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PREVALENCE OF CO-MORBID EMOTIONAL PROBLEMS IN TYPE II-DM

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Abstract

Diabetes is a global health problem. It is one of the world's most important causes of expenditure, mortality, disability and lost economic growth (IDF, 2006). In general, DM refers to a group of diseases that affect glucose regulation in the blood. It is primarily categorized into two different forms: type 1 and type 2. Type 2 diabetes is the most common type of diabetes. Type 2 accounts for 90-95% of the total diabetes population. India accounts for 1 in 7 of all adults living with diabetes in the world. Epidemiologic analyses (observational studies or secondary analyses of trials) suggest a correlation between higher rates of cardiovascular disease (CVD) and chronic hyperglycemia. The role of psychological factors in the risk of T2DM onset has received recent attention. Adverse early-life events, particularly childhood neglect, depression (from depressive symptoms to clinical depression), and work-related stress, mainly job strain and long working hours (≥55 hours per week), are the most frequently examined factors in relation to T2D. Previous studies have indicated that the risk of developing diabetes is elevated in persons who report high depressive symptoms and/ or clinical depression compared to those with fewer symptoms or without a clinical diagnosis. The presence of diabetes increases the risk for having a diagnosis of depression, and people with diabetes are more likely to have deficits in cognitive function. Present study aims to identify levels of co-morbid emotional problems in Type II DM patients. The study was conducted in Narayana Medical College & Hospital, Nellore, AP. Result of study clearly reveals that emotional and depressive symptoms are three fold increased in diabetic individuals when compared with healthy individuals. Depressive symptoms are increased along with duration DM, which leads to serious complications. Study concludes that intervention by clinical pharmacist will help the patient to get rid from depressive and diabetic complications.

Keywords: Diabetes, Depression, Hyperglycaemia, Insulin.

INTRODUCTION

Diabetes Mellitus:

Diabetes is a global health problem. It is one of the world's most important causes of expenditure, mortality, disability and lost economic growth (IDF, 2006). Diabetes according to the World Health Organisation (WHO) is*"A metabolic disorder of multiple aetiology characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both. The effects of diabetes mellitus include long term damage, dysfunction and failure of various organs"*.
It is primarily categorized into two different forms: type 1 and type 2.

Type 2 Diabetes

Type 2 diabetes is the most common type of diabetes. It accounts for 90-95% of the total diabetes population. It is characterised by a combination of resistance to insulin action and it ranges from insulin resistance with an inadequate compensatory insulin secretory response, to insulin resistance with insulin secretory defect. The insulin secretion disorder is not due to β-cell destruction, but its aetiology is unclear. People with disorders in insulin action cannot use insulin effectively. Risk factors for this type of diabetes are considered to be age, obesity, and lack of physical activity.

There are two sub-divisions of type 2 diabetes. The "Not Insulin Requiring" diabetes, managed by lifestyle measures alone and sometimes oral drugs, and the "Insulin requiring for control" diabetes, where insulin is required for control, rather than survival.[7] Unlike Type 1, Type 2 diabetes is a condition where the pancreas produces some insulin, so hyperglycaemia may exist on a chronic asymptomatic basis, and in most cases cannot be easily noticed until some complication occurs. Thus, although Type 2 diabetes does not usually provoke acute episodes, such as ketoacidosis, it may create severe chronic complications with a consequent impact on the individual's health status and use of health services

Diabetes Mellitus Prevalence:
The prevalence of diabetes mellitus is increasing worldwide with estimates suggesting that 537 million adults (20-79 years) are living with diabetes worldwide – 1 in 10. The total number of people with diabetes is predicted to rise to 643 million (1 in 9 adults) by 2030 and 784 million (1 in 8 adults) by 2045. India accounts for 1 in 7 of all adults living with diabetes in the world. 1 in 11 adults in India have diabetes – 90 million. The number of people living with diabetes is predicted to increase by 69% to 152 million by 2045. Over 1 in 2 (51.2%) adults living with diabetes are undiagnosed. Diabetes is responsible for 747,000 deaths in 2021. Total diabetes-related expenditure in the region amounts to USD 10 billion – the second lowest of all IDF Regions. 1 in 4 live births are affected by hyperglycaemia in pregnancy.

Psychological risk factors
Negative emotional well-being and T2DM
The role of psychological factors in the risk of T2DM onset has received recent attention. A growing body of longitudinal studies indicates that psychological factors contribute to the risk of T2DM in initially diabetes-free individuals. The vast majority of work so far has investigated associations between negative psychosocial factors and future T2DM onset. More specifically, previous studies have mainly focused on negative psychological factors such as perceived stress, work-related stress (encompassing phenomena such as job strain, long working hours, burn-out, and effort-reward imbalance), psychological disorders including depression, anxiety, and post-traumatic stress disorder, negative personality traits such as anger and hostility, and adverse early-life events. Overall, findings revealed that negative psychosocial factors increase the risk of developing T2D in the long-term.

Association between depression and diabetes
Depression and diabetes are two serious medical conditions and health concerns that afflict millions of people worldwide. Multiple meta-analyses have suggested an association between depression and diabetes as bidirectional. The bidirectional association between diabetes and depression was first documented by Golden and colleagues who described the relationship as “modest” and “partially explained by lifestyles”, and Eaton and colleagues were the first to report the results of an epidemiological study that confirmed this relationship.
The bidirectional relationship between depression and diabetes can be elaborated with the help of two hypotheses. One hypothesis suggests that depression is a consequence of diabetes and may be a result of the burden of chronic disease or of biochemical changes that occur in diabetes. Another hypothesis proposes depression as a risk factor for the development of diabetes which may be a consequence of a decline in health-maintenance behaviours among depressed persons or resulting from biochemical changes associated with depression.
Role of pro-inflammatory cytokines
The second most widely discussed explanation for the link between depression and diabetes involves the inflammatory response or dysregulation of the immune system. Both depression and diabetes are associated with increased C-reactive protein, TNF-α and pro-inflammatory cytokines. However, disagreement between this assumption and the proposed hypothesis that cortisol inhibits inflammation and the immune response; whereas depression is correlated with both elevated cortisol and increased inflammatory markers. This apparent contradiction could be explained with the help of a finding that melancholic depressed patients had increased HPA axis activity and no signs of inflammation, whereas non-melancholic depressed patients did show signs of inflammation and normal HPA axis activity. There is a growing body of evidence to support an association between inflammation and depression.
The elevated levels of proinflammatory cytokines such as interleukin-6 (IL-6) and C-reactive protein (CRP) have been implicated in the pathophysiology of T2DM. Meta-analyses have also suggested an association between elevated level of CRP and increased risk of T2DM. The association of elevated CRP levels and depressive symptoms with a higher incidence of T2DM, suggests that individual who have both depression and inflammation are at greater risk of developing diabetes, and both increased the risk of abdominal obesity, metabolic syndrome, and coronary heart disease.
The role of inflammatory mediators in the development of diabetes has been supported by at least two population-based studies. It is suggested that inflammation may be associated with oxidative damage and the release of free radicals that damage pancreatic β cells, thus limiting the release of insulin. The inflammatory process may inhibit insulin uptake, a critical process in glucose regulation. Moreover, in cross sectional studies, inflammatory markers, including the cytokines interleukin-1β, and tumour necrosis factor-α and C-reactive protein, were found to be elevated in depressed persons. CRP has been linked to insulin resistance via obesity, adipose tissue which is a main source of pro-inflammatory cytokines and impairment of endothelial permeability.

NEUROENDOCRINE CONNECTION BETWEEN DIABETES AND DEPRESSION

DIABETES DISTRESS

While comorbid psychiatric disorders like depressive disorders are a relatively well-known phenomenon another lesser known and rather new phenomenon is; diabetes distress or diabetes related distress. Diabetes distress is a relatively new term gaining more eminence in literature in last decade. Diabetic distress is still evolving as a phenomenon and different authors and investigators have defined it in different ways. More simplistically diabetes distress can be defined as a QoL issue due to combination of medical and psychological burden of DM as a chronic and complex malady that creates an emotional distress that often remains hidden from providers and at times from the sufferer as well. However, diabetes distress can influence diabetes management and treatment outcomes in an unfavorable way.

It should be emphasized here that diabetes distress is not a psychiatric disorder but it is rather an affective state resulting from constant worry about adherence with diet, exercise, blood glucose monitoring while feeling scared, anxious, overwhelmed, at times angry and burnout. The level of diabetes distress is noted to be much higher in patients who are younger; female non-white had higher BMI, and patients who are being treated with insulin versus patients who are treated with oral hypoglycemic agents. Diabetes distress does not appear to be related to duration of illness. In other words, an adolescent or young adult may feel more distressed about having DM diagnosed recently versus someone who has dealt with DM for most of their lives. However, using DM management with insulin injections as proxy of severer illness (compared to DM managed by diet or medications), it can be predictive of patient with more emotional distress.

MANAGEMENT OF DIABETES DISTRESS

Provider awareness of the possibility of presence of diabetes distress is the first step in managing it. Most patients may not even be cognizant of being distressed until they are asked specific questions or they do self-assessment using a structured screening tool. Many scales are available to screen for emotional distress specifically associated with DM. These scales have been validated and are available for use in clinical practice. Providers may feel that the time constraints of a busy diabetes clinic may preclude them from utilizing long, time consuming surveys.

However, the potential benefit of devoting some clinical time to reviewing these tools with patients may ultimately prove to be not only time saving in the long run but also would save the provider from frustration and angst about not been able to have good outcomes and be able to manage a patient more optimally. Several screening scales have been used which can help delineate emotional distress related to patients with diabetes. They may aid the provider in improving DM outcomes by understanding their patient's plight and to offer them some solutions to overcome their difficulties.

First and foremost is the acknowledgment in a provider's mind that DM is not just a physical ailment completely isolated from a patient's psyche. Addressing QoL issues will improve the outcome measures for DM thus improving the risk of long term complications. A study of 20 patients with T2DM showed improved fasting blood glucose and two-hour postprandial blood glucose levels in patients treated with progressive relaxation techniques and biofeedback treatment suggesting that a less anxious state may improve diabetes care. Treating patients in silos of specialized medicine is not conducive of good outcome in any disease and especially a complex disease such as DM. It is of utmost importance that healthcare providers know that patients with DM are likely to have some level of emotional distress, detachment from their social support system, as well as possible distrust of health care professionals affecting their psychological state.

NON PHARMACOLOGICAL THERAPY FOR DIABETES DISTRESS

Psychotherapy

A variety of psychotherapies are available as a sole treatment or adjunctive to antidepressant medication. Interpersonal psychotherapy, cognitive-behavioral therapy, behavioral therapy, brief dynamic therapy, and marital therapy have all been used in the treatment of depression. These psychotherapies have been shown to often be effective for mild to moderate depression, but studies in continuation or maintenance therapy are lacking. Medication can eliminate symptoms of depression, whereas psychotherapy is best at assisting the patient in day-to-day coping skills that can prevent relapse. Thus, a combination of medication and psychotherapy yields the best results.

PSYCHOTHERAPEUTIC MANAGEMENT OF DIABETES DISTRESS AND PSYCHIATRIC COMORBIDITIES OF DM

Many psychological interventions have shown promise in addressing emotional distress relating to general medical conditions. Simple interventions like engaging patient in supportive psychotherapy where they can talk about their emotional distress and work with the therapist to understand their frustrations can be helpful. Behavior therapies where modifications are made by learning to improve specific behaviors that can be self-destructive such as being non-compliant with treatment protocol and adhering to the healthy life style can be beneficial. CBT which makes a person understand one's own flawed cognitive schemas and thought patterns leading to negative emotional state that in turn leads to maladaptive behaviors has also been shown to be very

effective. Some alternative therapies like neuro and biofeedback, distraction techniques, relaxation, and imagery therapy, all have shown some level of efficacy. Psychiatric screening for all DM patients is not necessary, however, identifying patients at risk and screening them for particular psychiatric conditions is prudent. Other treatment modalities like group therapy and family therapy have all been shown to be effective in mild cases of depression. More serious and recurrent episodes that fail to respond to psychosocial support and psychotherapy should be assessed carefully for a trial of psychotropic medications.

Supportive psychotherapy (ST)

ST is a psychotherapeutic approach that can be utilized when patient is in relative acute stages of illness and is not yet ready to engage in deep insight-oriented or other structured therapies. ST can be performed with relative ease with patients facing acute changes in their life circumstances affecting their emotional wellbeing like dealing with a major complication of DM or having a setback in the management of DM. ST strives to reinforce a patient's ego by providing them support for their current stressors and to enable patients to adapt well to challenges they are facing.

ST was conceptualized to identify and enhance the inherent abilities of the patient and to help them realize their own potential in hopes to help them cope with their stressors. ST motivates patients to recognize that they are the protagonists in their own management plan and this helps then to cope with their treatment challenges in a better way. At times ST therapist may use some explorative and interpretative techniques as indicated. DM patients faces multiple changes in their daily life, change in life style, feeling guilt for burden on their loved ones, and dealing with medical and physical issues affecting function and at times causing disability with major medical complications. ST can be especially helpful in the early stages of engaging DM patients to understand the nature and stage of the disease as its non-exploratory and non-judgmental approach may put patients at ease and help patient accept the demands and complexity of treatment regimens. ST focuses on conscious issues apparent to the patient, what symptoms they are dealing with, and how it is affecting their life in which the therapist carefully and empathetically listens for the emerging themes and patterns. Success depends on the therapist's ability to interpret the transference, counter transference, and resistance, expertly to help DM patients understand the underlying subconscious conflicts. As these needs are explored patient's learn to develop an emotional state where conflicts can be dealt with in a healthy and sustainable manner.

Interpersonal therapy (IPT)

IPT is a time limited structured therapy consisting of 16 weeks of weekly sessions addressing four main areas where interpersonal relationship can be challenged and can give rise to persisting depression. The first of the four focus areas is grief, in which IPT may prove to be a very effective way of addressing grief associated with the diagnosis of a chronic disease with a major impact on self-image and lifelong change in life style. IPT can be employed to improve interpersonal and social connectedness difficulties, which are a common area of emotional distress for DM patients. It can also improve self-esteem, self-worth, and alleviate despair and dysphoria. IPT has shown to diminish the helplessness and hopelessness in depressed patients that can lead to suicidal thoughts.

Interpersonal and social rhythm therapy (IPSRT)

IPSRT is a combination of IPT and social rhythm therapy (SRT) for the treatment of major depression and bipolar disorder. IPSRT is a time-limited therapy, consisting of 20–24 sessions of individual therapy delivered over a period of 8 months. IPSRT techniques take into account the fact that most relapses of mood disorder occur as a result disruption of interpersonal harmony, non-compliance with treatment and/or interruption of social rhythm. The goals of the IPSRT include: increase compliance to pharmacotherapy, develop skills for healthy coping with life-events, and to restore, maintain and monitor of a healthy circadian rhythm.

Cognitive behavior therapy (CBT)

CBT is based on the information processing theory, which requires a more active role from both therapist and patient. CBT utilizes structured tools and assignments to assess and monitor progress towards therapeutic goals CBT aims to assess the difficulties encountered in early development as it is considered that these emotional difficulties contribute to cognitive distortions or automatic thoughts impacting a person's and emotional state and the formation of personality. A distorted or negative cognitive schema about self, future, and the world around, impacts a person's perceptions resulting in maladaptive and faulty behaviors. CBT was shown to be superior in the treatment of depression in comparison to supportive and family therapy.

Behavioral therapy (BT)

The premise of BT is that the stressors lead to the development of maladaptive coping mechanisms. This in turn results in negative behavior that consequently forms diminished contingent positive reinforcement. With persistent faulty coping mechanisms the likelihood of developing dysphoria and anxiety increases. This negative feedback loop results in rumination, self-blame, self-criticism, as well as faulty perceptions and behaviors about others. BT is rooted in re-routing these negative feedback loops.

Aim and objective: To evaluate the prevalence of diabetic distress in type 2 DM patients in Narayana medical college and Hospital. The major objective of the study is to analyze the depression and anxiety severity levels in diabetes patients

Methodology: The study was conducted for a period of 18months (Jan-2020 to June 2021) with the study population of 2689 patients in the departments of Endocrinology, Psychiatry, and General Medicine at Narayana medical college & hospital, Chinthareddypalem,Nellore.

The study was approved by institutional ethical committee of Narayana Medical college and Hospital. Patients were enrolled into the study based on enrolment criteria after obtaining informed consent form. Patient data was collected with specially designed patient data collection proforma(annexure-1)

Patient's enrolment criteria: The patients aged above 40 years and less than or equal to 80 years were enrolled into the study based on inclusion and exclusion criteria.

Inclusion criteria: Patients suffering with Type-II Diabetes Mellitus **,** Diabetic Distress, Depression with Type- II DM, Type-**II** DM with Anxiety, Type –II DM with concurrent Depression and Anxiety Diseases with past history of 5 year and above.

Exclusion criteria: The patients with Type 1 Diabetes Mellitus, Type 2 Diabetes Mellitus patients with past history below 5 years, Type 2 Diabetes Mellitus with non-psychological disorders, Juvenile diabetes, Gestational Diabetes, Acute diseased patients, Other chronic diseases, Immunosuppressive patients, Paediatrics and Pregnancy were excluded from the study.

RESULTS AND DISCUSSION:

A total of 2689 patients were recruited into the study. The patient demographic details were tabulated as follows

1. **Distribution of patients based on gender**
2. **Distribution of patients based on age**
3. **Distribution of patients based on education level**
4. **Distribution of patients based on DM duration in years**
5. **Distribution of patients based on risk factors**
6. **Distribution of patients based on DM complications**
7. **Distribution of patients based on psychological complications**
8. **Distribution of patients based on diabetic distress levels(DDS-17)**
9. **Distribution of patients based on diabetic distress type (DDS-17)**

Distribution of patients based on gender

A total of 2689 patients were recruited into the study. Out of 2689 patients, males were 1781 (66.23%) female subjects were 908 (33.77%) percentage. The distribution of patients was represented in the table No: 1.

Table 1: Distribution of patients based on Gender

Sl.No.	**Gender**	**Weighted Total**	
		(n)	**{%}**
1	Male	1781	**66.23**
2	Female	908	33.77
3	**Total**	**2689**	**100**

Distribution of patients based on age

The patients were distributed based on the age group. Out of 1781 male patients, 498(27.96%) patients were under the age group off 40 to 50 years. 688(38.62%) patients were under the age group of 51 to 60 years. 375(21.05%) male patients were under the age group of 61 to 70 years. Only 220(12.35%) patients were under the age group of 71 to 80 years.

Out of 908 female patients, 218 (24%) female patients were identified in the age group of 40 and 50 years . 336(37%) female patients were identified in the age group of 51to 60 years. Between 61 and 70 years of age with 219 female patients. a very least percentage of population was seen in the age group of 71 and 80 years with percentage accounting for 14.87 and the number of female patients were 135. table to 2 describe the distribution of patients based on the age.

Table 2: Distribution of patients based on Age

Sl.No.	**Gender**	**Age group**	**Weighted Total (1781)**	
			(n)	**{%}**
1	**Male**	40-50	498	27.96
		51-60	688	**38.62**
		61-70	375	21.05

		71-80	220	12.35
		Total	**1781**	**100**
			Weighted Total (908)	
			(n)	**{%}**
2	**Female**	40-50	218	24
		51-60	336	**37**
		61-70	219	24.13
		71-80	135	14.87
		Total	**908**	**100**

Distribution of patients based on education level:
Table number 3 describes the distribution of patients based on the education level, out of 2689 population only 1067 patients were identified with education which accounts for 39.68 percentage of the recruited population and the remaining 60.31 percentage of the population were uneducated. Out of 1067 educated patients, 560 patients were having primary education. 484 patients were identified to have to secondary level of education. Only 21 patients, off which 12 male and 9 female patience having education level of intermediate accounting for 0.78 percentage. Only 2 male patients were identified with graduation level of education accounting for 0.07 percentages.

Table 3: Distribution of patients based on Education Level

S;.No.	**Education**	**Population**		**Weighted Total (2689)**	
		Male	**Female**	**(n)**	**{%}**
1	Primary	229	331	**560**	**20.82**
2	Secondary	370	114	**484**	**17.99**
3	Intermediate	12	9	**21**	**0.78**
4	Graduation	2	0	**2**	**0.07**
5	Post-Graduation	0	0	**0**	**0**
6	**TOTAL**	**513 (19.07%)**	**354 (13.16%)**	**1067 (39.68%)**	**100**

Distribution of patients based on DM duration in years:
The table number 4 describes the distribution of patients based on the duration of diabetes mellitus. Out of 1781 male patients 46.65 percentage of the patient population were falling with the duration of 5 to 7 years of suffering from diabetes mellitus with 831 male patients, this was observed as the highest percentage of the male population suffering from diabetes mellitus. 589 male patients we're falling with the duration of 8 to 10 years of sufferings with 33.07 percentage ranking second after the 5 to 7 years of suffering duration.
15.27 percentage of population with 272 patients were identified in the group of diabetes mellitus duration of 11 to 13 years. a very least percentage of population who were seen in the group of diabetes mellitus duration of 13 to 15 years with 89 male patients accounting for 5 percentage of the entire male population. Out of 908 female patients 497 the highest percentage accounting for 54.73 were seen in the group of 5 to 7 years of diabetic sufferings followed by 30 percentage of entire female population with 273 patients were seen in the group of 8 to 10 years of diabetic sufferings.
104 female patients were seen in the group of 11 to 13 years of diabetic sufferings with 11.45 percentage of the population and a very least of 34 female patients were seen in the group of 13 to 15 years of diabetic sufferings accounting for 3.75 percentage of the entire population. figure number 4 illustrates the distribution of patients based on duration of diabetes mellitus.

Table 4: Distribution of patients based on Duration DM

Sl.No.	**Gender**	**Duration (years)**	**Weighted Total (1781)**

			(n)	{%}
1	**Male**	5-7	831	**46.65**
		8-10	589	33.07
		11-13	272	15.27
		13-15	89	05.00
		Total	**1781**	**100**
			Weighted Total (908)	
			(n)	**{%}**
2	**Female**	5-7	497	**54.73**
		8-10	273	30.06
		11-13	104	11.45
		13-15	34	03.75
		Total	**908**	**100**

Distribution of patients based on risk factors:
Table number 5 describes the distribution of patients based on risk factors, the highest percentage of male patients were observed with obesity accounting for 50.25 percentage with 895 patients followed by 652 patients accounting for 36.6 percentage we're having the major risk factor as age, hypercholesterolemia accounts for 10.38 percentage with 185 male patients followed by diet lifestyle and hereditary accounting for 1.34, 0.78 and 0.61 percentages respectively with the population of 24, 14 and 11 respectively.

Out of 908 female patients, highest percentage of 42.62 with 387 patients seen with age as the primary risk factor followed by obesity with 273 patients accounting for 30.06 percentage, hypercholesterolemia 22.68 percentage having 206 patients. hereditary accounts for 2.09 percentage with 19 patients, lifestyle 1.43 percentage with 13 patients and diet was the least risk factor with 1.1 percentage having only 10 female patients. figure number 5 describes the distribution of patients based on the risk factors.

Table 5: Distribution of patients based on Risk Factors

Sl.No.	**Gender**	**Risk Factors**	**Weighted Total (1781)**	
			(n)	**{%}**
1	**Male**	Age	652	36.60
		Obesity	895	**50.25**
		Hypercholesterolemia	185	10.38
		Hereditary	11	0.61
		Diet	24	1.34
		Lifestyle	14	0.78
		Total	**1781**	**100**
			Weighted Total (908)	
			(n)	**{%}**
2	**Female**	Age	387	**42.62**
		Obesity	273	30.06
		Hypercholesterolemia	206	22.68
		Hereditary	19	2.09
		Diet	10	1.10
		Lifestyle	13	1.43
		Total	**908**	**100**

Distribution of patients based on DM complications:
Table number 6 describes the distribution of patients based on the diabetes mellitus complications or the consequences. Micro and macro vascular diabetic complications were considered in distributing the patients. in the male patients highest percentage accounting for the diabetic complications were seen with the hypercholesterolemia with 298 male patients and 16.73 percentage of the population. Atherosclerosis accounted for 16.11 percentage with 287 male subjects, hypertension accounted for 15.21 percentage with 271 subjects, heart failure accounted for 13.30 percentage with 237 patients, nephropathy accounted for 11.17 percentage with 199 patients, cardiovascular diseases accounted for 8.36 percentage with 149 patients, retinopathy accounted for 7.91 percentage with 141 patients, neuropathy with 134 patients accounted for 7.52 percentage and diabetic

foot ulcers were considered as the least complication identified in the population with 3.64 percentage with 65 patients.

Sl.No.	**Gender**	**DM Complications**	**Weighted Total (1781)**	
			(n)	**{%}**
1	**Male**	Retinopathy	141	7.91
		Nephropathy	199	11.17
		Neuropathy	134	7.52
		Hypercholesterolemia	298	**16.73**
		Heart failure	237	13.30
		Hypertension	271	15.21
		Cardiovascular disease	149	8.36
		Atherosclerosis	287	16.11
		Diabetic foot ulcers	65	3.64
		Total	**1781**	**100**
			Weighted Total (908)	
			(n)	**{%}**
2	**Female**	Retinopathy	129	14.20
		Nephropathy	72	7.92
		Neuropathy	59	6.49
		Hypercholesterolemia	211	**23.23**
		Heart failure	119	13.10
		Hypertension	121	13.32
		Cardiovascular disease	79	8.70
		Atherosclerosis	91	10.02
		Diabetic foot ulcers	27	2.97
		Total	**908**	**100**

Table 6: Distribution of patients based on DM Complications

Distribution of patients based on psychological complications:
All the 2689 patients were examined to study psychological complications. Four types of psychological complications were studied, they were diabetic distress, depression, anxiety and depression with anxiety. Out of 1781male patients, 1640 patients were identified as diabetic distress, 70 were with depression, 40 were with anxiety and 31 patients were suffering with depression with episodes of anxiety. Out of 908 female patients, 844 patients were identified as diabetic distress, 28 were with depression, 19 were with anxiety and 17 patients were suffering with depression with episodes of anxiety. Result was tabulated in table no: 7.

Table 7: Distribution of patients based on Psychological Complications

Sl.No.	Gender	Psychological Complications	Weighted Total	
			(n)	{%}
1	Male	Diabetic Distress	1640	92.08
		Depression	70	3.93
		Anxiety	40	2.24
		Depression with Anxiety	31	1.74
		Total	1781	100
		Psychological Complications	Weighted Total	
			(n)	{%}
2	Female	Diabetic Distress	844	92.95
		Depression	28	3.08
		Anxiety	19	2.09
		Depression with Anxiety	17	1.87
		Total	908	100

Distribution of patients based on Diabetic Distress Levels (DDS -17 Scale):

Out of 2689 patients, it was identified that 2484 patients were suffering with diabetic distress with male occupancy 1640 and females were 844. All 2484 patients were examined to identify diabetic distress levels with the help of international standard scale DDS-17. Out of 1640 male patients, 918(55.97%)patients were with moderate distress, male patients 612(37.31%)) were with low distress levels. 110(6.70%) patients were with high distress levels. Result was tabulated in table no: 8

Table 8: Distribution of patients based on Diabetic Distress Levels (DDS -17 Scale)

S.No.	Diabetic Distress Level (DDS- 17 Scale)	Gender				Total (2484)	
		Male		Female			
		(n)	(%)	(n)	(%)	(n)	(%)
1	Low Distress	612	37.31	245	29.02	857	34.50
2	Moderate Distress	918	55.97	537	63.62	1455	58.57
3	High Distress	110	6.70	62	7.34	172	6.92
4	Total	1640	100 %	844	100 %	2484	100%

Distribution of patients based on Diabetic Distress Type (DDS -17 Scale):
Out of 2689 patients, it was identified that 2484 patients were suffering with diabetic distress with male occupancy 1640 and females were 844. All 2484 patients were examined to identify diabetic distress type with the help of international standard scale DDS-17. Out of 1640 male patients 470 patients ware suffering with emotional burden. 279 patients were suffering with physician related distress. 359 patients were with regimen related distress and 532 patients were with interpersonal distress. Out of 844 female patients 232 patients ware suffering with emotional burden. 230 patients were suffering with physician related distress. 168 patients were with regimen related distress and 214 patients were with interpersonal distress. The result was tabulated in table no: 9

Table 9: Distribution of patients based on Diabetic Distress Type (DDS -17 Scale)

S.No.	Diabetic Distress Type (DDS-17 Scale)	Gender				Total (2484)	
		Male		Female			
		(n)	(%)	(n)	(%)	(n)	(%)
1	Emotional Burden (EB)	470	28.65	232	27.48	702	28.26
2	Physician Related Distress (PRD)	279	17.01	230	27.25	509	20.49
3	Regimen Related Distress (RRD)	359	21.89	168	19.90	527	21.21
4	Interpersonal Distress (ID)	532	32.43	214	25.35	746	30.03
5	Total	1640	100 %	844	100 %	2484	100%

CONCLUSION:
It was concluded that diabetic distress is one of the most addressing issue in diabetic patients. In the management of diabetic patients, clinical pharmacist plays very important role. Before management of diabetes, patient must be counseled for management of distress to get good pharmacological and therapeutic response.

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