

Impact of Covid-19 pandemic on Diabetic Distress among type-II Diabetes Patients in Urban and Rural field practice area of North Karnataka, India.

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Abstract

Background: Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced. Diabetes is a challenging disease that is considered to be hard to live with as it encompasses a lot of restrictive instructions in normal conditions, leads to Diabetic distress. Pandemic COVID-19 lockdown has put forth undue psychological distress with anxiety and depression amongst general population as a whole and particularly those afflicted with chronic diseases like people living with diabetes.

Objectives:

1. To assess and compare the diabetes distress score and Self-care activities using diabetes distress scale and DSMQ questionnaire respectively among urban and rural type II diabetic patients.
2. To study the impact of Covid 19 pandemic on Diabetic distress and Self-care in type II diabetes.

Methodology: A cross-sectional study was conducted in both urban and rural field practice area of SNMC, Bagalkot. 140 study participants were from urban area and 70 study participants were from rural area. Diabetic self-care activities and diabetic distress were analyzed before and After Covid pandemic.

Results: Our study showed most of the study participants had poor self-care activities. Our study showed 60% of rural participants screen positive for moderate diabetic distress where as 52.1% of urban participants showed positive for high diabetic distress. In urban area, Mean DDs score before and after covid was found to be 2.42 & 3.01 respectively, which was found to be statistically highly significant ($P < 0.001$) DSMQ score was 1.12 and 1.01, before and after Covid respectively, which was also statistically significant ($P < 0.05$). whereas in Rural area, Mean DDs score before and after covid was found to be 2.40 & 2.92 respectively, which was found to be statistically highly significant ($P < 0.001$) DSMQ score was 1.92 and 0.92, before and after Covid respectively, which was also statistically significant ($P < 0.001$).

Conclusion: People with diabetes have significant diabetes distress and psychological adaptive difficulties that is aggravated by the COVID-19 pandemic. An integrated multidisciplinary approach is needed to manage the prevailing psychological issues amongst people with diabetes during the COVID-19

Key words: diabetic distress, self-care, type 2 diabetes, Covid-19 pandemic.

Introduction

Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced. Diabetes is a challenging disease that is considered to be hard to live with as it

encompasses a lot of restrictive instructions^[1].

It is well-established that diabetes under 'normal' conditions can have a significant and negative effect on quality of life. Around 40% of people with diabetes experience diabetes distress as well as an increased prevalence of a range of psychosocial

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problems, including depression, anxiety, eating disorders and general stress compared with the general population^[1,2]. Self-care in diabetes has been defined as an evolutionary process of development of knowledge or awareness by learning to survive with the complex nature of diabetes. Diabetic distress refer to an emotional state where people experience feelings such as stress, guilt or denial that arise from the living with diabetes and the burden of self-management. These emotional burdens and worries about diabetes, and its management, threats of complications, and unmet needs of moral support from family, friends and health care providers have been recognized as diabetes distress.

Spread of corona virus disease 2019 (COVID-19) was declared a global pandemic by the World Health Organization (WHO) on 11 March 2020. For most people, COVID-19 will cause only mild symptoms similar to a common cold, but it can also cause severe respiratory infections and multi-organ failure. The COVID-19 outbreak started in the Hubei Province, China in December 2019. Since then, the virus has spread rapidly to multiple countries across the globe within a very short space of time^[3].

Self-care diabetes has been defined as an evolutionary process of development of knowledge or awareness by learning to survive with the complex nature of diabetes^[4,5,6]. The vast majority of day-to-day care in diabetes is handled by patients and/or families, there is an important need for reliable and valid measures for self-management of diabetes^[7,8,9]. It is expected that those with the greater knowledge will have a better understanding of the disease and have a better impact on the progression of disease and complications. A Study conducted in South India found that there is a very poor self-care practices and adherence to the treatment^[10].

Diabetic distress refer to an emotional state where people experience feelings such as stress, guilt or denial that arise from the living with diabetes and the burden of self-management The emotional distress facing people with diabetes due to such life style restriction. The instructions given by the educator or the physician can seem to be complicated for a person from a non-medical background, which further compounds the emotional distress of the diagnosis and necessary life style changes^[11]. These emotional burdens and worries about diabetes, and its management, threats of complications, and unmet needs of moral support from family, friends and health care providers have been recognized as diabetes distress^[12]. Studies have shown that there is Diabetic distress upto 60% in Asia^[13], and in South

Indian study it was found to be 40%.^[10] This indicates the unmet need for the Diabetes mellitus information to Diabetes Mellitus patients.

Diabetic Self Management Education and support (DSME/S) has a positive effect on other clinical, psychosocial, and behavioral aspects of diabetes. DSME/S is reported to reduce the onset and/or advancement of diabetes complications, to improve quality of life and lifestyle behaviors such as having a more healthful eating pattern and engaging in regular physical activity, to enhance self-efficacy and empowerment, to increase healthy coping, and to decrease the presence of diabetes-related distress and depression. These improvements clearly reaffirm the importance and value-added benefit of DSME^[14]. Hence the study is taken up with above mentioned objectives.

The COVID-19 outbreak and associated mass media coverage about the course of the pandemic worldwide and the frightening mortality levels in some countries are expected to increase the prevalence and change the character of psychological problems, including anxiety, depression and stress among citizens in affected countries^[15,16,17]. Pandemic COVID-19 lockdown has put forth undue psychological distress with anxiety and depression amongst general population as a whole and particularly those afflicted with chronic diseases like people living with diabetes^[18,19,20].

Objectives of the study:

1. To assess and compare the diabetes distress score and Self care activities using diabetes distress scale and DSMQ questionnaire respectively among urban and rural type II diabetic patients.
2. To study the impact of Covid 19 pandemic on Diabetic distress and Self care in type II diabetes.

Methodology

After obtaining the ethical clearance from institution from institutional ethical clearance, this cross-sectional study was conducted. Sample size estimation was done using open epi software version 2.3.1 at 95% confidence level and 40% power of the study at 20% relative precision. According to the study conducted by (Sasishekar et al, in South India to estimate diabetic distress) 8 proportion of type II diabetes mellitus with diabetic distress in South India - 40%. Sample size was calculated using formula $4pq/L^2$. According to the study conducted by (Sasishekar et al, in South India to estimate diabetic distress)¹⁰ Proportion of type II diabetes mellitus with diabetic distress in South India - 40%, with 15%

relative precision, Sample size obtained was 190. Urban and Rural prevalence was found to be 20% and 10% respectively^[21] 129 type II diabetes subjects from Urban field practice area and 63 type II diabetes subjects from Rural field practice area. Informed consent was obtained. Those patients were selected randomly from the family folders maintained in the respective health centers. Patients who were suffering from type II DM with diabetic history for at least one year, age of patient should be more than 20 years and patients who were taking allopathic medicine for diabetes were included in the study whereas patients who were not physically fit due to significant medical/surgical conditions, pregnant and lactating women and patients who did not give consent to participate in this study were not considered in the study. Study was initiated in December 2018 (Before Covid) and April-June 2021 (After Covid information).

Data was collected using pretested and predesigned proforma, which included socio demographic details such as name, age, sex, educational status, occupational status, socio-economic status. Duration of diabetes and treatment history in the past were recorded. Clinical and anthropometric parameters and existence of co-morbidities were also recorded.

Post or After covid information was obtained on telephonic interview.

Self care in diabetes was assessed using Diabetes Self-Management Questionnaire. It consisted of 16 items covering five different aspects of diabetes self management. All items are formulated as behavioural descriptions from the person’s point of view. Respondents rate the extent to which each description

applies to them on a four-point Likert scale (3-‘applies to me very much’ to 0-‘does not apply to me’), referring to previous eight weeks. Item scores are transformed so that higher scores indicate more desirable self management behavior and transformed to five scale scores with ranges from 0 to 10. The scales reflect patients’ dietary control, medication adherence, blood glucose monitoring, physical activity and physician contact^[22].

Diabetic distress was assessed using Diabetic distress Scale. The DDS is a 17-item scale that captures four critical dimensions of distress: emotional burden, regimen distress, interpersonal distress and physician distress. Each question was answered according to the following 1-6 scale: 1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem. Scoring: The three DDS categories were defined as: “little or no DD” (mean score <2.0), “moderate DD” (mean score =2.0– 2.9), and “high DD” (mean score ≥3.0).¹⁸. If score exceeds more than 3 in any of the dimension, it is considered as a level of distress worthy of clinical attention^[23].

Results

In the present study, 192 type-II Diabetes mellitus patients participated in the study. Maximum of 42% were in the age group of 51-60 years in urban area, whereas 36.5% were in the age group of 61-70 years in Rural area. Maximum of 46% were illiterate in urban area and 41% illiterates in rural area. In the present study 55% in Urban area and 43% in rural area belonged to Socio-economic status of class IV and V. (Table 1)

Age (Years)	Urban		Rural	
	Frequency	Percentage	Frequency	Percentage
30-40	2	1.6	1	1.6
41-50	20	15.5	16	25.4
51-60	55	42.6	17	27.0
61-70	38	29.5	23	36.5
71-80	14	10.9	6	9.5
Gender				
MALE	70	54.3	44	69.8
FEMALE	59	45.7	19	30.2
Educational status				
ILLITERATE	60	46.5	26	41.3
PRIMARY	35	27.1	12	19.0
HIGH-SCHOOL	1	.8	00	00
PUC	4	3.1	00	00
DIPLOMA	5	3.9	6	9.5
GRADUATE	5	3.9	6	9.5
PROFESSIONAL	19	14.7	13	20.6

Religion				
HINDU	89	69.0	57	90.5
MUSLIM	32	24.8	5	7.9
OTHERS	8	6.2	1	1.6
Family				
JOINT	54	41.9	31	49.2
NUCLEAR	72	55.8	29	46.0
THREE- GENERATION	3	2.3	3	4.8
SOCIO-ECONOMIC STATUS				
CLASS I	10	7.8	11	17.5
CLASS II	17	13.2	19	30.2
CLASS III	29	22.5	5	7.9
CLASS IV	30	23.3	22	34.9
CLASS V	43	33.3	6	9.5

About 70% of subjects in Urban area were diagnosed with diabetes for 5 to 10 years, whereas 50% in rural area. Maximum were taking oral hypoglycemic drugs. They were spending atleast 1000 rupees per month for medication as a direct expenses towards medication.(Table 2)

Table 2: Diabetes Care.

Duration of Diabetes (Years)	Urban		Rural	
	Frequency	Percentage	Frequency	Percentage
1-5	62	48.1	14	22.2
6-10	48	37.2	19	30.2
11-15	09	7.0	06	9.5
16-20	03	2.3	03	4.8
21-25	00	00	21	33.3
26-30	01	0.8	00	00
31-35	03	2.3	00	00
36-40	03	2.3	00	00
MEDICATION				
OHA	127	98.4	59	93.7
OHA + INSULIN	2	1.6	4	6.3
MONEY SPENT OF DRUGS (MONTHLY)				
Rs. 100 - Rs. 500	63	48.8	22	42.8
Rs. 501 - Rs. 1000	57	44.2	34	54.0
Rs.1001 - Rs. 2000	9	7.0	7	11.1

The High Diabetic distress was increased in rural area by 3 points, when compared 1 point in Urban area. There is no much difference in DSMQ categories before and after covid pandemic. (Table 3)

Table 3: Comparison of Diabetic distress score and Diabetics self-management score in Before and after covid pandemic.

Diabetic Distress (DD)	Urban				Rural			
	Before Covid		After covid		Before Covid		After covid	
	No	%	No	%	No	%	No	%
LITTLE DD	26	20.2	12	9.30	11	17.5	9	14.2
MEDIUM DD	25	19.4	38	29.4	16	25.4	16	25.3
HIGH DD	78	60.5	79	61.3	36	57.1	38	60.5
TOTAL	129	100.0	129	100.0	63	100.0	63	100.0

DSMQ	URBAN				RURAL			
	Before Covid	After covid		Before Covid	After covid			
	No	%	No	%	No	%	No	%
0-3	116	89.9	118	91.4	47	74.6	49	77.7
4-7	10	7.8	8	6.2	14	22.2	14	22.3
8-10	3	2.3	3	2.4	2	3.2	0	0
TOTAL	129	100.0	129	100.0	63	100.0	63	100.0

In urban area, Mean DDS score before and after covid was found to be 2.42 & 3.01 respectively, which was found to be statistically highly significant ($P < 0.001$). DSMQ score was 1.12 and 1.01, before and after Covid respectively, which was also statistically significant ($P < 0.05$). Whereas in Rural area, Mean DDS score before and after covid was found to be 2.40 & 2.92 respectively, which was found to be statistically highly significant ($P < 0.001$). DSMQ score was 1.92 and 0.92, before and after Covid respectively, which was also statistically significant ($P < 0.001$) (Table 4)

Table 4: Mean DDS score and DSMQ score before and After Covid pandemic.

Urban	Mean	N	Std. Deviation	t	p
DSMQ (Before Covid)	1.12	129	.395	1.9	0.05
DSMQ (After covid)	1.01	129	.45		
DDS (before covid)	2.42	129	.805	7.2	0.001
DDS (After Covid)	3.01	129	.479		
Rural	Mean	N	Std. Deviation		
DSMQ (Before covid)	1.29	63	.521	4.4	0.001
DSMQ (After covid)	0.92	63	.43		
DDS (Before covid)	2.40	63	.773	3.94	0.001
DDS (After covid)	2.92	63	.710		

Discussion

Most of the study participants both in urban and rural were in their fifth and sixth decade of lives which is similar to study conducted by sasekhar et al^[10], where the mean age of diabetes was found to be 55 years. Most of them were hindu by religion. Most of the study participants belonged to lower middle class when per capita income was analysed.

Our study showed 60% of rural participants screen positive for moderate diabetic distress where as 52.1% of urban participants showed positive for high diabetic distress. According to a study, it showed 25% of the participants screened positive for moderate to high DRD on a DDS-17 scale. According to study conducted by sasekhar et al^[10], diabetic distress was found to be 40% in their study participants. It is said urbanization influence the health outcome. This might be due to change in life style which is adopted living in urban. Urbanization has both positive and negative impacts on health. Diabetes, being a chronic condition raises economic burden. Living in urban area and dealing with Diabetes might have increased burden economically. This could be probable reason for difference in diabetic distress seen in this study.

In one study^[24] of 1396 people with diabetes showed

that worries related to the COVID-19 pandemic were highly prevalent. Participants most frequently worried about 'being overly affected due to diabetes if infected with COVID-19' (56%), that 'people with diabetes are characterized as a risk group' (39%) and 'not being able to manage diabetes if infected with COVID-19' (28%). People with diabetes have been informed of the necessity to be acutely aware of the advice and restrictions imposed by the health authorities^[2] In our population, 25% experienced diabetes distress at the beginning of the COVID pandemic, which corresponds to what is found under normal circumstances^[25,26,27]. Our findings also showed that experiencing high diabetes distress and feeling lonely were related to experiencing COVID-19 specific worries^[24].

Living with diabetes and managing the condition on a day-to-day basis are associated with heightened levels of anxiety and distress^[1,2]. Likewise, a range of different factors, such as sex, diabetes type and presence of complications, moderate the levels at which distress and anxiety are experienced^[2,28].

Our study showed most of the study participants had poor self-care activities. In urban it was 96.4% of study participants ranged between score 0 and 3 of self-care activities. In rural, it was 80% of study

participants ranged between score 0 and 3 of self-care activities. In our study, 5.7% of urban participants and 22.8% of rural participants did not check their blood sugar regularly. This could be due to easy availability of facilities. Urban residents have better access to health care facilities easily than in rural. In study conducted by Rajasekharan D et al.^[29], showed similar results, where 23% of the study participants did not check their blood sugar regularly. 43.6% of urban participants and 42.8% of rural participants avoided physical activity even after being told by physician about the importance of physical activity. Similar results were found in study Dinesh PV et al.^[30], where only 19% adapted physical activity in their lives.

There are significant concerns regarding worsening of glycemic control, unavailability of appropriate medicines, inaccessibility to health care or acquiring SARS-CoV-2 infection and subsequent poorer outcomes during the COVID-19 pandemic. Although there are some guidance documents for managing diabetes and associated complications during COVID-19 pandemic but very few address the psychological issues in people with diabetes. We discuss the psychological adaptive difficulties and an approach to address the psychosocial concerns in people with diabetes during the COVID-19 pandemic.

Pandemic COVID-19 lockdown has put forth undue psychological distress with anxiety and depression amongst general population as a whole and particularly those afflicted with chronic diseases like people living with diabetes^[18,19,20]. An online survey found that almost one-fourth of the studied general Indian public had moderate to extreme depression^[19]. People with diabetes have multiple psychosocial issues, which coupled with the psychological stressors of a pandemic, social distancing, lockdown, and quarantine creates an unsettling situation^[20,31,32,33]. COVID-19 pandemic and subsequent lockdown has disrupted the lifestyle patterns include eating habits and self-care ability for the disease^[34]. It is noticed that there is increased tendency for snacking, decrease exercise duration and less often self-monitoring of blood glucose (SMBG) in people with type 2 diabetes^[35]. 28y An online-based survey reported that only one-fourth of the participants (28%) were regularly monitoring their blood glucose during the COVID-19 lockdown and two-fifth of participants (40%) were anxious about COVID-19 infection^[36]. More than half of the participants with diabetes are worried about the greater risk of developing COVID-19 and about one-third are concerned about difficulties in managing their diabetes if they contract COVID-19^[35,37] The lockdown following COVID-19 has

affected insulin injection supplies but also lack of support from diabetes care teams, reduced access to health care, and reduced social support, thus making people more vulnerable to stress and anxiety. Lockdown has also resulted in variations in healthy life style behaviors, the type and duration of exercise, disordered eating behaviours, and excessive mental stress. Fear of contracting the infection often makes people less likely to approach health care for non-emergency issues, especially those pertaining to mental health^[38]. This bears the risk of mental health problems, obstructing the healthy coping measures of people with diabetes.

Conclusion and Recommendations

Diabetic affects the psychology of patients. It does have an impact on the mental health making patient anxious and stressed. Emotional disorder might be due to various reasons such as diagnosis of diseases, non-compliance to medications or with emergence of complications.

To combat the stress associated with diabetes, it is important to educate the patient to adapt with change in their life style following the diagnosis of diabetes. The self-care in diabetes play a vital role in reducing the complications associated with it. The patients need to be emphasized on inculcating the self-care habits in their lives, which would prevent complications. Patients attitude and self-care ability through a behavior change communication, may be useful tools for designing management strategies for certain poorly controlled patients. This study highlights a high prevalence of worry among people with diabetes during the COVID-19 pandemic related to being part of a high-risk group, as well as several other significant worries due to diabetes. People with diabetes have significant diabetes distress and psychological adaptive difficulties that is aggravated by the COVID-19 pandemic. An integrated multidisciplinary approach is needed to manage the prevailing psychological issues amongst people with diabetes during the COVID-19.

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