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Original Article

Self care practices and psychological distress among diabetic patients in Manipur during COVID-19: A scenario from the North East

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ABSTRACT

Background and aim: Uncontrolled diabetes has emerged as one of the major risk factors for mortality in patients with coronavirus disease (COVID-19). Physical inactivity, alterations in dietary habits, and inability to seek guidance from the physician are some of the contributing factors. This study aims to assess the self-care practices and psychological distress during the pandemic among diabetic patients visiting the institute's out patient department.

Method: A convenient sampling method was used to recruit subjects from a representative clinical sample using validated scales like the Summary of Diabetes Self-Care Activities (SDSCA) and Kessler Psychological Distress Scale (K10).

Result: The study enrolled a total of 108 subjects with the mean age being 56.3 years. The everyday healthy eating plan was followed by 76.85% (N = 83) subjects and daily physical activity for at least 30 min performed by 50% (54) subjects. Only 12.04% (13) subjects tested their blood sugar and 6.48% (7) respondents checked their feet daily. There was no significant difference found between the SDSCA and psychological distress based on socio-demographic variables.

Conclusion: Participants in this study typically reported a good level of self-care behavior particularly for diet followed by exercise whereas the self-care behavior was not adequate for foot care and blood-glucose testing. People were not too anxious about COVID-19. This study highlighted the fact that people with diabetes should monitor their blood sugar levels more often along with their foot care.

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1. Introduction

Diabetes Mellitus (DM) is a metabolic disease characterized by chronic hyperglycemia resulting from defects in insulin secretion, insulin action, or both [1]. The burden of diabetes has steadily increased in India and across the globe over the last few decades. The prevalence of overweight in adults aged 20 years or older in India increased from 9.0% in 1990 to 20.4% in 2016 [2]. The global diabetes prevalence in 2030 is estimated to be 10.2% (578 million) rising to 10.9% (700 million) by 2045 [3].

Coronavirus disease (COVID-19) outbreak on December 31, 2019 in the city of Wuhan in China is characterized by a febrile respiratory syndrome caused by a new Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2) [4]. Even though COVID-19 has varying degrees of illness, the mortality rate is low in healthy

individuals [5]. However, patients suffering from DM have distinctive co-morbidity that is associated with severe diseases, like acute respiratory distress syndrome (ARDS). With a large pool of undiagnosed people with DM in India, it is reasonable to recommend a blood glucose check above 30 years who have COVID-19 [6]. Among the geriatric population also, hypertension and DM poses a risk for many diseases like heart attack, stroke, kidney failure, leg amputation, vision loss, blood vessels, and peripheral nerve damage. A study in Uttarakhand, India showed a high prevalence of hypertension and DM in the geriatric population residing in rural areas that were unaware of their health issue [7].

DM is common in developing countries including India with a big impact on mental health, the reason being the burden of physical and financial sufferings that were enough to cause depression among the patients [8]. Anxiety and depression are commonly found in patients with diabetes and have a big impact on the health-related quality of life [9]. Also elevated symptoms of anxiety in diabetes patients lead them to a more stressful life [10]. A study with a high prevalence of depression in diabetic patients

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showed that the risk factors for depression were age, central obesity, diabetic complications particularly neuropathy and diabetic foot disease, and increased pill burden which is associated with poor outcomes [11].

Good glycemic control is an important factor in preventing the complications associated with DM that can be attained by adaption of good lifestyle modification including a balanced diet, exercise, proper sleep, and psychological well-being with medical guidance. Self-care for diabetes patients during COVID-19 has been a great struggle physically as well mentally due to the impact of social distancing, quarantine, and frequent lockdown and containments. Few main problems faced are diminished physical activity, restriction in food supplies compelled patients to alter food habits leading to uncontrolled hyperglycemia, problems of medication, and lastly difficulty to access medical consultation for routine checkups.

Self-monitoring of blood glucose once or twice a week is acceptable and patients should discuss psychological issues with their physicians [12]. Both physical inactivity and obesity seem to be strongly and independently associated with DM and its related co-morbidities [13]. It has been known that diabetes and hyperglycemia were independent predictors for death and morbidity in Severe Acute Respiratory Syndrome (SARS) patients and metabolic control may improve the prognosis in these patients [14]. There is evidence of increased incidence and severity of COVID-19 in patients with DM and COVID-19 could affect the pathophysiology of diabetes. Blood glucose control is important not only for diabetic patients infected with COVID-19 but also in uninfected [15].

The current evidence hints towards a poorer outcome in both new-onset hyperglycemia without diabetes and new-onset diabetes in COVID-19 compared with normoglycemic individuals and people with pre-existing diabetes [16,17]. Hence, it is advisable for persons with underlying DM to take extra precautions by following guidelines on social distancing, hand and respiratory hygiene. People with DM should ensure good glucose control as improvement in glycemia does boost host immune response [18]. There is scarce data on diabetic ketoacidosis in COVID-19 infection yet diabetic ketoacidosis occurs as a result of interactions between SARS-CoV-2 and the renin-angiotensin-aldosterone system which might aggravate pancreatic beta-cell function and precipitate diabetic ketoacidosis [19].

During the COVID-19 pandemic, regardless of the severity and duration of diabetes, it is very crucial to aware patients about self-care, maintaining weight, reducing intake of saturated fat, quitting alcohol and smoking, increasing physical activity, nutrition counseling, self-monitoring blood glucose, and improving medication adherence [20]. Considering the mental health issues as a major health concern during the ongoing COVID-19 pandemic, it is indispensable to study how diabetic people are coping with such a major disaster and to appropriately understand their mental health status [21]. Determining the prevalence of stress is the first important step for implementing early targeted intervention and reducing the possibility of further irrational behaviors might help diabetic people return to normal life. Therefore, this present study aims to assess the impact of COVID-19 on psychological well-being and self-care practices among diabetics during the period of the pandemic.

2. Methodology

2.1. Study setting

A cross-sectional study was conducted from 3rd August to August 28, 2020 among diabetic patients who are under treatment at the out patient department (OPD) of Regional Research Institute

for Homoeopathy, Imphal. Participants above 18 years who agree to participate in the study were enrolled in the study.

2.2. Study procedure

The prevalence of DM in Manipur is around 7% [22]. Epi-info software was used for calculating the sample size for observational study [23]. Considering the level of significance 5% (confidence interval 95%) and a design effect of one, the estimated sample size for the study was calculated to be 101 subjects. The diabetic patients who visited the OPD for treatment were recruited on-site using the assessment questionnaires. No incentive was offered to any participant in the survey. The study was approved by the Institutional Ethical Committee of Regional Research Institute for Homoeopathy, Imphal.

2.3. Study instruments

The participants were informed about the background, objectives of the study, and confidentiality of identity through the 'Informed written consent form'. Respondents who gave consent of their free will/and understand that they have the right to withdraw from the study at any time without any effect on the treatment in OPD of the institute signed the form. In the case of illiterate, a literate witness (attendant) gave consent on his/her behalf. Participant's socio-demographic characteristics were recorded in a pre-designed format. The self-reported questionnaire in this study included questions from validated scales that are:

- **The Summary of Diabetes Self-Care Activities (SDSCA):** It is a brief self-report questionnaire of diabetes self-management that includes items assessing the following aspects of the diabetes regimen: general diet, specific diet, exercise, blood-glucose testing, foot care, and smoking. It consists of ten questions that inquire about diabetes self-care activities during the past seven days with response options being the mean number of days. One additional question records the smoking behavior of the participants and the final score was calculated after reversing the response to question number four and summing the response to all the questions [24].
- **Kessler Psychological Distress Scale (K10):** It is a simple measure of psychological distress and involves ten questions about emotional states each with a five-level response scale. Scores of the 10 items are summed, yielding a minimum score of 10 and a maximum score of 50 [25].

2.4. Statistical analysis

The descriptive analysis gave frequency, percentage, mean scores, and standard deviation (SD) of response under each section. Analysis of Variance (ANOVA) or *t*-test was performed to find any significant difference in SDSCA and K10 scores depending on demographic variables. The *p*-value was kept at 0.05.

3. Results

The study recruited a total of 108 subjects. The demographic characteristics of the study participants are given in Table 1. The mean age of the study sample was 56.3 years with the maximum participants between the age of 46–55 years ($N = 33$; 30.56%). The majority of the subjects were male (60; 55.56%), married (106; 98.15%), and lived in urban areas (64; 59.26%). The educational level of the participants with graduate and higher qualification was 36.11% ($N = 39$) while 23.15% (25) attained education up to

Table 1
Socio-demographic characteristic of the study participants.

Demographic variable		N = 108	%
Age	Mean age	56.306	
	Standard Deviation	11.600	
	Upto 45 years	20	18.52
	46–55 years	33	30.56
	56–65 years	27	25.00
Gender	Above 65 years	28	25.93
	Male	60	55.56
Marital status	Female	48	44.44
	Married	106	98.15
Type of area	Unmarried	2	1.85
	Rural	44	40.74
Education	Urban	64	59.26
	Upto junior high school	19	17.59
	High school	25	23.15
Occupation	Higher secondary	25	23.15
	Graduate and higher	39	36.11
	Government job	15	13.89
	Private job	12	11.11
	Business	18	16.67
Type of family	Retired	18	16.67
	Homemaker/Housewife	35	32.41
	Unemployed	10	9.26
	Nuclear	28	25.93
Prophylactic medicine	Joint	80	74.07
	Homoeopathic medicine	37	34.26
Source of information	I did not take any medicine	71	65.74
	News media	83	76.85
	Social media	25	23.15

N= Number.
% = Percentage.

intermediate level. 32.41% (35) participants were homemakers and 74.07% (80) lived in a joint family. 65.74% (71) of the population did not take any prophylactic medicine for COVID-19 while 34.26% (37) of people took Homoeopathic medicine as a prophylactic measure against COVID 19. The main source of information about COVID-19 was from News media (83; 76.85%).

The response to SDSCA under different heads is given in Table 2. The results of the study showed that a daily healthy eating plan was followed by 76.85% (83) subjects in the last seven days and 75% (81) subjects over the past month. 45.37% (49) of the participants ate five or more serving of fruits and vegetables and 48.15% (52) of subjects consumed high-fat food in the last seven days. The mean score and the standard deviation (SD) of the general diet score was 6.347 (1.383) and the specific diet score was 5.38 (1.414). Daily physical activity for at least 30 min was performed by 50% (54) subjects while 24.07% (26) participated in specific exercise such as swimming, walking, etc. in the last seven days giving the mean score (SD) of exercise 3.954 (2.29). Among the participants, 85.19% (92) subjects had not tested their blood sugar while only 12.04% (13) subjects tested once in the last seven days as recommended by health care providers. The mean score (SD) of the blood glucose test was 0.148 (0.394).

Participants showed poor foot care behavior evident by the fact that 83.33% (90) didn't check their feet and 97.22% (105) subjects didn't inspect the inside of the shoes in the last seven days. Only 6.48% (7) respondents checked their feet daily in the last seven days. The mean score (SD) of the foot care was 0.394 (1.142). Out of all the participants, 99.07% (107) subjects did not smoke even one puff during the past seven days. The mean (SD) of the total SDSCA score was 16.231 (3.068).

During the past one month, 32.41% (35) subjects often felt tired out for no reason, 17.59% (19) felt nervous and 12.04% (13) subjects felt so nervous that nothing could calm down. The restless or fidgety feeling was felt by 17.59% (19) whereas 12.04% (13)

respondents felt so restless that they couldn't sit still in past one month. A feeling of depression was experienced by 14.82% (16) subjects, 4.63% (5) subjects felt hopeless, 2.78% (3) could often feel worthless and 27.78% (30) subjects felt that everything was an effort in last month. Only a few respondents (8; 7.41%) could feel so sad that nothing could cheer them up and in the last month. The mean score (SD) of the Kessler's Distress scale was 15.083 (5.088) (Table 3). The study found no significant differences in the SDSCA and Kessler's Distress scale based on any socio-demographic variables (Table 4).

4. Discussion

The current situation of intermittent lockdown and frequent confinements being a significantly important step to stop and prevent the spread of COVID-19 infection was taken by the government of Manipur but it may have affected the lifestyle and ultimately the glycemic control in diabetic patients [26]. Good lifestyle including a healthy diet, regular exercise, and sound sleep is important to have good immunity and glycemic control which helps to prevent complications related to DM. Diabetes self-care becomes an important aspect as the majority of day-to-day care in diabetes is handled by patients and their families which includes a range of activities (e.g. self-monitoring of blood glucose, eating a healthy, low-saturated-fat diet, regular physical exercise, and checking one's feet). Hence this study aimed to identify the self-care measures adopted by the diabetic patients visiting the institute's OPD during this current pandemic.

Diabetes was the condition reported to be most impacted by the reduction in healthcare resources due to COVID-19 [27]. It is not yet known whether people with diabetes are more susceptible to COVID-19, but several studies have reported a greater risk of severe COVID-19 in diabetic patients [28,29]. SDSCA is probably the most widely used self-report instrument for measuring diabetes self-

Table 2
The summary of diabetes self-care activities (SDSCA).

	0		1		2		3		4		5		6		7		Mean	SD	95% CL
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%			
How many of the last SEVEN DAYS have you followed a healthful eating plan?	0	0.00	0	0.00	6	5.56	2	1.85	4	3.70	5	4.63	8	7.41	83	76.85	6.370	1.378	0.263
On average, over the past month, how many DAYS PER WEEK have you followed your eating plan?	0	0.00	0	0.00	6	5.56	2	1.85	5	4.63	6	5.56	8	7.41	81	75.00	6.324	1.400	0.267
General Diet Score																	6.347	1.383	0.264
On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?	10	9.26	5	4.63	17	15.74	6	5.56	8	7.41	7	6.48	6	5.56	49	45.37	4.657	2.566	0.489
On how many of the last SEVEN DAYS did you eat high fat foods such as red meat or full-fat dairy products?*	2	1.85	1	0.93	0	0.00	0	0.00	2	1.85	20	18.52	31	28.70	52	48.15	6.102	1.282	0.245
Specific Diet Score																	5.380	1.414	0.270
On how many of the last SEVEN DAYS did you participate in at least 30 min of physical activity?	14	12.96	0	0.00	1	0.93	4	3.70	12	11.11	16	14.81	7	6.48	54	50.00	5.204	2.379	0.454
On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?	57	52.78	2	1.85	1	0.93	1	0.93	8	7.41	7	6.48	6	5.56	26	24.07	2.704	3.085	0.589
Exercise Score																	3.954	2.290	0.437
On how many of the last SEVEN DAYS did you test your blood sugar?	92	85.19	15	13.89	0	0.00	0	0.00	1	0.93	0	0.00	0	0.00	0	0.00	0.176	0.508	0.097
On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health care provider?	95	87.96	13	12.04	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.120	0.327	0.062
Blood Glucose Testing Score																	0.148	0.394	0.075
On how many of the last SEVEN DAYS did you check your feet?	90	83.33	5	4.63	2	1.85	2	1.85	0	0.00	2	1.85	0	0.00	7	6.48	0.685	1.868	0.356
On how many of the last SEVEN DAYS did you inspect the inside of your shoes?	105	97.22	1	0.93	0	0.00	1	0.93	0	0.00	0	0.00	0	0.00	1	0.93	0.102	0.735	0.140
Foot Care Score																	0.394	1.142	0.218
Have you smoked a cigarette—even one puff—during the past SEVEN DAYS?	107	99.07	1	0.93															
No = 0																			
Yes = 1																			
Total SDSCA Score																	16.231	3.068	0.585

N= Number.
% = Percentage.
SD= Standard Deviation.
CL= Confidence Limit of Mean.
* = Response is reverse coded.

Table 3
Kessler's distress scale.

	None of the Time		A Little of the Time		Some of the Time		Most of the Time		All of the Time		Mean	SD	95% CL
	N	%	N	%	N	%	N	%	N	%			
In the past 4 weeks, about how often did you feel tired out for no good reason?	43	39.81	30	27.78	28	25.93	7	6.48	0	0	1.991	0.962	0.183
In the past 4 weeks, about how often did you feel nervous?	55	50.93	34	31.48	15	13.89	4	3.70	0	0	1.704	0.846	0.161
In the past 4 weeks, about how often did you feel so nervous that nothing could calm you down?	79	73.15	16	14.81	11	10.19	2	1.85	0	0	1.407	0.749	0.143
In the past 4 weeks, about how often did you feel hopeless?	95	87.96	8	7.41	4	3.70	1	0.93	0	0	1.176	0.526	0.100
In the past 4 weeks, about how often did you feel restless or fidgety?	62	57.41	27	25.00	15	13.89	4	3.70	0	0	1.639	0.859	0.164
In the past 4 weeks, about how often did you feel so restless you could not sit still?	79	73.15	16	14.81	12	11.11	1	0.93	0	0	1.398	0.723	0.138
In the past 4 weeks, about how often did you feel depressed?	64	59.26	28	25.93	15	13.89	1	0.93	0	0	1.565	0.765	0.146
In the past 4 weeks, about how often did you feel that everything was an effort?	74	68.52	4	3.70	9	8.33	15	13.89	6	5.56	1.843	1.348	0.257
In the past 4 weeks, about how often did you feel so sad that nothing could cheer you up?	88	81.48	12	11.11	6	5.56	2	1.85	0	0	1.278	0.653	0.125
In the past 4 weeks, about how often did you feel worthless?	102	94.44	3	2.78	3	2.78	0	0.00	0	0	1.083	0.365	0.070
TOTAL											15.083	5.088	0.971

N= Number.
% = Percentage.
SD= Standard Deviation.
CL= Confidence Limit of Mean.

management in adults [30–33]. The SDSCA has been administered to the participants as a self-completion questionnaire in paper and-pencil form. Among the total participants, very few (12.04%) subjects tested their blood sugar levels once in the last seven days. Another study also reported that only 28% of participants tested their blood sugar levels regularly [34]. From this study, we highlight that education among the patients about the importance and use of self-testing their blood sugar levels is required. Patients must be

educated and sensitized on this aspect to keep their diabetes under control.

Diabetic foot syndrome is one of the severe complications in diabetes mellitus due to increased plantar pressure, which resulted from undetected mechanical trauma of the lower extremities. High incidence of foot lesions and ulceration are at the plantar region of metatarsal heads, where plantar pressures are mostly the highest [35,36]. It is also noteworthy in this study that foot care among

Table 4
Comparison of SDSCA and Kessler's Distress score based on socio-demographic variables.

		N	%	SDSCA				Kessler Distress			
				Mean	SD	t/F*	p-value	Mean	SD	t/F	p-value
Age	Upto 45 years	20	18.52	16.231	3.068			15.083	5.088		
	46–55 years	33	30.56	15.250	3.279	1.879	0.138	15.000	5.099	0.098	0.961
	56–65 years	27	25.00	16.955	3.045			14.727	6.611		
	Above 65 years	28	25.93	16.685	3.244			15.259	3.928		
Gender	Male	60	55.56	15.643	2.589	1.618	0.109	15.393	4.166		
	Female	48	44.44	16.658	2.961			14.717	5.149	−0.838	0.404
Marital status	Married	106	98.15	15.698	3.147	1.967	0.299	15.542	5.027		
	Unmarried	2	1.85	16.278	3.073			14.915	4.976	−4.415	0.142
Type of area	Rural	44	40.74	13.750	1.768	−0.827	0.411	24.000	2.828	−0.342	0.733
	Urban	64	59.26	15.932	3.234			14.886	4.632		
Education	Upto junior high school	19	17.59	16.438	2.957	0.413	0.744	15.219	5.412	2.026	0.115
	High school	25	23.15	16.368	3.833			17.579	6.239		
	Higher secondary	25	23.15	15.640	2.523			14.200	3.329		
	Graduate and higher	39	36.11	16.320	3.162			15.040	4.605		
Occupation	Government job	15	13.89	16.487	2.983	1.801	0.119	14.462	5.481	0.241	0.943
	Private job	12	11.11	17.267	3.615			14.467	6.833		
	Business	18	16.67	17.667	3.360			14.750	5.048		
	Retired	18	16.67	16.778	2.396			15.056	6.467		
	Homemaker/Housewife	35	32.41	16.333	2.389			16.222	3.059		
Type of family	Unemployed	10	9.26	15.457	2.956			14.857	4.551		
	Nuclear	28	25.93	16.300	3.751	0.171	0.865	15.200	5.051	−0.676	0.501
	Joint	80	74.07	16.321	3.312			14.607	3.852		
				16.200	3.000			15.250	5.467		

SDSCA= Summary of Diabetes Self-Care Activities.
 N= Number.
 % = Percentage.
 SD= Standard Deviation.
 * = t-test or Analysis of Variance (ANOVA)p-value< 0.05.

diabetic patients came out very poor (6.48%). Diabetic foot education among the patients may enhance the reduction of plantar pressures and improve functional outcomes and quality of life in the diabetic population. The majority of participants (76.85%) maintained good dietary compliance along with everyday intake of fruits, vegetables which is also in compliance with another study with 80% and 95% people following their routine dietary advice [34,37]. Side by side, the intake of high-fat foods was also seen among half of the patients.

Although measures by the government are necessary to fight COVID-19 spread, there are some concerns that prolonged home confinement to avoid SARS-CoV2 transmission may lead to reduced physical activity. The beneficial effect of physical activity on HbA1c has been extensively investigated, and a recent meta-analysis showed an overall effect on HbA1c of −0.85% [38]. Restriction measures for the COVID-19 pandemic do not imply that all forms of physical activities must be eliminated. Indoor exercises that can be safe, simple, and easily implementable (e.g., bodyweight exercise, jump rope, yoga, etc.) can help in preserving fitness levels while maintaining social distancing [39]. It has been postulated that some activity is better than none, and more is better than less [40]. Half of the participants (50%) in this study were found to be physically active, though specific exercises as walking were limited to a small group only (24.07%). One study showed that some form of exercise was followed by 62% of patients while 80% of participants were regular with their exercise in another study. Similar results were found in another study with 61% performing physical activity during the quarantine [34,41,42].

In the current situation, regular exercise is fundamental not only for glycemic control but also for psychological well-being, since regular physical activity reduces stress and anxiety and improves mood and sleep quality [43]. Surprisingly, people in this study were not too anxious about the COVID-19 situation and were very optimistic contrary to another Indian study where the prevalence of anxiety (3.29%), obsession (13.47%), and fear (46.9%) from COVID-19

was found significantly high [44]. Participants in this study typically reported good levels of dietary self-care followed by exercise self-care. A poor level of self-care was reported for foot care and blood-glucose testing.

The present study has a few limitations. First, being a cross-sectional study, results are based on single observation and do not factor in the effect of prolonged restrictions due to the prevailing pandemic situation. Second, the data were collected from residents of Manipur state and it might have been affected by the cultural norms. A larger study may be designed to recruit participants from diverse cultural backgrounds. Third, a convenient sampling method may bias the data and may not be representative of the population. Despite these limitations, the present study generates robust evidence and it is important that these findings need to be ascertained in a larger sample of patients.

5. Conclusion

To conclude, COVID-19 is a novel viral infection, an ongoing pandemic. It is imperative to follow preventive measures such as social distancing, frequent hand washing for at least 20 s using soap/alcohol-based hand sanitizer, wearing the mask in the public, watch for symptoms, practicing respiratory hygiene [45]. During the current pandemic there have been many lifestyle changes noted in all people with diabetes. Taking care of diet with the inclusion of fruits daily and physical exercise regularly could help patients with DM maintain good glycemic control. Since people with DM seem to develop more severe complications with COVID-19 infection, they should take adequate care of their blood sugar levels. This study highlighted the fact that people with diabetes should monitor their blood sugar levels more often along with their foot care.

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Conflicting Interest (if present, give more details)

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