

Original Research Article

Self-care practices among type 2 diabetes patients of urban community of coastal city of Uttara Kannada, Karnataka

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ABSTRACT

Background: Diabetes mellitus requires sustained self-management, including appropriate medication use, dietary regulation, physical activity, glucose monitoring, and engagement with healthcare providers. This study assessed self-care practices among patients with type 2 diabetes mellitus using the diabetes self-management questionnaire-revised (DSMQ-R).

Methods: A community-based cross-sectional study was conducted among 189 patients with type 2 diabetes mellitus registered at the Urban Primary Health Centre, Baithkol, Karwar, Karnataka, from July to December 2025. Participants were selected from the non-communicable disease register. Data were collected after informed consent using the DSMQ-R and analyzed using descriptive statistics, the chi-square test, correlation analysis, and multiple linear regression in SPSS version 27.0.

Results: Of the 189 participants, 93.7% were aged >40 years and 63.0% were male. Nearly half (47.1%) had diabetes for 1–5 years, and 27.0% were receiving insulin. Overall, 57.6% demonstrated moderate self-care adherence, 23.2% fair adherence, 14.3% good adherence, and 4.7% poor adherence. Diabetes duration was significantly associated with overall self-care practice scores ($\chi^2=15.854$, $p=0.045$). Overall self-care scores showed significant positive correlations with eating behaviour, medication-taking, glucose monitoring, cooperation with the diabetes care team, and insulin management (all $p<0.001$). In regression analysis, eating behaviour was the strongest positive predictor ($\beta=0.357$, $p<0.001$).

Conclusion: Most participants demonstrated moderate self-care practices, but important gaps remained in glucose monitoring and insulin management. Structured self-care education and DSMQ-R-based counselling at the primary healthcare level may strengthen diabetes self-management.

Keywords: Type 2 diabetes mellitus, Self-care, Diabetes self-management, DSMQ-R, Primary healthcare

INTRODUCTION

The term diabetes mellitus describes a group of metabolic disorders characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both.¹ Globally, the number of people living with diabetes has increased substantially over recent decades. In 2022, approximately 830 million adults were living with diabetes.² In India, an estimated 77 million adults are living with diabetes.³ Under the national programme for

prevention and control of non-communicable diseases (NP-NCD) in Karnataka, 28,83,541 individuals were reported to have diabetes among 2,37,00,475 people screened in 2024.⁴ Successful day-to-day diabetes management depends on several behaviours performed by patients themselves, including taking prescribed treatment, making appropriate food choices, remaining physically active, monitoring glucose when indicated, and responding appropriately to problems.⁵ The extent to which these behaviours are maintained may be affected

by patients' knowledge, psychological and social circumstances, and their access to continuing healthcare support.⁶ The revised DSMQ-R provides a structured way of examining these behaviours across important domains of diabetes care.^{7,8} Its reported psychometric performance supports its use for assessing diabetes self-management in both research and clinical settings.^{7,8} Evidence from Indian populations indicates that diabetes self-care is variable and that deficiencies may occur in different aspects of routine disease management.^{9,10} As the number of people requiring long-term diabetes care continues to increase, identifying specific self-care deficiencies at the community level can help primary healthcare teams design practical interventions. The present study therefore examined self-care practices among adults with type 2 diabetes mellitus living in an urban community of coastal Uttara Kannada, Karnataka.

Objective

To assess self-care practices among patients with type 2 diabetes mellitus in an urban community of coastal Uttara Kannada, Karnataka.

METHODS

Study design and setting

A community-based cross-sectional study was conducted among patients with type 2 diabetes mellitus registered at the Urban Primary Health Centre (UPHC), Baithkol, Karwar, Karnataka.

Study duration

The study was conducted over 6 months, from July 2025 to December 2025.

Study population

Patients diagnosed with type 2 diabetes mellitus residing in the urban field practice area of the department of community medicine were eligible for participation.

Inclusion criteria

Patients with type 2 diabetes mellitus who had been residing in the study area for at least 6 months.

Exclusion criteria

Individuals who did not provide consent and individuals whose houses remained locked despite two visits.

Sample size

The sample size was calculated using the reported lowest prevalence of a self-care practice, namely foot care (8.6%), among patients with diabetes attending an urban

health centre in Puducherry, as reported by Selvaraj et al.⁹ The calculated sample size was 189.

Sampling and data collection

The list of patients with diabetes was obtained from the Non-Communicable Disease register of the UPHC, Baithkol. The register contained 438 entries, from which alternate names were selected. Data collection continued until 189 eligible participants were enrolled. Home visits were repeated when houses were locked, with a maximum of two visits. Data collection was undertaken during evenings and weekends to improve participant availability and was avoided on festive days. The study purpose and procedures were explained to participants, and written informed consent was obtained before data collection.

Study instrument

Self-care practices were assessed using the Diabetes Self-Management Questionnaire-Revised (DSMQ-R), a validated instrument assessing multiple domains of diabetes self-management, including eating behaviour, medication-taking, glucose monitoring, physical activity, cooperation with the diabetes care team, and insulin management.^{7,8}

Statistical analysis

Data were entered and compiled in Microsoft Excel and analyzed using IBM SPSS Statistics version 27.0 for Windows. Descriptive statistics were summarized as frequencies, percentages, means, and standard deviations. Associations between categorical variables and self-care practice categories were assessed using the chi-square test. Correlations between overall self-care practice scores and selected parameters were assessed using correlation analysis. Multiple linear regression was used to identify independent predictors of overall self-care practice scores. A p value <0.05 was considered statistically significant.

RESULTS

A total of 189 participants were included in the study. The mean age was 54.42±10.64 years. Most participants (93.7%) were aged >40 years, and 63.0% were male. Most participants belonged to nuclear families (86.8%). Nearly half (47.1%) had been living with diabetes for 1–5 years, followed by 31.2% with a duration of 6–10 years. 27.0% were receiving insulin therapy. Hypertension was present among 46% of participants. Diabetes duration was significantly associated with overall self-care practice scores ($\chi^2=15.854$, $p=0.045$). Type of family, living arrangement, and insulin use were not significantly associated with overall self-care practice scores. Participants aged 45–60 years constituted the largest proportion of those in the considerable-degree category (Table 2).

Table 1: Basic characteristics of study participants.

Variables	Frequency (N)	%
Age ≤40 years	12	6.3
Age >40 years	177	93.7
Female	70	37.0
Male	119	63.0
Joint family	25	13.2
Nuclear family	164	86.8
Diabetes duration <1 year	17	9.0
1–5 years	89	47.1
6–10 years	59	31.2
11–20 years	20	10.6
21–30 years	4	2.1
On insulin: Yes	51	27.0
On insulin: No	138	73.0

Table 2: Association of overall self-care practice response categories with selected study parameters.

Parameters	Category	Applies to some degree N (%)	Applies to a considerable degree N (%)	Applies to very much N (%)	Significance
Gender	Female	12 (28.6)	58 (39.7)	0 (0)	$\chi^2=2.33$, p=0.312
	Male	30 (71.4)	88 (60.3)	1 (100)	
Age (in years)	30–45	8 (19.0)	24 (16.4)	0 (0)	$\chi^2=7.905$, p=0.443
	45–60	25 (59.5)	72 (49.3)	0 (0)	
	60–75	6 (14.3)	44 (30.1)	1 (100)	
	75–90	3 (7.1)	5 (3.4)	0 (0)	
	>90	0 (0)	1 (0.7)	0 (0)	
Diabetes duration (in years)	<1	2 (4.8)	15 (10.3)	0 (0)	$\chi^2=15.854$, p=0.045*
	1–5	20 (47.6)	69 (47.3)	0 (0)	
	5–10	17 (40.5)	42 (28.8)	0 (0)	
	10–20	1 (2.4)	18 (12.3)	1 (100)	
	20–30	2 (4.8)	2 (1.4)	0 (0)	
Type of family	Joint	5 (11.9)	20 (13.7)	0 (0)	$\chi^2=0.245$, p=0.885
	Nuclear	37 (88.1)	126 (86.3)	1 (100)	
Living arrangement	Living with family	40 (95.2)	129 (88.4)	1 (100)	$\chi^2=2.049$, p=0.727
	Living with spouse	2 (4.8)	14 (9.6)	0 (0)	
	Other	0 (0)	3 (2.1)	0 (0)	
Insulin use	No	30 (71.4)	107 (73.3)	1 (100)	$\chi^2=0.429$, p=0.807
	Yes	12 (28.6)	39 (26.7)	0 (0)	

*Statistically significant.

Table 3: Correlation of overall self-care practice scores with selected parameters.

Parameters	Correlation coefficient (r)	P value
Age	0.055	0.350
Duration of diabetes	−0.009	0.474
Eating behaviour	0.668	<0.001*
Medication-taking	0.776	<0.001*
Glucose monitoring	0.708	<0.001*
Physical activity	0.206	0.072
Cooperation with diabetes team	0.630	<0.001*
Insulin management	0.700	<0.001*

*Statistically significant.

Table 4: Multiple linear regression analysis of overall self-care practice scores.

Study parameters	B	SE	Standardized β	t	P value
Age	-0.001	0.001	-0.038	-1.152	0.256
Diabetes duration	0.004	0.002	0.068	1.988	0.053
Eating behaviour	0.254	0.022	0.357	11.770	<0.001*
Medication-taking	0.163	0.031	0.252	5.268	<0.001*
Glucose monitoring	0.179	0.022	0.275	8.029	<0.001*
Physical activity	0.101	0.016	0.179	6.152	<0.001*
Cooperation with diabetes team	0.173	0.020	0.260	8.635	<0.001*
Insulin management	0.111	0.024	0.206	4.661	<0.001*
Constant	0.102	0.079	—	1.290	0.204

*Statistically significant. B: unstandardized coefficient; SE: standard error; β : standardized coefficient.

Correlation analysis demonstrated significant positive correlations between overall self-care practice scores and eating behaviour ($r=0.668$), medication-taking ($r=0.776$), glucose monitoring ($r=0.708$), cooperation with the diabetes care team ($r=0.630$), and insulin management ($r=0.700$) (all $p<0.001$). No significant correlations were observed with age ($r=0.055$, $p=0.350$), duration of diabetes ($r=-0.009$, $p=0.474$), or physical activity ($r=0.206$, $p=0.072$). Medication-taking demonstrated the strongest positive correlation (Table 3).

Multiple linear regression analysis showed that eating behaviour ($\beta=0.357$, $p<0.001$) was the strongest positive predictor of overall self-care practice scores. Glucose monitoring ($\beta=0.275$), cooperation with the diabetes care team ($\beta=0.260$), medication-taking ($\beta=0.252$), insulin management ($\beta=0.206$), and physical activity ($\beta=0.179$) were also significant positive predictors (all $p<0.001$). Age and diabetes duration were not significant predictors (Table 4).

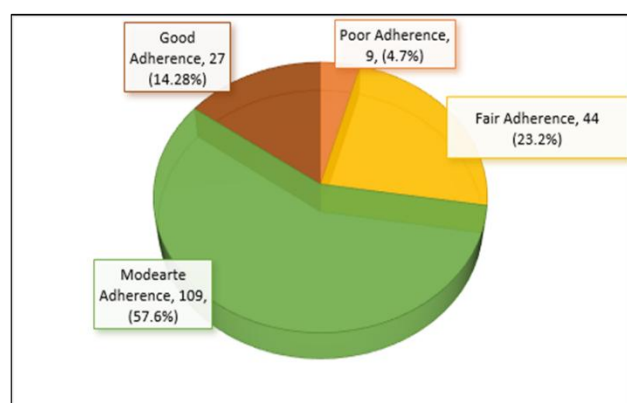


Figure 1: Adherence of self-care practices among study participants (n=189) based on total DSMQ-R score.

DISCUSSION

This investigation used the DSMQ-R to characterize diabetes self-care in a community-based group of patients with type 2 diabetes mellitus. The largest proportion of participants fell within the moderate-adherence category,

whereas relatively few achieved a good level of adherence. Thus, most participants were undertaking some recommended self-management activities, but consistent performance across all components of care was not achieved. Comparable concerns about incomplete diabetes self-care have been described in Indian community and hospital populations.^{11,12} Participants were predominantly middle-aged, with a mean age of 54.42 ± 10.64 years. This pattern is broadly consistent with reports from other Indian studies examining self-care among people with type 2 diabetes.^{1,13} The concentration of disease in this age group is important from a public-health perspective because inadequate self-management over many years can increase the cumulative risk of diabetes-related complications.

Among the DSMQ-R domains, medication-taking had the strongest positive relationship with the overall self-care score. This may indicate that participants were more consistent with prescribed medicines than with some behaviours requiring additional equipment, skills, or lifestyle modification. Previous Indian research has similarly identified medication-related behaviours as relatively better maintained than several lifestyle practices.¹² Limited access to glucometers, cost considerations, and insufficient practical instruction may partly explain weaker glucose-monitoring practices.¹³

In this study, overall self-care did not differ significantly according to age, sex, family structure, living arrangement, or insulin use. The absence of these associations suggests that self-management cannot be adequately explained by demographic characteristics alone. Individual knowledge, motivation, healthcare support, and the circumstances in which patients manage their illness may have greater influence on day-to-day diabetes care.¹¹

A significant relationship was observed between duration of diabetes and overall self-care practice. Longer exposure to the disease may provide patients with more opportunities to learn about treatment, recognize problems, and develop routines through repeated contact with healthcare providers. An association between disease duration and self-care has also been reported in Indian

community-based research.¹³ Nevertheless, self-care education should begin soon after diagnosis rather than being deferred until patients have accumulated substantial experience with the disease. The correlation analysis showed that several individual DSMQ-R domains moved positively with the overall self-care score. Eating behaviour, medication-taking, glucose monitoring, interaction with the diabetes care team, and insulin management were all significantly correlated with the total score. Medication-taking had the largest correlation coefficient, while physical activity was statistically insignificant. The pattern supports the view that effective diabetes self-management is a combination of related behaviours rather than an isolated activity.¹⁴

After adjustment in the multiple linear regression model, eating behaviour had the highest standardized coefficient among the assessed predictors. Dietary behaviour is particularly relevant in diabetes because food choices are influenced by household practices, cultural preferences, affordability, and the patient's understanding of dietary recommendations.¹⁴ Glucose monitoring, interaction with the diabetes care team, medication-taking, insulin management, and physical activity also remained significant positive predictors, reinforcing the need for a broad rather than single-domain approach to diabetes education.

The association observed for cooperation with the diabetes care team also has practical implications. Regular contact with healthcare workers can provide opportunities to correct misconceptions, reinforce medication instructions, review dietary habits, and demonstrate self-monitoring techniques. Continued patient education and supportive follow-up have been identified as important components of diabetes self-care in earlier studies.¹²

The study has practical public health implications. Although most participants demonstrated moderate self-care, gaps remained in glucose monitoring and insulin management. Strengthening access to self-monitoring facilities, patient education, family support, and patient-provider communication may improve diabetes self-management and potentially reduce complications. Self-care education should therefore be integrated into routine primary healthcare services.

The study was cross-sectional and conducted in a single urban field practice area, limiting generalizability. Self-care practices were assessed using self-reported responses and may therefore be affected by recall or social-desirability bias. The study did not establish a causal relationship between the identified predictors and self-care practices. Most participants demonstrated moderate overall self-care practices. Insulin management and glucose monitoring showed important gaps, with fair adherence reported in these domains; among participants with fair adherence in these domains, 79% were aged above 50 years. Dietary control and physical activity

demonstrated moderate adherence. These findings highlight the need for continued patient education focusing on self-monitoring of blood glucose, dietary modification, medication adherence, and regular physical activity. Integration of DSMQ-R-based counselling into routine primary healthcare services may strengthen patient engagement and improve diabetes self-management.

CONCLUSION

Most participants demonstrated moderate self-care practices, but important gaps remained in glucose monitoring and insulin management. Structured self-care education and DSMQ-R-based counselling at the primary healthcare level may strengthen diabetes self-management.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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