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Self care practices among type II diabetics in urban field practice area of a medical college, Mumbai: a cross-sectional study

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Abstract

Background: Diabetes is a long-term condition affecting upwards of 422 million individuals worldwide and is linked to 1.5 million deaths each year, with rising prevalence due to insulin resistance or insufficient insulin production. Diabetes management requires patient adherence to self-care practices like nutrition, physical activity, and treatment. Despite proven benefits, long-term compliance remains low, raising concern among health professionals and researchers. The main purpose of this research was to evaluate self-care practices among diabetic patients visiting an Urban Health Training Centre in Mumbai.

Methods: This cross-sectional study carried out in a facility in December 2023, included 142 Type II Diabetics attending the Chronic OPD at the Urban Health Training Centre, Malvani, Mumbai, using the complete enumeration method. Interviews were conducted with patients to assess their diabetes condition and health management practices using "the Summary of Diabetes Self-Care Activities (SDSCA)" Measurement scale, while Adherence to prescribed medications was evaluated through the "Morisky Medication Adherence Scale-4 (MMAS-4)". Data was analyzed using SPSS software, version 23. The occurrence of self-care practices was presented as proportions, and 'Chi-square' tests were utilized to examine the associations between risk factors and the scores.

Results: Among 142 participants, 26.05% were male, and 73.94% were female, with a mean age of 53 years (SD 10.81). More females (21.90%) were widowed compared to males (8.10%). Males (54.05%) had diabetes for over 5 years. Uncontrolled diabetes was higher in females (44.76%), who also had more obesity (26.67%). Among self-care practices, adherence to medication was highest, with males reporting 81.08%. Adherence to medication was significantly associated with self-care practices.

Conclusion: The identified gaps in 'self-care' management among our study participants underscore the urgent requirement for integrating extensive diabetes management education within standard clinical routines.

Keywords: *Adherence, blood sugar, diabetes, self-care, India*

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Evidence in Context

- Emphasizes the critical role of self-care in managing diabetes.
- Highlights gender differences in health outcomes and self-care adherence.
- Shows how socioeconomic status impacts self-care practices.
- Uses SDSCA and MMAS-4 scales for assessing adherence.
- Advocates for comprehensive diabetes education in clinical routines

To view Article

Introduction

As a long-term condition, diabetes is defined by high blood sugar levels, that can result in damage to the heart, kidneys, blood vessels, nerves, and eyes, with type II diabetes mellitus being the most common, occurring when the human body becomes resistant to insulin. Over the last 30 years, type 2 diabetes has affected 422 million individuals and is accountable for 1.5 million deaths annually, primarily in low- and middle-income countries [1]. It primarily results from changing life expectancy and lack of healthcare improvements [2].

In India, diabetes treatment costs increased from Rs. 10,000–12,000 crore in 2003 to an estimated Rs. 1,26,000 crore by 2025 [3].

Diabetes patients must follow a complex daily care regimen, integrating various tasks into their routine. "Self-care in diabetes is described as a continuous process of acquiring knowledge and awareness to manage the complex nature of the disease within a social setting. Since most of the daily management of diabetes is carried out by patients and their families, there is a significant need for reliable and valid tools to assess diabetes self-management" [4]. According to the WHO, adherence to long-term treatment refers to the extent to which a person's behaviors—such as adhering to medication, maintaining a diet, and implementing lifestyle modifications—correspond with the guidance provided by a healthcare professional [5].

Adhering to diabetes medications is vital for managing the disease, delaying complications, and preventing mortality and morbidity. As stated by the WHO, "average adherence to long-term treatments for chronic diseases is about 50%, with even lower rates in developing countries" [6]. This research was to examine self-care behavioural practices amongst Type 2 diabetic patients visiting an Urban Health Training Centre in Mumbai, This will serve as a reference point for upcoming evaluations of the impact of educational training initiatives for individuals with diabetes. Additionally, it will help modify interventions to enhance patient compliance and self-management, ultimately leading to improved health outcomes and reduced financial burdens associated with diabetes.

Methods

This cross-sectional study, conducted at a facility in December 2023, spanned one month, from December 1, 2023, to December 31, 2023, among Type II Diabetics who were attending the Chronic OPD at the Urban Health Training Centre, Malvani, Mumbai which is the urban field practice area of Medical College. Patients who aged 18 and above, had received a diagnosis of T2DM for at least 1 year were part of the study. Patients who were newly diagnosed with diabetes (diagnosed for less than one year) and those unwilling to give consent were not included in this research. Sampling technique used was the Complete enumeration method. The total (Diabetes mellitus Type II, more than 1-year-old) registered under Chronic OPD in the Urban Health Training Centre is 142. So, the sample size was 142.

Study procedure - A structured interview schedule was utilized to acquire information on patient's demographic and clinical profiles related to their Type II diabetes status. Self-care management practices were evaluated using essential questions on diet, foot care, exercise, smoking, blood sugar monitoring, and medication adherence, from "the Summary of Diabetes Self-Care Activities" Measurement scale [7]. Medication adherence was evaluated by means of the "Morisky Medication Adherence Scale-4" [8]. A "1" score was allocated for each component present, while a score of "0" was given for its absence. The questions included the following:

01. Carbohydrate intake limited to ≤2 times per week
02. Fat intake limited to no more than twice a week.
03. Intake of fruits and raw vegetables at least ≥5 times per week
04. Foot examinations conducted at least ≥5 times per week
05. Exercise routine maintained at least five times a week.
06. No smoking
07. Glucose monitoring is conducted every three months.

The patients were asked questions about their medication adherence using the MMAS-4, and they received a score ranging from 1 to 4. The questions included:

01. Have always remembered to take medications.
02. Have always been diligent about medications.
03. Do not discontinue medications if the participant experiences worsening symptoms.
04. Do not discontinue medications if the participant is symptom-free.

The overall score was determined by combining the scores from the "SDSCA" (which ranges from 0 - 7) and the "MMAS-4" scale, yielding an uppermost possible total of 11.

Participants were subsequently divided into 3 categories according to their overall scores:

A score ranging from 0 to 4 indicates poor

A score ranging from 5 to 7 signifies moderate

A score from 8 to 11 represents good self-care practices

A clinical assessment was conducted to evaluate patient's height, weight, which were subsequently utilized to find out their body mass index (BMI). 'BMI values were categorized based on the World Health Organization (WHO) classification' standard for Asian populations, ensuring more accurate assessment of body composition and associated health risks in this demographic [9].

A standardized glucometer was used to assess the RBS (Random Blood Sugar) measurement, with greater than 180 mg/dL considered indicative of uncontrolled diabetes mellitus (DM) [10,11].

Data analysis and statistical methods

All collected data were systematically input and evaluated through software known as SPSS, version 23. The prevalence of self-care management among participants was expressed as proportions. To assess the relationship between various risk factors and self-care scores, a Chi-square test was used. A p-value of ≤ 0.05 was considered statistically significant, indicating meaningful associations between variables and outcomes.

Results

Table 1 presents the demographic profile. Among the 142 participants in total, 37 (26.05%) were male and 105 (73.94%) were female. The greater proportion of males 30 (81.08%) and females 66(62.86%) were over the age of 50. However, males have a comparatively higher percentage in this age group, while a relatively less number of males are under 50 years old. The mean age was 53 year and SD was 10.81. Maximum 16 (43.24%) of males and 54 (51.43%) of females are illiterate, with females showing a comparatively higher percentage of illiteracy. A low percentage of males 2 (5.40%) have graduated, while no females have reached this level of education, indicating a significant educational gap. A major percentage of females 91 (86.67%) were unemployed, which was comparatively higher than the 23 (62.16%) of unemployed males. Socioeconomically, according to Modified kuppuswamy scale a major part of males 25 (67.56%) and females 76 (72.38%) fell into the upper lower class, with females having a comparatively higher representation in this category. Majority of females 82 (78.09%) and males 23 (62.16%) were Muslim. A higher percentage of females (21.90%) were widowed compared to males (8.10%).

The income of study participants ranges from Rs. 5000 to Rs 15000. Table 2 displays the clinical profile. A higher percentage of males 20 (54.05%) had DM for more than 5 years and the greater proportion of females 58 (55.23%) had diabetes mellitus (DM) for less than 5 years and conversely, the percentage of uncontrolled diabetes was slightly higher in females 47 (44.76%) compared to males 16(43.24%). Females 16 (15.23%) had a comparatively higher percentage of family history compared to males 3 (8.10%). Females had a higher percentage in the Obese 2 category 28 (26.67%) than males 5 (13.51%). In terms of Body Mass Index (BMI), a low percentage of females 3 (2.85%), were underweight, while no males were in this category. Both males 7 (18.91%) and females 24 (22.85%) had similar percentages in the normal BMI range. Regarding blood pressure (BP) status control, a higher percentage of females 80 (76.19%) had controlled BP compared to males 25 (67.56%)

Table 3 displays the prevalence of self-care practices. Regarding weekly consumption of carbohydrates, both males 21 (56.76%) and females 63 (60.00%) consumed them more than 2 days per week. For fats consumption, a major portion of males 26 (70.27%) consumed fats less frequently (0-2 days per week) compared to 60 (57.14%) of females. For weekly consumption of fruits and raw vegetables, both genders with 28 (75.68%) of males and 79 (75.24%) of females consuming these foods 0-4 days per week. For weekly foot examination, a higher percentage of females 93 (88.57%) performed this examination compared to males 31 (83.78%).

In terms of weekly exercise, a greater percentage of females 63 (60.00%) engaged in regular exercise (5-7 days per week) compared to 19 (51.35%) of males. Both genders showed similar periodic blood sugar testing practices, with 26 (70.27%) of males and 73 (69.52%) of females undergoing testing over the past three months.

However, males demonstrated higher adherence to medications 30 (81.08%) compared to females 73 (69.52%).

Table 1: Demographic variables of study group (n=142)

Characteristics	Male		Female	
	Frequency	%	Frequency	%
Age				
Less than 50	7	18.92	39	37.14
More than 50	30	81.08	66	62.86
Total	37	100.00	105	100.00
Education				
Illiterate	16	43.24	54	51.43
Primary school	5	13.51	24	22.86
Middle school	7	18.92	18	17.14
High school	7	18.91	9	8.57
Graduate	2	5.40	0	0
Total	37	100	105	100
Occupation				
Unemployed	23	62.16	91	86.67
Elementary occupation	3	8.10	8	7.61
Craft and trade workers	4	10.81	2	1.90
Plant and Machine operators and Assemblers	4	10.81	2	1.90
Skilled Worker / shop and market sale workers	3	8.10	1	0.95
Skilled agricultural and fishery	0	0	1	0.95
Total	37	100	105	100
Socio economic status				
Lower	7	18.91	24	22.85
Upper lower	25	67.56	76	72.38
Lower middle	5	13.51	5	4.76
Religion				
Hindu	14	37.83	22	20.95
Christian	0	0	1	0.95
Muslim	23	62.16	82	78.09
Total	37	100	105	100
Marital status				
Married	34	91.89	82	78.09
widowed	3	8.10	23	21.90
Total	37	100	105	100

A higher percentage of females 24 (22.86%) had poor self-care practices (0-4) compared to males 6 (16.22%). A larger percentage of males 20 (54.05%) followed good self-care practices (8-11) compared to females 42 (40.00%) (Table 4). Age and self-care practices were found to be significantly associated, p-value of 0.05, indicating that age influences self-care practices. Additionally, adherence to medication showed a significant association with self-care practices, reflected by chi-square test with a p-value of 0.001 suggesting that individuals with better self-care practices tended to exhibit higher medication adherence. However, no significant association was observed between self-care practices and blood sugar measurement.

Table 2-Clinical profile of study participants (n=142)

Parameters	Male		Female	
	Frequency	%	Frequency	%
Duration of DM				
Less than 5 years	17	45.94	58	55.23
More than 5 years	20	54.05	47	44.76
Status of DM				
Controlled	21	56.75	58	55.23
uncontrolled	16	43.24	47	44.76
Family history				
No	34	91.89	89	84.76
yes	3	8.10	16	15.23
BMI				
Underweight	0	0	3	2.85
Normal	7	18.91	24	22.85
Overweight	7	18.91	18	17.14
Obese 1	18	48.64	32	30.47
Obese 2	5	13.51	28	26.67
BP status control				
No	12	32.43	25	23.80
Yes	25	67.56	80	76.19

Discussion

In our research study, among the 142 participants, 26.05% were males and 73.94% were females, which similar to the findings of Emire et al, [12]. where females comprised 66.1% and males 33.9%. The participants had a mean age of 53 years (SD = 10.81), similar to the Mamo study where the mean age was 43.54 years (SD = 12.38) [12]. These findings indicate a higher burden of disease among females, increased health-seeking behavior among women and also middle-aged population had a significant burden of disease. 49.29% of participants were illiterate, which is notably higher than the 22.5% reported in the study by Chali et al, [13] which can influence disease management and health-seeking behavior. In our study, 97.18% of participants reported no smoking addiction, This higher proportion of non-smokers compared to the 70.9% reported in Raithatha et al [14] study. 18.30% of participants were widowed, which is significantly higher compared to the 1.7% reported in the study by 'Kassa et al'[15], which suggest increased burden of health among widowed individuals in our study setting. In the study conducted by 'Raithatha et al' [14], the mean duration of diabetes was 8.75 years. In contrast, our study found that most participants (52.81%) had diabetes for less than 5 years. This indicates recent onset or better disease management leading to earlier diagnosis. Only 13.38% reported having diabetes mellitus in their family, which is lower compared to the 20.4% reported in the study by Kassa et al [15].

In our study, 40.84% of participants adhered to the recommended carbohydrate intake, which is comparable to the 49.7% reported in Addisu et al [16] study. Regarding exercise, 60% of females in our study engaged in regular physical activity (5-7 days per week), higher than the 44.5% reported in Addisu et al study [16]. This suggests better exercise adherence in our population, though dietary adherence remains slightly lower. Regarding foot care, only 12.67% indicated that they regularly checked their feet. Our findings on foot care are lower than Garg et al's study [17] in West Bengal and Goyal and Gupta study [18] in Uttar Pradesh. But study done in Ethiopia by Dedefo et al [19] "found that the majority (82.9%) of the study population practiced adequate foot care" [19]. This differences highlights a critical gap in foot care practices among our study population, suggesting a need for enhanced education and interventions to improve foot care habits. In our study, 69.71% of participants showed satisfactory blood sugar monitoring, which is lower than the 75.2% indicated by Karthik et al [8].

High adherence to medication was observed in 72.53% of the population. "Similar adherence rates were reported in studies by Garg et al [17] (72.3%), Goyal et al [18] (71.4%), and Recharla et al [8] (70.4%).

Table 3- Prevalence of self-care practices among the study participants(n=142)

Parameters	Male		Female	
	Frequency	%	Frequency	%
Weekly consumption of carbohydrates?				
0-2 days	16	43.24	42	40.00
More than 2 days	21	56.76	63	60.00
Weekly consumption of fats?				
0-2 days	26	70.27	60	57.14
More than 2 days	11	29.73	45	42.86
Weekly consumption of fruits and raw vegetables?				
0-4 days	28	75.68	79	75.24
5-7 days	9	24.32	26	24.76
Weekly foot examination?				
0-4 days	31	83.78	93	88.57
5-7 days	6	16.22	12	11.43
Weekly exercise regime?				
0-4 days	19	51.35	63	60.00
5-7 days	18	48.65	42	40.00
Smoking history				
Present	4	10.81	0	0.00
Absent	33	89.19	105	100.00
Periodic blood sugar testing done over past 3 months				
No	11	29.73	32	30.48
Yes	26	70.27	73	69.52
Adherence to medications* (MMAS-4 scale)				
High adherence(3,4)	30	81.08	73	69.52
Low adherence (0,1,2)	7	18.92	32	30.48

* - *P value 0.001 – statistically significant.*

However, Selvaraj et al, reported a significantly higher adherence rate of 95% [20], which is notably higher than the findings in our study. The prevalence of good self-care practices was 43.66%, which is similar with the findings of Pavankumar et al [21] who reported that 50% of their study subjects had good self-care practices. In contrast, the research conducted by Karthik et al. from Chennai revealed that only 5.6% of diabetic patients adhered to good self-care practices, while a significant majority (52.4%) exhibited poor self-care practices [8].

Table 4- Self-care practices scoring among the study participants(n=142)

Scores	Male		Female	
	Frequency	%	Frequency	%
Poor (0-4)	6	16.22	24	22.86
Moderate (5-7)	11	29.73	39	37.14
Good (8-11)	20	54.05	42	40.00

Limitation

The study is facility-based and therefore cannot be generalized to the entire diabetic population. Additionally, it is limited by selection bias, as it only includes patients who visited health facilities for treatment.

Conclusion

The identified gaps in self-care practices among our study participants pointed out the urgent need for integrating comprehensive diabetes self-care education into standard clinical routines. Effective programs should target problem-solving skills, foot care, dietary habits, physical activity and the significance of medication adherence in promoting overall diabetes treatment.

Recommend providing dietary counselling for diabetes patients at UHTCs through a dietician. Encourage everyone to regularly check their blood sugar at camps and UHTCs (Urban Health Training Centres). Also, make it easier for people to get testing supplies and set up reminders to help them stay on track. Encourage patients to set up reminders in their phone to assist them in regularly monitoring their blood sugar levels.

Abbreviations

BMI: Body mass index

SDSCA: the Summary of Diabetes Self-Care Activities

MMAS-4: Morisky Medication Adherence Scale-4

UHTCs: Urban Health Training Centres

Supporting information: None

Ethical Considerations: Ethical Considerations and Participant Consent: Before the initiation of the study, approval was granted by the Institutional Ethics Committee. Each patient was fully briefed on the aims, procedures, and their rights. All patients provided consent before data collection began, ensuring voluntary participation and confidentiality throughout the process.

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