

Comparative Assessment of Diabetes Knowledge and Self-Care Practices Among Rural and Urban Diabetic Patients in Southern India

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Abstract—Diabetes mellitus is a major public health challenge that requires effective self-management to prevent complications and improve quality of life. Diabetes-related knowledge is a key determinant of successful self-care; however, disparities in healthcare access and educational opportunities may influence knowledge and self-management practices among rural and urban populations. This study aimed to assess and compare diabetes-related knowledge and self-care practices among diabetic patients residing in rural (coastal) and urban communities of Thiruvananthapuram district, Kerala, and to examine the relationship between knowledge and self-care practices. A quantitative comparative research design was employed among 100 adult diabetic patients, including 50 participants each from selected rural (coastal) and urban communities. Participants were recruited using a non-probability consecutive sampling technique. Data were collected using a structured questionnaire that assessed demographic characteristics, clinical profile, diabetes-related knowledge, and self-care practices. Urban participants demonstrated significantly higher knowledge scores than rural participants (11.68 ± 2.97 vs. 10.28 ± 2.55 ; $t = -2.53$, $p = 0.013$), with 74% of urban participants exhibiting good knowledge compared with 46% of rural participants. Although urban participants had slightly higher self-care practice scores than rural participants (35.32 ± 7.74 vs. 33.52 ± 8.28), the difference was not statistically significant ($p = 0.264$). A moderate positive correlation was observed between diabetes-related knowledge and self-care practices ($r = 0.48$, $p < 0.001$). Knowledge was significantly associated with age, educational status, and family history among rural participants, whereas occupation was associated with knowledge among urban participants. Among urban participants, occupation and the absence of diabetic complications were significantly associated with

better self-care practices. The findings indicate that while urban diabetic patients possessed significantly better diabetes-related knowledge, self-care practices were comparable between rural and urban groups. Strengthening community-based diabetes education, behavioural counselling, and continuous follow-up, particularly in rural and coastal communities, may enhance self-care practices and improve diabetes outcomes.

Index Terms—Diabetes mellitus; diabetes knowledge; self-care practices; rural health; urban health; patient education; Kerala.

I. INTRODUCTION

Diabetes Mellitus (DM) is one of the most prevalent chronic non-communicable diseases worldwide and has emerged as a major public health challenge in India. Diabetes, which is characterized by chronic hyperglycemia brought on by deficiencies in insulin secretion, action, or both, is linked to major problems that impact the neurological, cardiovascular, renal, and visual systems [1].

Over 529 million people worldwide suffer from diabetes, with India accounting for a major portion of this number, according to the Global Burden of Disease Study 2021 [2]. Rapid urbanization, sedentary lifestyles, poor eating habits, population aging, and genetic predisposition are all factors contributing to the rising incidence of diabetes.

Management of diabetes is more than pharmacological treatment and includes active participation of the patient in daily self-care activities. “Self-care

practices” are the things people do to take care of their condition, prevent complications, and stay healthy [3]. Key self-care activities include taking prescribed medicine, following a nutritious diet, engaging in regular physical activity, checking blood glucose levels, taking care of the feet, quitting smoking, and attending frequent medical check-ups. When consistently followed, these strategies have been demonstrated to improve glycemic control, minimize the risk of complications, improve quality of life, and decrease healthcare expenditures. Diabetes self-care may be viewed as an evolutionary process to increase knowledge and awareness; it is accomplished by learning to deal with the complications of diseases in the social setting [4].

Evidence from India suggests that the adoption of recommended self-care practices remains suboptimal, despite the acknowledged significance of self-management. Significant variations in adherence to various self-care components were reported in a recent systematic review and meta-analysis of diabetes self-care practices across India [1]. Numerous patients exhibited insufficient compliance with diet modification, physical activity, blood glucose monitoring, and foot care.

When comparing rural and urban populations, the difficulties with diabetes self-care are more noticeable. Healthcare facilities, diabetes education programs, diagnostic services, and specialized care are typically more accessible to urban dwellers [5]. However, metropolitan living frequently encourage stress, poor eating habits, and physical inactivity, all of which can have a negative impact on managing diabetes. Rural communities, on the other hand, often encounter obstacles such as poor access to diabetes education, low health literacy, limited healthcare infrastructure, financial limitations, and cultural attitudes that impact disease management practices. Poor adherence to self-care practices, particularly with regard to blood glucose monitoring and foot care, has been documented in studies carried out in rural India, while studies comparing rural and urban settings have found different obstacles impacting self-management in each community.

Additionally, recent research from India's rural and urban areas has highlighted how important it is for patients with Type 2 Diabetes Mellitus to take care of

themselves [6]. These factors include educational attainment, the length of their diabetes, family support, socioeconomic circumstances, and access to healthcare services. Designing focused solutions that cater to the particular requirements of various communities requires an understanding of these characteristics.

Given the increasing prevalence of diabetes in India and the critical role that self-management plays in disease control, it is critical to evaluate and contrast the self-care behaviors of diabetic patients living in rural and urban areas. These comparisons can offer insightful information about current opportunities, obstacles, and gaps in diabetes care. Thus, the current study intends to evaluate the self-care practices of patients with diabetes mellitus in specific rural and urban locations in India and to determine the factors impacting their self-management behaviors.

Considering the increasing prevalence of Diabetes Mellitus and the pivotal role of self-care behaviours in achieving optimal glycaemic control and preventing complications, it is essential to understand the extent to which patients adhere to recommended self-management practices. Knowledge regarding diabetes is a fundamental determinant of effective self-care and can significantly influence patients' ability to manage their condition successfully. Furthermore, variations in healthcare accessibility, socioeconomic status, educational background, and cultural practices between rural and urban populations may contribute to differences in diabetes-related knowledge and self-care behaviours. Therefore, the present study is undertaken to assess and compare the level of self-care practices and knowledge regarding Diabetes Mellitus among patients residing in selected rural and urban settings of Trivandrum.

The study also seeks to determine the association of self-care practices with selected demographic and clinical variables and to examine the relationship between diabetes-related knowledge and self-care practices. The findings of this study are expected to provide valuable insights for healthcare professionals, particularly nurses, in developing targeted educational interventions and community-based strategies aimed at improving diabetes self-management and reducing the burden of diabetes-related complications among diverse populations.

II. METHODOLOGY

A quantitative comparative research design was employed in the present study to assess and compare the knowledge and self-care practices among patients with diabetes mellitus residing in rural and urban settings, and to examine the relationship between diabetes-related knowledge and self-care practices. The study was conducted in selected rural and urban areas of the Thiruvananthapuram district, Kerala, India. The urban study setting comprised selected residential areas under the Thiruvananthapuram Corporation, while the rural setting included selected areas under a Gram Panchayat within the same district. The study population consisted of adult patients diagnosed with diabetes mellitus residing in the selected rural and urban communities. A non-probability consecutive sampling technique was adopted to recruit eligible participants. A total of 100 participants were enrolled, including 50 diabetic patients from rural areas and 50 from urban areas, all of whom satisfied the predefined inclusion criteria.

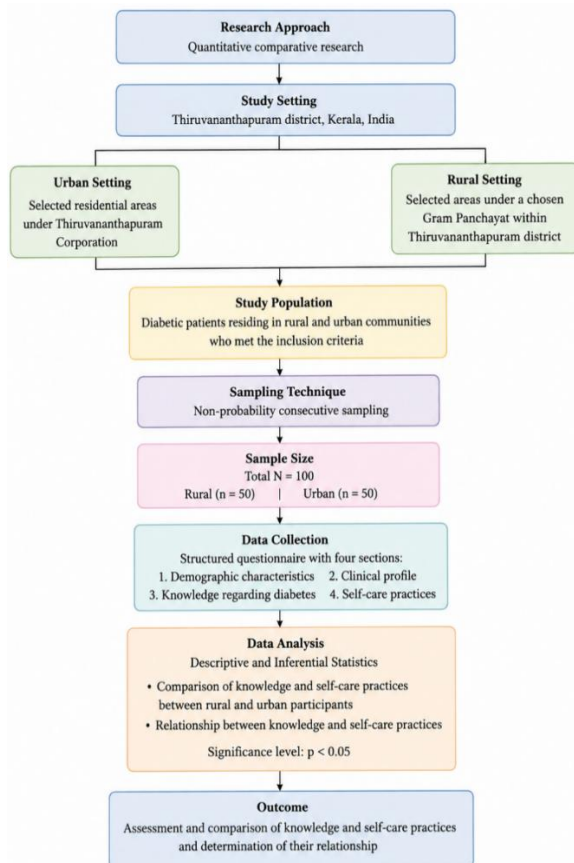


Figure 1. The flowchart illustrates the overall methodology adopted for the study

Data were collected using a structured questionnaire comprising four sections: demographic characteristics, clinical profile, knowledge regarding diabetes mellitus, and self-care practices. The collected data were analyzed using both descriptive and inferential statistical methods. Descriptive statistics were used to summarize the demographic and clinical characteristics of the participants, whereas inferential statistics were employed to compare knowledge and self-care practices between rural and urban participants and to determine the association between diabetes-related knowledge and self-care practices. Statistical significance was established at an appropriate level ($p < 0.05$).

III. RESULTS

The findings describe the level of diabetes-related knowledge and self-care practices among diabetic patients residing in rural (coastal) and urban communities of Thiruvananthapuram district, Kerala. Comparative analyses were performed to identify differences in knowledge and self-care practice scores between the two groups. In addition, the relationship between knowledge and self-care practices was examined, and the associations between selected baseline variables and both knowledge and self-care practice scores were evaluated.

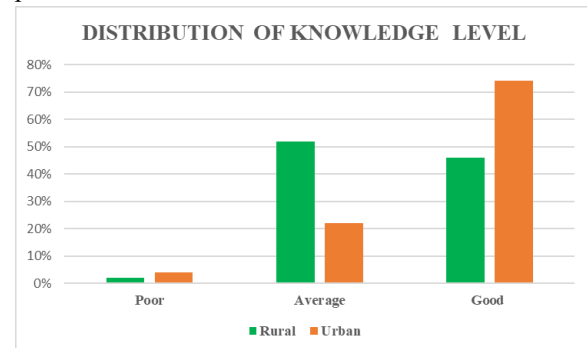


Figure 2. Distribution of diabetes-related knowledge levels among rural (coastal) and urban diabetic patients.

Nearly three-fourths (74%) of the urban participants demonstrated a good level of diabetes-related knowledge, compared with less than half (46%) of the rural (coastal) participants (Figure 2). Conversely, more than half (52%) of the rural participants exhibited only an average level of knowledge. These findings suggest that diabetic patients residing in

urban areas possessed significantly better awareness and understanding of diabetes and its management than their rural counterparts.

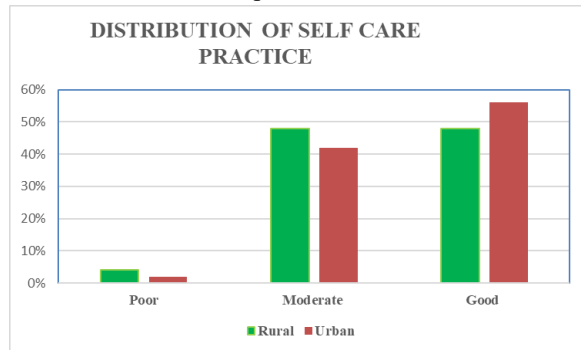


Figure 3. Distribution of self-care practice levels among rural (coastal) and urban diabetic patients

The Figure 3 illustrates the distribution of self-care practice levels among diabetic patients residing in rural (coastal) and urban communities. Nearly half of the participants in both groups demonstrated moderate self-care practices (48% in rural and 42% in urban participants). A slightly higher proportion of urban participants exhibited good self-care practices (56%) compared with rural participants (48%). Poor self-care practices were observed in only a small proportion of participants in both rural (4%) and urban (2%) groups. Overall, the findings indicate that while urban participants had a marginally higher proportion of good self-care practices, the distribution of self-care practice levels was comparable between the two groups.

Comparison of Knowledge Score Between Rural (Coastal) and Urban Diabetic Patients N= (50+50)

Table 1. Comparison of knowledge scores between rural (coastal) and urban diabetic patients (N = 100)

Group	Mean	SD	t Value	pValue
Rural (Coastal)	10.28	2.55	-2.53	0.013
Urban	11.68	2.97		

The mean knowledge score was significantly higher among urban diabetic patients (11.68 ± 2.97) than among rural (coastal) diabetic patients (10.28 ± 2.55). An independent samples *t*-test revealed a statistically significant difference between the two groups ($t = -2.53$, $p = 0.013$), indicating that diabetic patients

residing in urban areas had significantly better knowledge regarding diabetes and its self-care management compared with those living in rural (coastal) areas.

Comparison of Self Care Practice Scores Between Rural (Coastal) and Urban Diabetic Patients N= (50+50)

Table 2. Comparison of self-care practice scores between rural (coastal) and urban diabetic patients (N = 100)

Group	Mean	SD	t Value	pValue
Rural (Coastal)	33.52	8.28	-1.12	0.264
Urban	35.32	7.74		

The Table 2 presents the comparison of mean self-care practice scores between diabetic patients residing in rural (coastal) and urban communities. Urban participants had a slightly higher mean self-care practice score (35.32 ± 7.74) than rural (coastal) participants (33.52 ± 8.28). However, the difference was not statistically significant, as determined by an independent samples *t*-test ($t = -1.12$, $p = 0.264$). These findings indicate that self-care practice levels were comparable between rural (coastal) and urban diabetic patients.

Correlation Between Knowledge and Self-Care Practices Among Diabetic Patients N=100

Table 3. Correlation between diabetes-related knowledge and self-care practice scores among diabetic patients (N = 100)

Variables	Mean	Pearson Correlation	P Value
Knowledge		0.48	<.001
Self-Care Practice			

The Table 3 explains the relationship between diabetes-related knowledge and self-care practice scores among the study participants. Pearson's correlation analysis revealed a moderate positive correlation between knowledge and self-care practice ($r = 0.48$), which was statistically significant ($p < 0.001$). This finding indicates that higher levels of

diabetes-related knowledge were associated with better self-care practices among diabetic patients.

Association Between Selected Base Line Variables and Level of Knowledge

Among the rural participants a statistically significant difference in knowledge score was observed among participants aged 41–50 years ($p < 0.001$). Participants with graduate education also demonstrated significantly higher knowledge scores compared to others ($p = 0.014$), although this finding should be interpreted cautiously because only a few participants belonged to this category. A significant association was also observed with family history ($p = 0.026$). No statistically significant associations were found between knowledge scores and gender, occupation, or duration of illness ($p > 0.05$).

Among the urban participants occupation showed a statistically significant association, with government employees demonstrating significantly higher knowledge scores than other participants (mean = 13.33, $p = 0.041$). No statistically significant association was observed between knowledge score and age, gender, educational status, duration of diabetes, family history of diabetes, or diabetic complications ($p > 0.05$).

Association Between Selected Base Line Variables and Self-Care Practice Scores

Among the rural (coastal) participants, no statistically significant associations were observed between self-care practice scores and any of the selected baseline variables, including age, gender, educational status, occupation, duration of diabetes, family history of diabetes, and diabetic complications (all $p > 0.05$). These findings indicate that self-care practice scores were comparable across the different demographic and clinical characteristics of the rural participants.

Among the urban participants, self-care practice scores were not significantly associated with age, gender, educational status, duration of diabetes, or family history of diabetes (all $p > 0.05$). However, occupation showed a significant association, with participants employed in the private sector demonstrating higher self-care practice scores than other occupational groups (mean = 40.88, $p = 0.001$). Furthermore, participants without diabetic complications had significantly higher self-care practice scores than those with complications (38.65

vs. 33.10, $p < 0.05$). These findings suggest that occupation and the presence of diabetic complications were significant determinants of self-care practices among urban diabetic patients.

IV. DISCUSSION

The present study demonstrated that diabetic patients residing in urban areas had significantly higher diabetes-related knowledge than those living in rural (coastal) communities. The mean knowledge score of urban participants (11.68 ± 2.97) was significantly higher than that of rural (coastal) participants (10.28 ± 2.55) ($p = 0.013$). These findings suggest that place of residence plays a significant role in determining diabetes-related knowledge. The higher knowledge scores among urban participants may be attributed to greater access to healthcare facilities, structured diabetes education programmes, digital health resources, mass media, and more frequent interactions with healthcare professionals.

Conversely, the comparatively lower knowledge observed among rural (coastal) participants may be associated with lower educational attainment, socioeconomic constraints, limited availability of specialized diabetes care, and fewer opportunities for structured health education. Coastal communities often rely primarily on primary healthcare centres, where comprehensive diabetes education may be less readily available. These findings highlight the need for targeted community-based educational interventions to improve diabetes awareness among underserved rural populations. These findings are consistent with Ayele et al., who reported that diabetes-related knowledge significantly influences self-care behaviour, with better knowledge being associated with improved adherence to recommended self-management practices among diabetic patients in Eastern Ethiopia [10].

The present findings are consistent with those reported by Joshy et al. (2014), who observed significantly lower diabetes awareness among rural residents (36.8%) compared with urban residents (58.4%). Similarly, Shrivastava et al. reported that urban populations possess better knowledge regarding diabetes prevention and self-management because of higher literacy levels and improved access to healthcare services. These findings are further supported by the International Diabetes Federation

(IDF), which identifies health literacy and access to structured diabetes education as essential determinants of effective diabetes management and recommends patient education as a core component of diabetes care. Although urban participants demonstrated higher mean self-care practice scores (35.32 ± 7.74) than rural (coastal) participants (33.52 ± 8.28), the difference was not statistically significant ($p = 0.264$). This finding suggests that higher knowledge levels do not necessarily translate into significantly better self-care behaviours. Diabetes self-management is a multifactorial process influenced not only by knowledge but also by behavioural, psychosocial, cultural, and environmental factors. Several factors may explain the comparable self-care practices observed in both groups. Family support, cultural beliefs, affordability of healthy food, accessibility to medications, availability of opportunities for physical activity, regular follow-up with healthcare providers, and personal motivation all contribute to adherence to diabetes self-management. Despite having comparatively lower knowledge, rural (coastal) participants may have developed satisfactory self-care practices through routine follow-up at primary healthcare centres and support from family members. The present findings are comparable with those of Toobert et al., who reported that although diabetes knowledge contributes to self-management, behavioural practices are strongly influenced by family support, motivation, accessibility of healthcare services, affordability of healthy food, and cultural beliefs. Likewise, Srinivasan et al. found only modest differences in self-care practices between urban and rural diabetic populations despite variations in knowledge levels, emphasizing the importance of continuous healthcare support and family involvement in sustaining self-care behaviours. The findings are also in agreement with the recommendations of the American Diabetes Association (ADA), which emphasizes that effective diabetes self-management requires ongoing diabetes self-management education, behavioural counselling, regular clinical follow-up, and continuous support in addition to patient knowledge.

Overall, the findings of the present study indicate that although diabetes-related knowledge was significantly higher among urban participants, this did not result in a corresponding improvement in self-care practices. These results suggest that improving knowledge alone

may be insufficient to achieve optimal diabetes self-management. Similarly, Almutairi highlighted that effective diabetes management depends not only on patient knowledge but also on healthcare system factors such as access to diabetes education, continuity of care, healthcare resources, and professional support. Addressing these barriers is essential for improving diabetes self-management and long-term outcomes [11]. Comprehensive diabetes care should therefore integrate structured patient education with behavioural counselling, family participation, continuous follow-up, and community-based support programmes to promote sustained improvements in self-care practices, particularly among rural and coastal populations.

REFERENCES

- [1] S. Chaudhuri, V. Agiwal, C. Chandrasekhar, *et al.*, "Self-care practices in diabetes among populations in India: A systematic review and meta-analysis," *Discov. Public Health*, vol. 22, Art. no. 510, 2025, doi: 10.1186/s12982-025-00915-w.
- [2] K. L. Ong, L. K. Stafford, S. A. McLaughlin, E. J. Boyko, S. E. Vollset, A. E. Smith, *et al.*, "Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: A systematic analysis for the Global Burden of Disease Study 2021," *Lancet*, vol. 402, no. 10397, pp. 203–234, 2023.
- [3] N. J. Jyotsana, N. Pandit, S. Sharma, and L. Kumar, "Self-care practices and influencing factors among type 2 diabetes mellitus patients: A hospital-based cross-sectional study," *Clin. Epidemiol. Glob. Health*, vol. 30, Art. no. 101822, 2024, doi: 10.1016/j.cegh.2024.101822.
- [4] H. C. Cooper, K. Booth, and G. Gill, "Patients' perspectives on diabetes health care education," *Health Educ. Res.*, vol. 18, no. 2, pp. 191–206, Apr. 2003, doi: 10.1093/her/18.2.191.
- [5] R. Shivananda, M. K. Savkar, R. S. Manchukonda, and R. S. Krishnegowda, "Self-care practices among type 2 diabetes mellitus patients in rural India," *Int. J. Basic Clin. Pharmacol.*, vol. 9, no. 11, pp. 1700–1705, 2020, doi: 10.18203/2319-2003.ijbcp20204495.
- [6] A. George, J. Deshmukh, P. Nair, and E. Mathew, "Assessment of self-care practises among patients

- with type 2 diabetes mellitus attending urban health training centre of a tertiary health care institute in Central India: A cross-sectional study,” *Int. J. Community Med. Public Health*, vol. 12, no. 9, pp. 3968–3973, 2025, doi: 10.18203/2394-6040.ijcmph20252838.
- [7] P. Joshi, “Knowledge and awareness of diabetes in urban and rural India: The Indian Council of Medical Research India Diabetes Study (Phase I): Indian Council of Medical Research India Diabetes 4,” *Indian J. Endocrinol. Metab.*, 2014, doi: 10.4103/2230-8210.131191.
- [8] M. A. Qurieshi, R. Ganesh, K. Leelamoni, and B. Kurian, “A community-based study on knowledge of diabetes mellitus among adults in a rural population of Kerala,” *Int. J. Med. Sci. Public Health*, vol. 5, pp. 2075–2081, 2016.
- [9] Shrivastava et al., “Diabetes education and self-management practices,” *Clin. Epidemiol. Glob. Health*. [Online]. Available: [https://cegh.net/article/S2213-3984\(2020\)2930011-7/pdf](https://cegh.net/article/S2213-3984(2020)2930011-7/pdf)
- [10] K. Ayele, B. Tesfa, L. Abebe, T. Tilahun, and E. Girma, “Self-care behavior among patients with diabetes in Harari, Eastern Ethiopia: The health belief model perspective,” *PLoS One*, vol. 7, no. 4, Art. no. e35515, 2012, doi: 10.1371/journal.pone.0035515.
- [11] K. M. Almutairi, “Quality of diabetes management in Saudi Arabia: A review of existing barriers,” *Arch. Iran. Med.*, vol. 18, no. 12, 2015.