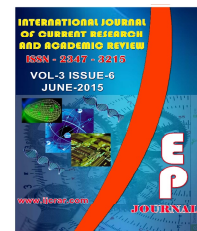




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Evaluation of self-care practices among diabetic patients in a rural area of Bangalore district, India

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KEYWORDS

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A B S T R A C T

The prevalence of the diabetes is increasing at an alarming rate particularly in developing countries. Self-care in diabetes is defined as behaviours undertaken by people with or at risk of diabetes in order to successfully manage the disease on their own. It is believed that appropriate patients knowledge of self-care is the key to achieving therapeutic goals in ambulatory care. Objectives: 1. To evaluate self-care practices among diabetic patients in the rural population of Anekal Taluk, Bangalore Urban District, Karnataka. 2. To study the factors associated with self-care practices among diabetic patients. Diabetic patients attending a General hospital, Bangalore Urban District, Karnataka were approached to participate in this cross sectional study. After obtaining informed written consent, a structured interview schedule using a standard questionnaire with necessary modifications was administered to patients by the investigators. Of the 101 diabetic patients who participated in the study, low levels of self-care were recorded in the domains of foot care (4%), physical activity (45%), regular follow up (58%) and medication adherence (58.4%). Males, persons who were better educated, and those with a higher per capita income were largely found to have better self-care practices in most domains. Better self-care practices were found to be associated with good glycemic control in this study. More awareness about self-care, with emphasis on various domains of self-care among diabetics should be created. Improved focus on foot care including the importance of glycemic control, adherence, following advice given by health professionals is necessary. Education is the key factor in achieving good self-care practices.

Introduction

Diabetes is characterized by a state of chronic hyperglycaemia resulting from several environmental and genetic

aetiologies acting jointly¹. The prevalence of the diabetes is increasing at an alarming rate particularly in developing countries.

Estimate of global diabetes prevalence predict 6.4%, affecting 285 million adults in 2010, and will increase to 7.7% and 439 million adults by 2030.² India harbours the largest number of diabetic patients in the world. The International Diabetes Federation (IDF) reported that the total number of diabetic subjects in India is 41 million in 2006 and that this would rise to 70 million by the year 2025³. Increased prevalence in India is attributed to the lifestyle transition coupled with urbanization, industrialization.⁴ Diabetes is also a major risk factor for cardiovascular disease, stroke, and kidney failure.⁵

Self-care in diabetes is defined as behaviours undertaken by people with or at risk of diabetes in order to successfully manage the disease on their own⁶⁻¹¹. It is believed that appropriate patients knowledge of self-care is the key to achieving therapeutic goals in ambulatory care. Because the vast majority of day-to-day care in diabetes is handled by patients and/or families¹², there is an important need for reliable and valid measures for self-management of diabetes¹³⁻¹⁵. There have been very few studies addressing self-care practices in diabetics, far fewer in rural areas where people lack knowledge about the disease.

We, therefore, conducted a study in a General hospital in a rural area of Bangalore urban district to document the patterns of self-care practice among diabetic patients and study the factors associated with self-care practices in these diabetic patients.

Materials and Methods

Patients with Type 2 Diabetes Mellitus seeking care at a Taluk hospital Bangalore Urban District, Karnataka were interviewed in this cross sectional study. Total

participants of the study were 101 patients. Those diabetics who were seriously ill and unable to practice self-care were excluded from the study. A sample size of 92 was calculated using reported prevalence of 60% (Padma K et al²²) of adequate self-care practices, with 5% level of significance and 95% confidence interval with 10% of true estimate.

Data was collected from September to October 2014. Convenience sampling was used to recruit patients for this study. Ethical approval was obtained from the Institutional Ethics Review Board. Informed consent was obtained from each patient. The questionnaire was administered to each patient by one of the investigators.(authors 4)

The study questionnaire was adapted from The Summary of Diabetes Self-care Activities (SDSCA) Measure. The questionnaire captured the socio-demographic details, the medical history of the patient, the diabetic history in particular.

The questionnaire then assessed various domains of self-care using specific questions. A score of 8-10 was considered as good self care, 5-7 as moderate and 0-4 as poor self care practice. Adherence to medication was assessed using the Morisky Medication Adherence Scale-8 (MMAS-8).

A random blood sugar test (GRBS) test was done to each of the subjects at the time of interview. Patients with a GRBS of <180mg/dl were considered to be under glycaemic control. Fasting blood glucose value of 70-130 mg/dl and postprandial value of 180 was taken as cut off. Subjects were also asked whether they were under glycaemic control by virtue of previous GRBS testing done at the hospital.

Statistical analysis

Descriptive statistics are reported using frequencies and proportions. Pearson's Chi-square test, Pearson's correlation test, Independent samples t-test were used to find the association between the glycaemic control and the various domains of self-care and total self-care score and glycaemic control. The data were analysed using SPSS version 20. Level of significance less than 5% was considered as statistically significant.

Data were analysed to examine the factors associated with self-care practices in diabetic patients. Important close ended questions from each domain of self-care were chosen and assigned a score of 1 for the appropriate answer. The score from each domain was added up to get a total self-care score (maximum of 11). The subjects were then categorized into 3 groups based on their total self-care scores into poor (0 – 4), moderate (5 – 7) and good (8 – 11) self-care.

Results and Discussion

Of the 101 study subjects, 50 were males and 51 were females. Mean age was 57.72 years with SD of 11.046 with 60 (59.4%) subjects in the age group of 40-60 years. Most of the subjects i.e. 55(55.4%) were illiterate. 76(75.2%) subjects belonged to Class-V (modified BG Prasad classification 2014¹⁶) (table-1).

The mean age at diagnosis was 52.69 ± 10.38 yrs, with the mean duration of treatment being 4.97 ± 5.36 yrs. Out of the 101 subjects, 94(93.1%) were being treated with oral hypoglycaemic agents(OHA's).

Six domains of Self-care were carefully assessed in our study (Table 2) including diet, physical activity, blood sugar testing,

foot care, adherence to medications and regular follow up. We found that 71(70.2%) subjects reported to having received advice on healthy eating / diet plan of which 58(82%) subjects reportedly followed the advice given. Only 46(45.5%) subjects reported to engage in physical activity (at least 30 minutes of walking, 5 days a week or more). Males were found to be more physically active ($P < 0.01$) and subjects with better education showed higher physical activity levels ($P < 0.05$) (table-4). Most of the subjects i.e. 74 (73.26%) reported regular blood sugar testing(once in a month) from the time of diagnosis with subjects with better education showing higher rates of regular blood sugar testing as opposed to those with no formal education(table-4). Only 4% of subjects were aware of foot care and examined their feet at least once a week for

ulcer/cracks/cuts/blister/sores/redness/swelling. On assessment of MMAS scores, 59(58.4%) subjects showed good adherence to their medications (MMAS score of 8) (table-2). Only 59(58.4%) subjects were on regular follow-up for management of Type 2 Diabetes Mellitus. Males and subjects with higher per capita income were found to be on regular follow-up ($P < 0.01$) (table-4)

On evaluation of the glycaemic control of the subjects, of the 101 subjects interviewed, only 25(24.75%) subjects were under glycaemic control.

Various factors associated with glycaemic control were then analysed in our study. The study found that subjects who were given dietary advice had better glycaemic control ($P < 0.01$)(table-5.1). Out of the 25 subjects who were under glycaemic control, 24(96%) subjects underwent regular monitoring of blood glucose levels ($P < 0.01$) (table-5.4). We also found that out of 26(25.7%) subjects with a low adherence to

medications (MMAS score 0 – 5), 25(96.2%) subjects were not under glycaemic control (table-5.2), conversely patients under glycaemic control were found to have better adherence (17 out of 25 i.e. 68% with good adherence and 7 out of 25 i.e. 28% with moderate adherence, $P<0.01$).

When the total self-care score of the subjects was calculated (table-3), we found that only 9(8.9%) subjects had a good self-care score, where as 51(50.5%) subjects had a poor self-care score. Of the 9(8.9%) subjects with a good self-care score, 7(77.8%) subjects were under glycaemic control. Of the 51(50.5%) with a poor self-care score, 48(93.1%) were not under glycaemic control ($P<0.01$). We found that subjects with higher MMAS scores also had higher total self-care scores ($P<0.001$). Subjects with higher number of years of education were found to have better self-care scores ($P<0.001$).

From table 4 it is shown that higher level of physical activity is seen among males and those with better education. Regular blood sugar testing was seen in those with better education. Males and subjects with higher per capita income (PCI) were found to be on regular follow-up visits. Table 5.1 shows subjects who were given dietary advice had better glycaemic control.

Subjects who underwent regular blood glucose monitoring had better glycaemic control. Diabetes is a silent killer. Many patients become aware that they have diabetes only when they develop one of its life-threatening complications.¹⁷ Self-care in diabetes has been defined as an evolutionary process of development of knowledge or awareness by learning to survive with the complex nature of the diabetes in a social context.^{18, 19} There are seven essential self-care behaviours in people with diabetes which predict good outcomes. These are

healthy eating, being physically active, monitoring of blood sugar, compliant with medications, good problem-solving skills, healthy coping skills and risk-reduction behaviors.²⁰ Self-care encompasses not only performing these activities but also the interrelationships between them. All these seven behaviours have been found to be positively correlated with good glycaemic control, reduction of complications and improvement in quality of life.⁶⁻¹¹

In our study, we found that among self-care practices following dietary advice (58 out of 71, 82%) and regular blood sugar testing (74 out of 101, 73%) were found to be better adhered to, while, awareness about foot care (4 out of 101, 4%), higher physical activity score (45 out of 101, 45%) were poorly adhered to. Knowledge of diabetes mellitus can assist in early detection of the disease and reduce the incidence of complications. A meta-analysis of self-management education for adults with type 2 diabetes, reported self-management education improves glycaemic control at immediate follow-up, and increased contact time increases the effect.²¹ Diabetes self-care requires the patient to make many dietary and lifestyle modifications supplemented with the supportive role of healthcare staff for maintaining a higher level of self-confidence leading to a successful behaviour change.

Karam Padma, Samir D Bele et al.²² found following a controlled diet and compliance with drugs were significantly associated with the achieving glycaemic control which is similar to the findings in our study. Recent research has increased the emphasis on tight metabolic control as several large intervention studies have indicated maintaining good metabolic control can delay or prevent the progression of complications associated with diabetes.

Table.1 Socio demographic variables

Sl. No.	Variable	Category	Male (%)	Female (%)
1	Age (in Years)	20-40 41-60 >60	2(2) 27(26.7) 21(20.8)	3(3) 33(32.7) 15(14.8)
			Frequency	Percentage
2.	Education	Illiterate Up to High School PUC and above	56 39 6	55.4 38.6 5.9
3.	Occupation	Skilled Semiskilled Unskilled Retired Housewife	6 18 41 9 27	5.9 17.8 40.7 8.9 26.7
5.	Family type	3 generation Nuclear Joint Extended	40 52 7 2	39.6 51.5 6.9 2
6.	Financial dependence	Complete Partial None	31 28 42	31 27 42
7	Socioeconomic status(2014-ModifiedBG Prasad classification)	≥5570 2785-5569 1671-2784 835-1670 <835	0 2 5 18 76	0 2 5 17.8 75.2
8.	Habits	Smoking Non-smokers Alcohol Non-alcoholic	38 63 6 95	37.6 62.4 5.9 94.

Table.2 Domains of self-care

Domain	Frequency	percentage
Followed advise on diet	58	57.4
Physical activity	45	44.5
Regular blood sugar testing	73	72.3
Foot care	4	3.9
Adherence to medications		
0-5 (low)	26	25.7
6-7 (medium)	16	15.9
8 (good)	59	58.4
Regular follow up	58	58

Table.3 Total self-care score

Final Score	Frequency	%	
0 – 4 (Poor)	51	50.5	Mean – 4.82 SD – 1.8 Range – 2 – 10
5 – 7 (Moderate)	41	40.6	
8 – 11 (Good)	9	8.9	

Table.4 Factors associated with self care activity

Self-care activity	variables	P value
Physical activity	Gender	0.01
	Education	0.05
Regular blood sugar testing	Education	0.05
Regular follow up visits	Gender	0.01
	Per capita income	0.01

Table 5.1 Association between subjects who received dietary advice and their glycaemic control

		Glycaemic control			P-value
		No	Yes	Total	
Received dietary advice	No	28(93.3%)	2(6.7%)	30(100%)	<0.01
	Yes	48(67.6%)	23(32.4%)	71(100%)	
	Total	76	25	101	$\chi^2 - 7.495$

Table.5.2 Association between adherence levels and glycaemic control

MMAS	Glycaemic control		Total	P-value <0.01 $\chi^2 - 9.724$
	No	Yes		
Poor	25(96.2%)	1(3.8%)	26(100%)	
Moderate	9(56.2%)	7(43.8%)	16(100%)	
Good	42(71.2%)	17(28.8%)	59(100%)	

Table 5.3 Association between Total self-care scores and glycaemic control

Total Self Care Score	Glycaemic control		Total	P-value <0.01 $\chi^2 = 26.418$
	No	Yes		
0 – 4	48(93.1%)	3(5.9%)	51(100%)	
5 – 7	26(63.4%)	15(36.6%)	41(100%)	
8 – 11	2(22.2%)	7(77.8%)	9(1000%)	

Table 5.4 Association between subjects who underwent regular blood glucose monitoring and their glycaemic control

		Glycaemic control			
		No	Yes	Total	
Regular monitoring	No	26(96.3%)	1(3.7%)	27(100%)	Pvalue<0.01 X ² =8.766
	Yes	50(67.6%)	24(32.4%)	74(100%)	

In our study, we found males, persons who were better educated, and those with a higher per-capita income were largely found to have better self-care practices in most aspects. Chiou et al (2009)²³ also found that high income was correlated with high self-care ability. Chiou et al; Tang et al²⁴ and Xu and Pan²⁵ also found that higher educational attainment were associated with high level of physical activity, and regular glucose monitoring which was similar to our study.

Limitations of this study include first, the use of GRBS values to decide the glycaemic control. HBA1c value to determine blood sugar control was not used as most of the subjects could not afford the test. Second, our study was cross-sectional and a purely hospital-based study. Subjects included were those who attended the out-patient clinic at the hospital. There could be a larger population of diabetic patients in the community who haven't been to hospital for a follow-up visit, and with varying glycaemic control. Third, our sampling was convenience based. Fourth, social desirability bias existed while the subjects answered the questionnaire.

Conclusion

Overall, better self-care practices were found to be associated with good glycaemic control in this study. Among self-care practices, foot care was the self-care practice that was least adhered to.

Thus, it is important to create awareness about self-care, with emphasis on demonstration of foot care and examination of the foot.

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References

1. Park K: Textbook of Preventive and Social Medicine. 22nd edition. Jabalpur: BanarsidasBhanot; 2009:341.
2. Shaw JE, Sicree RA, Zimmet PZ. Global estimates of the prevalence of diabetes for and 2030. *Diabetes ResnClinPract* 2010; 87:4-14.
3. Sicree R, Shaw J, Zimmet P. Diabetes and impaired glucose tolerance. In: Gan D, editor. *Diabetes Atlas*. International Diabetes Federation. 3rd ed. Belgium: International Diabetes Federation; 2006 p. 15-103.
4. Ramachandran A, Snehalatha C, Baskar AD, Mary S, Kumar CK, Selvam S, et al. 3. Temporal changes in prevalence of diabetes and impaired glucose tolerance associated with lifestyle transition occurring in the rural population in India. *Diabetologia* 2004; 47:860-5.
5. National Diabetes Fact Sheet. American Diabetes Association Web site. Available at:

- <http://www.diabetes.org/diabetes-basics/statistics/>
6. American Association of Diabetes Educators: AADE7 Self-Care Behaviors. *Diabetes Educ* 2008, 34:445–449.
 7. Povey RC, Clark-Carter D: Diabetes and healthy eating: A systematic review of the literature. *Diabetes Educ* 2007, 33(6):931–959.
 8. Boule NG, Haddad E, Kenny GP, Wells GA, Sigal RJ: Effects of exercise on glycaemic control and body mass in type 2 diabetes mellitus: A met analysis of controlled clinical trials. *JAMA* 2001, 286(10):1218–1227.
 9. American Diabetes Association: Standards of Medical Care in Diabetes -2009. *Diabetes Care* 2009, 32(Suppl 1):S13–S61.
 10. Odegard PS, Capoccia K: Medication taking and diabetes: A systematic review of the literature. *Diabetes Educ* 2007, 33(6):1014–1029.
 11. Deakin T, McShane CE, Cade JE, Williams RD: Group based training for self-management strategies in people with type 2 diabetes mellitus. *Cochrane Database Syst Rev* 2005, 2:CD003417.
 12. Etzwiler DD: Diabetes translation: a blueprint for the future. *Diabetes Care* 1994, 17(Suppl. 1):1–4.
 13. Bradley C: *Handbook of Psychology and Diabetes*. Chur, Switzerland: Harwood Academic; 1994
 14. Johnson SB: Health behavior and health status: concepts, methods and applications. *J PediatrPsychol* 1994, 19(2):129–141
 15. McNabb WL: Adherence in diabetes: can we define it and can we measure it? *Diabetes Care* 1997, 20(2):215–218
 16. Dudala SR, Reddy KAK, Prabhu GR. Prasad's socio-economic status classification- An update for 2014. *Int J Res Health Sci* 2014 Jul 31;2(3):875-8. Available from <http://www.ijrhs.com/issues.php?val=Volume2&iss=Issue3>
 17. Wee HL, Ho HK, Li SC: Public Awareness of Diabetes Mellitus in Singapore. *Singapore Med J* 2002, 43(3):128–134.
 18. Cooper H, Booth K, Gill G: Patients' perspectives on diabetes health care education. *Health Educ Res* 2003, 18(2):191–206.
 19. Paterson B, Thorne S: Developmental evolution of expertise in diabetes self-management. *ClinNurs Res* 2000, 9(4):402–419.
 20. American Association of Diabetes Educators: AADE7 Self-Care Behaviors. *Diabetes Educ* 2008, 34:445–449.
 21. American Diabetes Association: Standards of Medical Care in Diabetes - 2009. *Diabetes Care* 2009, 32(Suppl 1):S13–S61
 22. Karam padma, samir d bele, trupti n bodhare, sameer valsangkar, evaluation of knowledge and self care practices in diabetic patients and their role in disease management: *National journal of community medicine* vol 3 issue 1 jan-march 2012
 23. Chiou, C; Bai, Y. & Chang, Y. (2009). Self-care behavior and related factors in older people with type 2 diabetes. *Journal of Clinical Nursing*, 18, 3308-3315.
 24. Tang, T; Anderson, R; Brown, M. & Funnell, M. (2008). Social support, quality of life, and self-care behaviors among African Americans with type 2 diabetes. *The Diabetes Educator*, 34(2), 266-276
 25. Xu, Y. & Pan, W. (2010). Self-management practices of Chines Americans with type 2 diabetes. *Nursing and Health Sciences*, 12, 228-234.