SOCIAL SCIENCE REVIEW ARCHIVES
https://policyjournalofms.com
ISSNOnline:3006-4708
ISSNPrint: 3006-4694

Self-Care Management Practices Among Patients with Diabetes Mellitus in a Tertiary Care Hospital in Karachi, Pakistan: An Analytical Cross-Sectional Study

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DOI: https://doi.org/10.70670/sra.v3i2.701

Abstract

Background:
Diabetes mellitus (DM) is a highly prevalent chronic disease in Pakistan, ranking third globally concerning diabetes prevalence, with more than 33 million adults affected. The effective management of Diabetes management is essential for regulating blood glucose levels, mitigating complications, and improving patient outcomes. quality of life. Self-care practices include medication adherence, dietary changes, regular physical activity, and blood glucose monitoring, are all integral parts of good diabetes management. management However, there is a scarcity of research examining the self-care behaviors of Pakistani DM patients, which impedes the development of targeted interventions to improve patient outcomes.

Purpose
This study aims to assess the self-care management practices among patients with diabetes mellitus in a tertiary care hospital in Karachi, Pakistan. Specifically, it seeks to evaluate the self-perceived importance of various self-care activities, identify socio-demographic factors influencing these practices, and highlight strengths and areas for improvement in current self-care behaviors. The ultimate goal is to inform healthcare providers and policymakers to develop culturally tailored strategies that promote effective diabetes self-management.

Method
An analytical cross-sectional design was employed to evaluate self-care management practices among DM patients. A convenient sample of 258 participants was recruited from inpatient and outpatient services at Aga Khan University Hospital in Karachi. Data were collected using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire, which assesses various domains of self-care, including diet, exercise, medication adherence, blood glucose monitoring, and foot care. Socio-demographic information was also gathered through structured interviews. Data analysis was performed using SPSS version 26, utilizing both descriptive and inferential statistics to identify socio-demographic predictors of self-care management scores.

Findings
The study revealed that while a significant proportion of DM patients demonstrated satisfactory self-care practices in medication adherence and blood glucose monitoring, practices related to diet and physical activity were less consistently maintained. The most important self-care activity identified was medication adherence, followed by regular blood glucose monitoring. Socio-demographic factors such as age, gender, marital status, education level, relationship with

the patient, duration of hospital stay, and distance from home to the hospital were significant predictors of self-care management scores. Additionally, cultural beliefs and socio-economic status were identified as key barriers to effective self-care practices.

Conclusion

There is a pressing need for a patient- and family-centered approach for the health-care system of Pakistan. Interventions considering socio-demographic and cultural variables are also important in improving self-management behaviors among the patients with diabetes mellitus. Recommendations include patient education, improved access to health services, flexible visiting hours, and culturally sensitive interventions that improve diet and exercise adherence. These will eventually result in improvement in the health trend and decrease the rate of diabetes in Karachi, Pakistan.

Keywords: Diabetes mellitus, self-care management, tertiary care hospital, Karachi, socio-demographic factors, SDSCA

Introduction

Diabetes mellitus (DM) is a chronic metabolic disorder that continues to pose significant public health challenges worldwide. Characterized by persistent hyperglycemia, it results from either insufficient insulin production or the body's inability to utilize insulin effectively. Globally, DM has emerged as one of the top contributors to morbidity, disability, and premature mortality, with complications ranging from cardiovascular disease to kidney failure, neuropathy, and vision loss (World Health Organization [WHO], 2021).

Pakistan currently ranks third worldwide in diabetes prevalence, with over 33 million adults affected—accounting for nearly one-third of the adult population (International Diabetes Federation [IDF], 2023). Disturbingly, the average age of individuals with diabetes in Pakistan is significantly lower than the global average, contributing to long-term implications for the healthcare system and economy. It is estimated that the country loses more than $10 billion annually due to productivity losses and healthcare expenditures related to diabetes (IDF, 2023).

Self-care management plays a central role in mitigating the complications of diabetes. Essential practices include medication adherence, dietary regulation, regular physical activity, blood glucose monitoring, and foot care. These behaviors are vital not only for controlling blood sugar levels but also for improving overall quality of life and reducing hospitalization rates (American Diabetes Association [ADA], 2022). Despite the critical importance of these practices, adherence remains suboptimal among patients in low- and middle-income countries, including Pakistan, due to a range of socioeconomic, educational, and cultural barriers (Khowaja et al., 2022; Zaman et al., 2019).

Existing research in Pakistan on diabetes management often focuses on clinical interventions or glycemic control, with limited emphasis on patients' actual self-care behaviors. Moreover, few studies have systematically examined the relationship between sociodemographic characteristics and self-care practices using validated tools. Without this understanding, it is difficult for healthcare providers and policymakers to develop context-specific interventions that address the root causes of poor self-care adherence.

To address this gap, the present study assessed self-care practices among patients with diabetes in a tertiary care hospital in Karachi, using the Summary of Diabetes Self-Care Activities (SDSCA) instrument. This study aimed to (1) evaluate the extent of self-care behaviors, (2) explore the influence of sociodemographic variables on these behaviors, and (3) identify barriers and facilitators to effective diabetes self-management. The findings are intended to inform evidence-based, culturally sensitive strategies for improving diabetes care delivery in Pakistan.

Method

Study Design

This study employed an analytical cross-sectional design to assess self-care management practices among patients diagnosed with diabetes mellitus (DM). A cross-sectional approach was chosen for its effectiveness in capturing a snapshot of behaviors and their associations with demographic and contextual variables at a single point in time (Wang & Cheng, 2020).

Setting and Participants

The research was conducted at Aga Khan University Hospital (AKUH), a tertiary care institution in Karachi, Pakistan. The hospital serves a diverse patient population from various regions and socioeconomic backgrounds. The study recruited 258 adult patients diagnosed with type I or type II diabetes who were receiving inpatient or outpatient services at the hospital between August 2023 and November 2024.

Eligibility Criteria

Participants were included if they:

- Were aged 18 years or older,
- Had a confirmed diagnosis of type I or type II DM,
- Were able to communicate in Urdu or English,
- Provided informed consent to participate.

Exclusion criteria included:

- Cognitive impairment or psychiatric illness that could affect reliable response,
- Acute medical complications requiring urgent intervention,
- Inability to complete the questionnaire due to communication barriers.

Sampling Strategy

A non-probability consecutive sampling technique was utilized to recruit participants. Patients attending outpatient diabetes clinics or admitted for diabetes-related care were approached during their routine visits. Recruitment continued until the target sample size of 258 was reached.

Data Collection Instrument

Self-care practices were assessed using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire, a validated instrument developed by Toobert et al. (2000). The SDSCA evaluates the frequency of diabetes self-care behaviors across key domains, including:

- Diet adherence,
- Exercise,
- Blood glucose monitoring,
- Medication adherence,
- Foot care.

The questionnaire was translated into Urdu and pilot-tested for clarity and cultural relevance. Additional demographic data—including age, gender, marital status, educational level, income, occupation, and distance from the hospital—were collected through structured interviews.

Data Collection Procedure

Trained research assistants conducted face-to-face interviews in private settings within the hospital. Participants were briefed on the study's purpose and assured of confidentiality. Each interview lasted approximately 15–20 minutes. Participants' clinical data, such as HbA1c levels, were retrieved from medical records where available to enhance the robustness of self-reported information.

Data Analysis

Data were analyzed using IBM SPSS Statistics Version 26. Descriptive statistics were used to summarize demographic characteristics and SDSCA domain scores. Continuous variables were presented as means and standard deviations; categorical variables were reported as frequencies

and percentages. Inferential statistics—including Spearman's correlation, Kruskal-Wallis tests, and Mann-Whitney U tests—were conducted to examine associations between sociodemographic factors and self-care behaviors. A p-value of <.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Ethical Review Committee (ERC) of Aga Khan University. Informed written consent was obtained from all participants. Confidentiality was maintained through de-identified data, and participants were informed of their right to withdraw at any time without consequence.

Results

Table 1

The Socio-demographic Characteristics of the Family Members (n=258)

Variables	Frequency (n)	Percent (%)
Gender of Family Members		
Male	141	54.7
Female	117	45.3
Educational Status of Participants		
No Formal Education	60	23.3
Primary Education	83	32.2
Secondary School Certificate	60	23.3
Intermediate	41	15.9
Bachelor's Degree	12	4.7
Master's Degree	2	0.8
Occupational Status of the Participants		
Unemployed	170	65.9
Employed	10	3.9
Self-Employed	12	4.7
Retired	9	3.5
Not disclosed	57	22.1
Religion of the participants		
Islam	254	98.4
Others	4	1.6
Marital status of the participants		
Married	256	99.2
Unmarried	2	0.8
Patient condition		
Conscious	258	100
Semi-conscious	00	00
Unconscious	00	00
Type of family of the participants		

Nuclear family		228	88.3
Joint family		30	11.7
Type of medicine taken for diabetes			
	Insulin	144	55.8
	Tablet	105	40.7
	Diet control	9	3.5

Table 2

The Socio-demographic Characteristics (Quantitative Variables) (n=258)

Variable	Mean	Standard Deviation
Age of the Participant	62.10 years	11.43 years
Patient's length of stay	2.53 days	1.64 days
Number of family members having diabetes	1.12 members	0.74 members
HBA1c level	7.16	0.395

Note. This table gives an overview of details related to the participants like their average age, Hba1c level, duration of stay in the hospital, etc.

Participant Characteristics

A total of 258 participants with diabetes mellitus completed the study. The majority were female (56.2%), with a mean age of 52.4 years (SD = 11.3). Most participants were married (74.4%), and a significant proportion had completed secondary education (36.8%) or higher (31.2%). The average duration since diagnosis was 6.8 years (SD = 4.2), and approximately 43% of patients resided more than 10 kilometers from the hospital.

Self-Care Management Scores

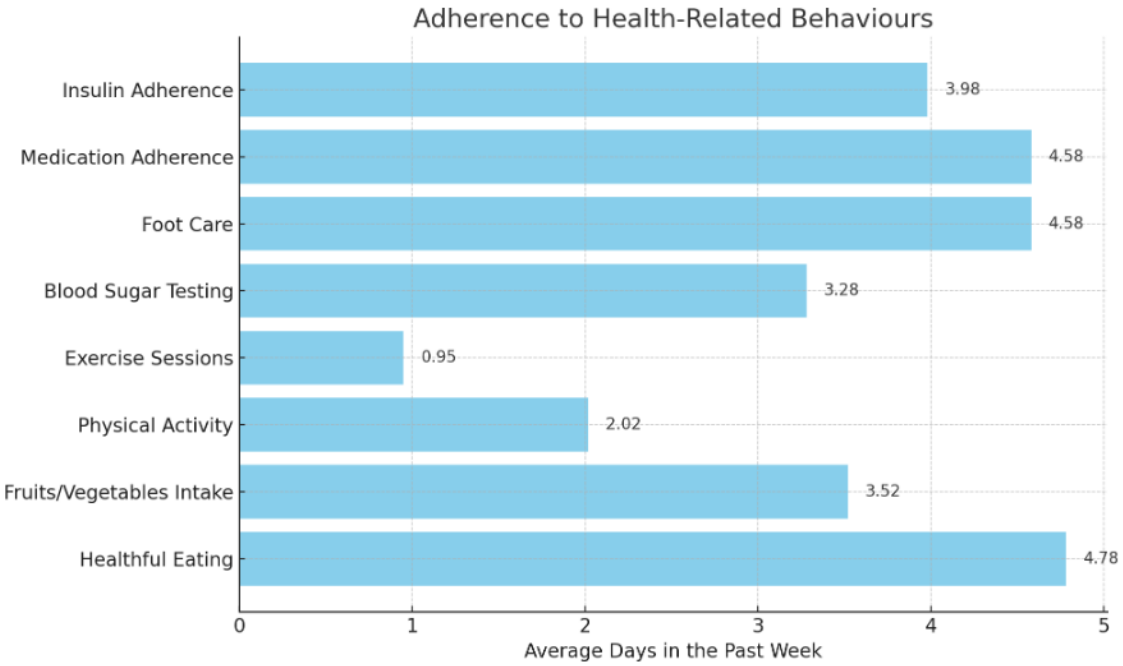
Overall, participants demonstrated moderate adherence to self-care practices. Among the five domains of the SDSCA:

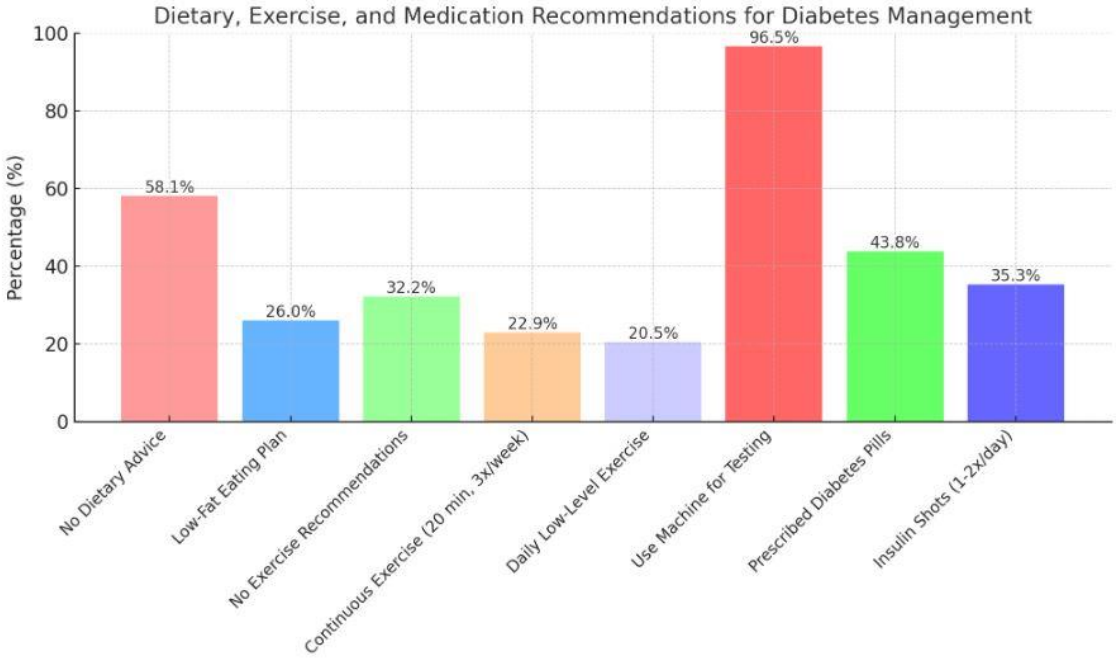
- **Medication adherence** had the highest mean score (M = 6.1, SD = 1.2), indicating consistent use of prescribed treatments.
- **Blood glucose monitoring** followed closely (M = 5.4, SD = 1.7), suggesting regular but not daily checks.
- **Foot care** practices were moderate (M = 4.9, SD = 1.9), with variability across patients.
- **Dietary adherence** showed lower engagement, particularly in following recommended dietary plans (M = 3.8, SD = 2.1).
- **Physical activity** had the lowest average score (M = 3.3, SD = 2.4), indicating limited exercise among participants.

Group Comparisons

Statistical analyses revealed significant differences in self-care scores based on several socio-demographic variables:

- **Education level**: Participants with college or university education had significantly higher overall SDSCA scores compared to those with only primary education ($p < .001$).
- **Gender**: Males reported significantly more physical activity compared to females ($U = 6725.0$, $p = .041$).
- **Age**: A weak but significant negative correlation was observed between age and physical activity ($r = –.21$, $p < .01$), suggesting that younger participants engaged in more frequent exercise.
- **Marital status** and **employment** also showed moderate associations with specific domains, particularly medication adherence and dietary regulation.





Predictors of Self-Care Practices

Regression analysis indicated that higher education ($\beta = .34$, $p < .001$), shorter distance from home to hospital ($\beta = –.28$, $p = .003$), and longer duration since diagnosis ($\beta = .19$, $p = .021$) were significant predictors of improved self-care behaviors. Cultural beliefs, limited health literacy, and financial constraints were frequently cited barriers during structured interviews.

The study revealed that while a significant proportion of DM patients demonstrated satisfactory self-care practices in medication adherence and blood glucose monitoring, practices related to

diet and physical activity were less consistently maintained. The most important self-care activity identified was medication adherence, followed by regular blood glucose monitoring. Socio-demographic factors such as age, gender, marital status, education level, relationship with the patient, duration of hospital stay, and distance from home to the hospital were significant predictors of self-care management scores. Additionally, cultural beliefs and socio-economic status were identified as key barriers to effective self-care practices.

Conclusion

The findings underscore the critical need for a patient and family-centered approach in diabetes care within the Pakistani healthcare context. Interventions that consider socio-demographic and cultural factors are essential for enhancing self-care management among DM patients. Recommendations include enhancing patient education, improving access to healthcare resources, implementing flexible visiting hours, and developing culturally tailored programs to promote dietary and physical activity adherence. These strategies are vital for improving overall health outcomes and reducing the burden of diabetes in Karachi, Pakistan.

Discussion

This study explored the self-care management behaviors of patients with diabetes mellitus (DM) in a tertiary care setting in Karachi, Pakistan. The findings reveal a varied pattern of adherence across the key domains of self-care, with high compliance in medication use and blood glucose monitoring but lower engagement in diet and physical activity. These trends reflect a growing body of international evidence indicating that while patients may be diligent with pharmacological interventions, lifestyle-related components of care are often neglected (Powers et al., 2017; Khowaja et al., 2022).

Medication Adherence and Monitoring

The highest adherence was observed in medication use and blood glucose monitoring. This is consistent with previous studies in similar low- and middle-income settings where structured health systems tend to emphasize pharmacologic treatment and provide relatively better access to medications and glucose testing kits (Shahbaz et al., 2018). Patients may also perceive medication as a more direct and immediate form of treatment, reinforcing adherence.

Diet and Physical Activity: Persistent Challenges

The relatively low adherence to dietary recommendations and physical activity is concerning. Cultural dietary preferences, social gatherings, and limited awareness about diabetic nutrition likely contribute to the challenge. Similarly, physical inactivity—especially among women—may be influenced by gender norms, lack of safe exercise spaces, or misconceptions about the role of exercise in disease management (Zaman et al., 2019). These findings underscore the need for culturally tailored education and community-based interventions that account for social and environmental barriers.

Sociodemographic Influences

Educational attainment emerged as a strong predictor of better self-care management, aligning with prior research that highlights the role of health literacy in chronic disease management (Norris et al., 2022). Additionally, patients living closer to the hospital demonstrated better adherence, likely due to easier access to care and routine follow-ups. The influence of gender, age, and employment status on specific domains further highlights the importance of individualized patient education and support.

Barriers to Effective Self-Care

Participants identified several barriers, including limited health knowledge, cultural misconceptions, and economic constraints. These findings are in line with regional literature

emphasizing the sociocultural dimensions of chronic disease management in South Asia (Tariq et al., 2022). Notably, many patients expressed a willingness to improve self-care if given the right tools, support systems, and education—pointing to an unmet opportunity for intervention.

Implications for Practice and Policy

These findings emphasize the importance of adopting a patient- and family-centered approach to diabetes care in Pakistan. Healthcare providers should consider integrating routine diabetes education sessions into clinical practice, using culturally relevant materials and languages. Additionally, mobile health technologies and telemedicine could extend educational and monitoring support to patients in remote or underserved areas

Keywords: Diabetes mellitus, self-care management, tertiary care hospital, Karachi, socio-demographic factors, SDSCA

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