

An Epidemiological Study to Assess the Knowledge and Self Care Practices among Type 2 Diabetes Mellitus Patients Residing in Rural Areas of Tamil Nadu

Prateek Saurabh Shrivastava*, Saurabh Ram Bihari Lal Shrivastava and Jegadeesh Ramasamy

Department of Community Medicine, Shri Sathya Sai Medical College and Research Institute, Kancheepuram, India

Abstract

Background: Diabetes Mellitus is a major public health problem and is acknowledged as one of the leading cause of death and disability worldwide. So the present study was done with the objective of assessing the knowledge and self-care practices among diagnosed type 2 diabetes mellitus patients residing in rural areas of Tamil Nadu.

Methods: A cross-sectional descriptive study for a period of 3 months (October 2014 – December 2014) was conducted among diagnosed Type-2 Diabetes Mellitus patients attending outreach camps. The study subjects were selected based on their suitability with the inclusion and exclusion criteria. The total sample size was 143. Statistical analysis was done by using SPSS 19 software. Frequency distribution was calculated for all the socio-demographic variables.

Results: Majority of the subjects, 76.2%, 67.1%, 87.4%, had correct knowledge with regards to role of diet, exercise, smoking and alcohol, respectively, in diabetes. 72% subjects had strict drug compliance while only 29.3% subjects followed a favourable physical exercise schedule.

Conclusion: In conclusion, even though knowledge with regard to risk factors of type-2 diabetes mellitus was observed to be better among the patients, they were significantly lagging in terms of self-care practices in the same domains. Thus, there is a great need to provide periodic health education to the diagnosed patients so that this knowledge-application gap is narrowed down.

Keywords: Diabetes mellitus; Self-care; Physical activity; Smoking

Introduction

Diabetes Mellitus (DM) is a major public health problem, globally and is ever growing as an epidemic in both developed as well as developing nations [1,2]. In 2014, the global prevalence of diabetes was estimated to be 9% among adults aged above 18 years [3]. In India, the prevalence of Type 2 Diabetes Mellitus is reported to be the highest in the world with more than 28 million cases in 2007. It is also expected that it will further grow more rapidly in India than in any other country in the world with an estimated 60 million and 80 million people affected by DM by the years 2017 and 2030 respectively [4]. Recent surveys indicate that diabetes now affects a staggering 10-16% of urban population and 5-8% of rural population in India and Sri Lanka [5-7]. Even in countries like United Kingdom and Iran, the prevalence rate of diabetes was found to be 6% and 8.6% respectively [8,9]. DM is also recognized as one of the leading cause of death and disability worldwide [2].

The aetiology of diabetes is multi-factorial and both modifiable (like socioeconomic class, lifestyle, dietary habits, presence of obesity, etc.) and non-modifiable (such as genetic - Obesity-related genomic loci or genes determining lipid metabolism or polymorphism in the receptor and its co-activator, age of the individual, positive family history, etc.) parameters have been identified [10-15]. The physical, social and economic factors involved in the management of diabetes are a continuous strain for health sector as well as to Government Agencies. Findings of a study revealed that increasing patient knowledge regarding disease and its complications has significant benefits with regard to patient compliance to treatment and to decreasing complications associated with the disease [16]. Hence, the present study was conducted with the objective of assessing the knowledge and self-care practices among type 2 diabetes patients.

Materials and Methods

A cross-sectional descriptive study was conducted among diagnosed Type 2 Diabetes Mellitus patients attending outreach camps organized by Shri Sathya Sai Medical College and Research Institute. The study was conducted for a period of 3 months (October 2014 – December 2014). The study subjects were selected based on the following inclusion and exclusion criteria.

Inclusion criteria

- Known cases of type 2 diabetes mellitus, diagnosed at least 6 months back.
- Patients who were willing to give informed consent.

Exclusion criteria

- Newly diagnosed cases of type 2 diabetes mellitus or those

*Corresponding author: Dr. Prateek Saurabh Shrivastava, Department of Community Medicine, 3rd floor, Shri Sathya Sai Medical College and Research Institute, Ammapettai Village, Thirupporur - Guduvancherry Main Road, Sembakkam Post, Kancheepuram - 603108, Tamil Nadu, India, Tel: +919884227228; E-mail: prateekbobbhate@yahoo.co.in

Received April 16, 2015; Accepted May 30, 2015; Published June 06, 2015

Citation: Shrivastava PS, Shrivastava SR, Ramasamy J (2015) An Epidemiological Study to Assess the Knowledge and Self Care Practices among Type 2 Diabetes Mellitus Patients Residing in Rural Areas of Tamil Nadu. Biol Med S3: 002. doi: 10.4172/0974-8369.S3-002

Copyright: © 2015 Shrivastava PS, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

diagnosed within 6 months.

- b) Patients who were not willing to give informed consent.

A total of 167 patients diagnosed with type-2 diabetes mellitus were available as the study sample. Out of these 167 patients, 15 patients were newly diagnosed with type 2 DM and therefore excluded from the study. Also, 9 patients did not give consent for the study so they were also excluded from the study. Thus, a total of 143 study subjects were available as the final sample size. All the selected study subjects were interviewed face to face using a pretested semi-structured questionnaire after obtaining their informed consent. The questionnaire comprised of the following parts:

- i. Socio-demographic information (age, sex, education, occupation, income, etc.);
- ii. Knowledge regarding diabetes among subjects (nature of the disease, risk factors, mode of diagnosis, importance of diet, exercise and drug compliance, etc.); and
- iii. Self-care practices followed by them (testing blood sugar, lifestyle modification, compliance to the drugs, foot and eye care, etc.).

The subjects' knowledge and self-care practices regarding diabetes were scored using an arbitrary scoring system. Each correct response under knowledge attracted one point, whereas any wrong or don't know answer attracted no mark. Overall, total score of ten points was designed for assessing the knowledge of the study participants. For the final assessment of knowledge of the participants, subjects were categorized as having poor knowledge (0-4 points); fair knowledge (5-7 points) and good knowledge (8-10 points). Similarly, self-care practices of the subjects were also assessed based on eight domains with each correct practice securing one point with a total score of eight points. Self-care practice was also categorized into good practice (6-8 points), average practice (3-5 points) and below average practice (0-2 points).

Rapport was established with each of the participant in order to retrieve correct information. Socioeconomic status of the patient was calculated by using modified B.G. Prasad classification.

Operational definitions

4.3a: Type 2 diabetes mellitus: Defined as per guidelines proposed by Indian Council of Medical Research (ICMR) [fasting blood sugar (>125 mg/dL) and/or postprandial blood sugar (>200 mg/dL)] [17]. But individuals who were already under treatment with oral hypoglycemic agents/insulin were labelled as diabetic irrespective of their blood glucose status.

4.3b: Regular exercise: At least 30 minutes of brisk walking for 4 days or more in a week.

4.3c: Regular blood sugar testing: Every quarterly check-up of blood sugar.

4.3d: Treatment compliance: Daily consumption of medication as advised by the physician.

Statistical Analysis

Statistical analysis was done by using SPSS 19 software. Frequency distribution was calculated for all the socio-demographic variables.

Ethical considerations

Clearance from the Institutional Ethics Committee was obtained. Written informed consent was obtained from the study subjects before obtaining any information from them.

Results

Table 1 shows the baseline characteristics of the study subjects. Majority of the subjects, 51 (35.7%), were more than 60 years of age with the youngest subject being 29 years old and the eldest being 84 years of age. The study sample had a slight female preponderance, 56.7%. Most of the subjects were Hindus, 68.6% and married, 79%. Among the employed subjects, majority, 72.8% were working on daily wages while only 17% were engaged in sedentary lifestyle. About 42.6% subjects were on the higher side of normal on the body mass index scale.

Table 2 reveals the varied status of diabetes among the study participants. It was observed that as many as 79.5% of the subjects were diagnosed after the age of 40 years which suggests significant lack of appropriate screening methods being employed for early diagnosis of the disease. It also shows that hypertension was a common co-morbidity among 37.8% subjects.

Table 3 shows the knowledge and self-care practices among the study participants. It was observed that 79.8% of the subjects had correct knowledge about the hereditary nature of diabetes, even then as many as 70.7% also opined that consuming excess of sugar causes diabetes. Almost half of the subjects believed that diabetes can be cured. Majority of the subjects, 76.2%, 67.1%, 87.4%, had correct knowledge with regards to role of diet, exercise, smoking and alcohol, respectively, in diabetes. It was also observed that more than half the subjects, 54.5%, were of the opinion that anti-diabetic drugs can be stopped once the sugar levels are controlled. Few of the subjects 18.3% also agreed to the fact that if they forget any dose anytime, they take double the dose next time.

The table also reveals the self-care practices followed by the study participants. It was observed that only 29.3% subjects followed a favourable physical exercise schedule. With regards to medical adherence, majority of the subjects, 76.2% were getting their blood glucose levels checked regularly while, 72% subjects had strict drug compliance. While majority of the subjects, 82.5% agreed to be regularly wearing footwear only a meagre, 17.5% subjects took extra care of their feet.

Based on the arbitrary scoring system it was seen that 19 (13.3%) subjects observed good self-care practices while 53 (31.1%) and 71 (49.6%) subjects observed average and below average self-care practices respectively.

Table 4 depicts the association between socio-demographic parameters and knowledge about diabetes among the study subjects. It was observed that 33 (23.1%) subjects had good knowledge while 65 (45.4%) and 45 (31.5%) subjects had fair and poor knowledge about diabetes respectively. Significant association was observed between literacy and socio-economic status and knowledge regarding diabetes.

Discussion

The present study reveals that even though majority of the subjects (79.8%) were aware about the hereditary nature of type 2 diabetes mellitus, myth that excess consumption of sugar causes diabetes was highly prevalent (70.7%). In contrast to our findings, a study conducted in Warangal revealed that 63.5% of the participants correctly knew that there was no relation between excess sweet consumption and causation

Socio-demographic characteristics		Number	Percentage (%)
Age	21 – 30 years	4	2.8
	31 – 40 years	13	9.2
	41 – 50 years	37	25.8
	51 – 60 years	38	26.5
	>60 years	51	35.7
Sex	Male	62	43.3
	Female	81	56.7
Religion	Hindu	98	68.6
	Muslim	37	25.8
	Others	8	5.6
Marital status	Married	113	79
	Unmarried	9	6.3
	Others (divorcee/widow)	21	14.7
Literacy	Literate	63	44.1
	Illiterate	80	55.9
Socio-economic status	Upper	2	1.4
	Middle	92	64.3
	Lower	49	34.3
Occupation	Unemployed	78	54.5
	Employed	65	45.5
Body Mass Index	Underweight	8	5.6
	Normal	74	51.8
	Overweight	40	27.9
	Obese	21	14.7

Table 1: Socio-demographic characteristics of the study subjects.

Parameter	Number	Percentage (%)	
Age at diagnosis of diabetes	20 – 30 years	5	3.6
	30 – 40 years	24	16.9
	40 – 50 years	62	43.4
	50 – 60 years	49	34.3
	>60 years	4	2.8
Duration of diabetes	< 1 year	7	4.9
	1 – 5 years	61	42.7
	6 – 10 years	42	29.3
	>10 years	33	23.1
Associated co-morbidities	Hypertension	54	37.8
	Bronchial asthma	7	4.9
	Osteoarthritis of knee	25	17.5
	Others	4	2.8

Table 2: Status of Type 2 diabetes mellitus among the study participants.

of diabetes [18,19]. This could be because of more number of literate study subjects in the study done in Warangal.

In the present study, it was observed that majority of the subjects, 76.2% and 67.1%, was aware about beneficial effects of dietary modification and exercises in diabetes respectively as also 87.4%, were aware about adverse effects of smoking and alcohol. Similar results were also obtained in various other studies done in Andhra Pradesh, Gujarat and Karnataka, respectively [20-23].

The present study also depicted that about half the subjects had

Knowledge and self care practices related to type 2 diabetes mellitus		Correct (%)	Incorrect (%)	
Knowledge	Hereditary nature of disease	114 (79.8%)	29 (20.2%)	
	Can you cite any two symptoms of diabetes?	76 (53.1%)	67 (46.9%)	
	Does excess sugar intake lead to diabetes?	101 (70.7%)	42 (29.3%)	
	Diagnosis of diabetes	134 (93.7%)	9 (6.3%)	
	Can diabetes be cured?	83 (51%)	70 (49%)	
	Can dietary modification control diabetes?	109 (76.2%)	34 (23.8%)	
	Do smoking and alcohol play a role in diabetes causation?	125 (87.4%)	18 (12.6%)	
	Is exercise beneficial in control of diabetes	96 (67.1%)	47 (32.9%)	
	Can medication be discontinued once diabetes is controlled?	65 (45.5%)	78 (54.5%)	
	Can you cite any two complications of diabetes	43 (30%)	100 (70%)	
Practices		Yes	No	
Self care practices	Regular physical activity	42 (29.3%)	101 (70.7%)	
	Dietary control	78 (54.5%)	65 (45.5%)	
	Medical adherence	Regular blood sugar testing	109 (76.2%)	34 (23.8%)
		Drug compliance	103 (72%)	40 (28%)
	Extra care of foot	25 (17.5%)	118 (82.5%)	
	Use of footwear	118 (82.5%)	25 (17.5%)	
	Regular eye check up	1 (0.7%)	142 (99.3%)	
	Precautions while travelling	1 (0.7%)	142 (99.3%)	

Table 3: Knowledge and self care practices related to type 2 diabetes mellitus.

Socio-demographic factors		Good	Fair	Poor	P value
Sex	Male	18 (29%)	29 (46.8%)	15 (24.2%)	0.16
	Female	15 (18.5%)	36 (44.4%)	30 (37.1%)	
Literacy	Literate	29 (46%)	27 (42.9%)	7 (11.1%)	<0.001
	Illiterate	4 (5%)	38 (47.5%)	38 (47.5%)	
Socio-economic status	Upper	1 (50%)	1 (50%)	0	<0.001
	Middle	25 (27.2%)	53 (57.6%)	14 (15.2%)	
	Lower	7 (14.3%)	11 (22.4%)	31 (63.3%)	
Occupation	Unemployed	19 (24.4%)	35 (44.9%)	24 (30.7%)	0.9
	Employed	14 (21.5%)	30 (46.2%)	21 (32.3%)	
Total		33 (23.1%)	65 (45.4%)	45 (31.5%)	

Table 4: Socio-demographic factors influencing respondents' knowledge regarding diabetes.

incorrect knowledge about diabetes being a curable disease and hence, as many as 54.5%, believed that anti-diabetic drugs can be stopped once the sugar levels are controlled. Similar results were obtained in a study conducted in Andhra Pradesh [20]. The finding suggests need for adequate counselling of all diabetic patients not only at the time of diagnosis but time and again at each and every follow up visit in order to reinforce the importance of drug compliance.

Significant knowledge – application gap was observed in the present

study pertaining to physical activity - while 67.1% knew about benefits of regular physical activity, in reality, only 29.5% were practicing the same. Similar results were obtained in studies done in Warangal and Tiruchirappally [18,23].

In the present study, 72% subjects agreed to have strict drug compliance, similar to that observed in a study done in Uganda [24]. However, our results contradict the results of a study done in India which found 75% of the subjects to be non-adherent to drug management [25]. This difference could possibly be due to the fact that our patients were receiving free medical care and drugs whereas in the other study patients may have had to pay for their treatment. Also, in the current study, only 17.5% subjects took extra care of their feet in contrast to 56% subjects in a study conducted in Gujarat [20].

The current study had its limitations in the form that the sample size was not large enough to generalize the results to entire population. Also, only self-reported self-care practices were taken into consideration.

Conclusion

In conclusion, even though knowledge with regard to risk factors of type-2 diabetes mellitus was observed to be better among the patients, they were significantly lagging in terms of self-care practices in the same domains. Thus, there is a great need to provide periodic health education to the diagnosed patients so that this knowledge-application gap is narrowed down.

References

1. Zimmet PZ (1999) Diabetes epidemiology as a tool to trigger diabetes research and care. *Diabetologia* 42: 499-518.
2. Neelammakol, Manisha (2008) Diabetes an emerging health problem in India. *Health Action* 6:4-16.
3. World Health Organization (2012) Global status report on non-communicable diseases 2014. WHO press, Geneva.
4. World Health Organization (2013) Prevalence of diabetes, WHO, Geneva.
5. Wild S, Roglic G, Green A, Sicree R, King H (2004) Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care* 27: 1047-1053.
6. Pradeepa R, Mohan V (2002) The changing scenario of the diabetes epidemic: implications for India. *Indian J Med Res* 116: 121-132.
7. Katulanda P, Constantine GR, Mahesh JG, Sheriff R, Seneviratne RD, et al. (2008) Prevalence and projections of diabetes and pre-diabetes in adults in Sri Lanka--Sri Lanka Diabetes, Cardiovascular Study (SLDCS). *Diabet Med* 25: 1062-1069.
8. Diabetes UK (2014) Diabetes Facts and Stats.
9. Majeed A, El-Sayed AA, Khoja T, Alshamsan R, Millett C, et al. (2014) Diabetes in the Middle-East and North Africa: an update. *Diabetes Res Clin Pract* 103: 218-222.
10. Shrivastava SR, Ghorpade AG (2014) High prevalence of type 2 diabetes mellitus and its risk factors among the rural population of Pondicherry, South India. *J Res Health Sci* 14: 258-263.
11. Kong X, Zhang X, Zhao Q, He J, Chen L, et al. (2014) Obesity-related genomic loci are associated with type 2 diabetes in a Han Chinese population. *PLoS One* 9: e104486.
12. Starčević JN, Petrović D (2013) Carotid intima media-thickness and genes involved in lipid metabolism in diabetic patients using statins--a pathway toward personalized medicine. *Cardiovasc Hematol Agents Med Chem* 11: 3-8.
13. Chang YC, Liu PH, Yu YH, Kuo SS, Chang TJ, et al. (2014) Validation of type 2 diabetes risk variants identified by genome-wide association studies in Han Chinese population: a replication study and meta-analysis. *PLoS One* 9: e95045.
14. Kruzliak P, Haley AP, Starcevic JN, Gaspar L, et al. (2015) Polymorphisms of the peroxisome proliferator-activated receptor- γ (rs1801282) and its coactivator-1 (rs8192673) are associated with obesity indexes in subjects with type 2 diabetes mellitus. *Cardiovasc Diabetol* 14: 42.
15. Kunej T, Globocnik Petrovic M, Dovc P, Peterlin B, Petrovic D (2004) A Gly482Ser polymorphism of the peroxisome proliferator-activated receptor-gamma coactivator-1 (PGC-1) gene is associated with type 2 diabetes in Caucasians. *Folia Biol (Praha)* 50: 157-158.
16. Gulabani M, John M, Isaac R (2008) Knowledge of diabetes, its treatment and complications amongst diabetic patients in a tertiary care hospital. *Indian J Community Med* 33: 204-206.
17. Indian Council of Medical Research (2005) Guidelines for management of type 2 diabetes. Indian Council of Medical Research, New Delhi, India.
18. Thungathurthi S, Thungathurthi S, Kumar VG (2012) Self care knowledge on diabetes among diabetic patients in Warangal region. *Inter J Life Sci Pharma Res* 2: 16-21.
19. Padma K, Bele SD, Bodhare TN, Valsangkar S (2012) Evaluation of knowledge and self care practices in diabetic patients and their role in disease management. *Nat J Com Med* 3:3-6.
20. Shah VN, Kamdar PK, Shah N (2009) Assessing the knowledge, attitudes and practice of type 2 diabetes among patients of Saurashtra region, Gujarat. *Int J Diabetes Dev Ctries* 29: 118-122.
21. Priyanka CK, Angadi MM (2010) Hospital-based KAP study on Diabetes in Bijapur, Karnataka. *Indian J Med Specialties* 1:80-83.
22. Mohan D, Raj D, Shanthirani CS, Datta M, Unwin NC, et al. (2005) Awareness and knowledge of diabetes in Chennai--the Chennai Urban Rural Epidemiology Study [CURES-9]. *J Assoc Physicians India* 53: 283-287.
23. Shankar PS, Ramya N (2011) Non-adherence to diabetic treatment and its effect on glycaemic control, study at a rural hospital of Tiruchirappalli, Tamilnadu, India. *The Internet J Health*. 2:1-3.
24. Kalyango JN, Owino E, Nambuya AP (2008) Non-adherence to diabetes treatment at Mulago Hospital in Uganda: prevalence and associated factors. *Afr Health Sci* 8: 67-73.
25. Shobhana R, Begum R, Snehalatha C, Vijay V, Ramachandran A (1999) Patients' adherence to diabetes treatment. *J Assoc Physicians India* 47: 1173-1175.

This article was originally published in a special issue, [Human Biology and Education](#) handled by Editor. Saurabh Ram Bihari Lal Shrivastava, Shri Sathya Sai Medical College and Research Institute, India