The International Journal of Indian Psychology
ISSN 2348-5396 (Online) | ISSN: 2349-3429 (Print)
Volume 12, Issue 2, April- June, 2024
DIP: 18.01.367.20241202, DOI: 10.25215/1202.367
https://www.ijip.in

Research Paper

Depression and Distress among Patients with Diabetes Mellitus during COVID-19 Pandemic

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ABSTRACT

Depression and distress among patients with diabetes mellitus is highly prevalent and common co morbidity which are often unrecognized and underdiagnosed. This study was aimed at assessing the depression and distress among patients with diabetes mellitus. **Methods and Materials**: This study was conducted using cross sectional, descriptive correlational research design, in Dharmapuri and Chennai districts of Tamil Nadu among 150 diabetic patients who were selected using purposive sampling technique. The data was collected using the pretested and predetermined tools such as Demographic variables proforma, clinical variables proforma and Rating scale on COVID 19 Peritraumatic Stress Index Questionnaire using the Google forms through WhatsApp and E-mail. Collected data was analyzed through appropriate descriptive statistics (Frequency, %, Mean and SD) and inferential statistics (Chi Square). **Results:** Regarding level of depression and distress among patients with diabetes mellitus 80% had some form of depression and 67.3% had some form of distress which varied in degrees. Depression and distress scores were higher with the mean score of depression was 16.9 /35.2 with SD 9.73 and mean score of distress was 16.8/35 with SD 11.05. Depression and distress scores were higher among COVID 19 in self, family members, close relatives, neighbors and patients with family history of diabetes mellitus. **Conclusion:** Depression and distress are common co morbidity among patients with diabetes mellitus during COVID 19 pandemic, which can be identified and treated effectively.

Keywords: *Depression, Distress, Diabetes Mellitus and COVID 19*

A person with sound mental health possesses an adjustment of human beings to the self, world and to each other with a maximum of effectiveness and happiness. Mental illnesses are health conditions involving changes in emotion, thinking or behavior (or a combination of these). It is associated with depression and distress or problems functioning in social, work or family activities. Those with mental disorders struggle to cope with everyday life because of their altered thinking, mood or behavior. According to the Centers for Disease Control and Prevention, more than 50% of individuals were diagnosed with mental illness in their lifetime[1].

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Received: April 26, 2024; Revision Received: June 27, 2024; Accepted: June 30, 2024

Depression is a common mental illness that negatively affects how one feels the way he/she thinks and how one acts. However, depression can be treated effectively when identified. Globally, more than 264 million people of all ages suffer from depression. When it comes to countries, India is the most depressed country in the world, followed by China and the USA[2].Distress is more than just feeling stressed or worried. People with diabetes may become anxious over a variety of things. These can include monitoring their glucose levels, weight and diet. They may also worry about short-term health complications, such as hypoglycemia, as well as long-term effects. People with diabetes are at higher risk for certain health complications, such as heart disease, kidney disease, and stroke[3].

In India, 463 million people have diabetes in the world and 88 million people in the Southeast Asian region. Of this 88 million people, 77 million belong to India. The prevalence of diabetes in the population is 8.9 %. It is one of the global emergencies of the 21st century. Depression and distress are the 4th cause, while diabetes is the 8th cause of disability adjusted life years (DALYS) in developed countries4. Blood glucose levels of diabetics rose by 20% during COVID-19 lockdown. Typical pre-pandemic fasting sugar levels in January until mid-February was 138 mg/dl, in March 2020, the blood glucose degree of diabetics started rising[5].

Although more research is needed to fully understand the link between diabetes and depression, it is clear that there's a connection. It is thought that alterations in brain chemistry tied to diabetes may be related to the development of depression. For example, damage resulting from diabetic neuropathy or blocked blood vessels in the brain may contribute to the development of depression in people with diabetes. Symptoms of depression can make it more difficult to successfully manage diabetes and prevent diabetes-related complications[6].

Diabetes and other metabolic diseases increase the risk of developing severe COVID-19[7] Patients with diabetes do not only have a higher risk of developing severe COVID-19, they are also more prone to serious long-term consequences[8,9]as COVID-19 may lead to an aggravation of underlying metabolic diseases and to new-onset-diabetes[10]

The COVID-19 pandemic seriously affects mental health. During a pandemic, mental health was affected for many people which was even higher than the number of people affected by the infection[11]. Prolonged exposure to stressors, such as social isolation, infection/fear of being infected, and loss of relatives or friends, increases the risk of developing major depression, anxiety and post-traumatic stress disorders[12].

COVID-19, diabetes and depression form a vicious cycle. On one hand, diabetes increase the risk of severe COVID-19. On the other hand, COVID-19 may lead to new-onset diabetes or worsening of already existing metabolic disorders. On top of this, depressed individuals show a higher risk of developing diabetes and patients with diabetes have a higher risk of developing symptoms of depression. Furthermore, in patients with type 2 diabetes and in COVID-19 survivors the prevalence of depression is increased. Finally yet importantly, lockdown and quarantine measurements during the COVID-19 pandemic has led to an increase in depression.[13]

Even though depression and distress in diabetic patients are prevalent and can significantly affect quality of life, yet it is often unrecognized and under diagnosed. It is also noted by the researcher that, even though there are studies conducted in various parts of the country, and countries around the world, there is paucity of research in this area especially in Tamil Nadu.

Therefore, this study was undertaken by the researchers to assess the depression and distress among patients with diabetes mellitus.

METHODS AND MATERIALS

This study was conducted using cross sectional, descriptive- correlational research design in Dharmapuri and Chennai districts of Tamil Nadu, after obtaining ethical clearance from Apollo College of Nursing, Chennai. Purposive sampling technique was used to select the150 samples. Sample size was estimated based on the pilot study findings (50% depression and 60% distress) in openepi[14], keeping confidence level- 95%, power- 90% and design effect- 1.5, required sample size for depression was 145 and distress was 139, which was rounded up to 150.

The sample who fulfilled the criteria during the study period, and given consent to participate in the study were included in the study. Inclusion criteria included – known cases of diabetes mellitus, willing to participate in the study, available at the time of data collection, aged 30-59 years and have access to E mail or WhatsApp. Exclusion criteria included- patients with other major co morbid illness such as cardiac problems, renal diseases, cancer etc, patients aged 60 years and above and patients who cannot read and write in Tamil or English.

The tools used for the data collection were, 1. Demographic variables proforma to collect information on socio demographic characteristics of patients, 2. Clinical variables proforma to collect information on health status of the patients and 3. Rating scale on COVID 19 Peritraumatic Stress Index Questionnaire. It is five-point rating scale, consisted of 24 items. Scoring for each item ranged from 0-4. Hence obtainable score was 0-96. The 24 items were divided into two parts (Depression & Distress). Obtained score was interpreted as follows. 0-8- Normal, 9-15- Mild Depression, 16-23- Moderate Depression, 24 and above- Severe Depression and 0-8- Normal, 9-15- Mild Distress, 16-23- Moderate Distress, 24 and above- Severe Distress. Individual item scores were totaled and level of depression and distress assessed accordingly. Data was collected using Google forms through Email and WhatsApp. Collected data was analyzed through appropriate descriptive statistics (Frequency, %, Mean and SD) and inferential statistics (Chi Square) in SPSS 21 version.

RESULTS

Table 1: Frequency and Percentage Distribution of Demographic Variables among Patients with Diabetes Mellitus during COVID-19 Pandemic (N= 150)

Variables	f	%
Age in Years		
30-40	22	14.7
41-50	38	25.3
51-59	90	60
Gender		
Male	65	43.3
Female	85	56.7
Marital Status		
Unmarried	17	11.3
Married	117	78
Separated/Divorced	1	0.7
Widowed	15	10
Residence		

Variables	f	%
Rural	54	36
Semi Urban	59	39.3
Urban	37	24.7
Family Type		
Living alone/Nuclear Family	111	74
Joint Family	37	24.7
Extended Family	2	1.3
Educational Qualification		
Uneducated	26	17.3
Primary	19	12.8
Secondary	20	13.3
Higher Secondary	29	19.3
Undergraduate	35	23.3
Postgraduate and above	21	14
Occupation		
Unemployed	12	8
Employed	61	40.7
Business	18	12
Retired	23	15.3
Homemaker	36	24
Monthly Family Income in INR		
Up to 10,000	43	28.7
10,001-20,000	25	16.7
20,001-30,000	20	13.3
30,001-40,000	26	17.3
Above 40,000	36	24
Religion		
Hindu	86	57.3
Muslim	4	2.7
Christian	60	40

Table 1 reveals that, majority of diabetic patients were aged between 51-59 yrs (60%), married (78%), from nuclear family/ living alone (74%). More than half of them were females (56.7%) and Hindus (57.3%). With regard to other variables, 40.7% were employed, 39.3% of them were residing in semi urban area, 23.3% were undergraduates, and 28.7% had monthly family income of Rs.10, 000.

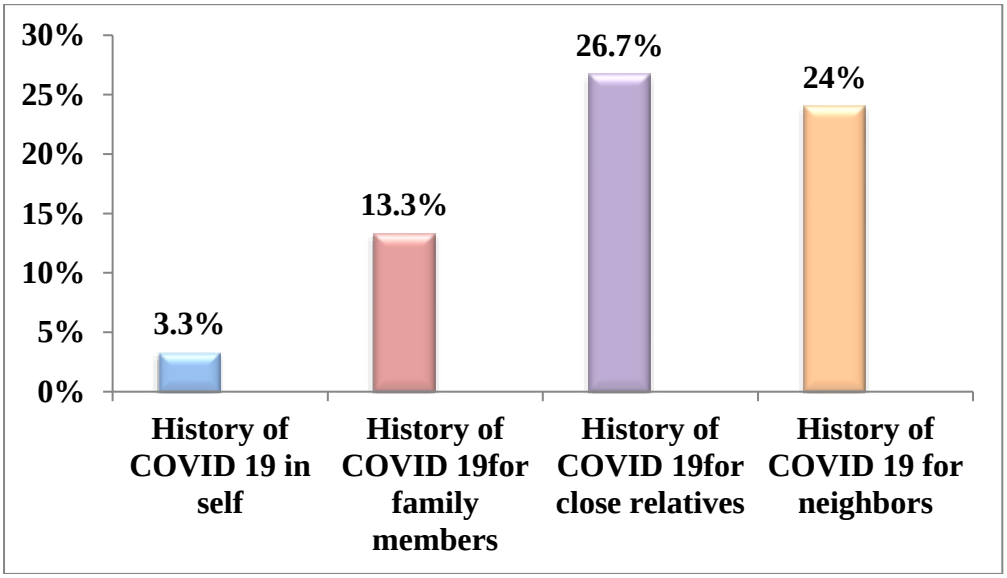

Fig 1: Percentage Distribution of History of COVID 19 in Self, Family Members, Close Relatives and Neighbors among Patients with Diabetes Mellitus during COVID19 Pandemic

Figure 1depicts that, with regard to history of COVID 19, was present among 3.3% of them (in self), 13.3% had history of COVID 19 among family members, 26.7% had history of COVID 19 among close relatives and 24% had history of COVID 19 among neighbors.

Table 2: Frequency and Percentage Distribution of Clinical Variables among Patients with Diabetes Mellitus during COVID-19 Pandemic (N=150)

Variables	f	%
Body Mass Index		
Underweight: BMI<18.5	4	2.7
Normal weight: BMI (18.5 to 24.9)	67	44.7
Over weight: BMI (25 to 29.9)	64	42.6
Obese: BMI>30	15	10
Life Style		
Sedentary	57	38
Low active	63	42
Highly active	30	20
Duration of Illness (Diabetes Mellitus)		
< 5 years	71	47.3
5 – 10 years	40	26.7
Above 10 years	39	26
Presence of co morbidities		
Nil	60	40
Hypertension	90	60
Others	0	0
Habit of Smoking		
Yes	14	9.3
No	136	90.7

Variables	f	%
Habit of Alcohol Intake (Regular Intake)		
Yes	19	12.7
No	131	87.3
Family History of Mental Illness		
Yes	22	12.7
No	128	87.3
If yes specify the relationship (n=22)		
First degree	7	-
Second degree	11	-
Third degree	4	-

Table 2 reveals that, majority of diabetic patients had co morbidities of hypertension (60%), family history of diabetes mellitus (67.3%) , had no habit of smoking (90.7%), no habit of alcohol intake (87.3%) and no family history of mental illness (87.3%). With regard to other variables, 44.7% had normal weight, 42% were low active, 43.4% had blood glucose level of 150mg/dl, 47.3% of patients had diabetes mellitus for < 5 years and 46.7% of them had mild level of stress.

Table 3: Level of Depression among Patients with Diabetes Mellitus during COVID-19 Pandemic (N=150)

Level of Depression (Depressive scores)	f	%
Normal (0-8)	30	20
Mild depression (9-15)	45	30
Moderate depression (16-23)	30	20
Severe depression (24 and above)	45	30

Table 3 reveals that, regarding depression 30% had severe depression, 30% had mild depression, 20% had moderate depression and 20% were normal.

Table 4: Level of Distress among Patients with Diabetes Mellitus during COVID-19 Pandemic (N=150)

Level of Distress (Distress Scores)	f	%
Normal (0-8)	49	32.7
Mild distress (9-15)	20	13.3
Moderate distress (16-23)	30	20
Severe distress (24 and above)	51	34

Table 4 reveals that, 32.7% were normal, 34% had severe distress, 20% had moderate distress and 13.3% had mild distress.

Table 5: Mean and Standard Deviation of Depression and Distress Scores among Patients with Diabetes mellitus during COVID-19 Pandemic (N=150)

Variables	Obtainable Score	Max & Min Score (Obtained score)		Mean	Mean %	SD
		Max	Min			
Depression	0-48	42	0	16.9	35.2	9.73
Distress	0-48	42	0	16.8	35	11.05

Table 5 reveals that, mean score of depression was 16.9 /35.2 with SD 9.73 with range of 0-42, and mean score of distress was 16.8/35 with SD11.05 with range of 0-42.

Table 6: Correlation between Depression and Distress among patients with Diabetes Mellitus during COVID-19 Pandemic

Variables	**r value**	**p value**
Depression	0.815	0.001
Distress		

Table 6 reveals that, there is strong positive correlation between depression and distress score ($p = 0.001$)

Table 7: Association between Depression and Demographic Variables of Patients with Diabetes Mellitus during COVID-19 Pandemic (N=150)

Variables	**n**	**Depression Scores**		**$\chi 2$**	**p value**
		Up to Mean Score	**Above Mean Score**		
Age in Years					
30 – 44	77	42	35	0.29	
45 – 59	73	43	30	NS	p > 0.05
Gender					
Male	65	41	24	1.92	p > 0.05
Female	85	44	41	NS	
Educational Qualification					
Up to higher secondary	94	56	38	0.87	p > 0.05
Graduated and above	56	29	27	NS	
Occupation					
Employed & Business	79	39	40	3.62	p > 0.05
Others	71	46	25	NS	
Monthly Family Income in INR					
Up to 40,000	114	69	45	2.88	p > 0.05
Above 40,000	36	16	20	NS	
Perceived Family Support					
Good	108	70	38	10.43	p < 0.001
Average & Others	42	15	27	S	
History of COVID 19 in self					
Yes	5	1	4	0.22#	p>0.05
No	145	84	61	S	
History of COVID 19(For Family Members)					
Yes	20	6	14	6.68	p < 0.001
No	130	79	51	S	
History of COVID 19(For Close Relatives)					
Yes	40	14	26	10.43	p < 0.001
No	110	71	39	S	
History of COVID 19(For Neighbors)					
Yes	36	10	26	16.09	p < 0.001
No	114	75	39	S	

Table 7 depicts that, there was statistically significant association between depression and selected variables such as perceived family support, history of COVID 19 for self, family members, close relatives and neighbors($p<0.001$). However, there was no statistically significant association between depression and demographic variables such as age, gender, educational qualification, occupation and monthly family income ($p>0.05$).

Table 8: Association between Depression and Clinical Variables of Patients with Diabetes Mellitus during COVID-19 Pandemic (N=150)

Variables	n	Depression Scores		$\chi 2$	p value
		Up to Mean Score	Above Mean Score		
Body Mass Index					
Lean (<18.5) & Normal weight (BMI 18.5 to 24.9)	71	39	32	0.17 NS	p > 0.05
Over weight (BMI 25 to 29.9)& Obese(>30)	79	46	33		
Life Style					
Sedentary	57	21	36	14.71 S	p < 0.001
Low & Highly active	93	64	29		
Random Blood Glucose Levels					
Up to 150mg/dl	85	60	25	15.48 S	p < 0.001
Above 150mg/dl	65	25	40		
Duration of Illness(Diabetes Mellitus)					
< 5 years	71	47	24	4.99 S	p < 0.05
>5 years	79	38	41		
Habit of Smoking					
Yes	14	7	7	0.28 NS	p > 0.05
No	136	78	58		
Habit of Alcohol(Regular Intake)					
Yes	19	8	11	1.88 NS	p > 0.05
No	131	77	54		
Family History of Mental Illness					
Yes	22	11	11	0.47 NS	p > 0.05
No	128	74	54		
Family History of Diabetes Mellitus					
Present	101	46	55	15.56 S	p < 0.001
Absent	49	39	10		
History of Heart Disease					
Present	12	8	4	0.67 #S	p>0.05
Absent	138	77	61		
History of Kidney Disease					
Present	7	5	2	0.67 #S	p>0.05
Absent	143	80	63		
Perceived Stress					
No Stress	35	30	5	0.16 #S	p < 0.001
Mild to severe stress	115	55	60		

Table 8 depicts that, there was statistically significant association between depression and clinical variables such as life style, random blood glucose levels, duration of illness and family history (diabetes mellitus, heart disease and kidney disease) and perceived stress ($p<0.05$). However, there was no significant association between depression and clinical variables such as body mass index, habit of smoking, alcohol intake and family history of mental illness ($p>0.05$).

Table 9: Association between Distress and Demographic Variables of Patients with Diabetes Mellitus during COVID-19 Pandemic (N=150)

Variables	**n**	**Distress Scores**		**$\chi 2$**	**p value**
		Up to Mean Score	**Above Mean Score**		
Age in Years					
30 – 44	77	38	39	0.11	
45 – 59	73	38	35	NS	p > 0.05
Gender					
Male	65	36	29	1.02	p > 0.05
Female	85	40	45	NS	
Educational Qualification					
Up to higher secondary	94	51	43	1.29	p > 0.05
Graduated and above	56	25	31	NS	
Occupation					
Employed & Business	79	35	44	2.70	p > 0.05
Others	71	41	30	NS	
Monthly Family Income in INR					
Up to 40,000	114	62	52	2.63	p > 0.05
Above 40,000	36	14	22	NS	
Perceived Family Support					
Good	108	63	45	9.07	p < 0.001
Average & Others	42	13	29	S	
History of COVID 19 in self					
Yes	5	1	4	0.35	p>0.05
No	145	75	70	#S	
History of COVID 19(For Family Members)					
Yes	20	3	17	10.16	p < 0.001
No	130	73	57	#S	
History of COVID 19(For Close Relatives)					
Yes	40	10	30	14.38	p < 0.001
No	110	66	44	S	
History of COVID 19(For Neighbors)					
Yes	36	7	29	18.47	p < 0.001
No	114	69	45	S	

Table 9 depicts that, there was statistically significant association between distress and demographic variables such as perceived family support, history of COVID 19 in self, for family members, close relatives and neighbors ($p<0.001$). However there was no significant association between distress and demographic variables such as age, gender, educational qualification, occupation and monthly family income ($p>0.05$).

Table 10: Association between Distress and Clinical Variables among Patients with Diabetes Mellitus during COVID-19 Pandemic (N=150)

Variables	n	Distress Scores		$\chi 2$	p value
		Up to Mean Score	Above Mean Score		
Body Mass Index					
Lean (<18.5)&Normal weight(BMI 18.5 to 24.9)	71	33	38	0.95 NS	p > 0.05
Over weight (BMI 25 to 29.9) & Obese (>30)	79	43	36		
Life Style					
Sedentary	57	16	41	18.78 S	p < 0.001
Low & Highly active	93	60	33		
Random Blood Glucose Levels					
Up to 150mg/dl	85	52	33	8.67 S	p < 0.001
Above 150mg/dl	65	24	41		
Duration of Illness(Diabetes Mellitus)					
< 5 years	71	40	31	1.73 NS	p > 0.05
>5 years	79	36	43		
Habit of Smoking					
Yes	14	8	6	0.26 NS	p > 0.05
No	136	68	68		
Habit of Alcohol(Regular Intake)					
Yes	19	8	11	0.64 NS	p > 0.05
No	131	68	63		
Family History of Mental Illness					
Yes	22	11	11	0.46 NS	p > 0.05
No	128	65	63		
Family History of Diabetes Mellitus					
Present	101	37	64	24.36 S	p < 0.001
Absent	49	39	10		
Perceived Stress					
No Stress	35	29	6	18.93 S	p < 0.001
Mild to severe stress	115	47	68		

Table 10 depicts that, there was statistically significant association between distress and clinical variables such as life style, random blood glucose levels, family history of diabetes mellitus and perceived stress ($p<0.001$). However there was no significant association between distress and clinical variables such as body mass index, duration of diabetes mellitus habit of smoking, alcohol intake and family history of mental illness ($p>0.05$).

DISCUSSION

This study was aimed at assessing depression and distress among patients with diabetes mellitus. Table 1 reveals that, majority of diabetic patients were aged between 51-59 yrs (60%), married (78%), from nuclear family/ living alone (74%). More than half of them were females (56.7%) and Hindus (57.3%).With regard to other variables, 40.7% were employed, 39.3% of them were residing in semi urban area, 23.3% were undergraduates, and 28.7% had monthly family income of Rs.10, 000.

Regarding level of depression among diabetic patients Tab 2 indicates that, 30% had severe depression, 30% had mild depression, 20% had moderate depression and 20% were normal. In terms of distress, Tab 3 indicates that, 32.7% were normal, 34% had severe distress, 20% had moderate distress and 13.3% had mild distress. Overall 80% of them had some form of depression and 67.3% had some form of distress even though it varied in severity. It reflects the fact that depression and distress are highly prevalent among diabetic patients especially during Covid 19. The mean score of depression was 16.9 /35.2 with SD 9.73 and mean score of distress was 16.8/35 with SD11.05. There is strong positive correlation between depression and distress score ($p = 0.001$).

These findings are consistent with various other studies conducted in different parts of the world. It is true that, the overall prevalence of depression among diabetes patients at the diabetes clinic was 87%15. A study by Magliaet al16, states that overall, 23.1% and 29.2% of the patients reported moderate to severe and mild depression, respectively; 18.5% and 24.6% reported moderate to severe and mild anxiety, respectively. Alessi et al17 states that, almost 43% of patients showed evidence of significant psychological distress, with a significant greater tendency in patients with type 2 diabetes. Qui et al18et al, out of this total diabetic participants, 524 (26.8%) had psychological distress.

The study findings also reveal that, there was statistically significant association between depression and selected variables such as perceived family support, history of COVID 19 for self, family members, close relatives and neighbors($p<0.001$). Depression scores were higher among COVID 19 in self, family members, close relatives and neighbors.

Similarly, the study findings also reveal that, there was statistically significant association between depression and clinical variables such as life style, random blood glucose levels, duration of illness and family history (diabetes mellitus, heart disease and kidney disease) and perceived stress ($p<0.05$). The depressive scores were higher among family history of diabetes mellitus.

There was statistically significant association between distress and demographic variables such as perceived family support, history of COVID 19 in self, for family members, close relatives and neighbors ($p<0.001$). The distress scores were higher among self, for family members, close relatives and neighbors.

There was statistically significant association between distress and clinical variables such as life style, random blood glucose levels, family history of diabetes mellitus and perceived stress ($p<0.001$). The distress scores were higher among family history of diabetes mellitus.
Depression and distress during COVID 19 pandemic cause a greatly diminished quality of life in diabetic patients by worsening physical symptoms, and increases the negative impact on patients and their families throughout the course of the disease. It can cause diabetic burnout and patients may end up with further more complications physiologically. Depressed diabetic patients are also at a higher risk of suicide compared with the general public. However, due to stigma and lack of awareness many patients do not receive treatment they deserve19.

Overall, the study findings indicate that, depression and distress are highly prevalent among diabetic patients. However, most of the time it is often unrecognized and underdiagnosed.20,21These facts clearly indicate the requirement to effectively identify, diagnose and treat depression and distress in diabetic patients in order to improve quality of life, psychological wellbeing, prognosis and survival rates. Both psychosocial interventions

and pharmacotherapy are effective in treating depression and distress in diabetes mellitus depending upon the severity of the illness. The management may likely to be different in each patient.

CONCLUSION

Depression and distress are the major psychological problems which has a serious impact on a person's well being, their ability and self care-management of Diabetes. It also can be the most common psychiatric disorder witnessed among the diabetic patients. Overall study findings revealed that, depression and distress among diabetic patients during COVID pandemic was highly prevalent which highlights the need for planning intervention by health care professionals. Health care professionals play vital role in supporting and reassuring the diabetic patients with facts on Diabetes and depression, which are interrelated. Patients with moderate to severe depression must be referred for professional help by counselors and psychiatrists.

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Acknowledgment
The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest
The author(s) declared no conflict of interest.

How to cite this article: Jovita, J., Vijayalakshmi, K. & Sasikala, D. (2024). Depression and Distress among Patients with Diabetes Mellitus during COVID-19 Pandemic. *International Journal of Indian Psychology, 12*(2), 4124 – 4136. DIP: 18.01.367.20241202. DOI: 10.25215/1202.367