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The Psychological Impact of the Second Wave of COVID-19 on People Living with Type-2 Diabetes Mellitus

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A B S T R A C T

BACKGROUND: COVID-19 pandemic has led to an increase in various psychological problems for people in India.

AIM: The aim of this research was to assess the psychological impact of COVID-19 on people living with Type 2 Diabetes Mellitus evaluating their stress, anxiety, and depression levels during pandemic.

MATERIALS AND METHOD: The study used validated Hindi version of GASS-21 questionnaire, It was handed out to 1143 eligible and consenting patients across eight secondary care centres in Lucknow.

RESULTS: The study enrolled 1143 participants and out of that, 8% were depressed, 19% were anxious, and 6% were stressed. The significant psychological drivers were family members who tested positive for COVID 19, death of a first degree family member, post covid infections and vaccination status. Patients who were not vaccinated for COVID were significantly more affected psychologically.

CONCLUSION: COVID-19 and associated morbidity and mortality, post covid complications and vaccinations on apprehensions were significantly associated COVID-19 related psychological impacts that were studied.

KEYWORDS: Psychological Impact, Diabetes, COVID-19, DASS-21, Stress, Anxiety, Depression

INTRODUCTION

COVID-19 pandemic being a multi-dimensional stressor, led to an increase in many psychological problems for people. Studies suggest that more than two-fifths of the population experienced mental disorders due to lockdown and the prevailing COVID-19 pandemic, which most commonly include stress, anxiety, and depression.[1] Stress is an emotional strain or pressure that might be triggered by any physical or psychological factor an may lead to disturbance in homeostasis. On the other hand, anxiety is the fear of the unknown, which is the body's natural response to stress. Depression is the constant state of disinterest in daily chores and activities.[2]

In a pandemic situation, with a lack of substantive cure, emerging variants and sub-variants of the virus, a plethora of fake news via social media, future uncertainties regarding livelihood, and overwhelming media-created fear psychosis, people became more susceptible to anxiety, depression, and stress.[3] Any stress caused to the body, mental or physical, has been shown to have significant effects on the individual's metabolism. Hence, it is even more evident in patients with chronic medical conditions and comorbidities. A

potential impact of stress is chronic hyperglycaemia in Type 2 diabetes mellitus.[4] Globally, Type 2 Diabetes Mellitus has been identified as a significant risk factor for increased morbidity and mortality in the COVID-19 study. Patients with severe COVID-19 and diabetes were significantly more likely to require ventilator support and admission in the ICU and had higher mortality than those with severe COVID-19 without Diabetes.[5] Our own study done earlier revealed that lockdown during Covid 19 lead to more stress and change in dietary and sleep pattern.[6]

This study assessed the mental health of people living with diabetes during the second wave of COVID-19 using the DASS-21 scale. The DASS-21 scale, a 21-item version of the Depression Anxiety Stress Scale, can be easily administered to people with diabetes. Furthermore, its clinical ease of use and ability to produce comparative data on a real-time basis has been commended.[7] Its validation in Hindi, the language commonly spoken and understood in North India, was the reason for its choice.[8] The study's objective is to gauge the mental impact of the pandemic on people living with diabetes and the probable factors

contributing to them.

MATERIALS AND METHOD

Study Design: It was a multicentre, qualitative, cross-sectional study involving people living with diabetes mellitus conducted at eight participating secondary diabetes care centres in the geographic bounds of the city of Lucknow, Uttar Pradesh, India.

Inclusion/Exclusion Criteria:

Inclusion Criteria was
• People with Type 2 diabetes mellitus over the age of 18
• Patients taking either Insulin injections or oral medications or both
•Patients with history of Type 2 DM for more than six months
• Patients willing to accept and sign informed consent before data collection.

Exclusion Criteria was
• Illiterate people
• People unable to understand and comply with instructions
• Patients unable to perform self-care, self-administer medications, or have poor cognitive functions.
• Patients with severe or life-threatening systemic abnormalities (organ failure, ICU ridden, trauma)
• Hospitalized patients

To elicit responses from all enrolled patients, study proforma was used and was then digitized by a trained medical assistant.

Research Instruments: DASS-21 questionnaire was the research instrument of choice for this study. The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress. Each of the three DASS-21 scales contains seven items, divided into subscales with similar content. DASS-21's psychometric properties were deemed commendable. It is reliable, valid, and easy to use. The Depression Anxiety Stress Scale (DASS) developed by Lovibond and Lovibond is one of the instruments commonly used to assess subjective depression and anxiety in patients.[9] Our study used a validated Hindi version of the DASS questionnaire 10. DASS is a quantitative measure of distress based on the three dimensions of depression, anxiety, and stress. It is not a diagnostic indicator. Inherently, emotional syndromes like depression and anxiety vary along a continuum of severity (regardless of the diagnosis).

Therefore, selecting a single cut-off score as a measure of clinical severity is necessarily arbitrary (Table 1).

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Table 1. Calculation system/ Scoring System of the DASS-21 Questionnaire

Demographic data, data related to diabetes duration and control, comorbidities associated with diabetes, the financial status of the family, and illness related to COVID-19 were captured in case record form (CRF). The CRF was created specifically for this study and was explained well to the patients during data collection (Figure 1).

Figure 1. The Case Record Form (CRF)

Methodology: The patients were screened from the eight participating secondary diabetes care centres and were shortlisted according to the eligibility criteria. Once they had signed the written consent form, data was collected in the case record form (CRF), followed by providing the DASS-21 questionnaire to patients to collect their responses.

Sampling Sizes and Bias: The sample size was 1143 over a timeframe of (MM) in 8 participating tertiary care centres. As far as geographic representation was concerned, the centres were well distributed all over the study.

Statistical Methods: Statistical analysis was performed using SPSS statistics windows version 18. Categorical data were represented in proportions, and continuous data were defined as mean and standard deviation. Statistical significances were tested using a t-test for means and proportions at 1% and 5% significance levels.

RESULTS

1143 subjects were recruited from at 8 study sites immediately after the second COVID 19 wave. Table 2 highlights the demographic profile of the patients participating in the survey. The mean age of patients was 53.9 years, the total number of female patients was 519, and male patients were 625. The mean BMI came out to be 26.79 kg/m2 and the average duration of the diabetes was 6.23 years. The comorbid conditions that were analysed included hypertension (487), Obesity (211), Hypothyroidism (175), and Psychiatric Illness (88). Table 2 highlights the contribution of each site [Table 2 (a) & (b)].

For this study, Mild, Moderate, Severe, and Extremely Severe classifications of Depression, Anxiety, and Stress in the DASS21 questionnaire were clubbed together as Depressed, Anxious, and Stressed, respectively. Based on the category, of all patients, 8% were Depressed, 19% were Anxious, and 6% were stressed as per the DASS-21 scoring system [Figure 2(a)].

Figure 2 (b) highlights the further break-up of Depression, Anxiety, and Stress as per the DASS21 questionnaire. Significantly few patients reported Severe or Extremely Severe on the three parameters.
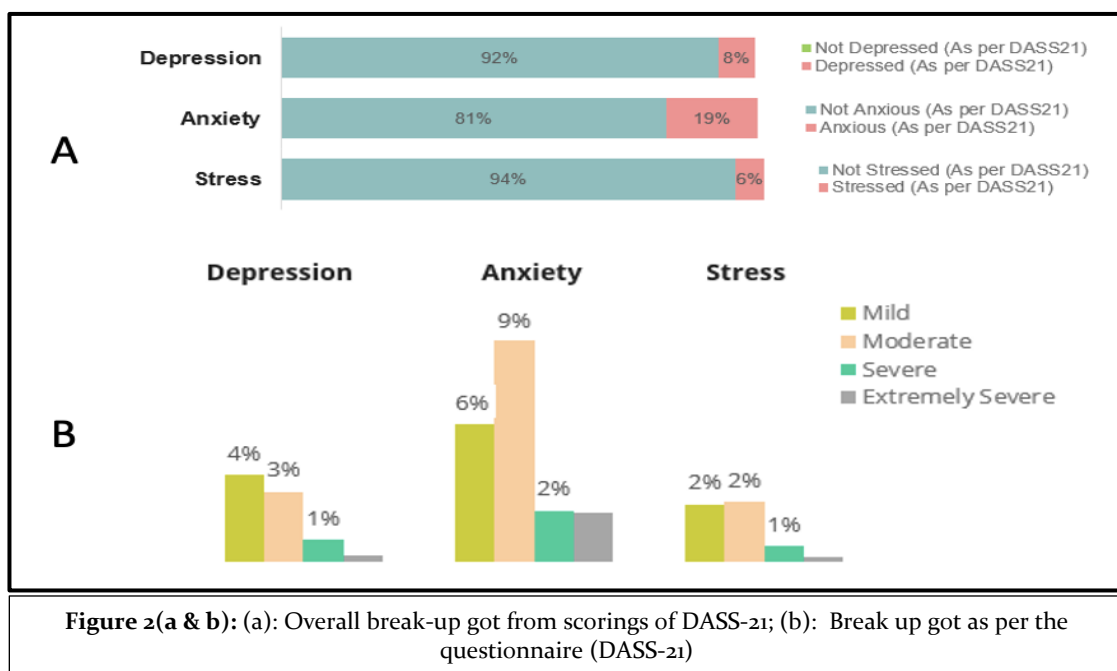
Out of the various aspects of stress-inducing COVID-related parameters that were measured in the CRF, the most crucial COVID-19-related drivers of psychological

DEMOGRAPHICS		
Gender		n = 1144
	Male	54.6% (625)
	Female	45.4% (519)
Age		n = 1125
	Average Age	53.9 Years
	SD	11.3
	95% lower CI for Mean	53.2
	95% upper CI for Mean	54.6
BMI		n = 1107
	Average - BMI	26.79
	SD	5.1
	95% lower CI for Mean	26.5
	95% upper CI for Mean	27.1
Duration of Diabetics		n = 788
	<1 years	1.3% (10)
	1-5 years	39.9% (314)
	5-10 years	34.5% (272)
	>10 years	24.4% (192)
	Average Duration	6.23 Years
Comorbid conditions		n = 1130
	Hypertension	43.1% (487)
	Obesity	18.7% (211)
	Hypothyroidism	15.5% (175)
	Psychiatric illness	7.8% (88)

Table 2 (a). Demographic data of participants

Site	No. of Participants Enrolled
Site 1	37
Site 2	131
Site 3	236
Site 4	131
Site 5	276
Site 6	224
Site 7	15
Site 8	95

Table 2 (b). Contribution from each site of participants

Figure 2(a & b): (a): Overall break-up got from scorings of DASS-21; (b): Break up got as per the questionnaire (DASS-21)

impact were Family members (who tested positive for COVID), first-degree family member's death because of COVID, and Post COVID infections [Figure 3(a), (b) & (c)].

Vaccination Status is another critical driver of the psychological impact of COVID-19. Patients who were not vaccinated were significantly more affected psychologically. 50% (180 patients) out of 371 patients who were not vaccinated yet, the reasons for not getting vaccinated included doubts about vaccination (n=180), non-availability (n=94), confusion about dosing (n=42), not well versed with the registration process (n=20) and apprehension of harm (n=17)25%. (94 patients) did not get vaccinated because of the non-availability of dosages. Only a few patients, 4% (17 patients), were concerned about potential harm from vaccination.

DISCUSSION

People with diabetes are at a higher risk of developing depression, almost 24% more than those without diabetes. [11] This has been discussed in studies where depression has been found to be responsible for poor glycaemic index control, increasing the risk of diabetes-related complications and comorbidities.[11] While stress directly affects the blood glucose level or indirectly impacts a patient's ability to maintain a healthy regime, disrupting their adherence to diet and treatment. [13,14] Khuwaja et al.[15] reported that anxiety and depression are common among diabetic patients in Pakistan. However, in the indexed study, it has been reported

that the prevalence of psychological disorders in type 2 diabetic patients, depression, anxiety, and stress are only 8%, 19%, and 6%, respectively. Studies also show that developed countries had almost double the number of people with similar conditions.[16]

The conducted index study's results focus on the factors that cause distress among people with diabetes. The news of post-covid fungal infection did have significant impact on people living with diabetes in causing anxiety. Additionally in people with T2 diabetes stress and depression significantly correlated to their families testing positive or the demise of any first-degree relative. Depression, contradicting the above studies, didn't show any specific significant correlation.

In the study by Joaquim et al.[17], they concluded that losing any family member/friend amplifies psychological distress, especially in patients with existing mental conditions or comorbidities.

Palgi et al.[18] demonstrated that hesitancy toward the COVID-19 vaccinations among the population was one of the most significant driving factors for stress, anxiety, and depression among Israelis. Vaccination status also played an essential driver of psychological distress in our study, where higher levels of vaccine hesitancy could double the risk of depression in patients.

The study conducted had certain limiting factors. It included only people with type 2 diabetes mellitus attending secondary diabetes care centres and, possible
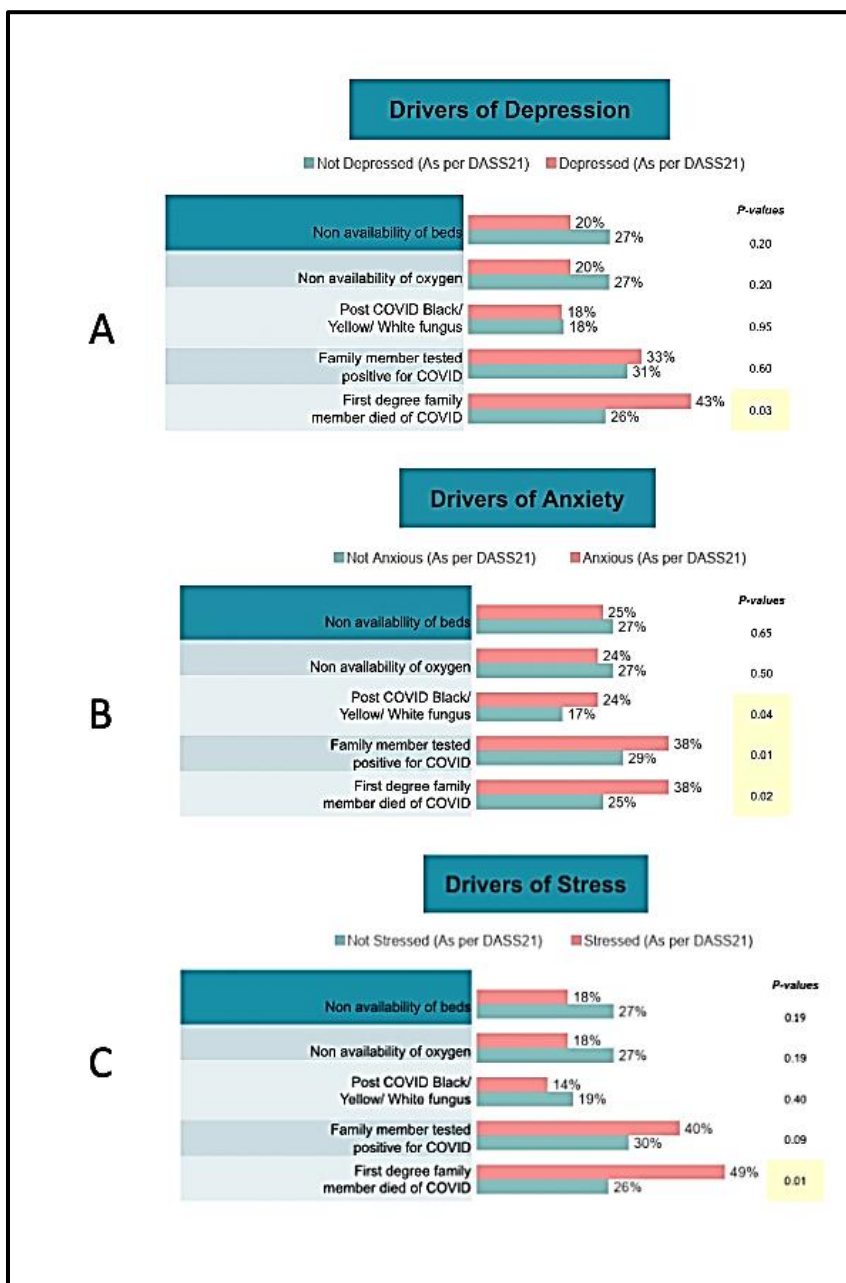
Figure 3(a, b & c): (a): COVID-19 related Drivers of Depression with p-values; (b): COVID-19 related Drivers of Anxiety with p-values; (c): COVID-19 related Drivers of Stress with p-values

recall bias for the CRF was administered on the first post-covid visit. Second, since the number of factors triggering psychological distress is innumerable, there could be many factors other than those considered in this exploratory study. Third, the break-up of patients into depressed, anxious, and stressed was entirely done as per the scoring of the DASS questionnaire, which is a screening and not a diagnostic tool.

CONCLUSION
The index study highlights the factors which were associated with increased risk of depression, anxiety and stress in people living with diabetes during second wave of Covid-19. Covid-19 and associated morbidity and mortality, post covid complications, and vaccination apprehensions were significantly associated Covid-19 related psychological impacts

studied. The study also highlights the importance of evaluating factors related to psychological stressors in high-risk populations like people with diabetes and preparing patients for stressors like the COVID-19 pandemic in a country like India, where mental health facilities are nascent.

REFERENCES

1. Santomauro DF, Mantilla Herrera AM, Shadid J, Zheng P, Ashbaugh C, Pigott DM, et al. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. The Lancet 2021;398(10312):1700–12.

2. Lesse S. The relationship of anxiety to depression. Am J Psychother. 1982 Jul;36(3):332-49. doi: 10.1176/appi.psychotherapy.1982.36.3.332.

3. Rehman U, Shahnawaz MG, Khan NH, Kharshiing KD, Khursheed M, Gupta K, Kashyap D, Uniyal R. Depression, Anxiety and Stress Among Indians in Times of Covid-19 Lockdown. Community Ment Health J. 2021 Jan;57(1):42-48. doi: 10.1007/s10597-020-00664-x.

4. Hackett RA, Steptoe A. Type 2 diabetes mellitus and psychological stress — a modifiable risk factor. Nature Reviews Endocrinology 2017 13;91:547–60.

5. Rajpal A, Rahimi L, Ismail-Beigi F. Factors leading to high morbidity and mortality of COVID-19 in patients with type 2 diabetes. Journal of Diabetes;12(12):895–908.

6. Tiwari A, Kumar D, Ansari MS, Chaubey SK, Gupta NR, Agarwal V, et al. Impact of lockdown on self- care management among patients with type 2 Diabetes Mellitus residing in Lucknow city, India – A cross-sectional study, Clinical Epidemiology and Global Health (2021):100703. https://doi.org/10.1016/j.cegh.2021.100703.

7. Ng F, Trauer T, Dodd S, Callaly T, Campbell S, Berk M. The validity of the 21-item version of the Depression Anxiety Stress Scales as a routine clinical outcome measure. Acta Neuropsychiatrica. 2007;19(5):304–10.

8. Kumar K, Kumar S, Mehrotra D, Tiwari S, Kumar V, Dwivedi R. Reliability and psychometric validity of Hindi version of Depression, Anxiety and Stress Scale-21 (DASS-21) for Hindi speaking Head Neck Cancer and Oral Potentially Malignant Disorders Patients. Journal of Cancer Research and Therapeutics 2019;15(3):653.

9. Lovibond SH, Lovibond PF. Manual for the depression anxiety stress scales. Psychology Foundation of Australia; 1996.

10. Singh B, Prabhuappa KP, Singh AR. Depression, Anxiety and Stress Scale: Reliability and Validity of Hindi Adaptation. International Journal of Education and Management Studies 2013;3(4):446–9.

11. Bădescu S v., Tătaru C, Kobylinska L, Georgescu EL, Zahiu DM, Zăgrean AM, et al. The association between Diabetes mellitus and Depression. Journal of Medicine and Life 2016;9(2):120.

12. Nouwen A, Winkley K, Twisk J, Lloyd CE, Peyrot M, Ismail K, et al. Type 2 diabetes mellitus as a risk factor for the onset of depression: a systematic review and meta-analysis. Diabetologia 2010 Dec;53(12):2480–6.

13. Marcovecchio ML, Chiarelli F. The effects of acute and chronic stress on diabetes control. Sci Signal. 2012 Oct 23;5(247):pt10

14. Gonzalez JS, Safren SA, Cagliero E, Wexler DJ, Delahanty L, Wittenberg E, et al. Depression, self-care, and medication adherence in type 2 diabetes: relationships across the full range of symptom severity. Diabetes Care 2007;30(9):2222–7.

15. Khuwaja AK, Lalani S, Dhanani R, Azam IS, Rafique G, White F. Anxiety and depression among outpatients with type 2 diabetes: A multi-centre study of prevalence and associated factors. Diabetol Metab Syndr. 2010;2(1).

16. Woon LSC, Sidi H bin, Ravindran A, Gosse PJ, Mainland RL, Kaunismaa ES, et al. Depression, anxiety, nd associated factors in patients with diabetes: Evidence from the anxiety, depression, and personality traits in diabetes mellitus (ADAPT-DM) study. BMC Psychiatry 2020;20(1):1–14.

17. Joaquim RM, Pinto ALCB, Guatimosim RF, de Paula JJ, Souza Costa D, Diaz AP, et al. Bereavement and psychological distress during COVID-19 pandemics: The impact of death experience on mental health. Current Research in Behavioral Sciences. 2021;2:100019.

18. Palgi Y, Bergman YS, Ben-David B, Bodner E. No psychological vaccination: Vaccine hesitancy is associated with negative psychiatric outcomes among Israelis who received COVID-19 vaccination. J Affect Disord. 2021;287:352-3. doi: 10.1016/j.jad.2021.03.064.

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