellitus (GDM) is a rising health concern in many regions of the world; some surveys have shown that GDM occurs in 2.2% to 8.8% of pregnancies.<sup>[6]</sup> Gestational diabetes mellitus is usually asymptomatic. However, it causes complications that can be minimized by prompt diagnosis and early intervention, making screening essential in pregnancy. Detection and diagnosis of hyperglycemia during pregnancy provide an opportunity to help pregnant women establish and maintain a healthy lifestyle and habits that will reduce maternal and fetal complications by facilitating normoglycaemia throughout pregnancy and beyond.<sup>[7]</sup> Individuals at high risk for gestational diabetes include: older women; obese women; those with a previous history of glucose intolerance; any pregnant woman who has elevated fasting, or casual, blood glucose levels; those with a history of gestational diabetes mellitus; those with a history of large-for-gestational-age babies; women from certain high risk ethnic groups; strong family history of diabetes mellitus.<sup>[5]</sup>

Between 14% to 23% of pregnant women will have depressive symptoms while pregnant.<sup>[8, 9]</sup> Antenatal depression, hence may suffer significant adverse effects that may extend beyond pregnancy and have more significant long-term effects on psychosocial functioning.<sup>[10, 11, 12]</sup> There is no question that severe clinical depressive symptoms are the literal and dangerous disease. However, sadness is a normal and healthy reaction to many life situations, as are stress and anxiety.<sup>[13]</sup>

Pregnancy and the postpartum period appear to confer an even greater risk for women with bipolar disorder. Rates of relapse are estimated at 30-50% during the post-partum period. Special considerations are needed when psychotic disorders present during pregnancy. Pregnant women may have many clinical signs and symptoms overlapping with those seen in major depression (e.g. Sleep and appetite disturbance, decreased libido, and low energy).<sup>[14]</sup>

Depression is defined as a state that is characterized by much more than an appropriate feeling of sadness (that is often just a normal emotion that anyone would naturally feel when having to cope with and adjust to life’s difficulties), despair, loneliness, low self-esteem, & self-reproach. Accompanying signs and symptoms include persistent, debilitating and change how they interact with the world, withdrawal from social contact, and vegetative states such as loss of appetite and insomnia.<sup>[15]</sup>

Several risk factors and psychosocial correlates have been named as contributing to depression during pregnancy. The most clearly identified risk factors include a previous history of depression, discontinuation of medication(s) by a woman who has a history of depression, a previous history of postpartum depression, and a family history of depression. Several key psychosocial correlates may also contribute to depression during pregnancy: a negative attitude toward the pregnancy, a lack of social support, maternal stress

associated with negative life events, and a partner or family member who is unhappy about the pregnancy.<sup>[16]</sup>

## 2. Research Question

- What is the prevalence of diabetes mellitus among medical disorders pregnant women in Beni Suef?
- What is the relationship between diabetes mellitus among pregnant women and depressive symptom levels?

## 3. Subjects and Methods

**Subjects:** Precisely, 400 pregnant women associated with medical disorders and undergoing either intervention in the high-risk obstetric departments, and the antenatal outpatient clinics for all governmental hospitals in Beni-Suef City.

**Methods:** An explorer design was selected for the current study. A specially designed interview questionnaire designed by the researcher based on the literature review and was written in a simple Arabic language. Data were collected through using one tool containing three main parts as follows:

**Part I:** included sociodemographic characteristics as age, occupation, education, and income adequacy.

**Part II:** included women's obstetrical history as gestational age, parity, and abortion.

**Part III:** included questions about the depressive symptoms by using the Depression Anxiety Stress Scale (DASS-21).<sup>[17]</sup> The DASS Depression focuses on reports of low mood, motivation, and self-esteem. A respondent indicates on a 4-point scale the extent to which each of 21 statements applied over the past week. Each point is scored from 0 (did not apply at all) to 3 (applied very much or most of the time). Higher scores on each subscale indicate greater levels of depression

## 4. Statistical Analysis

Data were analyzed using the software, Statistical Package for Social Science, (SPSS) version 16. Frequency distribution with its percentage and descriptive statistics with mean and standard deviation were calculated. Chi-square, correlations were done whenever needed. Doughnut chart for the graphical presentation. P values of less than 0.05 were considered significant.

## 5. Results

The distribution for the studied sample as regards the prevalence of Pregnancy associated with diabetes mellitus is presented in **figure (1)**. It shows that more than one third (45%) of the studied sample had diabetes mellitus with their pregnancy.

The distribution of the studied sample as regards sociodemographic characteristics and its association with depression symptom severity is presented in **table (1)**. It reveals that depression symptoms were serious in women

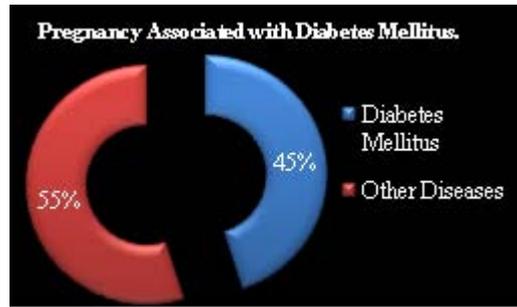
aged 25-30 years (51.8%), Technical education level (84.8%), working women (65.9%) and urban residence (92.7%). Occupation and educational level had a significant relation with symptoms of depression scale score. (P = 0.000).

The distribution of the studied sample as regards obstetric characteristics and associations with depression severity is presented in **table (2)**. It shows that 26.2% of women who were in 2nd trimester, Multiparous (54.3%) and had a history of abortion (31.7%) had severe depression symptoms. A highly significant relation was found. (p=0.000).

The distribution of the studied sample as regards associated between diabetes mellitus and depression symptom severity is presented in **table (3)**. It demonstrates highly significant correlation (P = 0.000).

**Table 1:** Pregnant women sociodemographic characteristics and associations with depression symptom severity

Variables	Normal	Mild to Moderate	Severe	P-Value
<b>Age</b>				
< 20-	0	24	22	0.224
	0.0%	11.1%	13.4%	
20-	9	72	45	
	47.4%	33.2%	27.4%	
25-	10	101	85	
	52.6%	46.5%	51.8%	
30-	0	20	12	
	0.0%	9.2%	7.4%	
<b>Educational level</b>				
Primary	3	27	5	0.000
	15.8%	12.4%	3.0%	
Technical	16	182	139	
	84.2%	83.9%	84.8%	
University	0	8	20	
	0.0%	3.7%	12.2%	
<b>Occupation</b>				
Working	0	110	108	0.000
	0.0%	50.7%	65.9%	
Housewives	19	107	56	
	100%	49.3%	34.1%	
<b>Family adequacy</b>				
Enough	3	29	22	0.938
	15.8%	13.4%	13.4%	
Not enough	16	188	142	
	84.2%	86.6%	86.6%	
<b>Obesity</b>				
Present	16	118	111	0.003
	84.2%	54.4%	67.7%	
Absent	3	99	53	
	15.8%	45.6%	32.3%	
<b>Residence</b>				
Urban	19	193	152	0.130
	100%	88.9%	92.7%	
Rural	0	24	12	
	0.0%	11.1%	7.3%	



**Figure 1:** Prevalence of pregnancy associated with diabetes mellitus.

**Table 2:** Pregnant women obstetric characteristics and associations with depression symptom

Variables	Normal	Mild to Moderate	Severe	P-Value
<b>Trimesters</b>				
1st Trimester	19	171	100	0.000
	100%	87.8%	61.0%	
2nd Trimester	0	27	43	
	0.0%	12.4%	26.2%	
3rd Trimester	0	19	21	
	0.0%	8.8%	12.8%	
<b>Gravida</b>				
Multigravida	9	171	114	0.004
	47.4%	78.8%	69.5%	
primigravida	10	46	50	
	52.6%	21.2%	30.5%	
<b>Parity</b>				
Multiparous	18	103	89	0.000
	94.7%	47.5%	54.3%	
Nulliparous	1	114	75	
	5.3%	52.5%	45.7%	
<b>Abortion</b>				
None	4	200	112	0.000
	21.1%	92.2%	68.3	
Once or more	15	17	52	
	78.9%	7.8%	31.7	
<b>Still/birth defects</b>				
None	19	156	91	0.001
	100%	71.9%	55.5%	
Once or more	0	61	73	
	0.0%	28.1%	44.5%	

**Table 3:** Associated between diabetes mellitus and depression symptom severity (N = 400).

Pregnancy associated with diabetes mellitus	Normal	Mild to Moderate	Severe	P-Value
No	17	140	63	0.000
	89.5%	64.5%	38.4%	
Yes	2	77	101	
	10.5%	35.5%	61.6%	

## 6. Discussion

Age, systolic blood pressure, diastolic blood pressure, maternal weight, history of delivery of a baby weighing greater than or equal to 4.0kg and family history of diabetes mellitus in a first degree relative were subjected to univariate analysis. History of unexplained stillbirths, two or more spontaneous miscarriages and a history of GDM were not subjected to regression analysis as no pregnant woman diagnosed with GDM had them.<sup>[18]</sup>

The prevalence of diabetes mellitus increases with age, and there is evidence that the current life expectancy in the majority of Eastern Mediterranean countries.<sup>[1]</sup> The results of the present study showed that 45% of medically disordered pregnant suffered from diabetes mellitus. This result is in line with Khatib O. (2006) who reported that there are a number of factors that might explain the increasing prevalence of diabetes mellitus in the Eastern Mediterranean Region, not least of all the significant social and economic changes which are being experienced. Rates of obesity are increasing, while people are becoming less physically active; both of these factors increase the risk of developing diabetes.<sup>[1]</sup> The findings of the present survey showed that 61.3% of the study sample were obese, moreover, 54.4% and 67.7% of obese women had a more severe level of depression symptoms. Statistically significant impact of obesity among women on their depression symptom level ( $p = 0.003$ ) was observed.

Age over 30 years is recognized as a risk factor for GDM.<sup>[19,20]</sup> In this study, most of the studied sample's depressive symptoms were in the mid twenty-five to thirty years; the mean age of the pregnant women in this study was  $25 \pm 4.495$  years. In addition, the age of those who had DM was not statistically different with the level of depression in this study, ( $p=0.224$ ). This result was in line with what Diabetes atlas (2006) report, it stated that the majority of persons with diabetes mellitus are in the older age group, the majority in developing countries tend to be middle-aged and at the most productive stage of life. Many Eastern Mediterranean nations are directly describing the onset of type 2 diabetes mellitus at an increasingly young age.<sup>[21, 1]</sup> As the majority of persons with diabetes mellitus in industrialized countries.<sup>[1]</sup> While the difficulties many patients face adjusting to life with diabetes have been well documented, few studies have examined racial and ethnic differences in the often disproportionately exposed to social risk factors for health and psychological problems. Cultural influences can also affect an individual's experience with diabetes. For example, racial and ethnic minorities may differ in their perception of physical or emotional experiences as a problem, causal attribution about the disease, understanding of self-care recommendations, and the everyday implementation of these recommendations. Additional barriers to health include cultural inappropriateness of treatment; linguistic barriers; differential quality of interpersonal care or patient-provider communication; and access to and receipt of appropriate diagnostic, prophylactic, and therapeutic services and modalities.<sup>[22]</sup> When we compared the prevalence of depression symptoms, according to residence, the results of the study showed that women who live in urban areas had severe depression symptoms than the rural ones. This result does not contradict diabetes atlas (2006) as stated, over the past three decades, key social and economic changes have occurred in the majority Eastern Mediterranean nations. These include progressive urbanization and increased life expectancy. Traditional activities and dietary patterns that have sustained people over generations are rapidly going away and the socioeconomic situation in many countries has pushed people to move to urbanized areas to seek employment, where they are less likely to lead a healthy lifestyle.<sup>[21, 1]</sup>

The current study findings showed that nearly one-third of the study sample are housewives. Severe depressive symptoms were more prevalent among working women (65.9%) than housewives' ones (34.1%) with highly statistically significant associations between woman's occupational and educational status and severity level of depression symptoms, ( $p=0.000$ ). This result may be because the woman has a lot of psychological distress and depressed mood related to the burden of her job added to the condition. These results were in line with a number of studies<sup>[23, 24, 25]</sup> and contradicted to those of other studies, as that of Domar A et al. (1992) who illustrated that depression was observed more in housewives more than in outside employees.<sup>[26]</sup>

The present study showed that more 86.5% of the study sample hasn't adequate family income. Depressive symptoms were more prevalent among poor women (86.6%) than rich ones (13.4%). This may due to that, the patients belonging to poor families were concerned about themselves and about the treatment expenses because they were unable to bear high expenses of treatment of the threaded life medical disorder. These results were confirmed by a number of studies.<sup>[14, 23, 13]</sup>

The present study revealed that, 45.0% of the study sample have diabetes mellitus. Concerning to the level of depression symptoms among pregnant diabetic women, the present study showed that more than half (61.6%) of them had severe symptoms, while 35.5% had mild to moderate symptoms and only 10.5% did not suffer. This result consistent with the recent research which shows that significant associations between depressive symptoms and medical complications.<sup>[27]</sup> In addition, Leight L. (2010) reported that, estimates of the prevalence of depression during pregnancy vary depending on the criteria used, but can be as high as 16% or more women symptomatic and 5% with major depression.<sup>[28]</sup>

Based on obstetrical characteristics, the current study highlights statistically significant associations between gestational age ( $p=0.000$ ), gravidity ( $p=0.004$ ), parity ( $p=0.000$ ), history of abortion ( $p=0.000$ ) and history of birth defects ( $p=0.001$ ) and level of depression symptoms. It was noticed that depressive symptoms were greatest observed among women in the 1<sup>st</sup> trimester. It was observed that 87.8% of them had mild to moderate level of depression symptoms and 61.0% had severe levels in first trimester compared to 12.4% and 8.8% in the second and third trimester, respectively, and who were in second and third trimester 26.2% & 12.8% who had severe level. This was expected as pregnant women were more worried about their pregnancy in the first trimester. This result contradicted Evans J., et al. (2001) & Josefsson A., et al., (2001), they reported that, the prevalence of women who meet the diagnostic criteria for depression has been displayed to be between 13.6% at 32<sup>nd</sup> weeks gestation and 17% at 35<sup>th</sup> to 36<sup>th</sup> weeks gestation.<sup>[29, 30]</sup>

Severity of depressive symptoms may be affected by gravidity and parity.<sup>[31]</sup> The present study revealed that 78.8% of multigravida had mild to moderate level of depression symptoms compared with 21.2% primigravida. Moreover, 69.5% multigravida had severe level of

depression symptoms compared with 30.5% primigravida. Statistically significant impact of Parity among diabetic pregnant women on their level of depression symptoms, ( $p = 0.000$ ) was observed. Moreover, it is observed from the results of the present study that the level of depression symptoms affected by previous miscarriage and birth defects. 31.7% and 44.5% of pregnant women with previous abortion and stillbirth or birth defect, respectively, had severe level of depression symptoms. A statistically significant deviation was observed ( $p < 0.05$ ). This may be attributed to that; women were concerned with the destiny of their current pregnancy. They were very depressed in thinking that what will take place with their baby later in case of their death.

## 7. Conclusion

Based on the findings of the present study, different levels of depressive symptoms have been found to be associated with pregnant diabetic women. Statistically significant association between sociodemographic and obstetrical characteristics and level of depression symptoms.

## 8. Recommendation

In the light of the study findings, it is recommended to:

- 1) Psychological counseling for pregnant women may be necessary.
- 2) Activating the role of the nurse in antenatal clinics and departments of obstetrics to improve their ability to understand the nature of mood of the pregnant woman and handled well.

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