



## DIABETES MANAGEMENT AND DEPRESSION AND DIABETES DISTRESS

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**ABSTRACT** Diabetes is often found to be associated with a number of psychological effects. The current study aims to examine the association between diabetes management and experience of diabetes specific distress and depression. A sample of 333 (male 58.85%) adults visiting a diabetes care clinic in Visakhapatnam city, Andhra Pradesh, India, responded to Patient Health Questionnaire-9 (PHQ-9) and Diabetes Distress Scale (DDS) to measure their levels of depression and diabetes specific distress. The sample was divided into *poorly managing, good managing and excellently managing* groups based on their glycemic control as measured by HbA1c test. The poorly managing group reported experiencing significantly more depression and higher levels of diabetes specific distress on three of four dimensions of diabetes distress and total distress. It is also observed that the relation between diabetes management and distress is gender-specific. The three diabetes management groups within the female subsample differed significantly on all the four dimensions of *diabetes distress (emotional burden, physician related distress, regimen related distress and interpersonal distress) and total distress, while few such significant differences were observed in the male subsample. However, in both subsamples, the poorly managing group reported higher scores.*

**KEYWORDS :** Diabetes Management, Glycemic Control, Depression, Diabetes Distress

### INTRODUCTION

About 422 million people worldwide have diabetes, particularly in low-and middle-income countries and 1.6 million deaths are directly attributed to diabetes each year. Both the number of cases and the prevalence of diabetes have been steadily increasing over the past few decades (WHO, 2019). Findings by Thakur (2015) reveal that while 80 per cent of the people with type 2 diabetes residing in low and middle-income countries, most of the evidence on diabetes and depression come from high-income countries.

Diabetes is a chronic disease which has to be successfully managed by the patient in order to ward off future complications and maintain a healthy quality of life. Management of the disease involves altering one's lifestyle as well as learning self-care skills. The physiological changes in the brain due to the disease and the stress associated with disease management can lead to depression. Research evidence reveals that individuals with diabetes have at least twice the risk of developing depression compared to those without diabetes with figures as high as 31.7% (Anderson et al, 2001).

Depressive symptoms in people with diabetes mellitus are of concern because of their association with poor diabetes self-management (i.e., diet modification, physical activity, insulin injections) and an increased risk for diabetes-related complications such as cardiovascular diseases (Albasheer et al., 2018; De Groot et al., 2001). Furthermore, comorbid depression in people with diabetes mellitus is associated with functional disability, low work productivity, and low health service use (Black and Markides, 1998; Ciechanowski et al., 2000). This relationship between diabetes and depression can be bidirectional in nature and can be influenced by another condition called distress.

Diabetes distress is a distinct condition which may be present in individuals due to the stresses and worries that arise while coping with a demanding disease like diabetes (Fisher et al., 2010). This condition may simulate depression to such an extent that it may be confused with clinical depression and treated as such. Diabetes distress impacts living with diabetes and has tangible clinical importance, as it is associated with sub-optimal self-care (Dogra et al., 2017) and glycemic control which is a key indicator of effective diabetes management (Co et al., 2015; Stoop et al., 2014; Friis et al., 2015).

The prevalence of Diabetes distress has been reported across research studies to be 25% to 18% at the upper and lower ends (Aljuaid et al., 2018; Gahlan, et al., 2018; Tan et al., 2017; Zhou et al., 2017). With regard to the dimensions, emotional burden was reported to be most

prevalent (Zanchetta et al., 2016; Gahlan et al., 2018; Aljuaid et al., 2018) followed by physician related distress (Aljuaid et al., 2018). Moderate level of regimen related distress and interpersonal-related distress were reported by Hood et al., (2018).

Further mixed findings have been obtained with respect to the impact of demographic variables on the dimensions of diabetes related depression and diabetes distress. For instance Sweileh et al., (2014) surveyed the presence of depressive symptoms among 294 patients with Type 2 diabetes with results revealing a prevalence of depression in 40% of the patients with a higher level of depression seen in females as compared to males. However another cross-sectional study was done by Albasheer et al., (2018) indicated that while the presence of depression was associated with the presence of diabetes complications it was not associated with gender, among other demographic variables.

Results reported by Kuniss et al., (2016) also revealed gender differences and indicated a significantly greater experience of diabetes distress in women. On the contrary Polonsky et al., (1995) found no significant relationship between gender of the patient and diabetes distress.

Against this backdrop, the present study seeks to examine differences in diabetes management and its association with diabetes distress and depression. It can be noted that research is lacking in low and middle-income countries where eighty per cent of people with type 2 diabetes reside. In this regard, the current study has important relevance for India (a middle-income country with high prevalence of type 2 diabetes). The study seeks to reexamine gender differences in this context which would be meaningful considering the mixed findings so far.

### METHOD

The major aim of this study was to examine the association between diabetes management and depression and diabetes specific distress among people with type 2 diabetes. A cross-sectional design with purposive sampling method was used to recruit the participants for the study. A total of 333 adults with Type 2 diabetes visiting a leading endocrinologist in Visakhapatnam city, India, were recruited for the current study. The sample includes 196 male and 137 females with an age range of 25-78 years (M=50.09). Further, glycated hemoglobin levels as measured by HbA1c test was used to assess diabetes management in the participants. The total sample was categorized as three groups poorly managing (9and above), adequately managing (7and 8) and excellently managing (4 to 6) groups.

**Measures**

Two standardized questionnaires were used in the study to measure Depression (Patient Health Questionnaire-9) and, Distress (Diabetes Distress Scale) respectively.

The Diabetes Distress Scale (DDS), a 6-point Likert scale was developed by W.H. Polonsky (2005), lists 17 of the potential problem areas that people with diabetes may experience in their daily life. The scale consists of four subscales namely emotional burden, physician-related distress, regimen-related distress and interpersonal distress and also gives a separate total score. Higher scores on these scales indicate higher levels of distress.

The Patient Health Questionnaire-9 (PHQ-9) was developed by Kroenke (2002) is a self-administered, diagnostic screening instrument to be used by health care professionals for assessing and monitoring depression severity. It consists of 9 items and is a quick, cost-effective measure of probable depression in adults. The questionnaire asks clients to check off the number of days they have been bothered by each of the PHQ-9 symptoms over the “last two weeks.”

**Administration**

The questionnaires included in the study were administered to the participants after their consultation with the doctor was completed. Informed consent was obtained from the participants. The participants were administered either the English or the Telugu versions (local language) of the questionnaires as per their request.

**RESULTS**

**Table 1: Diabetes Management, Depression and Diabetes Distress**

| Variables                  |      | Poorly managed | Adequately managed | Excellently managed | F     |
|----------------------------|------|----------------|--------------------|---------------------|-------|
| Depression                 | Mean | 6.27           | 4.99               | 4.49                | 4.92* |
|                            | S.D  | 4.30           | 4.14               | 3.85                | *     |
| Emotional Burden           | Mean | 15.92          | 14.20              | 6.099               | 6.45* |
|                            | S.D  | 6.72           | 6.54               | .658                | *     |
| Physician related distress | Mean | 4.91           | 4.40               | 4.44                | 2.03  |
|                            | S.D  | 2.42           | 1.90               | 1.98                |       |
| Regimen related distress   | Mean | 20.54          | 15.38              | 11.85               | 42.12 |
|                            | S.D  | 6.90           | 6.77               | 5.87                | **    |
| Interpersonal distress     | Mean | 6.82           | 6.01               | 5.58                | 3.51* |
|                            | S.D  | 3.74           | 2.95               | 3.24                |       |
| Total distress             | Mean | 46.68          | 38.08              | 32.77               | 29.13 |
|                            | S.D  | 13.69          | 12.34              | 11.43               | **    |

\*p≤.05, \*\*p≤.01

Significant differences were observed among the three diabetes management groups (i.e. poorly managed, good and excellently managed) on depression and various dimensions of diabetes distress. It can be seen that the three group differed significantly on *depression* (F= 4.92, p≤.01). Further, significant differences were observed on three of the four dimensions of diabetes distress, namely, *emotional burden* (F=6.45, p≤.01), *regimen related distress* (F=42.12, p≤.01), *interpersonal distress* (F=3.51, p≤.05) and *total distress* (F=29.13, p≤.01). No such significant differences were observed on *physician related distress* among the three diabetes management groups. A close examination of the mean scores reveals that the poorly managing group reported higher scores on *depression* and also on *total diabetes distress*.

**Table 2: Diabetes Management, Depression and Diabetes Distress among Males**

| Variables                  |      | Poorly managed | Adequately managed | Excellently managed | F      |
|----------------------------|------|----------------|--------------------|---------------------|--------|
| Depression                 | Mean | 5.43           | 4.32               | 4.02                | 2.02   |
|                            | S.D  | 4.34           | 3.66               | 3.68                |        |
| Emotional Burden           | Mean | 13.28          | 13.65              | 11.78               | 1.43   |
|                            | S.D  | 6.53           | 6.57               | 5.79                |        |
| Physician related distress | Mean | 4.78           | 4.54               | 4.74                | .19    |
|                            | S.D  | 2.39           | 2.33               | 2.56                |        |
| Regimen related distress   | Mean | 19.89          | 15.82              | 11.68               | 18.53* |
|                            | S.D  | 7.51           | 7.10               | 5.57                | *      |
| Interpersonal distress     | Mean | 5.44           | 5.71               | 4.92                | 1.35   |
|                            | S.D  | 2.81           | 2.91               | 2.21                |        |

|                |      |       |       |       |        |
|----------------|------|-------|-------|-------|--------|
| Total distress | Mean | 42.22 | 37.91 | 31.72 | 9.65** |
|                | S.D  | 13.39 | 12.76 | 9.64  |        |

\*p≤.05, \*\*p≤.01

A further analysis was conducted to see if the observed difference on the psychological variables among the three diabetes management groups varies across the gender. Within the male subsample, no significant differences were observed among the three diabetes management groups (i.e. poorly managing, adequately and excellently managing) on *depression*. However, the three groups differed significantly on *total diabetes distress* (F=9.65, p≤.01) and *regimen related distress* (F=18.53, p≤.01). No such significant differences were observed on the other three dimensions of diabetes distress, i.e. *emotional burden*, *physician related distress* and *interpersonal distress* among the three groups. The mean scores reveal that the poorly managing group reported higher scores on *total diabetes distress* and *regimen related distress*.

**Table 3: Diabetes Management, Depression and Diabetes Distress among females**

| Variables                  |      | Poorly managed | Adequately managed | Excellently managed | F     |
|----------------------------|------|----------------|--------------------|---------------------|-------|
| Depression                 | Mean | 7.20           | 6.17               | 5.14                | 2.39  |
|                            | S.D  | 4.09           | 4.68               | 4.03                |       |
| Emotional Burden           | Mean | 18.84          | 15.17              | 13.56               | 8.42* |
|                            | S.D  | 5.69           | 6.44               | 6.43                | *     |
| Physician related distress | Mean | 5.06           | 4.13               | 4.03                | 6.46* |
|                            | S.D  | 2.47           | .52                | .16                 | *     |
| Regimen related distress   | Mean | 21.27          | 14.60              | 12.08               | 26.07 |
|                            | S.D  | 6.15           | 6.12               | 6.33                | **    |
| Interpersonal distress     | Mean | 8.33           | 6.56               | 6.50                | 3.66* |
|                            | S.D  | 4.06           | 2.97               | 4.15                |       |
| Total distress             | Mean | 51.16          | 38.38              | 34.22               | 22.30 |
|                            | S.D  | 12.54          | 11.68              | 13.54               | **    |

\*p≤.05, \*\*p≤.01

With respect to the female subsample, significant differences were observed among the three diabetes management groups (i.e. poorly managing, adequately and excellently managing) on all the four dimensions of *diabetes distress*, namely, *emotional burden* (F=8.42, p≤.01), *physician related distress* (F=6.46, p≤.01), *regimen related distress* (F=26.07, p≤.01) and *interpersonal distress* (F=3.66, p≤.05) and *total distress* (F=22.30, p≤.01). No significant differences were observed on depression among the three groups. A look at the mean scores reveals that the poorly managing group reported higher scores on all the four dimensions of *diabetes distress*.

**DISCUSSION AND CONCLUSION**

Diabetes management as measured by glycated hemoglobin levels (i.e., HbA1c levels) may have implications on the experience of diabetes specific distress and depression. It is found that, compared to adequate and excellently managing groups, the poorly managing group reported experiencing significantly greater depression. They also reported experiencing significantly higher levels of diabetes distress which included dimensions such as *emotional burden*, *Physician distress*, *regimen related distress*, *interpersonal distress* and *total distress*. These results reveal that poor diabetes management may involve a heightened experience of depression and diabetes distress.

While few earlier studies support the present findings, other studies have obtained mixed results. Papeelbaum et al., (2011) found that participants who displayed depression, showed higher levels of HbA1c (low glycemic control) in line with the findings obtained in this study. Other studies have however found a stronger association between poor glycemic control and diabetes distress and concluded that higher diabetes-specific distress was a better predictor of higher HbA1c and triglyceride levels than depression (Co et al., 2015; Stoop et al., 2014; Friis et al., 2015; Aljuaid et al., 2018).

An examination of the implications of diabetes management on diabetes distress and depression across gender groups in this study revealed that the observed consequences between diabetes management and distress are gender-specific. While the three diabetes management groups within female groups differed significantly on all the four dimensions of diabetes distress, few such significant differences were observed in the male group. However, in both subsamples, the poorly managing group reported higher scores.

## Implications

It is important to differentiate diabetes specific distress from depression and screening of diabetes distress can help in identifying impediments in the management of diabetes. Prolonged distress may lead to depression and effects management of diabetes. If distress is being paid more interest prevention of depression and diabetes management is possible. Women are projected as care givers than receivers. Along with social responsibilities disease management becomes more distressful for women. Social support, awareness of the disease, healthy life style can help women to manage distress.

More or equal importance should be given to the psychological and social factors of disease management. Along with physiological complications, psychological consequences also should be addressed by physicians and extra support should be provided by health psychologists by providing counseling for management of diabetes, distress and depression.

Diabetes specific distress and depression are consequences of poor management of diabetes or vice versa. So it is important to pay attention on the consequences of diabetes distress and depression in the management of diabetes.

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