Exploring the Determinants of Diabetes' Self-Care Practices among the Diabetics Living in Urban Field Practice Area of Medical College in Hyderabad

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ABSTRACT

Background: Diabetes is a chronic disease, and among the adults, type II diabetes is more common. In 2021, approximately 537 million adults between 20 to79 suffered from diabetes. Diabetics who follow self-care practices can manage their blood glucose levels better, which in turn prevents the secondary complications.

Methods: This was a community-based and cross-sectional study performed in the urban field practice (UHC) area of a tertiary care medical college conducted on 110 type II diabetics. The 'summary of diabetes self-care activities' questionnaire was used for data collection.

Results: Mean age was 53 +/- 7.6, 70% of whom were females and 45.4% were lower-middle Socio-Economic Status. 33% of the participants had uncontrolled diabetes. The majority of study subjects (68.2%) suffered from hypertension as a co-morbidity, followed by heart disease (10.9%), thyroid disease (10%), and hypercholestrolism (1.8%). 62.7% of the subjects showed treatment adherence for > 4 days/week. Diabetics who had the disease for more than 5 years and followed a proper diet and adhered to treatment (> 4 d/week), showed a better control of glucose levels.

Conclusion: The findings of this study can be used to strengthen NPCDCS program to bridge the knowledge gap regarding self-care among patients and caregivers.

Keywords: Type II Diabetes, Self-Care Practices, Diabetic Foot Care

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Introduction

Diabetes occurs when pancreas is unable to produce insulin or when body is unable to use the insulin produced. Type II diabetes constitutes 90% of all the cases of diabetes (1).

In 2021, approximately 537 million adults in the age group of 20-79 were living with diabetes. This number is estimated to increase to 643 million by 2030 and 783 million by 2045. 3 in 4 adults suffering from diabetes are predicted to belong to low- and middle-income countries (1).

In India, there are 77 million people who are above the age of 18 and suffer from type II diabetes, and nearly 25 million are prediabetics (2).

Diabetes treatment centers on a good control of blood sugar level. Apart from medication, life style factors such as diet, physical activity, and frequent checking of blood sugar levels act as behaviors that facilitate control of diabetes and help in prevention of complications (3).

Self-care practices involve all the activities that affect the patient's well-being with regard to any chronic disease (4).

Self-care practices encompass, physical activity, sleep (5).

Appropriate dietary practices, adherence to medication, regular hospital visits, daily foot examination, and knowledge about complications of hypoglycemic episodes (6, 7, 8)

Diabetic foot care is an important part of self-care for limb preservation as diabetics are prone to foot ulcers due to various biochemical changes that form the pathology of diabetes (9).

Diabetics who follow self-care practices can manage their blood glucose levels better, which in turn prevents secondary complications (6). This study aims to evaluate various factors influencing blood sugar control.

Methods

The present study was a community-based and cross-sectional study performed among type II diabetics living in slums around the urban field practice area of a tertiary care medical college. The prevalence of diabetes' self-care practices was taken to be 50% and using the formula $4pq/l^2$, a sample size of 110 was reached. The study subjects were selected using simple random sampling from among the three slums under the UHC (urban health center). The study tool used was the summary of diabetes self-care activities questionnaire (SDSCA) (10).

The above questionnaire contains details regarding diet regimen, life style practices such as exercise and addiction, and blood glucose testing. Ethical approval for the study was obtained from the institution. All the type II diabetics over the age of 18 were included in the study after obtaining their informed consent. Critically ill patients who were unwilling to participate in the study were excluded. The participants were approached at their preferred time of convenience with the help of the field staff from urban health center, and interviews were conducted. Data was collected during February and March of 2023. The data obtained was entered into MS excel and relevant statistical tests were performed.

Result

The study included 110 subjects.

Table 1. Distribution of study subjects based on sociodemographic characteristics (n = 110)

Socio demographic characteristics	n = 110
1. Mean age	53 +/- 7.6
2. Gender distribution	
Male	30% (33)
Female	70% (77)
3. Religion	
Hindu	68.20% (75)
Muslim	31.80% (35)
4. Type of family	
Nuclear	57.30% (63)
Joint	42.70% (47)
5. SES	
Upper	20.90% (23)
Upper – middle	9.10% (10)
Lower – middle	45.40% (50)
Upper – lower	15.50% (17)
Lower	9.10% (10)

The mean age of the study population was 53 +/- 7.6. 70% of them were females, 68.2% were Hindus, 57.3% had a nuclear family, and 45.4% belonged to the lower-middle socio-economic

status, as presented in Table 1.

Among 110 study subjects, 67% had controlled blood glucose levels, and 33% had uncontrolled diabetes as shown in Figure 1.
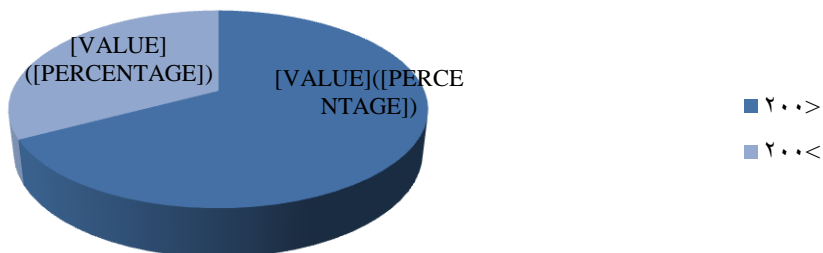

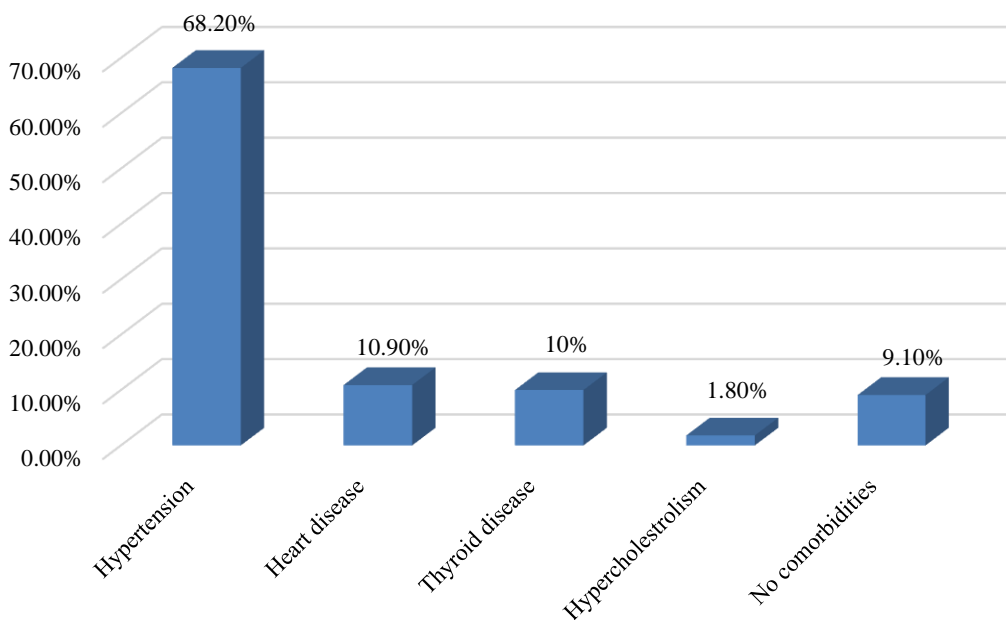**Figure 1.** Distribution of study subjects based on random blood sugar levels (n = 110)

Figure 2. Distribution of study subjects based on co-morbidities (n = 110)

68.2% of the participants had hypertension which was found to be the most common co-morbidity. This was followed by heart disease (10.9%), thyroid disease (10%), and hypercholestrolism (1.8%). 9.1% of the study subjects had no co-morbidities as shown in Figure 2.

Table 2 shows that 54.5% of the study subjects had diabetes for 5-10 years, and 26.4% of them for more than 10 years. Positive spouse diabetes status was found in 30.9% of the study subjects.

Among the study subjects, 32.7% showed uncontrolled diabetes (RBS > 200). 44.5% were overweight according to BMI, and 17.3% were obese. 8.2% of the individuals were on both OHA and insulin.

68.2% of them were having both diabetes and hypertension, and 25.3% suffered from chronic hypertensives. 42.7% had hypertension for 5-10 years as shown in Table 2.

Table 2. Distribution of study subjects based on medical history of diabetes (n = 110)

Parameters	n = 110
1. Duration of diabetes	
< 5 years	19.10% (21)
5 - 10 years	54.50% (60)
> 10 years	26.40% (29)
2. Spouse diabetes status	
Yes	30.90% (34)
No	69.10% (76)
3. **RBS** (mg/dl)	
< 200	67.30% (74)
>200	32.70% (36)
4. BMI	
Normal	38.20% (42)
Overweight	44.50% (49)
Obese	17.30% (19)
5. Medication	
Oral hypoglycemics	91.80% (101)
Oral hypoglycemics + insulin	8.20% (9)
6. H/o hypertension	
Yes	68.20% (75)
No	31.80% (35)
7. Duration of hypertension (N = 75)	
< 5 years	32% (24)
5 - 10 years	42.70% (32)
> 10 years	25.30% (19)

Table 3. Association between RBS control and the study variables

RBS control vs study variable	Odds ratio (95% CI)	P-value
Health profile		
1. Controlled RBS vs duration of diabetes	**5.4 (1.2 – 25.5)**	**< 0.05 (0.017)**
2. Controlled RBS vs BMI	1.5 (O.6 – 3.5)	> 0.05 (0.31)
3. Controlled RBS vs duration of hypertension	1.1 (0.4 – 3.4)	> 0.05 (0.82)
Others		
4. Controlled RBS vs spouse diabetes status	0.45 (0.2 – 1.0)	> 0.05 (0.06)
Self – care practices		
1. Controlled RBS vs general diet	**2.8 (1.0 – 7.3)**	**< 0.05 (0.02)**
2. Controlled RBS vs specific diet	2.2 (0.9 – 5.3)	> 0.05 (0.07)
3. Controlled RBS vs exercise	0.5 (0.2 – 1.2)	> 0.05 (0.11)
4. Controlled RBS vs foot care	1.4 (0.2 – 7.4)	> 0.05 (0.32)
5. Controlled RBS vs good adherence to medication	**3.5 (1.3 – 8.9)**	**< 0.01(0.007)**

According to Table 3, controlled RBS demonstrated a significant relationship with duration of diabetes where patients with diabetes of more than 5 years had 5.4 times better glycemic control than those with less period of diabetes. Among self-care practices, RBS showed a significant relationship with general diet where patients following general dietary guidelines had 2.8 times better glycemic control than those who did not follow the same diet. Glycemic control had an extremely significant relationship with medication where patients on regular medication (remembering to take medication regularly on 4 or more days of the week) had 3.5 times better glycemic control than those who did not take medication regularly, as shown in Table 3.

Discussion

The objective of this study was to evaluate various factors influencing blood sugar control among diabetics. The socio demographic findings of diabetics in this study were consistent with the findings of the study conducted in an urban slum in Hyderabad by Chandrika K et al. (11) and the study by Chandra Sekhar Chittooru, et al. (12) in terms of the mean age of the study population and the presence of a slight female preponderance among the study population. A study by V Viswanathan, et al. (13) also indicated a similar mean and gender distribution among the subjects.

The present study showed a higher proportion of diabetics having diabetes for more than 5 years duration. This was consistent with the results of a study done in rural area of Tamil Nadu by Karthik RC, et al (14). However, the prevalence of high BMI of the present study was found to be lower when compared to study conducted by Karthik, et al. (14) which showed a majority of the study subjects to be overweight.

The following co-morbidities among diabetics were compared with the study conducted in urban primary healthcare centers at Bhubaneswar in 2017 by Pati S et al. (15) In the present study, the co-morbidities found were hypertension, followed by heart disease and thyroid disease which were similar to the findings by Pati S, et al. (15) ; their study also revealed the co-morbidities of hypertension, followed by heart disease, stroke, and thyroid disease. The findings of this study were also in accordance with the results found by Shyamsundar Jagdish Raithatha, et al. (16) where the main co-morbidity was also hypertension, followed by ischemic heart disease.

Adherence to diet and foot care practices in the present study were at a low level. These findings were comparable to those conducted in urban slums of Bengaluru by Dasappa, et al. (17) among 163 diabetics where adherence to diet was low, and good foot care practices were found to be much higher than the findings of this study. However, adherence to physical activity and medication were similar to the present study. A study conducted in Mumbai by Shyamsundar Jagdish Raithatha et al. (16) also suggested that the majority of diabetic patients followed good foot care practices compared to the current study. The difference in findings could be due to varied socio-demographic features of the population compared to those of the present study. The majority of the population was selected from urban slums of Hyderabad. Studies done in urban slums of other major Indian cities demonstrated comparable findings.

Conclusion

The findings of this study can be used to strengthen the National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases and Stroke (NPCDCS). Knowledge levels of the patients as well as their care givers regarding self-care in diabetes must be increased through various information, education, and communication (IEC) campaigns as they play a significant role in glycemic control.

The strength of the study was using the validated questionnaire, 'summary of diabetes self-care activities. History regarding a wide variety of diabetes risk factors.

Limitations of the study were recall bias which may have affected aspects such as diet, and the finding of the study cannot be generalized as it was done in a limited area.

Implications for future research

There is a great need for extensive research in developing nations in the field of self-care in diabetes. Additionally, field research should be promoted in developing countries regarding the perceptions of patients as well as their care givers on the effectiveness of various self-care methods in order to allocate resources more efficiently to curb diabetes related morbidities.

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