

Diabetes Self-Care Activities: A Community-Based Survey in an Urban Slum in Hyderabad, India

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Abstract

Background: Diabetes is a chronic illness with silent manifestations, which can be better managed by the individual through self-care behaviors such as diet control, proper exercise, monitoring blood glucose, and adherence to drug. **Objective:** The present study was conducted to assess the prevalence of existing self-care behaviors among people with diabetes and its associated factors. **Methods:** It was a community-based, cross-sectional study conducted in an urban slum in Hyderabad. A total of 208 cases of diabetes mellitus were interviewed. The details of diabetes self-care activities were recorded by using the modified Summary Diabetes Self-care Activities Questionnaire. The data were analyzed by applying SPSS US at 24, and the factors associated with good self-care behavior were found. **Results:** The study revealed that the prevalence of good dietary behavior, good exercise behavior, good monitoring behavior, and good drug adherence was 29.8%, 30.3%, 44.2%, and 56.3%, respectively. Education of secondary class and above (odds ratio [OR] 3.001; 95% confidence interval [CI]: 0.139–6.447) was found to be associated with good dietary behavior, and male gender (OR 3.691; 95% CI: 1.965–6.936) was associated with good exercise behavior. Good monitoring behavior and good drug behavior were found to be associated with higher socioeconomic status (OR 4.540; 95% CI: 2.418–8.522) and age 50 years and above (OR 3.4; 95% CI: 1.731–6.675), respectively. **Conclusion:** Good dietary and exercise behavior were found poor in comparison to good monitoring behavior and drug adherence. The factors significantly associated were male sex, higher education, higher socioeconomic status, and age above 50 years.

Keywords: Adherence, self-care activities, Type 2 diabetes mellitus

INTRODUCTION

Diabetes mellitus is a complex and chronic illness requiring continuous self-care to achieve glycemic control to prevent acute as well as long-term complications and to improve the quality of life. It also reduces the burden on health-care services.^[1,2] It has attained epidemic proportions in India, and an estimated 98 million people will be suffering from diabetes by the year 2030.^[3] In the current scenario, Hyderabad has become the diabetes capital of India,^[4] and a recent survey reported that over 21% population of Hyderabad were diabetic against the national average of 8.8%.^[5]

Diabetes self-care includes certain activities to be performed by the people with or at risk of diabetes. The activities include healthy food choices every day and eating a healthy amount of food at each meal, staying physically active by doing the required exercise, self-monitoring of blood glucose, taking the recommended medication regularly, reducing risky behaviors, and developing problem-solving and healthy coping skills.^[6-11]

Relatively few community-based studies have been conducted in India to assess diabetes self-care activities with varied findings reported.^[12-17] However, no community-based study has been conducted in Hyderabad to assess the self-care activities among the people with diabetes despite increased disease burden.

The present study was conducted to assess the existing self-care behaviors and its associated factors among people with Type 2 diabetes residing in an urban slum of Hyderabad.

METHODS

This community-based, cross-sectional study was carried out

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between March and June 2018 in Shaikpet, an urban slum in Hyderabad. The study area is spread over 13 clusters with a population of 60,000. Most of the residents in the study area are migrants, are laborer by occupation, and are economically below the poverty line.

The sample size was calculated with the assumed prevalence rate of positive self-care activities 50%, with a relative precision of 20%, and at 95% confidence level using the formula $n = 4pq/l^2$ where $P = 50$, $q = (1 - p) = 50$, and $l = 10$. A design effect of two was applied for the cluster sampling and a sample size of 200 was obtained. Clearance from the institution's ethical committee was obtained prior to commencement of the study.

The study was conducted in all the 13 clusters. The houses in each cluster were identified by systematic random sampling method with a sampling interval of one. The inclusion criteria were individuals above 18 years of age, having diabetes duration more than 1 year, and willing to give written consent. The diabetic status was self-reported, and the individual could independently carry out activities for his/her daily living. Any eligible person who was found seriously ill or not willing to give consent was excluded from the study. During the visit, any adult in the family who was found having Type 2 diabetes was requested for interview. If two diabetes cases were found in a family, only one case was interviewed. If the house visited was found locked or no diabetes case was found, the next house was visited. A total of 16 cases were collected from each cluster, making a final sample size of 208.

Data were collected by using a structured questionnaire which comprised of two parts. Part I consisted of sociodemographic details of the respondent such as age, sex, education, occupation, socioeconomic status, marital status, duration of disease, smoking habits, and alcohol intake. Modified Kuppuswamy socioeconomic classification^[18] was used for the comparison of socioeconomic status. The lower and the upper lower class had been grouped as lower socioeconomic status and the lower middle, upper middle, and higher class had been grouped as higher socioeconomic status.

Part II contained the prevalidated "Summary Diabetes Selfcare Activities (SDSCA)" Questionnaire,^[19] which included details of the diabetes self-care activities with respect to diet, exercise, blood glucose monitoring, and drug adherence in the previous week prior to the interview. The SDSCA was modified keeping in view of the local cultural context of the study population.

Operational definition

Part II questionnaire included four components such as diet, exercise, blood glucose monitoring, and drug adherence. Diet comprised of four questions which included both general diet and specific diets, and the remaining three components included one question each.

In the dietary component, restriction of carbohydrates in all meals for all the 7 days, eating three cups or more vegetable and fruits including seasonal for all the 7 days, no fried food, and no sweet preparations including tea or coffee with sugar on any day in the previous week were considered as good dietary

behavior. Restriction of carbohydrates was defined as reducing the intake of quantity of rice/roti per meal and replacement of one rice meal with jowar/bajra/ragi roti.

In the exercise component, work-related activities had been considered as exercise behavior because doing any specific exercise other than work-related activities was not prevalent in the study population. Continuous strenuous physical activities at least for 30 min daily during occupation or separately for a minimum of 5 days in the previous week had been considered as good exercise behavior.

As daily monitoring of blood glucose was not prevalent in the study population, testing of venous blood glucose at least once in the previous 3 months by visiting the treating physician, had been considered as good monitoring behavior. Adhering to all prescribed medications including injection insulin in dose and time for all the 7 days in the previous week was considered as a good drug adherence.

Data were entered in MS Excel and analyzed by using IBM SPSS Statistics for Windows, version XXIV (IBM Corp., Armonk, N.Y., USA).^[20] Descriptive statistics in the form of frequencies and percentages were used to analyze the sociodemographic factors. The prevalence rate for good dietary, exercise, monitoring, and drug adherence behavior was calculated. Univariate analysis was applied to calculate the odds ratios (ORs) for associated factors. Adjusted OR was calculated by applying multiple logistic regression analysis.

RESULTS

In the present study, the mean age of the respondents was 51.36 (± 9.47) years; 50.5% of the study population were above 50 years of age and 54.3% were females. All respondents were married and staying with family. Nearly 76.4% of the respondents were having education of secondary class and below, 37.5% of the population were in lower socioeconomic group, 33.2% of the population were either sedentary workers or unemployed, and 73.6% of the study population were having diabetes more than 5 years.

In dietary behavior, it was found that 55.8% of the respondents had restricted carbohydrates in all meals, 39.9% had three or more cups of vegetables and fruits for all the 7 days, 52.9% had no fried food, and 72.6% had no sweets on any day in the previous week. In exercise behavior, 30.2% of the respondents had performed strenuous physical activity for at least 30 min for minimum 5 days in the last week, and 44.2% of the respondents checked their blood glucose at least once within the previous 3 months. The details of diabetes self-care behaviors among the participants are depicted in Table 1.

On univariate analysis, it was seen that good dietary behavior was significantly associated with respondents having secondary education and above (OR 2.490: 95% confidence interval [CI]: 1.230–5.041) and duration of diabetes more than 5 years (OR 2.00: 95% CI: 0.953–4.197). Men had significantly better exercise behavior than women (OR

3.611; 95% CI: 1.946–6.702). Good monitoring behavior was observed more with respondents having secondary education and above (OR 2.112; 95% CI: 1.209–3.688) and of higher socioeconomic status (OR 4.672; 95% CI: 2.576–8.474). Drug adherence was significantly associated with age 50 years and above (OR 4.125; 95% CI: 2.196–7.749) and duration of diabetes more than 5 years (OR 2.005; 95% CI: 1.150–3.496). The findings of univariate analysis are depicted in Table 2.

On multivariate analysis, good dietary behavior was found to be significantly associated with individuals having secondary education and above (OR 3.001; 95% CI: 0.139–6.447). Men were found having better exercise behavior (OR 3.691; 95% CI: 1.965–6.936). Good monitoring behavior was significantly associated with higher socioeconomic status (OR 4.540; 95% CI: 2.418–8.522), and drug adherence was significantly associated with higher age, i.e., 50 years and above (3.4; 95% CI: 1.731–6.675). The findings are depicted in Table 3.

DISCUSSION

The present study was conducted to assess the existing self-care behaviors and its associated factors among people with Type 2 diabetes residing in an urban slum of Hyderabad.

The study revealed that the prevalence of good dietary behavior,

good exercise behavior, good monitoring behavior, and drug adherence was 29.8%, 30.3%, 44.2%, and 56.3%, respectively.

In the present study, the prevalence of good dietary behavior (29.8%) was almost similar with the study carried out in an urban community in Vellore (29%),^[12] rural Karnataka (24%),^[15] Delhi (31%),^[16] and Chennai (37%),^[17] but was higher in comparison to the study conducted in a Bengaluru slum (12.26%)^[13] and much lower to the study conducted in Kollam (51.4%)^[14] and in Mangalore Hospital (45.9%).^[21]

The prevalence of good exercise behavior (30.3%) in the present study was similar to that of the study carried out in the Bengaluru slum (30.67%),^[13] higher to the study conducted at Vellore (19.5%)^[12] and at Kollam (24.1%),^[14] but lower to the study conducted in Delhi (60.7%)^[16] and at Mangalore hospital (43.4%).^[21]

The prevalence of good monitoring behavior (44.2%) in the present study was much higher to that of the study conducted at Delhi (7.7%)^[16] but lower to the study conducted at Vellore (70%),^[12] Bengaluru (77.9%),^[13] rural Karnataka (66.25%),^[15] and Mangalore (76.6%).^[21]

The drug adherence percentage (56.3%) of our study was similar to that of the study conducted at the Bengaluru slum (60.73%)^[13] and at Mangalore (60.5%),^[21] but lower to the study conducted at Vellore (79.8%)^[12] and at Kollam (66%).^[14]

In the present study, the exercise behavior was better in men than in women, similar to those of the studies conducted in Vellore,^[12] Kollam,^[14] and Delhi.^[16] This could be probably due to female respondents remaining busy in household activities and those who work mostly occupied in sedentary jobs.

Good dietary behavior in the present study was significantly associated with higher education, whereas the study conducted

Table 1: Details of diabetes self-care behaviors

Characteristics	Frequency (%)
Good dietary behavior	62 (29.8)
Good exercise behavior	63 (30.3)
Good monitoring behavior	92 (44.2)
Good drug adherence	117 (56.3)

Table 2: Univariate analysis of factors associated with healthy diabetes self-care behavior

Factor	OR (95% CI)			
	Good dietary behavior	Good exercise behavior	Good monitoring behavior	Good drug adherence
Age (≥50 years)	1.639 (0.877-3.062)	0.716 (0.394-1.303)	0.676 (0.387-1.181)	4.125* (2.196-7.749)
Gender (male)	1.597 (0.876-2.913)	3.611* (1.946-6.702)	1.259 (0.721-2.1998)	0.904 (0.517-1.579)
Education (secondary and above)	2.490*(1.230-5.041)	0.941 (0.445-1.991)	2.112*(1.209-3.688)	0.992 (0.499-1.975)
SE status (high)	0.845 (0.459-1.558)	0.815 (0.443-1.499)	4.672* (2.576-8.474)	0.725 (0.412-1.275)
Diabetes duration (≥5 years)	2.000* (0.953-4.197)	0.961 (0.493-1.875)	0.846 (0.456-1.571)	2.005* (1.150-3.496)

*Significant OR. CI: Confidence interval, OR: Odds ratio, SE: Socioeconomic

Table 3: Adjusted odds ratio from final logistic regression models regarding factors associated with good diabetes self-care behavior

Factor	OR (95% CI)			
	Good dietary behavior	Good exercise behavior	Good monitoring behavior	Good drug adherence
Age (≥50 years)	1.271 (0.518-3.123)	0.525 (0.217-1.272)	0.865 (0.360-2.079)	3.4* (1.731-6.675)
Gender (male)	1.516 (0.813-2.829)	3.691* (1.965-6.936)	1.342 (0.728-2.474)	0.760 (0.414-1.395)
Education (secondary and above)	3.001* (0.139-6.447)	0.976 (0.431-2.207)	1.956 (1.074-3.565)	1.346 (0.633-2.863)
SE status (high)	0.741 (0.372-1.475)	0.699 (0.348-1.401)	4.540* (2.418-8.522)	0.511 (0.275-0.952)
Diabetes duration (≥5 years)	1.610 (0.571-4.540)	1.218 (0.463-3.201)	1.330 (0.509-3.473)	1.436 (0.772-2.671)

*Significant OR. CI: Confidence interval, OR: Odds ratio, SE: Socioeconomic

at Mangalore^[21] observed that good dietary behavior was associated with duration of diabetes more than 10 years.

In the present study, good monitoring behavior was found to be significantly associated with higher socioeconomic status, which agrees with the study conducted in Vellore,^[12] whereas in the study conducted at the Bengaluru slum,^[13] the observed good monitoring behavior was associated with age <55 years.

Drug adherence in the present study was found to be significantly associated with age above 50 years, which agrees with the study conducted at Kollam,^[14] whereas in the study conducted at the Bengaluru slum,^[13] the observed drug adherence was significantly associated with working people.

In the present study, the prevalence of good dietary and exercise behavior was less in comparison to good monitoring behavior and drug adherence. The probable reasons could be attributed to low socioeconomic status and lack of health awareness regarding the benefits of healthy diet and regular exercise in the management of diabetes. Relatively poor exercise behavior in the study population could also be due to the facts of more number of female in the study population, many male respondents were unemployed, and those who were employed did not get regular employment throughout the week.

Blood glucose monitoring and drug adherence were comparatively better probably due to the location of the two urban health centers: one from the medical college and another from the municipality corporation where free blood glucose checkup and free drug supply were available.

Limitation of the present study is that other factors of diabetes self-care activities such as foot care behavior and smoking habits were not studied.

CONCLUSION

The overall prevalence of all self-care activities was low among the study population. Good dietary and exercise behavior were found significantly less in comparison to good monitoring behavior and drug adherence.

The key factors associated with the good self-care activities were education above secondary class, higher socioeconomic status, male sex, and age above 50 years. Hence, health education can be given to the target population of nonadherence such as females, those with low education, those belonging to low socioeconomic status, and patients below 50 years of age to create awareness about diabetes self-care management in the form of good dietary, good exercise behavior, regular blood glucose monitoring, and drug adherence in their daily life.

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Conflicts of interest

There are no conflicts of interest.

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