

Prevalence of Depression in Diabetes Mellitus and its Determinants

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Diabetes mellitus (DM) and depression both are common diseases. The World Health Organization projected that 300 million people will suffer from diabetes mellitus by 2025. India has the largest number of diabetic populations in the world and it is expected that there will be 69.9 million diabetic people in India by 2025. Depression is the most common psychiatric disorder. It is estimated that 340 million people are affected globally with this disorder, which is associated with significant morbidity and health-care cost. Depression is associated with physiological abnormalities, including activation of the hypothalamic-pituitary-adrenal axis, sympatho-adrenal system, and proinflammatory cytokines, which can induce insulin resistance. While depression may contribute to poor diabetic-related outcome, diabetes and its complication may also contribute to poor depression outcome.

Depression has been documented in patients with DM. Kan et al (2013) conducted a study to assess the relationship of diabetes and depression by a formal meta-analysis study; 24 studies supported that depression is significantly associated with the poor glycemic control. Although there are limited data with regards to depression among patients with diabetes, a few available studies indicated considerably high prevalence in this select group (patients with diabetes) with the common associated factors as gender, income, socioeconomic status, co morbid conditions, and complications. A proper knowledge about the extent and factors associated with depression in patients with diabetes might be of immense importance as it may pave the way for the clinicians toward an improved and effective management of the burdensome disease. It could as well help researchers and guide policy makers in identifying the group at high risk of developing depression and accordingly implement a successful preventive programme.

Review of Literature

Mishra *et al* (20017) studied prevalence of depression in diabetes mellitus and its determinants in Bihar,

India. Total 300 diabetic patients included in this study were screened for depression by patient health questionnaire-9. The results showed the prevalence rate of depression in diabetic patients was 43.33 percent. Diabetic female showed increased prevalence of depressive symptoms versus male participants. Joseph *et al* (2013) carried out study to find out the proportion and determinants associated with depression among patients with type 2 diabetes mellitus in Mangalore city of south India. Results revealed that of the 230 Table 2 DM patients, 119 (51.7%) were males. Among the participants, 71 (30.9%) met the criteria for moderate depression, 33 (14.3%) for severe depression, and the remaining 126 (54.8%) had no clinically significant depression. Among the risk factors, depression was found to be significantly associated with older age, female gender, low socioeconomic status, unskilled and retired status.

Conceptual framework: The framework used for this research study was based on the Modified Becker's Health Belief Model (HBM) (1988). This model can be applied for both illness and health behaviour. In this study it is used in the context of health promotion. This study sought to assess the relationship among depressive symptoms, knowledge and practice of diabetes and blood sugar level among rural woman with type 2 diabetes mellitus at selected villages in Rural Health and Training Centre of SRMC & RI in Vayalanallur, Thiruvallur District, Tamilnadu.

Objectives

The objectives of the study were: (a) To assess the knowledge and practice of diabetes, blood sugar level and depressive symptoms among rural women with type 2 diabetes; and (b) To find out the association between knowledge and practice of type 2 diabetes and blood sugar level and depressive symptoms with selected background variables.

Hypothesis: There is a significant association between depressive symptoms and selected background variables of rural women with type 2 diabetes mellitus.

Materials and Methods

This study was an observational prospective one conducted after approval from Institutional ethical Review Board, Sri Ramachandra University (TN) during the period Sep 2015 to Nov 2015. Number of participants included was 200 rural women.

Inclusion criteria: (a) Willingness to participate in this study, (b) Ability to understand Tamil or English, and (c) Rural women diagnosed to have DM in the age group 20-80 years. **Exclusion criteria:** (a) Patients who were having hearing defect, (b) Patients who had previous psychiatric problem, and (c) Patients who were seriously ill.

Study Tools: Three questionnaires were employed in the data collection process. These included a semi-structured questionnaire for the collection of socio demographic information as well as information on clinical and diabetes-related variables. It was designed by the investigators and validated by nursing experts. Second one was knowledge assessment questionnaire about diabetes mellitus; it was developed by the researcher. Third one was DASS scale, which is a free scale with standardised questionnaire to assess the depression, anxiety and stress.

Study Procedure: Data was collected over a period of 6 weeks during September to November 2015 in 9 villages that come under rural health training centre of SRMC&RI at Vayalanallur, Thiruvallur district, Tamilnadu. Data collection was done between 10 am to 12 noon. There was a rigorous house-to-house search for patients with type 2 diabetes in each of the 9 visited areas. The first house in each area was selected at random and the search continued to the next house. Data was analysed using Statistical Package for the Social Sciences (SPSS) version 19.0. The test statistics used for the purposes of data analyses are: descriptive statistics, reliability analysis. All statistically significant results were based on a $p < 0.05$ level.

Results

Out of 200 subjects 40 percent were less than 45 years and 60 percent were more than 45 years. With regard to marital status, 91.5 percent subjects were married, 7.5 percent subjects were widowers and 1 percent separated. Family history of diabetes mellitus shows that 53.5 percent subjects had family history of diabetes mellitus; 44 percent had the family history based on parents, 22 percent based on the family history of siblings, 7 percent had the family history of grandparents, 33 percent based on other relations and 46.5 percent subjects did not have any family history.

Further 62 percent had adequate knowledge, 13.0 percent had moderately adequate knowledge and 25

percent inadequate knowledge about complications, only 1.5% had desirable practice, 90.5 percent had moderately desirable practice and only very few (8%) had undesirable practice. Most of them had moderate and severe depression (37.5%, 31%). Only 5 percent of rural women had very severe depression. Regarding anxiety 32 percent had severe anxiety and 43.5 percent of them had very severe anxiety. Majority of them had normal stress (80.5%) (Table 1).

Table 2 shows that 28 percent had blood sugar between 110-160 mg/dl, 37 percent had blood sugar between 161-215 mg/dl, 30 percent had blood sugar between 216-400 mg/dl and 5.0 percent had blood sugar level between 401-550 mg/dl. The mean blood sugar level was 214mg/dl; 35 percent of rural women had blood sugar above the population mean. Depression was found to be significantly associated with a number of variables. The study shows that there was a significant association between depressive symptoms and work status, received health education, age, duration of having diabetes, Monthly income, hypertension, having attained menopause. The odds of depressive symptoms with low income group were 1.65 times large as the odds of depressive symptoms among high income group. This association is statistically highly significant at $p < 0.000$ level.

The odds of depressive symptoms with unemployed were 1.8 times larger than the odds of depressive symptoms among employed group. The odds of depressive symptoms were 1.5 times higher among no family history of diabetes than the odds of depressive symptoms with the family history of DM. The odds of depressive symptoms were 1.5 times higher among not having attained menopause than the odds of depressive symptoms among who attained menopause.

Discussion

Depressive symptoms (depression, anxiety, stress) among rural women with diabetes mellitus shows that 98 percent had mild to moderate depression and 2 percent had moderate to severe depression. Mean

Table 1: Prevalence of depression, anxiety and stress in the study population (N=200)

	Normal		Mild		Moderate		Severe		Very Severe	
	F	%	F	%	F	%	F	%	F	%
Depression	24	12	29	14.5	75	37.5	62	31	10	5
Anxiety	11	5.5	9	4.5	29	14.5	64	32	87	43.5
Stress	161	80.5	26	13	13	6.5	-	-	-	-

Table 2: Level of random blood sugar level (N=200)

Random blood sugar (mg/dl)	F	%
110-160 mg / dl	56	28
161-215 mg / dl	74	37
216-400 mg / dl	60	30
401-550 mg / dl	10	5

of depressive symptoms was 45.92 and standard deviation 17.06. These findings are supported by Thonsai, Watanabenjasopa and Youjaiyen (2013) in their study on depression in patients with type II diabetic outpatient clinic, in Samut Prakan. They identified the cause of severe depression as DM type II. The results showed that 66 percent study participants had a depression score at a low level and 42.9 percent felt worrying about their depression.

Depression was significantly more common among women aged more than 45 years. Similar findings were reported in many other studies. A common explanation to this age difference had been the fact that elderly play social roles different from their young counterparts with attendant disadvantages including dependence and unemployment. In our study, majority of the women were unemployed and were homemakers. A significant association was found between depression and employment in this study. The present study established a significant difference in prevalence of stress among patients with diabetes with one or more co morbidity compared to the patients without co morbidity. This is in similarity with the study done by Rahman, Flora and Rakibuz-Zaman during 2011. There was significant association between socioeconomic status and depression demonstrated in the present study. Depression was found to be significantly more frequent among unemployed participants than in employed ones. This is consistent with the findings of Joseph et al, Rahman et al. Being unemployed may affect an individual's mental balance in several ways including forcing someone to stay at home with little or no company for most parts of the day and to depend on others for their day-to-day financial expenses including that of diabetes care.

Recommendations: Same study can be done in larger sample. Similar comparative study can be conducted between rural and urban women. A study can be conducted in a various population.

Conclusion

An unexpectedly high prevalence of unrecognised depression was found in diabetic patients. Depression is common in diabetes patients' particularly poorly controlled. Hence, psychiatric assessment should be part of initial and ongoing evaluation of these patients, and psychiatric intervention may be necessary to achieve improved overall health in diabetic population. This study helps the nurse to develop insight to the development of teaching module and material towards promotion of mental health.

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