

# An analytical, comparative study of presence of anxiety and depression among diabetic and non-diabetic COVID patients using HADS in a dedicated tertiary COVID care center

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## ABSTRACT

**Introduction** –The American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorder describes diabetes as a mood disorder affecting the functional ability of the patients. Many diabetics suffer from depression and anxiety. COVID is the new kid on the block which has emerged as an important cause of anxiety and depression. The aim of this study is to compare the presence of anxiety and depression among diabetic and non diabetic patients in the presence of COVID-19 infection.

**Methodology** – Among COVID positive patients, 50 diabetic patients and 50 non diabetic patients (a total of 100 subjects) were selected randomly from patients coming to the SMS Hospital, Jaipur, Rajasthan. HADS (Hospital Anxiety and Depression Scale) developed by Zigmond and Snaith, distributed by Mapi trust, UK was applied to calculate the score after taking copyright permission.

**Results-** Mean Anxiety score in COVID DM patient were 12.22 with SD 2.95% while in COVID Non-DM patients it was 10.28 (SD 2.9) with significant p-value of 0.001%. Depression score in patients with COVID DM was 9.28 (SD 3.0%) value and in Non DM patients it was 7.9 (SD 2.297) which was statistically significant (p-value 0.011).

**Conclusion** –COVID -19 has changed the lives of people in an unprecedented way and has left its mark forever on the psyche of people, still Diabetic patients are more prone to develop anxiety and depression irrespective of their COVID status.

**Key words** –HADS (Hospital Anxiety and Depression Scale), COVID and Diabetes Mellitus.

## INTRODUCTION

On 11<sup>th</sup> March 2020, WHO declared COVID-19 a pandemic.<sup>[1, 2]</sup>The ongoing pandemic has changed the preferences of the public.<sup>[3,4]</sup>COVID-19 has had a detrimental effect on the mental health of individuals in the general population in the different ways. Some individuals developed psychological distress immediately, while in others the impact was delayed. As a consequence, the effect would be disproportionate on different people as suggested by some early evidence.<sup>[5]</sup>

This unprecedented event provoked people to bring dramatic changes in their lifestyle, which eventually led to a rise in anxiety and depression, especially in those who were already vulnerable including quarantined people, diabetes and other chronic illnesses, healthcare workers, SARS survivors and their families.<sup>[3]</sup>

The symptomatology of depression and anxiety ranges from subclinical manifestations to major episodes. Subclinical depression is more common, and are associated with increased morbidity, reluctance to avail health care facility, and it can even lead to premature mortality.<sup>[6,7]</sup>Person often lose interest in his or her favorite activities. Even the management of diabetes is neglected by them, leading to diabetes associated complications like nephropathy, retinopathy or neuropathy, and also make them more prone for COVID-19 infection.

Depression and anxiety are the 4<sup>th</sup> cause of disability adjusted life years (DALYS) in developed countries while diabetes is on 8<sup>th</sup> position.<sup>[8]</sup>The American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorder (DSM-5) describes diabetes as a mood disorder which disturbs the functionality of the patients.<sup>[9]</sup>It has been observed that risk of depression in people with diabetes is double the number of non diabetic population, and they are more vulnerable to develop anxiety, depression and eating disorders.<sup>[10]</sup>

A meta-analysis of 42 studies was conducted to analyze the association between depression and diabetes, it was evident that there is a correlation between the presence of complications of diabetes and the depression.<sup>[11]</sup>

**Objective of the study** – The primary objective of this study is to compare the presence of anxiety and depression among COVID positive diabetic patients and COVID positive non diabetic patients and the secondary objective is to evaluate the association between depression and diabetes in presence of COVID.

**Data Collection and Interpretation**– Patients coming to the COVID tertiary care center were recruited after applying inclusion and exclusion criteria. Data collected were entered in Microsoft excel software and analyzed using SPSS version 20.0. Quantitative data were expressed as mean and standard deviation and were analyzed using unpaired t test. Qualitative data were expressed as percentage and analyzed using chi square test. p-value <0.05 was considered as significant.

4. **METHODOLOGY**-This study was conducted in a dedicated COVID hospital, Jaipur, Rajasthan where 50 COVID diabetic and 50 COVID non diabetic patients were recruited randomly to avoid selection bias.

Inclusion criteria-

- Patients who were COVID positive by RT-PCR and willing to participate in the study.

Exclusion criteria-

- Patient who were not willing to participate in the study.
- Very sick patient who was not able to communicate.
- Known case of Depression, anxiety and other psychiatric illness.
- Patients with other major co-morbidities.

HADS (Hospital Anxiety and Depression Scale) developed by Zigmond and Snaith, distributed by Mapi trust, UK was applied to calculate the score after taking copyright permission. It is a questionnaire based scale. There are 14 questions with 4 options to answer. 0 to 3 numbers are given to each response, separately for anxiety and depression. HADS score would be calculated by adding them all. It is a short, easy-to-use, 14-item screening tool for depression and anxiety symptoms in the hospital setting. It is composed of two 7-item subscales (HADS-D and HADS-A for depression and anxiety respectively), both ranging from 0 to 21 with higher scores indicating more severe distress. Items enquire about symptoms over the preceding week and are self- or clinician-rated on a 4-point Likert scale. The developers suggested categorising subjects according to subscale score into noncases (0 to 7), possible cases (8 to 10), and probable cases (>10) of clinical depression.<sup>[12]</sup>

**RESULTS** – Out of 100 COVID patients recruited, 50 patients were diabetic and 50 patients were non diabetic. Distribution of the cases according to age and sex is shown in Table-1.

**Table-1: Distribution of study participants according to age and sex**

Variable	COVID DM (%)	COVID NON-DM (%)	P value
<b>Sex</b>			
Female	24 (48)	14 (28)	0.064
Male	26 (52)	36 (72)	
<b>Age group (Years)</b>			
21-40	5 (10)	8 (16)	0.329
41-60	37 (74)	30 (60)	
>60	8 (16)	12 (24)	
<b>Grand Total</b>	<b>50(100)</b>	<b>50(100)</b>	

Table-2 depicts that Mean Anxiety score in COVID DM patient were 12.22 with SD 2.95 while in COVID Non-DM it was 10.28 (SD 2.9) with significant p-value of 0.001. Depression score in COVID DM was 9.28 (SD 3.0) value. Non DM it was 7.9 (SD 2.297) which was statistically significant (p-value 0.011) (Fig 2).

**Table-2: Mean score of anxiety, depression**

Score	1 (COVID DM)	2 (COVID NON DM)	P value
<b>Anxiety score</b>			
Mean	12.22	10.28	0.001
SD	2.951	2.9	
<b>Depression score</b>			
Mean	9.28	7.9	0.011
SD	3.01	2.297	

On analysis of age-wise distribution of anxiety score, anxiety score was maximum in elderly people of age group more than 60 years in COVID DM (15.38, SD 2.066) as compared to COVID non-DM patients (13.58, SD 2.109) which was found to be non-significant. Same is with younger age group of 21-40 years where the difference in Anxiety score was statistically insignificant. Between the age group of 41-60 years there is significant difference between the Anxiety score (P Value <0.001). Similarly, in Depression Score also, the most vulnerable age group was 41-60 years (P value 0.009). In the sex-wise distributions of score, Anxiety score was high among males (P value 0.005) while Depression score is high in females (P Value 0.016)[Table-3]

**Table-3: Distribution of Anxiety, Depression and Total Score according to Age and Sex**

Score	1 (COVID DM)		2 (COVID NON DM)		P value
<b>Age wise Distribution of Score</b>					
<b>Anxiety score</b>	Mean	SD	Mean	SD	
21-40	10	5.05	6.88	1.246	0.115
41-60	11.84	2.267	9.87	2.063	<0.001
>60	15.38	2.066	13.58	2.109	0.077
<b>Depression score</b>					
21-40	7	2.345	5.88	0.641	0.216
41-60	8.84	2.598	7.37	1.608	0.009
>60	12.75	2.659	10.58	2.193	0.062
<b>Sex wise Distribution of Score</b>					
<b>Anxiety score</b>	Mean	SD	Mean	SD	
Male	12.54	2.901	10.31	3.041	0.005
Female	11.88	3.026	10.21	2.607	0.095
<b>Depression score</b>					
Male	9.27	2.906	8.28	2.362	0.144
Female	9.29	3.183	6.93	1.859	0.016

## DISCUSSION –

The COVID 19 pandemic has drastically altered people's lives, as well as multiple aspects of public, and private economy. Declines in tourism, agriculture, and the finance industry owing to the COVID-19 outbreak has shattered the economy globally. The uncertainties of unemployment, fears associated with the virus outbreak, mass lockdowns and economic recession has lead to an increase in mental disorder as well as increase in suicide rate. Outbreak of COVID-19 in China has pointed out a significant repercussions on the psyche of the general population as shown by the researches.<sup>[13,14]</sup>

Several studies have been reporting increased levels of stress, anger, anxiety and depression among individuals worldwide due to the COVID-19 pandemic and public quarantine.<sup>[15,16]</sup> Mitigating the hazardous effects of COVID-19 on mental health is an international public health priority.

Diabetes has become a major health problems of the world causing not only physical but mental illnesses. The prevalence of depression has been reported to increase moderately in prediabetic patients and undiagnosed diabetic patients, and markedly in the previously diagnosed diabetic patients compared to subjects with normal glucose metabolism.<sup>[17]</sup> The prevalence rates of depression could be up to three-times higher in patients with type 1 diabetes and twice as high in people with type 2 diabetes compared with the general population worldwide.<sup>[18]</sup> It was observed in our study that mean anxiety score was significantly higher compared to non-diabetic COVID patients. Similarly, depression score was also statistically significant in COVID -Diabetic patients. Anxiety appears in 40% of the patients with type 1 or 2 diabetes.<sup>[19]</sup> The presence of depression and anxiety in diabetic patients worsens the prognosis of diabetes, increases the non-compliance to the medical treatment, decreases the quality of life and increases mortality.<sup>[20-22]</sup> In our study group, COVID positive diabetic patients (n=20) were more than the non diabetic patients (n=10) in ICU while the non-diabetic COVID patients (n=40) were more than the COVID diabetic patients (n=30) in the ward indicating that the diabetic patients required more ICU care than the non-diabetic patients (Fig-1).

A recent study found that depression was more prevalent in people with diabetes, regardless of the fact that it was diagnosed or undiagnosed diabetes while anxiety was more prevalent only in participants who were aware of their diabetes.<sup>[23]</sup> The psychological burden of being ill may play an important role in triggering anxiety and depression while in people with undiagnosed diabetes, depression could be due to an unfavourable lifestyle, such as physical inactivity, unhealthy diet or a stressful lifestyle.<sup>[24]</sup>

In our study it was observed that diabetes played an independent triggering factor for anxiety and depression inspite of the fact that COVID pandemic was causing lots of anxiety and depression in general population.

It seems that there is a bidirectional association between diabetes and depression as the risk for depression is increased in people with diabetes, and the risk of diabetes is elevated in people with depressive disorders. There are a number of risk factors that have been identified as relevant for the occurrence of diabetes and depression, including low birth weight, adverse events in childhood, lifestyle, and obesity, and there is good evidence that complications of diabetes significantly increase the risk of depression.<sup>[25-26]</sup>

On analyzing the gender distribution, there were more male patients than the females in both the diabetic and non diabetic group possibly because of more exposure to the males. HADS-A score in males was significantly high in diabetic patients while in females HADS-A was non significantly higher. HADS-D was significantly higher in female diabetic patients while it was non significantly higher in male diabetic patients. Anxiety disorder has been seen at three-fold higher levels in women than in men during the COVID-19 pandemic. Female's anxiety risk was 3.01 times compared to males.<sup>[27]</sup>

The mean HADS-A score was significantly more in Diabetic patients than the non diabetic. Similarly, mean HADS-D score was significantly more in diabetic patients than non-diabetic patients, as shown by the previous studies that presence of chronic illnesses such as hypertension and diabetes are significantly associated with higher psychiatric morbidity.<sup>[28]</sup>

Analyzing the correlation between age and HADS, mean HADS-A and HADS-D were highest in the age group of >60 years but the difference was non-significant in diabetic and non-diabetic groups. This shows that elderly are more prone to depression and anxiety irrespective of their diabetes status and other possible factors like loneliness and fear of death could possibly make them vulnerable for psychological distress and this is quite understandable as people with physical ailments are more vulnerable to have mental illness and this stands true for the elderly population as well.<sup>[29,30]</sup> The experienced elderly population is aware of this. So this itself may result in apprehension, stress, and depressive cognition in the elderly population.

In our study, maximum patients belonged to the age group of 41-60 years in both the groups comprising 37 patients in diabetic group and 30 patients in non diabetic group.

Mean HADS-A score and HADS-D score were significantly more in the diabetic group than the non diabetic group in the age group of 41-60 years. This shows that diabetes as a co-morbidity may have an impact on the mental well being of the patients apart from added stresses of being the bread earners of family. A possible explanation could also be that these patients are more aware about the risk of diabetic complications in COVID patients.

**CONCLUSION**– In spite of widespread COVID pandemic panic, Diabetes mellitus remains a dominant factor for causing the depression and anxiety among the patients. This should be kept in mind while dealing with a diabetic patient because treating anxiety and depression is equally important as the it can help in controlling the blood glucose levels as well.

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