



## Evaluation of quality of life (QOL), depression prevalence and distress in diabetes mellitus diagnosed patients of a tertiary care teaching hospital - a prospective interventional analytical study

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Article History	Abstract
Received: 10-04-2022 Revised: 19-05-2022 Accepted: 27-06-2022	<p>Diabetic Mellitus is a group of metabolic disorders characterized by hyperglycaemia, which occurs due to defects in insulin secretion, insulin action, or both. Diabetics distress is an emotional distress response characterized by extreme apprehension, discomfort, or dejection due to a perceived inability to cope with the challenges and demands of living with diabetes. The goals of clinical pharmacist is to management of about medication adherence, to evaluate the quality of life, identify depression levels among diabetic patients, to identify anxiety levels in diabetic patients, to evaluate diabetic distress and its effects among diabetics. Diabetic distress is the major problem associated with diabetics which is making patients losing their self-confidence and positive attitude towards life. Due to diabetic distress, depression and anxiety significant percentage of patients work exhibited poor quality of life. Proper counselling, continuous interaction, effective therapy by the clinical pharmacists could improve patients quality of life, diabetes causative and medication adherence.</p> <p><i>Keywords:</i> Diabetes mellitus, Diabetic Distress, Depression, Medication Adherence, Clinical Pharmacists, Anxiety, Quality of life.</p>



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### Introduction

#### Diabetes Mellitus (DM)

It is a group of metabolic disorder characterized by hyperglycemia, which occurs due to defects in insulin secretion, insulin action or both. The chronic hyperglycemia results in long term damage, dysfunction, various organs failure, especially eyes, Kidneys, blood vessels, nerves and

heart. The causes of diabetic mellitus are due to auto immune destruction of pancreatic b-cells with consequent insulin deficiency to abnormalities that results in resistance to insulin [1, 2].

#### Types of Diabetes

##### Type 1 Diabetes

Type -1 diabetes once known as juvenile diabetes or insulin-Dependent Diabetes Mellitus, is a chronic auto immune disease associated with destruction of pancreatic  $\beta$  cells, but rare unknown or idiopathic process may contribute. In immune mediated, a potential disruption of the T-helper 1/ T-helper 2 balance may lead to higher T helper 1 activity with subsequent activation of the immune system and eventually destruction of pancreatic  $\beta$  cells. They are 4 main

features: (1) a long preclinical period marked by the presence of immune markers when  $\beta$  cells destruction occurs (2) hyperglycemia when 80% to 90% of  $\beta$  cells are destroyed. (3) transient remission and (4) established disease with associated risks for complications and death that initiate autoimmune process [3].

## 2. TYPE 2 DIABETES

Type -2 diabetes once known as Adult – Onset Diabetes or Non-Insulin – Dependent Diabetes Mellitus [NIDDM] is characterized by high blood sugar, insulin resistance and relative lack of insulin. People with this type of diabetes frequently are resistant to the action of insulin. Globally, it affects 5-7% of the world's population. The disease is usually controlled through dietary therapy, exercise and hypoglycemic agents. This is the most common form of diabetes mellitus and is highly associated with a family history of diabetes, older age, obesity and lack of exercise [4]

## 3. Gestational Diabetes

Gestational Diabetes is the third main form, and occurs when pregnant woman without a previous history of diabetes develop high blood sugar level. In woman with gestational diabetes, blood sugar usually returns to normal soon after delivery. However, there will be a higher risk of suffering from type 2 diabetes if you have had gestational diabetes [1, 2].

### Pre-Diabetes

- Pre diabetes or Borderline diabetes, occurs when the patient blood glucose levels are elevated but not enough for a diagnose of diabetes mellitus [2].

### SYMPTOMS:

The classic symptoms of untreated diabetes are

- weight loss
- polyuria (increased urination)
- polydipsia (increased thirst)
- polyphagia (increased hunger).
- Symptoms may develop rapidly (weeks or months) in type 1 diabetes, while they usually develop much more slowly and may be subtle or absent in type 2 diabetes.
- Several other signs and symptoms can be present along with diabetes although they are not specific to the disease.
- In addition to the known symptoms listed above, they include:
  - Blurred vision
  - Headache
  - Fatigue
  - Slow healing of cuts, and itchy skin.
  - Prolonged high blood glucose can cause glucose absorption in the lens of the eye, which leads to changes in its shape, resulting in vision changes.

- Long-term vision loss can also be caused by diabetic retinopathy.
- A number of skin rashes that can occur in diabetes are collectively known as diabetic dermatomes [5].

### Causes

1. Obesity/overweight (especially excess visceral adiposity)
2. Excess glucocorticoids (cushing's syndrome or steroid therapy)
3. Excess growth hormone (acromegaly)
4. Pregnancy, gestational diabetes
5. Polycystic ovary disease
6. Lipodystrophy (acquired or genetic, associated with lipid accumulation in liver)
7. Autoantibodies to the insulin receptor
8. Mutations of insulin receptor
9. Mutations of the peroxisome proliferators' activator receptor  $\gamma$  (PPAR  $\gamma$ )
10. Mutations that cause genetic obesity (e.g., melanocortin receptor mutation [6].

### Risk Factors

There are many multiples risk factors that are associated with the onset of diabetes. They include

- Alcoholic beverages
- Smoking
- Lack of physical exercises
- Genetics
- Atmosphere
- Dyslipidemia
- Hyperinsulinemia
- Sedentary life style
- Beta cells sensitivity reduction
- Improve glucagon activity
- Some classes of drugs including antipsychotics, diuretics, immunosuppressants are also associated with diabetes onset [7].

### Complications of Diabetes

All forms of diabetes increase the risk of long-term complications. These typically develop after many years (10–20) [8].

The major long-term complications relate to damage the blood vessels. The high blood glucose levels results in Diabetic nephropathy, Diabetic retinopathy, Diabetic cataracts. Uncontrolled diabetes also effects the kidney's function causing Diabetic ketoacidosis characterizing T2DM. Most of the T1DM patients develop obstructive pancreatitis due to inflammation of the pancreas. Diabetic patients also develop atherosclerosis, hypertension and cardiovascular diseases. Other macrovascular diseases include stroke and sudden cardiac death. Cognitive dysfunction occurs in T2DM patients which is indicated in

many of the studies and these complications are also a strong risk factor for severe COVID-19 illness [9].

### Pathophysiology

Insulin is the principal hormone that regulates the uptake of glucose from the blood into most cells of the body, especially liver, adipose tissue and muscle, except smooth muscle, in which insulin acts via the IGF-1. Therefore, deficiency of insulin or the insensitivity of its receptors play a key role in all forms of diabetes mellitus.10

The body obtains glucose from three main sources: the intestinal absorption of food; the breakdown of glycogen (*glycogenolysis*), the storage form of glucose found in the liver; and gluconeogenesis, the generation of glucose from non-carbohydrate substrates in the body. Insulin plays a critical role in regulating glucose levels in the body. Insulin can inhibit the breakdown of glycogen or the process of gluconeogenesis, it can stimulate the transport of glucose into fat and muscle cells, and it can stimulate the storage of glucose in the form of glycogen [11]. Insulin is released into the blood by beta cells (B-cells), found in the pancreas, in response to rising levels of blood glucose, typically after eating. Insulin is used by about two-thirds of the body's cells to absorb glucose from the blood for use as fuel, for conversion to other needed molecules, or for storage. Lower glucose levels result in decreased insulin release from the beta cells and in the breakdown of glycogen to glucose. This process is mainly controlled by the hormone glucagon, which acts in the opposite manner to insulin [12]. If the amount of insulin available is insufficient, or if cells respond poorly to the effects of insulin (insulin resistance), or if the insulin itself is defective, then glucose is not absorbed properly by the body cells that require it, and is not stored appropriately in the liver and muscles. The net effect is persistently high levels of blood glucose, poor protein synthesis, and other metabolic derangements, such as metabolic acidosis in cases of complete insulin deficiency [11]. When glucose concentration in the blood remains high over time, the kidneys reach a threshold of reabsorption, and the body excretes glucose in the urine (glycosuria). This increases the osmotic pressure of the urine and inhibits the reabsorption of water by the kidney, resulting in increased urine production (polyuria) and increased fluid loss. Lost blood volume is replaced osmotically from water in body cells and other body compartments, causing dehydration and increased thirst (polydipsia). In addition, intracellular glucose deficiency stimulates appetite leading to excessive food intake (polyphagia) [13].

### Diagnosis

Diabetes mellitus is diagnosed with a test for the glucose content in the blood, and is diagnosed by demonstrating any one of the following:

- Fasting plasma glucose level  $\geq 7.0$  mmol/L (126 mg/dL). For this test, blood is taken after a period of fasting, i.e. in the morning before breakfast, after the patient had sufficient time to fast overnight.
- Plasma glucose  $\geq 11.1$  mmol/L (200 mg/dL) two hours after a 75gram oral glucose load as in a glucose tolerance test (OGTT).
- Symptoms of high blood sugar and plasma glucose  $\geq 11.1$  mmol/L (200 mg/dL) either while fasting or not fasting.
- Random blood sugar test is also used.
- Glycosylated hemoglobin (HbA1C)  $\geq 48$  mmol/mol ( $\geq 6.5$  DCCT %) [14, 15].

Glycated hemoglobin is better than fasting glucose for determining risks of cardiovascular disease and death from any cause [7].

### Treatment

Depending on what type of diabetes you have, blood sugar monitoring, insulin and oral medications may play a role in your treatment. Antidiabetic drugs are used to lower the blood glucose levels in blood. These drugs either increase the levels of insulin or increase body's sensitivity. These drugs include

1. Insulin
 

It acts by inhibiting hepatic glucose production and reduces blood glucose by peripheral glucose uptake. It is used either together with the oral antidiabetic drugs or else as a monotherapy. They are classified as rapid-acting (Insulin glulisine) short-acting (Insulin glargine), intermediate acting (Insulin NPH) and long-acting insulin (Insulin detemir).
2. Oral Hypoglycemic agents
  - Biguanides [Metformin]- Improves insulin sensitivity, decreases hepatic glucose production
  - Di-peptidyl-peptidase-4 inhibitor [Sitagliptin] – Inhibits DPP-4 and enhances GLP-1 activity by decreasing circulating glucagon.
  - Sulfonylureas [Glimepiride]- Stimulates insulin release from pancreatic beta cells.
  - Thiazolidinediones [Rosiglitazone]- Decreases insulin resistance in adipose tissue, skeletal muscles and liver.

Eating a healthy diet, maintaining a healthy weight and participating in regular activity also are very important factors in managing diabetes [19].

### Healthy Eating

Opposite to popular perception, there's no specific diabetes diet. You'll need to center your diet on more fruits,

vegetables, lean proteins and whole grains — foods that are high in nutrition and fiber and low in fat and calories — and cut down on saturated fats, refined carbohydrates and sweets

#### Physical Activity

Everyone needs regular aerobic exercise, and people who have diabetes are no exception. Exercise lowers your blood sugar level by moving sugar into your cells, where it's used for energy. Exercise also increases your sensitivity to insulin, which means your body needs less insulin to transport sugar to your cells

Transplantation -In some people who have type 1 diabetes, a pancreas transplant may be an option. Islet transplants are being studied as well. If pancreas transplant is successful then insulin therapy is no longer needed [7].

#### Diabetes Distress

Diabetes distress (DD) is a psychological state, found in persons with diabetes and their caregivers. This is a state which causes significant emotional distress however it fails to meet the diagnostic criteria for major depressive disorder (MDD). The 2017 Standards of Medical Care in Diabetes, published by the American Diabetes Association, mentions the need to assess and manage DD to improve self-care and glycemic control and reduce cardiovascular risk and all-cause mortality [16].

It is defined as patient concerns about disease management, support, emotional burden, and access to care is an important condition distinct from depression [17].

#### Diabetic Distress Screening Scale -17 (DDS-17)

The DDS17 is a 17-item questionnaire examining distress experiences among patients with diabetes. Each individual item was measured on a Likert scale of 1 (no distress) to 6 (serious distress) and an average score was determined.

The DDS-17 divides into 4 subscales they are five items emotional burden EB (five items: 1, 3, 8, 11, 14), (ii) physician-related distress PD (four items: 2, 4, 9, 15), (iii) regimen-related distress RB (five items: 5, 6, 10, 12, 16) and (iv) diabetes-related interpersonal distress ID (three items: 7, 13, 17).

For example, clinicians and patients can identify areas where interventions might be helpful: emotional burden (feeling overwhelmed by diabetes), physician-related distress (worries about access, trust, and care), regimen related distress (concerns about diet, physical activity, medications), and interpersonal distress not receiving understanding and appropriate support from others [17].

To score the total diabetes distress scale plus 4 sub scale scores, simply add the patient's responses to the appropriate items and divide by the number of items in that scale, so that

the mean item score considered 3 or higher (moderate distress) as a level of distress worthy of clinical attention [18].

#### Hospital Anxiety and Depression (HADS)

The Hospital Anxiety and Depression Scale (HADS) was devised 30 years ago by Zigmond and Snaith to measure anxiety and depression in a general medical population of patients. The HADS (Hospital Anxiety and Depression Scale) aims to measure symptoms of anxiety (HADS Anxiety) and depression (HADS Depression).

The Hospital Anxiety and Depression Scale (HADS) is a frequently used self-rating scale developed to assess psychological distress in non-psychiatric patients. It consists of two subscales, Anxiety, and Depression It is useful for initial diagnosis and to track progression (or resolution) of psychological symptoms. It is one of the National Institute for Health and Care Excellence (NICE) recommended tools for the diagnosis of depression and anxiety.

The HADS is widely used but has shown beneficial results both regarding the factor structure and sex differences in the prevalence of depressive symptoms. There is also a lack of psychometric evaluations of the HADS in non-clinical samples of older people. The questionnaire comprises seven questions for anxiety and seven questions for depression and takes 2–5 min to complete. For both scales, scores of less than 7 indicates: mild (8-10), moderate (11-14) and severe (15-21). It is useful for initial diagnosis and to track the progression (or resolution) of psychological symptoms. It is one of the National Institute for Health and Care Excellence (NICE) recommended tools for the diagnosis of depression and anxiety [19, 20].

#### Medication Adherence

Medication adherence refers to the extent to which a patient takes his or her medications as prescribed by the healthcare provider [21].

Measurement of medication adherence is challenging because adherence is an individual patient behavior. The following are some of the approaches that have been used: (1) subjective measurements obtained by asking patients, family members, caregivers, and physicians about the patient's medication use; (2) objective measurements obtained by counting pills, examining pharmacy refill records, or using electronic medication event monitoring systems; and (3) biochemical measurements obtained by adding a nontoxic marker to the medication and detecting its presence in blood or urine or measurement of serum drug levels. Currently, a combination of these measures is used to assess adherence behavior. Along with the monitoring of outcome, these tools assist investigators in studying medication adherence [22].

### Quality of Life

It is a broad, multidimensional concept, including physiological, psychological and social factors of an individual. It takes into consideration both positive and negative aspects of an individual's life. It is an individual's insight of their position in conditions such as the value and culture systems in which they survive and in relation to their goals, expectations, standards and concerns [23].

The natural choice for optimization relapsed on the Diabetes Quality of Life Measure (DQOL), which, besides being the most consecrated specific instrument of evaluation of HRQOL in DM worldwide, is also the only one validated in Brazil for both type 2 and type 1 DM. The Brazilian version was called DQOL-Brazil. The DQOL-Brazil-8 uses the Likert scale of 5 points, consisting of 4 domains: "satisfaction" (2 questions), "impact" (3 questions), "concerns: social/vocational" (1 questions), and "concerns related to diabetes" (2 questions). The scores are calculated by the mean of the individual items: the closer to 1 (one), the better the HRQOL [24,25].

### Aims and Objectives

#### AIM

To evaluate quality of life (QOL), depression prevalence and distress in diabetes mellitus diagnosed patients in general medicine ward of a tertiary care teaching hospital.

#### OBJECTIVES

- To evaluate quality of life (QOL).
- To know the role of pharmacist in improving the medication adherence.
- To identify the depression among the diabetic patients.
- To evaluate the diabetic distress and its effects among the diabetic patients.
- To assess the anxiety levels related to diabetes

### Methodology

- The study was conducted in the department of general medicine of MIMS (Maharaja Institute Of Medical Sciences, Nellimarla) hospital, Vizianagaram.
- The participants enrolled in the study involves inpatients and outpatients only after filling a properly written informed consent.
- The data is collected in a pre-designed data collection form (Case Report).

#### Study Site

Maharaja Institute of Medical Sciences (MIMS), Nellimarla, Vizianagaram

### Study Population

The participants enrolled in the study involve inpatients and out patients only after filling a properly written informed consent. In this study 400 patients were included (N=400).

### Study Duration

8 Months [November 2021 to June 2022]

### Study Design

This study is a Prospective Interventional Analytical Study consisting of 400 patients.

### Study Criteria

#### Inclusion Criteria

- Patients of either sex attending general medicine department ward.
- Patients of age between 10-85 years.
- Patients who are willing to participate in the study by giving ICF.
- Patients with diabetes.

#### Exclusion Criteria

- Patients who are below 10 years of age and above 85 years.
- Patients who are not willing to participate to provide ICF.
- Patients not interested due to normal blood Glucose Levels.

### Material and Methods

#### Phase -1

#### Obtaining Consent from Hospital Authority

- The study was carried out in hospital by the department of pharmacy practice. So it has to be approved by the Medical Superintendent (MS) and same should be informed to all physicians and surgeons of the hospital.
- For obtaining the consent, a study protocol has prepared which include proposed title, study site, inclusion and exclusion criteria, objective and methodology about the work to be carried out.
- Then the protocol of the study was submitted to Medical Superintendent (MS), permitted to perform the study by ward round and utilize the hospital facilities through a letter.

#### Obtaining ICF from Individuals

- The study was carried on each individual patient. So it needs approval from every individual. For this cause informed consent form (ICF) should be obtained from individuals also.

#### Obtaining Clearance Certificate from Institutional Ethical Committee

- For obtaining the clearance certificate and application along with study protocol which include the proposed title, study site, inclusion and exclusion criteria, objective and methodology about

- The work to be carried out was submitted to chairman of institutional ethical committee of MIMS hospital. They have also reviewed and verified all documents related to Research proposal, Informed Consent, budget and granted approvals in the Ethics Committee and given proposal numbers.
- The study after approval by committee issued ethical clearance certificate.

#### Data Entry Format

- A separate data entry format for incorporating inpatient details was designed it includes demographic details, family history, medical history, diagnosis and various complications that a distress with diabetes mellitus would phase and they are designed as questionnaires using different tools

#### Phase-2

##### Collection of Data

- The study was planned to investigate 400 patient records to increase the precision of the parameters. Patient records from inpatient and outpatient wards of all departments were obtained. Each selected distress with diabetes mellitus was questioned regarding her complications by the help of designed data collection form.

##### Parameters Evaluated

1. Age distribution
2. Gender
3. Districts
4. Financial status
5. Diabetic range
6. HbA1c range
7. Medication adherence
8. Analysis from DDS-17 of 4 different domains
9. Analysis from HADS of 2 different domains
10. Analysis from QOL questionnaire of 4 different domains.

#### Phase -3

##### Analysis of Data

- The data from the selected patients were collected from both inpatient and outpatient medical departments, paying attention to inclusion and exclusion criteria.

##### Data Evaluation

- The data collected from all the selected patients were evaluated using SPSS software and information regarding the Quality of life, Depression prevalence and Distress in Diabetes mellitus were evaluated.

#### Results

Out of 400 patients, 140 (35 %) patients were reported with 110-160mg/dl diabetic range which is the highest range that most of the patients had ,138 (34.5%) patients were reported with 160-210mg/dl diabetic range, 76 (19%) patients were reported with 210-260mg/dl diabetic range, 25 (6.3%) patients were reported with 260-310mg/dl diabetic range, 20 (5%) patients were reported with 310-360mg/dl diabetic range, 1(0.3%) patients were reported with 360-410mg/dl diabetic range. Here the HbA1c range was 80 (20%) patients were reported with good-marginal range, 88 (22%) patients were reported with At risk ,102 (25.5%) patients were reported with Dangerously high range, 77 (19.3%) patients were reported with Many complications range,53(13.2%) patients were reported with Slow motion range.

At the time of 1ST intervention of MMAS among 400 patients, were reported with low medication adherence 78(19.5)%, 89(22.3%) moderate medication adherence 89(22.3%) and high medication adherence 233(58.3%),and 2nd intervention 38 (9.5%) patients were reported with low medication adherence, 119(29.8%) patients were reported with moderate medication adherence and 243(60.8%) patients were reported with high adherence at last the 3rd intervention was done reported as 24(6%) were reported with low medication adherence, 98(24%) were reported with moderate medication adherence and 278 (70%) were reported with high medication adherence.

In the diabetic distress screening scale-17, Out of 400 patients, 146 patients were reported with diabetic distress (36.5%) and whereas 254 patients were reported with no diabetic distress (63.5%)In depression out of 400 patients, 125(31.3%) patients were reported with normal depression levels,143 (35.8%) patients were reported with mild depression levels,119 (29.8%) patients were reported with moderate levels, 13(3.25%) patients were reported with severe depression of HADS scale whereas anxiety consists of 115(28.8%) patients were reported with normal anxiety levels,158 (39.5%) patients were reported with mild anxiety levels,117(29.3%) patients were reported with moderate levels, 10(2.5%) patients were reported with severe anxiety.

In QOL out of 400 patients, 10 (2.5%) patients were reported with high quality of life, 236 (59%) patients were reported with moderate quality of life and 154(38.5%) patients were reported with low quality of life.

#### Discussion

This study was conducted prospectively for 400 patients and evaluation of quality of life, depression and diabetic distress in diabetes mellitus patients were done. Tools used in this study were MMAS Scale consisting of questionnaire with 8 items; Diabetes Distress Scale – consisting of questionnaire with 17 items that are categorized into Emotional burden,

Interpersonal distress, Physician related distress, Regimen related distress and together the total diabetes distress screening scale; HADS Scale consisting of questionnaire with 14 items ,7 each belonging to depression and anxiety along with total HADS score; QOL scale consisting of questionnaire with 8 items that are categorized into 4 divisions as satisfaction quality of life, impact quality of life, concerns: social/vocational quality of life, concerns related to diabetes quality of life and together the total quality of life.

Out of 400 diabetic patients involved in the study, the maximum age of diabetes was found to be 80 and minimum age of diabetes was found to be 11 with a range of 69 and the mean diabetic age was found to be 47.32 years. Females are mostly affected by this condition when compared to males that is 54.5% and 45.5% respectively.

Out of 400 patients, the diabetic range in both males and females were reported with 110-160 mg/dl diabetic range and the highest range is reported with 140 [35%] patients and 160-210 mg/dl reported as the lowest range.

Out of 100 patients ,302[75.5%] patients from Visakhapatnam has the highest rate of diabetic range whereas 46[11.5%] patients from Vizianagaram reported with the lowest diabetic range.

Out of 400 patients 127[31.3%] patients reported under upper middle class and 75[18.5%] reported under lower class. Patients reported with dangerously high range of HbA1c range 102[25.5%] and 53[13.2%] patients were reported with slow motion suicide range

#### **Medication Adherence**

The responses after administering MMAS-8 Scale to 400 patients were recorded and analyzed using SPSS Software. At the time of 1st interaction the medication adherence out of 400 diabetics was found to be low in 19.5%, moderate in 22.3% and high in 58.3% patients respectively which was found to be better than the 1st interaction i.e., 9.5%, 29.8% and 60.8% low, moderate and high respectively in 2nd interaction. At the time of 3rd interaction the medication adherence was found to be far better than the first interaction with increase in high percentage to 70%. This study is in contrast to the work Reliability and validity of a self-reported measure of medication adherence in patients with type 2 diabetes mellitus in Korea done by Donald E Morisky et al who stated that proper and effective patient counselling could improve medication adherence. The reason for improved medication adherence was found to be due to continuous interaction and counselling sessions by clinical pharmacists about the importance of proper and regular intake of medication to control diabetes. The reason for non-medication adherence is forgetfulness, difficulty in taking number of pills for a longer period of time, fear of adverse drug reactions.

Based on the data interpretation of medication adherence result it was clearly identified that clinical pharmacist plays a crucial role in improving medication adherence ( p value significant<0.001) by continuing education and patient counselling..

#### **Diabetic Distress**

In consideration of diabetic distress out of 400 patients, it was found to be in 36.5% people and among them 31.3% patients had emotional burden distress, 25.3% had physician related distress, 29.5% had regimen related distress, 26.2% had interpersonal distress. DD is generally found to be in people using long term medications, insulin users. The major causes for diabetes distress might be due to physician related problems such as limited access, perceived inability, poor communication skills, lack of motivation, perceived inability to self-manage, heavy complications of burden, uncertain outcomes of diabetic patients; lack of understanding, lack of support from the family and friends. In our case the majority of the diabetic patients were suffering with emotional burden distress. The changes in life phases like adolescence, marriage, pregnancy, menopause, work environment, change in disease state like glycemic control, extra complications due to uncontrolled glycemic levels, changes in treatment may also lead to diabetic distress. The management of DD can be done by non-pharmacological treatment. The main thing in treatment is confidence building in the diabetics which is to be done by health care professionals. This can be achieved by conducting patient counseling sessions, providing diabetes education, self-management, coping skills training, filtering all their beliefs about the diseased condition. This work is in contrast to the Psychometric Properties of the Polish Version of the Diabetes Distress Scale (DDS) conducted by Ewelina bak, Sylwia Krzemińska et al in which there are many members affected with diabetes distress and majority had physician related distress and concluded that DDS can be successfully used for assessment of distress.

#### **Depression and Anxiety**

In consideration of depression and anxiety, it was observed that 115 cases of 28.8% were seen with normal anxiety levels, followed by 158 cases of 39.5% were with mild anxiety, 117 cases of 29.3% were with moderate anxiety and 10 cases of 2.5% with severe anxiety levels among 400 diabetics in the study. Life-long insulin-dependence, family conflicts regarding diabetes management, accompanying chronic diseases such as hypertension, CKD, pedal edema, heart related diseases and thereby indicating the risk of previous symptoms being associated with diabetes and severe hypoglycemia causing neuropathological changes, thereby laying the ground for depression and anxiety. Whereas depression was found to be 125 cases of 31.3% with normal depression levels, followed by 143 cases of 35.8% with mild

depression, 119 cases of 29.8% with moderate and 13 cases of 3.25% with severe depression out of 400 diabetic patients. This is similar to the work Anxiety and Depression in Diabetic patients according to the Hospital Anxiety and Depression Scale (HADS) Scoring done by Ibrahim Sahin et al which stated that there was a positive correlation between depression and anxiety scores and HbA1c in which psychiatric treatment along with diabetic treatment might increase patient's quality of life.

#### Quality of Life

In consideration of Quality of life in 400 diabetic patients, it was affected high in 10 cases of 2.5% followed by moderately in 236 cases of 59% and lower in 154 cases of 38.5%. In this study most of the cases were under quite satisfied domain 170 cases of 42.5% followed by 123 cases of 30.8% were under very satisfied domain. Most of the cases in this study were seen under always never domain of impact with 187 cases of 46.8%. Whereas many of the diabetics were seen under always never domain of concerns: social/vocational with 153 cases of 38.3%. And many of the cases were seen under always never domain of concerns related to diabetes with 142 cases of 35.5%. The quality of life is associated with socioeconomic status, age, depression, anxiety, inadequate glycemic control, presence of two or more complications, fear of disease complications, mood, energy, and diet. A positive attitude and improved quality of life are associated with better clinical outcomes such as lower HbA1c levels, exercising, monitoring glucose, adherence to new diet, self-management activities. Therefore, quality of life assessments should be included and considered essential in patient's medical management. The main goal is to minimize the deterioration of quality of life. This is similar to the work Determinants of Glycemic Control and Quality of Life in Type 2 Diabetic done by Rodrigo A.P. Souza et al who stated that assessment of DQOL was negatively affected by poor glycemic control.

#### Conclusion

After tough analysis and data interpretation of results the following conclusion were drawn: Uncontrolled diabetes is the major culprit for major diseases like CKD and other diseases. Early-stage diagnosis of diabetes (pre diabetic stage) could improve the state of patient by following effective medication and dietary plan. Proper counselling and continuous interaction by the clinical pharmacists could improve the patient medication adherence in a significant manner. Diabetic Distress is the major problem associated with Diabetes which is making the patients losing their self-confidence and positive attitude towards life. Significant percentage of patients were seen with diabetes causative depression which should be considered as a serious issue and to act accordingly by effective therapy and counselling.

Mild anxiety was seen in most of the cases due to presence of hypertension, fear and worriedness due to complications caused by diabetes. Due to diabetes diabetic distress, depression and anxiety significant percentage of patients were exhibited poor quality of life of which pharmacist could play an important role in improving the quality of life in diabetic patients.

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#### Author Contribution

All authors contributed equally.

#### Conflict of Interest

The authors declared no conflict of interest.

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